



UNC  
COLLEGE OF  
ARTS & SCIENCES

THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

DEPARTMENT of CITY and REGIONAL PLANNING

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February 20, 2015

Stephanie Schmitt  
Associate Dean for Academics  
Graduate School  
200 Bynum Hall, CB 4010

Dear Stephanie:

I strongly support the creation of the Graduate Certificate Program in the Study of Natural Hazards and Disasters. The Department of City and Regional Planning (DCRP) has a long history of nationally recognized faculty that have studied natural hazards, their effects on human settlements, and ways to reduce the impacts of disasters. The ability to draw on this wealth of knowledge will offer an opportunity for faculty to further explore joint research and teaching possibilities with those in the Curriculum for Environment and Ecology, the Law School, Marine Science, and other departments across campus. This collaborative, multi-disciplinary approach will also strengthen the certificate program's ability to transfer this knowledge to students through classroom and field-based experiences.

We are pleased to report that these collaborative benefits are already occurring. For instance, 10 of our graduate students that have been involved in research conducted jointly by the UNC Coastal Hazards Center and DCRP faculty have been hired in this area of study. As the certificate program is established, we believe that the number of city and regional planning students hired in this field will continue to grow.

Since some of the core courses and electives identified in the certificate represent existing courses offered by DCRP, we also realize that this represents a great opportunity to expose more students at UNCCH to the importance of city and regional planning. In addition to committing to teach core courses, one member of the Department of City and Regional Planning will be identified to serve on the certificate program's coordination committee.

We look forward to being part of this important program by helping students see the important role that planning can play in the study and practice of natural hazards and disasters.

Please let me know if you have any questions.

Sincerely,

Roberto G. Quercia  
Trudier Harris Distinguished Professor and Chair

# University of North Carolina at Chapel Hill

## Certificate Program Application Form

*Please use this application form as a guide for your Certificate Program proposal.*

**Name of Proposed Certificate Program:** Graduate Certificate in the Study of Natural Hazards and Disasters

**Sponsoring Academic Unit:** Department of City and Regional Planning

**Administering Unit, if different:**

**Primary Contact Name:** Gavin Smith

**Address and CB #:** 100 Europa Drive, Suite 540, CB 7581, Chapel Hill NC 27517

**Phone Number:** 919 606-5578      **Email:** gavin\_smith@unc.edu

**First Term the Certificate Would be Offered:** Fall 2015

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### **1. Describe the Certificate Program and provide a statement of educational objectives.**

The UNC Department of Homeland Security-Coastal Hazards Center of Excellence (“Coastal Hazards Center”)<sup>1</sup> and the Department of City and Regional Planning propose to create a certificate program focused on the study of natural hazards and disasters. Collaborative partners include: the Department of Marine Science, the Law School, the Department of Geological Sciences, the Department of Public Policy, School of Government, the Curriculum for Environment and Ecology, and the Center for Public Service, all of which are located at UNCCH. More specifically, this certificate program will focus 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. The curriculum will provide 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. The certificate program is designed to serve enrolled graduate students only 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 Coastal Hazards Center, we believe the certificate program will provide a significant enhancement to participating students’ graduate education and competitiveness on the job market.

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<sup>1</sup> The Coastal Hazards Center has procured funds for minor administrative costs (e.g. part-time administrative assistance, future course development). A six-year grant led to the creation of the Coastal Hazards Center, located at the University of North Carolina at Chapel Hill. Certificate funding is discussed in more detail in response to question # 11.

***Completed and approved applications should be submitted to:***  
Stephanie Schmitt, Associate Dean for Academics, [sschmitt@email.unc.edu](mailto:sschmitt@email.unc.edu)

*Updated: July 20, 2010*

## Educational Objectives:

- 1) Provide students with the knowledge and experience needed to actively contribute to the study and/or the practice of natural hazards and disaster management. More specifically, the certificate will help to produce well-trained researchers and practitioners who can help the public, non-profit and private sectors cope with natural hazards and disasters and adapt to the effects of a changing climate.
- 2) Attract and teach the next generation of natural hazards and disaster management scholars that are more reflective of the general population. In the case of disaster management, for instance, the field is less diverse than the general population, while those who study and engage in the practice of climate change adaptation comprise a relatively new cohort that is in need of additional scholars and policymakers. As such, the certificate program will strive to be inclusive, as reflected in participation by underrepresented minorities, women, and a mix of students with academic and practice-based career goals.
- 3) Coalesce the world class UNCCH faculty to address one of the most pressing issues of the 21st century, namely reducing the negative effects of natural hazards and disasters on human settlements, including those influenced by a changing climate.
- 4) Develop an “esprit de corps” among students through the establishment of applied group projects in the classroom, engagement in research with participating faculty, formation of a student association, and exposure to leaders in the field through mentoring programs, a certificate program lecture series, workshops and fieldwork.

The certificate program will achieve these objectives by focusing on four key areas:

- 1) **Gaining a greater understanding of the link between the state of our natural environment and the effects of natural hazards and disasters on human settlements.** Achieving this aim will require drawing on UNCCH faculty who focus on the physical sciences, including for instance, those located in the Department of Geological Sciences, the Department of Marine Sciences, the Curriculum for Environment and Ecology, the Department of City and Regional Planning, and the Institute for the Environment.
- 2) **Gaining a greater understanding of the management of natural hazards and disasters, including how nations, cities, communities, and organizations prepare for, respond to, mitigate against, and recover from extreme events.** Areas of study will include how these institutions and larger governance frameworks assist or hinder the ability of human settlements to adapt to the exacerbation of natural hazards and disasters in the face of a changing climate. Faculty drawn from the UNCCH Department of City and Regional Planning, the Curriculum for Environment and Ecology, the Law School, the School of Government, and others will play a role in this area. In addition, faculty from the North Carolina State University’s School of Public Administration (e.g., Tom Birkland) will support the certificate program by teaching a class on Disasters and Public Policy and provide class lectures in other courses when available.

- 3) **Growing the next generations of natural hazards and disasters scholars and practitioners.** Achieving this aim will involve the active recruitment of promising students as well as UNCCH faculty interested in teaching and mentoring future scholars and practitioners. The certificate program will also help to prepare graduates for careers in this growing field through hands-on learning opportunities and through interactions with practitioners in the classroom, a certificate lecture series, and in the field before and after disasters.
- 4) **Emphasizing the translation of knowledge generation to practice through applied research and experiential educational opportunities for students participating in the certificate program.** An important part of the certificate program involves developing curricula that emphasizes the application of knowledge generated through research and the degree to which this information is utilized by varied stakeholders in practice. This will be demonstrated through case study review, plan evaluation, model development and application, policy analysis, and other techniques. Classroom examples will be supplemented by fieldwork, summer internships, and regular interactions with policy makers and other practitioners drawn from international, federal, state, and local officials; scientists; non-profit and corporate organizations; and others as identified. For instance, we will be working with the Carolina Center for Public Services' Community Engagement Fellowship which is a competitive grant that provides funding to graduate students to develop an individual or team project in response to a community need.

**2. Include a statement about the need for such a Certificate Program, and specifically why there is a need to offer this Certificate at UNC-Chapel Hill. Is the Certificate offered at other universities or community colleges?**

The study of natural hazards and disasters, including those exacerbated by a changing climate, and translation of these findings to practice is becoming increasingly important. Disaster losses continue to rise at an exponential rate in the United States and across the world. With the advent of climate change, one of the most troubling manifestations of this change is an increase in the extent, duration, and intensity of natural hazards and disasters. Examples include more frequent flooding, droughts, extreme heat, wildfire, and hurricane-induced damages. In addition, direct climate change impacts are resulting in rising sea levels, increased flooding of low lying lands, and subsidence in arctic environments. The effects of a changing climate are particularly devastating to coastal communities, which comprise a disproportionate amount of the world's population. In the United States, for instance, more than 50% of the nation's population lives within 50 miles of the coast.

The Department of Homeland Security's Science and Technology Directorate, Office of University Programs (funder of the Coastal Hazards Center), 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 Department of Homeland Security's Science and Technology Directorate, Office of University Programs has expressed support for increased training in natural hazards and disasters by funding two courses (one taught three times in the Fall of 2012, 2013 and 2014 and one developed and being taught in the Spring of 2015) through the Coastal Hazards Center, and providing resources to help develop this certificate program proposal. In addition, DHS has

awarded the CHC a Career Development Grant that provides graduate students a \$25,000 annual stipend plus tuition and fees, an internship, and funds to attend one DHS-sponsored conference. Eligible grant recipients must be enrolled as a students in either the Department of City and Regional Planning, Marine Science, or a related field and agree to study natural hazards. The Coastal Hazards Center will continue to seek funding from DHS and other sources to support the certificate program.

The National Research Council reports, *Facing Hazards and Disasters: Understanding Human Dimensions* (2006) and *Adapting to the Impacts of Climate Change* (2010) describe the need to: 1) foster collaborative multi-disciplinary research, 2) encourage expanded teaching efforts, and 3) more effectively translate research to practice. With the increasing recognition of the interconnectedness between natural hazards, disasters, and climate change, *Adapting to the Impacts of Climate Change* emphasizes the creation of learning environments that help to unpack and act on these intertwined issues.

The National Science Foundation has developed the Next Generation Project targeting promising junior faculty members who have not yet crafted a research agenda and encouraging them to pursue a career in the study of natural hazards and disasters. The first three cohorts of junior faculty that participated in the program were led by senior researchers at the University of North Carolina (Raymond Burby-Department of City and Regional Planning), North Carolina State University (Tom Birkland-School of Public Administration), and Texas A&M University (Dennis Wenger-Department of Urban and Regional Planning).<sup>2</sup> All three of these researchers have participated in policy initiatives, joint research, and annual meetings associated with the Coastal Hazards Center. The relationships developed with these senior researchers provides a unique platform to talk with them about specific ways the certificate program can serve as a conduit to identify and develop junior faculty interested in the increasingly interconnected fields of natural hazards, disasters and climate change while helping to educate students who have decided that this is a discipline worthy of pursuing as a professional career.

Other universities offer a certificate program in the study of natural hazards and disasters, although most are discipline-specific rather than multi-disciplinary and few have effectively linked such a program to the exacerbating effects of climate change, including sea level rise, the increase in heavy precipitation, more intense coastal storms (including hurricanes), droughts, wildfire, and extreme heat expected in areas where the design of human settlements reflect past climactic conditions. The approach proposed here will advance the still emerging link between climate change adaptation and disaster management and draw on the expertise of UNCCH faculty across the physical and social sciences as well as planning and policy making as evidenced by the groups who are proposing to participate in this certificate program.

While there is an existing certificate program offered by the UNCCH School of Public Health for practicing professionals, the Community Preparedness and Disaster Management (CPDM) Certificate is very different from the proposed Graduate Certificate in the Study of Natural Hazards and Disasters in a number of ways. First the proposed Graduate Certificate in the Study of Natural Hazards and Disasters targets UNCCH graduate students whereas the CPDM is focused on mid-career emergency management professionals and does not require a degree to enroll in the program. Second, the CPDM is primarily an on-line curriculum whereas the Graduate Certificate in the Study of Natural Hazards and Disasters employs a traditional

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<sup>2</sup> Dr. Dennis Wenger currently serves as program director for Infrastructure Systems Management and Extreme Events at the National Science Foundation.

graduate level classroom-based lecture format. Third, the Graduate Certificate in the Study of Natural Hazards and Disasters provides a broader view of issues surrounding natural hazards and disasters rather than a more narrow focus on emergency management. The Graduate Certificate in the Study of Natural Hazards and Disasters will explore collaborative options with CPDM to include the joint provision of guest lectures and the potential acceptance of CPDM graduates into the Graduate Certificate Program if they have been accepted into a UNCCCH graduate program. Potential collaborative actions with the School of Public Health will include exploring the incorporation of graduate courses taught by faculty in the School of Public Health into the Graduate Certificate in the Study of Natural Hazards and Disasters and Public Health faculty serving as guest lecturers in existing certificate courses, including the lecture series.

The activities of the Coastal Hazards Center over the past 5 years have helped identify needs and opportunities for the proposed graduate certificate program at UNC. These include:

- 1) **The demand for knowledgeable graduates in the field as evidenced by the rapid hiring of students that have been employed through Coastal Hazards Center-sponsored research in the study of natural hazards and disasters.** One of the research projects funded through the Coastal Hazards Center and led by the Department of City and Regional Planning faculty has supported ten students over the life of the project, all of whom have found jobs in the field, many prior to graduation. An explicit benefit of the certificate program is to introduce students to potential employers through a Speaker Series, internships and fieldwork, and classroom lectures involving individuals drawn from outside the university.
- 2) **A desire of Coastal Hazards Center management to strengthen the reach of center activities through the expanded involvement of UNCCCH faculty that are not presently associated with the center, including those that study geophysical processes, environmental and social science phenomena as well as law and policy.** The certificate program provides an excellent venue to connect those that study natural hazards phenomena (e.g. hurricanes, storm surge, floods, earthquakes, etc.) as well as those that study disasters (e.g. the intersection of natural hazards and society) through joint teaching, multi-disciplinary research proposals, and the exposure of students from different fields of study engaged in team-based classroom projects and a proposed student association.
- 3) **A growing level of interest among students, many of whom have expressed their desire for more multi-disciplinary courses on natural hazards, disasters, and climate change.** Students at UNCCCH, like many others across the country are becoming increasingly interested in the study of natural hazards and disasters, including their link to climate change. Drawing on the rich history and knowledge base associated with how and why societies address natural hazards using a variety of proactive and reactive measures tied to hazard risk reduction and disaster recovery following extreme events provides tangible lessons for students who seek to better understand how societies can adapt to a changing climate. In addition, understanding the physical science behind both natural hazards and climate change provides an important base of knowledge upon which to understand the causes and consequences of these events and the still emerging understanding of how natural hazards and climate change are interconnected.

In addition, the presence of multiple strong, contributing departments that can be efficiently leveraged in support of a graduate certificate program provides a compelling reason to pursue this initiative at UNC.

**3. Describe the demographics of the target student population for the Certificate Program. Double click each box that applies and describe the intended audience.**

- Undergraduate Students
- Graduate Students
- Professional Students: \_\_\_\_\_
- Degree-seeking, Matriculated Students
- Non-Degree-Seeking Students

The certificate program is intended to appeal to graduate students from a wide range of disciplines and as such is open to all graduate students that meet entrance requirements and the approval of their faculty supervisor and/or departmental chair. We will purposefully pursue the development of a diverse student population to strengthen the exchange of ideas and disciplinary perspectives as this emerging field is highly interdisciplinary in nature and will rely on future graduates that possess broad perspectives and are able to work with multi-disciplinary teams to solve a range of complex interrelated problems that benefit from an exposure to both policy and science. It is also important to note that more minority researchers and practitioners are needed in part because they can help advance hazard risk reduction in minority communities, which tend to be the most vulnerable to hazards and disasters. In order to accomplish this aim the certificate committee will target recruiting efforts over time with Minority Serving Institutions as well as minority students and women in existing programs across campus. Overall, a marketing and outreach campaign will be developed and led by the Coastal Hazards Center with help from the other participating academic departments at UNCCH.

Priority will be given to UNCCH graduate students enrolled in the Department of City and Regional Planning, the Department of Marine Sciences, the Department of Geological Sciences, Curriculum for Environment and Ecology, and the Law School if the campus-wide demand exceeds enrollment numbers set by the certificate program coordination committee.

**4. Why is the Certificate Program necessary beyond offering the program as a minor, supporting area, or specialization/concentration/track?**

The certificate program is intended to offer a recognized value in the field as evidenced by an increased emphasis on professional training and certification among individuals and organizations. The continued rise in disaster-related losses has led to an increase in the study of this phenomenon and a demand for graduates who possess an understanding of natural hazards and disasters, including a balanced knowledge base derived from work in the classroom and in the field.

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).

The certificate program is also designed to help foster an “esprit de corps” among student cohorts. This will be accomplished through: 1) classroom participation in team projects and presentations, 2) interactions with professional practitioners and researchers through a lecture series and possible capstone work, 3) the development of multi-disciplinary research projects, and 4) the potential formation of a student association comprised of certificate program members. The certificate program will also serve to bring together faculty on campus with similar interests as this will help students identify mentors and faculty with whom they may engage in research and engagement activities.

A certificate program, led by a nationally recognized university like the University of North Carolina at Chapel Hill, would be highly attractive to prospective students who sought to pursue a career as a practitioner, academic or combination thereof.

**5. Provide specific courses and other requirements for the Certificate Program. Separate listings of courses may be included with the proposal.**

The certificate program includes: 1) two core course, 2) one elective, and 3) a 1 hour lecture series course. The certificate program includes two required 3 hour courses titled “Survey of Natural Hazards and Disasters” (housed in the Department of City and Regional Planning, taught in the Spring of 2015) and “Planning for Natural Hazards and Climate Change Adaptation” (housed in the Department of City and Regional Planning, taught in the Fall of 2012, 2013, and 2014). The required 1 hour lecture series course is also housed in the Department of City and Regional Planning.

**Core Course I: Survey of Natural Hazards and Disasters (3).** The course involves a two-part study of natural hazards and disasters. The first half of the course includes an exposure to the physical processes associated with geological, meteorological, hydrological, oceanographic, and climatological hazards. The second half of the course will focus on disaster management, including topical areas spanning engineering, social science, planning, policy, and hazards analysis. Disaster-based case studies are used to help students understand the connectivity of key concepts.

**Core Course II: PLAN 590 Planning for Natural Hazards and Climate Change Adaptation (3).** This course (taught as PLAN 590 in the past, awaiting registrar’s permanent number) applies planning principles and practices to the field of natural hazards risk management, including climate change adaptation. Topical areas include an introduction to planning, plan quality analysis, and the study of hazard mitigation, disaster recovery and their connectivity to climate change adaptation.

**Elective Courses:** Students may choose one additional 3-hour elective course from the list provided under the heading “recommended elective courses.” Students may also choose an elective from across the larger UNCCH course offerings in consultation with their program advisor and approval by the certificate committee. The elective courses included in this submission are not intended to represent a comprehensive list but rather a sampling of potential options. In future years, the Coastal Hazards Center will pursue funding to offer additional courses proposed by faculty. A student may choose to pursue a capstone project as an elective subject to the approval of their advisor and the availability of instructional faculty.



**Lecture Series:** This one-credit requirement is intended to expose students to a range of scholars and practitioners in the field and help foster an esprit de corps among those pursuing the certificate. It is also intended to publicize the certificate program across campus by introducing prospective students and interested faculty to a range of topical issues. The Certificate Program committee will co-host speakers with other departments and organizations across campus as a way to further publicize and develop interest in the program. Examples of those that have expressed interest include the Department of City and Regional Planning, Coastal Hazards Center, the Carolina Seminars Program, and the Center for Urban and Regional Studies.

Invited practitioners and scholars will discuss a range of pertinent topics, including research and experience in practice tied to natural hazards, disasters, and climate change adaptation. Speakers may include officials from federal, state, and local jurisdictional jurisdictions as well as the international arena; scholars from pertinent fields of study, including the physical and social scientists; private sector representatives, including corporations, insurance officials, developers, and consultants; members of the media; politicians; environmental and social justice advocates; community leaders; members of various professional associations; and others as identified. Students participating in the certificate program will be required to attend each lecture, draft a one-page overview of the presentation, and participate in a group discussion with the class instructor.

**Capstone Options:** Subject to the availability of instructors, students have the option of fulfilling the 3 hour course elective requirement by completing one of the two options listed below. Students will register for the capstone/practicum through the Department of City and Regional Planning or other venue as identified. In all cases, a faculty member will be identified as the instructor of record and responsible for ensuring the student meets the requirements established, including attending regular meetings/conversations and the writing of a 15 page report (option 1 or 2 only) summarizing their fieldwork or the summer student internship option. Lessons will be drawn from existing capstones delivered through the Institute for the Environment, including the importance of identifying faculty and staff able to administer the program, identifying appropriate topical areas, developing a clear problem to be analyzed, linking issues to a student's area of study, outlining the steps involved in the process, and developing sign-off procedures from all faculty and staff members involved in the process.

Capstone courses fall under independent studies rules and as such will be governed by their procedures (see information on the Office of the University Registrar's website under the title "UPM #30 Independent Study Policy" at <http://registrar.unc.edu/academic-services/policies-procedures/university-policy-memorandums/independent-study-policy>).

A learning contract (akin to a syllabus) will be developed between the student and the faculty member. The contract will include the learning objectives; the number of hours per week of work expected from the student; the number of required meetings between the instructor and student during the term; reading and writing assignments and due dates for them; assessment information specifying how the final grade will be determined; a brief work plan; and any other related information that specifies the conditions under which the student would get the credits.

UNCCH has adopted the Federal Definition of a Credit Hour, which requires a minimum of 750 minutes (12.5 hours) of instructional contact time for one hour of course credit; 2250 minutes (37.5 hours) are required for a three-credit course. Though a precise number of contact minutes does not apply to independent study courses, instructors should meet periodically with students throughout the semester. Students should expect to devote a minimum of three hours each week

for each credit hour of independent study, or at least nine hours per week for a three-credit independent study course.

The number of students a faculty member may supervise in an independent study course during a semester or summer session should be restricted to no more than two students.

Each unit must have a process in place for reviewing and approving the learning contracts, which should remain on file in the unit for a minimum of four years. If the learning contract is between a student and the chair of a unit, the contract must be approved by the chair's dean.

Registration for an independent study course must be completed after the learning contract has been approved and no later than the last day of "late registration" (the end of the first week of classes in a fall or spring semester or the equivalent date in each summer session).

**Option 1: Fieldwork.** If the fieldwork option is chosen, students will participate in a hands-on learning experience associated with an identified topic. Examples may include the collection of pre- or post-disaster data, assisting practitioners in the aftermath of an extreme event, or assisting communities develop response, hazard mitigation, disaster recovery or climate change adaptation plans. Students, in partnership with their faculty advisor, are expected to identify an individual(s) at the field site in which they will be working to assist them achieve the intent of the research/data collection project. The Executive Director of the Coastal Hazards Center has a wide range of contacts among practitioners and policymakers as well as academics working in this field and will assist faculty advisors and students identify appropriate fieldwork and summer internship opportunities. An additional opportunity includes identifying prospects through the Carolina Center for Public Service at UNCCCH, which regularly coordinates volunteer assistance following major disasters. This may allow for students to volunteer following disasters and receive credit through the capstone requirement. The possible identification of volunteer activities through the Carolina Center for Public Service must be approved by the student's faculty advisor in order to meet the intent of the fieldwork option. The Director, Lynn Blanchard has agreed to assist in this effort and serve on the certificate program committee.

**Option 2: Summer Student Internship/Externship.** If the internship/externship option is chosen, students will work with a private, public or non-profit organization involved in the field of natural hazards, disasters and/or climate change adaptation. Students, in partnership with their faculty advisor, are expected to identify an individual(s) at the student internship site in which they will be working to mentor them, and provide a tangible assignment or project that can be completed in the internship period. For instance, the certificate committee will encourage students to apply to FEMA's student internship program in both Region IV (the Southeastern US) as well as FEMA National offices in Washington, D.C. Additional opportunities may also arise as part of future disaster declarations and established relationships with FEMA disaster assistance employees. In addition, the Executive Director of the Coastal Hazards Center will seek to facilitate an internship program with the North Carolina Division of Emergency Management, drawing on relationships established while employed there as an Assistant Director. This may involve working on identified projects, assisting during disaster activations in the Emergency Operations Center, or working in the Disaster Field Office following major disasters. Initial discussions have been held with several private sector firms regarding possible internships as well.

## **Elective Courses**

The following courses listed below are drawn from existing UNCCCH curricula and may serve as a student's one elective incumbent on the approval of the Certificate Program Coordinating Committee. In some cases students must meet class prerequisites and/or approval by the faculty member that is teaching the course prior to admission. The course offerings noted here are not intended to serve as a comprehensive list of elective options. Other courses may be identified in consultation with the Certificate Coordinating Committee, including a special topics course.

**GEOG 811 Climate Change (3).** This seminar is focused on the climate change “consensus” document: the 2013/2014 Intergovernmental Panel on Climate Change Assessment Report #5 (IPCC AR5) (<http://www.ipcc.ch/report/ar5/index.shtml>). This document has multiple parts that are being released over 2013/2014: Working Group I (2013): The Physical Science Basis; Working Group II (2014): Impacts, Adaptation and Vulnerability; and Working Group III (2014): Mitigation of Climate Change.

**GEOL 508 Hydroclimatology (3).** Prerequisites, GEOL 101 or 110, MATH 231, PHYS 105. Permission of the instructor for students lacking the prerequisites. An introduction to methodologies and instrumentation for quantifying the movement of water in the earth system focusing on components of the hydrologic cycle. Emphasis is divided between analytical aspects and field procedures.

**GEOL 522 Physical Volcanology (3).** Required preparation, introductory courses in geology and physics. Course is aimed at understanding the physical properties and processes controlling volcanism and magma transport. Topics covered include volcanic processes from the formation of magma in the upper mantle to violent eruption at the surface. Emphasizes dynamic processes and underlying mechanisms.

**GEOL 807 Physics of Earthquakes (3).** Prerequisites, MATH 524 and PHYS 211. Permission of the instructor for students lacking the prerequisites. The earthquake source. Description. Moment tensor. Developments in the mathematical theory of seismic sources. Radiation patterns. Earthquake mechanisms and plate tectonics. Synthetic seismograms. Seismicity and self-organized criticality.

**GEOL 710 Advanced Coastal Environmental Change (3).** Prerequisites, GEOL 417, 430, 502, 503. Permission of the instructor for students lacking the prerequisites. Focuses on biological-physical couplings that shape coastal environments (i.e. coastal 'ecomorphodynamics') and determine how these environments change with climate and land use. Environments include: barrier islands, open ocean coastlines, and tidal wetlands.

**ENEC 530 Principles of Climate Modeling: Applications to the Study of Climate Change (3).** Prerequisites: Calculus and physics, at least one year of each. This is a graduate level class. Some familiarity with ordinary differential equations is needed as well as experience with Matlab and /or Mathematica/Maple. Objectives: Develop explanatory and predictive models of the earth's climate. The level is introductory and focused on modeling past climate with the hope of understanding its future. A thorough discussion of current global warming/climate change issues, including the science, the history and the controversy, is planned for the second half of the course.

**LAW 262 Ocean and Coastal Law (3).** Over the next decade, North Carolina will be confronting a number of emerging ocean and coastal policy issues. Among the policy issues are those relating to the siting of oil, gas, and alternative energy facilities and equipment in coastal or ocean waters, the privatization of public waters, the impact of rising sea levels upon ocean beaches and estuarine shorelines, beach nourishment and shoreline protection, development setback lines, the use of ocean outfalls to dispose of wastewater, and the future role of the Coastal Resources Commission. We will examine these and other emerging policy issues and the governing state and federal legal regime.

**MASC 506 Physical Oceanography (GEOL 506) (4).** Prerequisites, Math 231, 232, PHYS 104, 105, or permission. Descriptive regional oceanography, equations of motion, the Ekman layer, wind-driven currents, thermohaline circulation modern observations, waves, and tides.

**PLAN/ENEC 641: Ecology and Land Use Planning (3)** This course focuses on understanding the functions of ecosystems, how land development activities impact such functions, and how land use management tools can be used to create mitigation and restoration strategies. The functions, threats, and protection strategies of watersheds and wetlands will be examined. A key theme throughout the course will be to explore how the scientific knowledge of ecological relationships can be integrated into a land-use planning framework. The fundamental goal is to assure natural ecosystem integrity is sustained over the long-term, while accommodating human use and occupancy within natural ecological limits.

**PLAN 740 Land Use and Environmental Policy (3).** This course provides an intensive graduate level introduction to land use and environmental policy. The overarching goal is to develop a working knowledge of how policies and institutions influence land use and environmental outcomes. The course can stand alone as an introduction to land use and environmental policy. For students who wish to specialize in this subject, it also provides a means of identifying aspects of land use and environmental planning to be explored in greater depth in more specialized courses in planning and environmental management.

**PLAN 744 Development and Environmental Management (3).** Coordination of public powers and private actions to implement development plans and conserve environmental resources. Regulatory, public investment, incentive, and policy instruments used in land use and environmental guidance systems.

**PA (Public Administration) 553 Disasters and Public Policy (3).** This course (taught at North Carolina State University) is an introduction to policies and practices intended to prepare for, respond to, recover from, and mitigate the damage done by natural disasters, industrial accidents and terrorist attacks in the United States.

**SOWO 709 When Their World Falls Apart: Helping Families and Children Managing the Effects of Disasters (3).** The course is designed to examine the effects that disasters have on children, their families, and communities based on research. It gives students an understanding of the reactions of people exposed to disasters and how to decrease the chances of long term psychosocial damage.

**6. Provide a statement on the relationship of the Certificate Program to degree programs within the unit(s). To what extent will requirements for the Certificate overlap with requirements for bachelors, masters or doctoral degrees? Confirm how course credit transfer policies will be applied to students.**

The certificate program will complement the educational aims and affiliated degree programs in the participating departments. For instance, in the case of the Curriculum for Environment and Ecology, the Department of Marine Science and the Department of Geological Sciences, natural hazards and disasters are closely linked to environmental conditions (e.g. natural hazards are part of the natural environment). Natural hazards will most likely lead to disasters (a human construct) when human settlements are located in areas prone to natural hazards (providing a strong link to the Department of City and Regional Planning) and policies and laws are created that encourage development in these areas (providing a link to the Law School, School of Government, and the NCSU Department of Public Administration). Furthermore, the Coastal Hazards Center is focused on the study of natural hazards and disasters and the translation of research findings to practice through applied scholarship and education which spans all participating departments.

The certificate program will be administered by the Department of City and Regional Planning, with support and participation provided by the Coastal Hazards Center, the Law School, the Department of Marine Sciences, School of Government, Curriculum for the Environment and Ecology, and the Department of Geological Sciences in the following manner: 1) The certificate program will draw on faculty from the respective departments to teach certificate courses, including core and elective courses, 2) students from the respective departments will be given preference when considering those allowed to pursue the certificate, 3) faculty teaching courses in the program agree to serve as student advisors (based on a student's interests/area of study), 4) faculty participating in the certificate program (in consultation with the Certificate Program Coordinating Committee) agree to assist students identify a suitable capstone project (if the capstone option is chosen) and mentor them as appropriate. Those that receive a certificate will be recognized as having done so by a notation in their student transcript.

Per university policy, only one course can crossover between a Certificate and a degree credential. The Certificate Program Coordinating Committee understands this condition and will ensure compliance with the certificate guidelines that only one course can crossover between a student's degree work and the certificate.

**7. Will the Certificate Program be offered jointly with another university? If yes, describe the relationship with the joint unit.**

No, the certificate will be offered by UNCCH. Regardless of whether graduate students from North Carolina State University and Duke University are enrolled in the certificate program or not, they will be allowed to take certificate courses if: 1) they are in good standing within their respective universities, 2) classroom seats remain available in certificate-based classes after all UNCCH students either enrolled in the program or taking the class independent of the of the certificate are accommodated, and 3) the certificate program instructor agrees to allow petitioning North Carolina State University and Duke students to take the class. Relationships with faculty at both NCSU (Public Administration) and Duke (Nicholas School and the Sanford School) exist and may be further explored at a later date. If a distance learning approach is pursued, the certificate program committee will reach out to prospective universities that appear to be good collaborative candidates.

Discussions have been held with the University of Hawaii's National Disaster Preparedness Training Center (NDPTC) and the University of Washington as potential partners at a future date, to include, for example, a joint student and faculty exchange program, distance learning opportunities, and the development and co-teaching of future courses. A strong partnership has been established between the Hazards Center and NDPTC, resulting in an agreement in which UNCCH faculty will: 1) assist NDPTC develop and deliver training courses focused on natural hazards and disasters in the U.S, the Pacific Rim and the Caribbean, and 2) explore student and faculty exchange as part of the UNC-CH certificate program. Both efforts will provide a unique opportunity for students and faculty to gain experience through course development and teaching in a diverse environment in the US and select countries.<sup>3</sup>

The University of Washington's Master of Infrastructure Planning and Management has just begun a degree option in Floodplain Management. As a member of the program's advisory board, the Executive Director of UNCCH's CHC will draw from the experience of the University of Washington's program and explore collaborative opportunities. An example of collaboration may include the hosting of University of Washington summer courses at UNCCH. Identified courses may serve as an elective in the UNCCH Graduate Certificate Program in the Study of Natural Hazards and Disasters subject to the review and approval of the certificate program committee.

**8. Will the Certificate Program be offered on campus, as a distance education program, or a combination? Describe any distance education components in detail.**

The graduate certificate program will be offered on the UNCCH campus. At this point we do not intend to offer distance learning courses. Once the program becomes more established we will assess whether a distance learning format for some courses is warranted, including those potentially delivered by UNC system universities as well as the University of Hawaii and the University of Washington.

While not directly a part of the certificate program, revenue generating short courses will be explored, including those that may fulfill continuing education credits required as part of planning, law and other professional disciplines. This has been discussed with Law School faculty and may be pursued at a later date.

Student internships and pre- and post-disaster field work will be part of the curriculum (if chosen by a student as their elective), thus requiring students to work off-campus in some instances. Internships will allow students to work with federal, state or local agencies involved in disaster management and climate change adaptation while field work will involve collecting data in both pre and post-disaster environments. In many cases the collection of this data will require traveling to areas impacted by a disaster.

**9. Describe the admissions criteria and process in detail. Differentiate between processes for degree-seeking students and non-degree-seeking students, where applicable. Include information about residency for tuition purposes as needed.**

The certificate program is open to all master's and Ph.D. students from all departments at UNCCH that have identified an advisor in their home department that is willing to work with the

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<sup>3</sup> A course focused on disaster recovery is being jointly developed by NDPTC and faculty at the Coastal Hazards Center and is scheduled for delivery in the spring of 2015.

head of the certificate program or an advisor that is actively participating in the certificate program. The certificate program is not open to non-degree-seeking students. All students must receive a P or higher in all certificate coursework.

A Program Director (Gavin Smith) and Coordinating Committee - comprised of one representative from the Department of City and Regional Planning (Daniel Rodriguez), Curriculum for Environment and Ecology (to be determined), the Coastal Hazards Center (Rick Luetlich); the Law School (Don Hornstein); The Department of Public Policy (Pete Andrews), the Department of Marine Sciences (to be determined), the Department of Geological Sciences (to be determined); Carolina Center for Public Service (Lynn Blanchard); a student representative currently enrolled in the program (to be determined on a bi-annual basis); the Hazards Center's Practitioner-in-Residence (Ellis Stanley-member of the Coastal Hazards Center Advisory Board and UNCCH graduate); and one non-UNCCH hazards scholar will review applications for admission. The Program Director and 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, or other issues that may arise.

Upon completion of the Program, a Certificate of Accomplishment will be jointly awarded by the Department of City and Regional Planning and the Coastal Hazards Center and a "Certificate" notation will be added to the transcript by the UNCCH Office of the Registrar, thereby, indicating a satisfactory completion of the Program.

Students will pay fees according to graduate tuition rates (see the Office of the Registrar for current tuition rates). Loans, student hourly positions, and similar financial aid administered through the University are available depending on the student's degree status. Student employment as a research assistant may be available through grants administered by faculty members in the student's home department or by faculty members participating in the certificate program. Students can enroll in the Certificate Program throughout the academic year by contacting the Program Director.

The admissions process is as follows: In the case of existing UNCCH students, they should meet with their advisor and/or their department chair to discuss applying to the certificate program. Prospective UNCCH students that are in the process of applying to the university should include in their graduate school application an application to the certificate program and permission from their primary department.

Applicants to the program should write an essay (not to exceed 2 pages in length) describing their interest in the program and their rationale for applying. Prospective applicants must identify a requested start date (i.e., year and fall or spring semester) and full contact information. All of this information will be compiled in an application form. The applicants should indicate their interest in an assistantship or other department activities. The applicant must identify a certificate program faculty advisor, who may be the same or different from their primary graduate advisor. If the applicant cannot identify an advisor and they are accepted into the certificate program, the certificate committee will attempt to identify an appropriate advisor for the applicant to work with, in particular, one that is engaged in natural hazards and/or disaster-related research.

In addition, the certificate committee will consider the funding of a select number of student fellows who will be provided a stipend to allow for travel to one professional conference in a

calendar year. The number of students funded and their stipend amount will be predicated on available resources.

**10. Provide a three-year, semester-by-semester projection of enrollments and course offerings.**

<b>Projected Enrollment for First Three Years</b>			
<b>Semester</b>	<b>Admissions</b>	<b>Completion</b>	<b>Total Students in Program</b>
Fall 2015	3	0	3
Spring 2016	3	0	6
Fall 2016	4	2	8
Spring 2017	4	4	8
Fall 2017	5	2	11
Spring 2018	5	4	12

See the course offerings noted in question #5. All classes listed are expected to be taught on a regular basis over the next three years.

**11. Provide a three-year projection of the Certificate Program’s financial plan. Include the impact on campus resources, such as classrooms and instructional faculty/personnel. Also include plans for tuition and billing, if separate from standard rates across schools. Note: this response will be further fleshed out including faculty assignments**

Financial costs are minimal given that the courses have been developed or are currently under development. No general funds will be needed to implement the program. Other costs associated with course development and certificate administration (partial payment of a certificate Program Administrator) will be paid for through a grant with the Department of Homeland Security Science and Technology (DHS S&T) Directorate, Office of University Programs and other funds as identified. To date, DHS funding has been used to develop the certificate program and to pay for the course “Planning for Natural Hazards and Climate Change Adaptation” (PLAN 590 pending permanent course number from the registrar) which has been taught during the Fall of 2012, 2013, and 2014. The 1 hour lecture series course has been developed and the costs associated with its delivery will be assumed by the Department of City and Regional Planning and other supporting departments, institutes and centers. The development of the 3 hour course, “Survey of Natural Hazards and Disasters” has been funded by the Coastal Hazards Center (through the DHS S&T grant) and is being taught in the Spring of 2015. Any costs associated with a capstone course will be assumed by the Department of City and Regional Planning, the Coastal Hazards Center or other groups as identified. The Coastal Hazards Center will seek funds for additional course offerings over time.

The remaining courses will be drawn from those that already exist in a number of programs (see course listing in question #5). The appropriate department in which courses reside will identify classrooms and existing personnel as needed on a semester-by-semester basis.



**12. List all faculty members who will be responsible for planning and participating in the Certificate Program. Programs are encouraged to provide advising for students through the identification of one faculty member as the director of the Certificate.**

One of the key strengths of this proposal is the interconnectivity across faculty in the Department of City and Regional Planning, the Coastal Hazards Center, the Department of Marine Sciences, the Department of Geological Sciences, the Law School, The School of Government, Curriculum for Environment and Ecology, and the Carolina Center for Public Service, including joint appointments, established working relationships, and emerging partnerships. A Certificate Committee has been formed and is comprised of Rick Luettich, Richard Andrews, Don Hornstein, Laura Moore, Larry Benninger, Gavin Smith, and Lynn Blanchard. A faculty member from Environment and Ecology will serve in an ex officio role. Identified faculty who may teach elective and required courses and/or participate in the program include:

**Department of City and Regional Planning (DCRP)**

**Daniel Rodriguez**, Professor  
**Todd BenDor**, Associate Professor  
**Mai Nguyen**, Associate Professor  
**Nikhil Kaza**, Assistant Professor  
**Dave Salvesen**, Senior Research Scientist

**Coastal Hazard Center**

**Gavin Smith**, Executive Director, Department of Homeland Security Coastal Hazards Center of Excellence; Associate Research Professor, Department of City and Regional Planning  
**Ellis Stanley**, Coastal Hazards Center Practitioner-in-Residence, Advisory Board Member (former Emergency Management Director of Los Angeles, Fulton County Georgia, Emergency Management Accreditation Program reviewer, and National Academies of Science Disasters Roundtable).

**Curriculum for the Environment and Ecology Faculty (CEE)**

Faculty in CEE either hold adjunct appointments with home departments or are paid to teach in ENEC. Participating faculty from ENEC include Laura Moore and Jose Rial in Geological Sciences, Pamela Jagger in Public Policy, David Salvesen in the Institute for Environment, and Nikhil Kaza in City and Regional Planning.

**Department of Public Policy**

**Richard Andrews**, Professor, Public Policy  
**Pamela Jagger**, Assistant Professor

**Department of Marine Science**

**Rick Luettich**, Director, Department of Homeland Security Coastal Hazards Center of Excellence; Professor, Department of Marine Sciences; Director, Institute for Marine Sciences

**Department of Geological Sciences**

**Johnathan Lees**, Professor, Chair (geophysicist/volcanoes)  
**Larry Benninger**, Professor (sediment transport, carbon cycling)  
**Laura Moore**, Assistant Professor (coastal processes and geomorphology)  
**Jose Rial**, Professor (abrupt climate change)

### **UNC Law School**

**Victor Flatt**, Professor in Environmental Law, UNC Law School; Director of Center for Law, Environment, Adaptation and Resources

**Don Hornstein**, Professor of Law, UNC Law School

### **School of Government**

**Norma Houston**, Lecturer in Public Law and Government, UNC School of Government, Adjunct Professor of Law, UNC Law School

### **Carolina Center for Public Service**

**Lynn Blanchard**, Director

### **Department of Public Administration (North Carolina State University)**

Tom Birkland, Professor of Public Policy

## **13. Describe the evaluation plans for the Certificate Program.**

The certificate program will be evaluated annually according to a number of criteria. These include: 1) number of students enrolled in the certificate program, 2) number of students that graduate with the certificate, and 3) placement of students in relevant jobs or further graduate studies.

Students enrolled in the program as well as faculty that teach certificate courses and mentor students will be surveyed annually (on-line) across an established number of criteria tied to their perceived value of the program. These criteria will be developed by the certificate committee (which will include 1 student representative currently enrolled in the program). The certificate committee will also reach out to prospective employers of those students that have graduated with the certificate (i.e. government agencies, consultants, and external university departments) to ascertain how the certificate program can be improved over time (1 practicing professional and one academic advisor external to the certificate program will serve on the certificate committee). The certificate program committee will meet once a year to discuss the results of annual surveys of students and exit interviews conducted with students that are completing the certificate program. This information will be used to determine if the program will need to be changed to better meet the needs of students. This meeting may be held in conjunction with the Coastal Hazards Center Annual Meeting, if at all possible given that two Coastal Hazards Center Advisory Board members will serve on the committee.

## **14. Appropriate letters of support should be included with the proposal. All units sponsoring and participating in a Certificate Program should approve the proposal and provide support letters, including letters from units supporting the Certificate through resources (e.g., faculty time, course slots). Approval letters from the home school should accompany the proposal submitted to the Graduate School for final approval.**

Please see attached letters of support immediately following the list of references.

## References

National Research Council of the National Academies. 2006. Facing Hazards and Disasters: Understanding Human Dimensions. Washington, D.C.: The National Academies Press.

National Research Council of the National Academies. 2010. Adapting to the Impacts of Climate Change. Washington, D.C.: The National Academies Press.



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February 20, 2015

Stephanie Schmitt  
Associate Dean for Academics  
Graduate School  
200 Bynum Hall, CB 4010

**DANIEL P. GITTERMAN, PH.D.**  
*Thomas Willis Lambeth Distinguished Chair  
in Public Policy*

Dear Stephanie:

The proposed graduate certificate program focused on the study of natural hazards and disasters is strongly supported by the University of North Carolina's Public Policy program, including two scholars who plan to play an important part in the evolution of the program. Professor's Pete Andrews and Pamela Jagger have both expressed their commitment to link existing courses to the certificate's curriculum thereby exposing a range of students to the public policy aspects of natural hazards, disasters and climate change. Professor Andrews will serve on the certificate program's coordination committee.

I believe these important contributions will enable students from a variety of disciplines to better understand the many policy challenges we face as the costs of disasters continue to rise and we as a society continue to struggle with how we can lessen the impacts of extreme events today and in the future through the adoption and implementation of new and existing rules, regulations, programs, and governance agreements that fully recognize the nexus between a changing climate and the worsening of natural hazards and disasters.

Sincerely,

Daniel P. Gitterman  
Thomas Willis Lambeth Distinguished Chair in Public Policy  
University of North Carolina Public Policy



Homeland  
Security

19 February 2015

Stephanie Schmitt  
Associate Dean for Academics  
Graduate School  
200 Bynum Hall, CB 4010

Dear Dean Schmitt:

For the past three years, the Department of Homeland Security Science and Technology Directorate, Office of University Programs (DHS S&T OUP) has, through the DHS Coastal Hazards Center of Excellence at The University of North Carolina at Chapel Hill (UNC-CH), funded course development to support the creation of a Graduate Certificate in the Study of Natural Hazards and Disasters.

This effort reflects a key part of OUP's mission: to help educate the next generation of homeland security science and engineering professionals. It also meets a growing demand across the homeland security enterprise for graduates from multiple disciplines who possess the expertise to address the known and potential impacts of climatic trends such as rising sea levels and increased coastal erosion.

Courses developed thus far, Natural Hazards Planning (taught at UNC-CH Fall 2012); Survey of Coastal Hazards (taught at UNC-CH Fall 2012), and Planning for Natural Hazards and Climate Change Adaptation (taught at UNC-CH Fall of 2013), expose students to the latest research and knowledge on high priority concerns for the resilience of coastal communities. In partnership with the Center, OUP has worked to further student experiences through additional grant, internship, fellowship and visiting fellow opportunities.

Personally, meeting the high-caliber students engaged with the Center's research and education programs – and witnessing them find meaningful work in their fields upon graduation – has been one of the most rewarding aspects of my work with the Center. This includes research associates and students from UNC-CH.

The proposed Graduate Certificate in the Study of Natural Hazards and Disasters at UNC-CH has demonstrated successful outcomes to date and would provide a valuable education credential.

Sincerely,

A handwritten signature in black ink that reads "Eleanore Hajian".

Eleanore Hajian  
Program Manager  
Science and Technology Directorate  
Office of University Programs  
Department of Homeland Security

# Ellis Stanley Partners, LLC

[ellisstanleysr@gmail.com](mailto:ellisstanleysr@gmail.com) 213-359-7861

February 19, 2015

Stephanie Schmidt  
Associate Dean for Academics  
Graduate School  
200 Bynum Hall, CB 4010

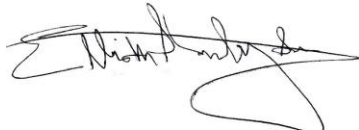
Dear Stephanie:

I strongly support the proposed graduate certificate program focused on the study of natural hazards and disasters. In addition to working my entire career in the emergency management field, to include serving as Director of Fulton County Georgia and Los Angeles County Emergency Management, I am an Advisory Board member of the UNC-led Department of Homeland Security Coastal Hazards Center of Excellence (CHC). This provides me unique access to key initiatives being undertaken by the CHC, to include the proposed Graduate Certificate Program. In addition, I am an Emergency Management Accreditation Program reviewer, and a member of the National Academies of Science Disasters Roundtable. These varied positions have uniquely positioned me to provide advice to the Certificate Program Committee on a range of issues including the knowledge base that practitioners are seeking in future graduates, research questions posed by academics, and the increasing professionalization of the discipline.

As such, I have agreed to serve as a "Practitioner-in-Residence" as stated in the certificate proposal to help the committee ground coursework in practical applications, identify key topical areas to address in the program, serve as a guest lecturer (which I have done this semester in one of the proposed certificate courses), and assist in the identification of internship opportunities.

I am a proud UNC graduate and I look forward to working with you on this exciting program.

Sincerely,

A handwritten signature in black ink, appearing to read "Ellis Stanley", with a stylized flourish at the end.

Ellis Stanley  
Coastal Hazards Center Advisory Board Member  
Practitioner-in-Residence



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February 20, 2015

Stephanie Schmitt  
Associate Dean for Academics  
Graduate School  
200 Bynum Hall, CB 4010

Stephanie:

I am pleased to support the proposed creation of the Graduate Certificate in the Study of Natural Hazards and Disasters. This program offers another means to further solidify a long-standing connection of faculty in the Department of Marine Science with those in the Curriculum for the Environment and Ecology (CEE) and the Department of Homeland Security-Coastal Hazards Center of Excellence (UNC Coastal Hazards Center). Key players in the certificate program's creation, including Dr. Rick Luetlich, who is the Director of the UNC Hazards Center, is also a member of the Department of Marine Sciences faculty. This contact will allow us to build on pre-existing relationships as well as forge new partnerships, including those among faculty and students located in Department of City and Regional Planning and the Law School.

The overlapping area of interest between the Department of Marine Science and other participants in this certificate program is clearly the coastal zone, which given its extreme vulnerability to natural hazards and disasters, including those tied to a changing climate (e.g. sea level rise, an increased number of extreme coastal events), will allow both students and faculty to explore an educational experience and research agenda tailored to their unique interests.

The ability to draw on existing courses in the Department of Marine Sciences will significantly facilitate our participation in this program while helping to achieve the larger aims of the certificate program, which is to help educate the next generation of natural hazards and disasters scholars. In an additional show of support, we agree to encourage one member of the Department of Marine Sciences to serve on the certificate program's coordination committee.

We look forward to working with this highly capable group of faculty scholars in making this certificate program a reality.

Sincerely,

Harvey Seim  
Professor and Chair Department of Marine Sciences



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February 20, 2015

Stephanie Schmitt  
Associate Dean for Academics  
Graduate School  
200 Bynum Hall, CB 4010  
University of North Carolina  
Chapel Hill, NC 27599

Dear Stephanie:

The proposed graduate certificate program focused on the study of natural hazards and disasters is strongly supported by the University of North Carolina's School of Law, including two legal scholars who plan to play an important part in the evolution of the program. Professor's Victor Flatt and Donald Hornstein have both expressed their commitment to link existing law courses to the certificate's curriculum, thereby exposing a range of students to the legal aspects of natural hazards, disasters and climate change. Professor Hornstein will serve on the certificate program's coordination committee.

I believe these important contributions will enable students from a variety of disciplines to better understand the many policy challenges we face as the costs of disasters continue to rise and we as a society continue to struggle with how we can lessen the impacts of extreme events today and in the future through the adoption and implementation of new and existing rules, regulations, programs, and governance agreements that fully recognize the nexus between a changing climate and the worsening of natural hazards and disasters.

Sincerely,

A handwritten signature in blue ink that reads "John Charles Boger".

John Charles Boger  
Dean and Wade Edwards Distinguished Professor of Law  
University of North Carolina School of Law





THE UNIVERSITY of NORTH CAROLINA  
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Jonathan Lees  
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February 19, 2015

Stephanie Schmidt  
Associate Dean for Academics  
Graduate School  
200 Bynum Hall, CB 4010

Dear Stephanie:

The proposed graduate certificate program focused on the study of natural hazards and disasters is supported by the University of North Carolina's Department of Geological Sciences, including two scholars who may play an important part in the evolution of the program. Professor Laura Moore and I have both expressed our commitment to link existing geology courses to the certificate's curriculum and possibly serve as occasional invited speakers to the 1 hour lecture series course, thereby exposing a range of students to the geological aspects of natural hazards, disasters and climate change. A faculty member from Geological Sciences will serve on the certificate program's coordination committee. I believe these contributions will enable students from a variety of disciplines to better understand geological hazards and how societies live in areas prone to volcanoes, coastal erosion, landslides, earthquakes, and subsidence.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jonathan M. Lees".

JONATHAN M. LEES  
PROFESSOR AND DEPARTMENT CHAIR  
THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
DEPARTMENT OF GEOLOGICAL SCIENCES



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February 19, 2015

Stephanie Schmitt  
Associate Dean for Academics  
Graduate School  
200 Bynum Hall, CB 4010

Dear Stephanie:

The letter is in support of the proposed graduate certificate program focused on the study of natural hazards and disasters. As you may know, the Carolina Center for Public Service has had a role in response to disasters since it was established (the same week Hurricane Floyd devastated eastern North Carolina).

As noted in the proposal there are a number of potential collaborative opportunities that can strengthen students' experiences. These include helping to identify internship or fieldwork tied to public service in areas impacted by disaster. It may provide opportunities for students to volunteer following disasters and receive credit through the capstone/fieldwork option (assuming they meet agreed upon criteria as spelled out by the certificate committee).

The Center has several programs to which students can apply for support to compete specific projects, including our Community Engagement Fellowships. These fellowships award individual or teams of graduate students up to \$2,000 to develop and implement an engagement or engaged scholarship projects that (1) employs an innovative, sustainable approach to a complex social need (such as disaster relief) and (2) has an academic connection (such as the graduate certificate). Preference is given to interdisciplinary projects.

As part of our support for this program, I have agreed to serve on the certificate program committee to explore these and other partnerships.

I look forward to assisting in the implementation of this exciting program that can provide graduate students with meaningful learning opportunities as well as enhance and strengthen Carolina's commitment to engagement with the state.

Sincerely,

Lynn White Blanchard, M.P.H., Ph.D  
Director, Carolina Center for Public Service



THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

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February 20, 2015

Stephanie Schmitt  
Associate Dean for Academics  
Graduate School  
200 Bynum Hall, CB 4010

Dear Stephanie:

As Director of the Institute for Marine Science (IMS) and Director of the UNCCH Center for the Study of Natural Hazards and Disasters (Coastal Hazards Center), I strongly support the creation of the Graduate Certificate in the Study of Natural Hazards and Disasters. This effort represents an opportunity to draw from a range of faculty in the Department of City and Regional Planning, the Law School, the Department of Marine Science, IMS and the Coastal Hazards Center. As evidence of this commitment, I have sought and received funding from the Department of Homeland Security's Science and Technology Directorate, through the DHS Coastal Hazards Center of Excellence grant that I lead, to help pay for the time associated with the creation of courses to be used in the certificate program as well as the development of the certificate program itself. In addition, I will encourage students and faculty involved in the certificate program to use IMS facilities (located in Morehead City) as they pursue capstone-related activities or seek to engage in coastal fieldwork.

The Coastal Hazards Center has agreed to work closely with the Department of City and Regional Planning, which will serve as the sponsoring academic unit. This partnership as well as those forged with other supporting departments and schools will provide a unique and critically important multi-disciplinary environment that will enrich the classroom experience for students while fostering greater collaboration across faculty lines, bringing together scholars to address the emerging frontier of the study of natural hazards, disasters, and a changing climate.

Sincerely,

A handwritten signature in black ink that reads "Rick Luetlich".

Rick Luetlich  
Professor of Marine Science and Environmental Sciences and Engineering  
Director, Center for the Study of Natural Hazards and Disasters  
Director, Institute of Marine Science

February 19, 2015  
Stephanie Schmitt  
Associate Dean for Academics  
Graduate School  
200 Bynum Hall, CB 4010

Dear Stephanie:

I am writing to indicate my strong personal support for the graduate certificate program focused on the study of natural hazards and disasters. As noted in the certificate program proposal, I occasionally teach a course on Disasters and Public Policy at NCSU that UNC students may take (as a certificate program elective). I am also very eager to provide guest lectures in other certificate courses as needed.

I will also provide input regarding an important element of the proposal: creating of the next generation of internationally prominent hazards scholars. I do so having led a National Science Foundation-funded project titled "Enabling the Next Generation of Hazards and Disasters Researchers." I have been involved in this effort four times, and led the third iteration of the project in 2008-09. The project targets promising junior faculty members who have not yet crafted a research agenda and encouraging them to pursue a career in the study of natural hazards and disasters. The Next Generation experience has provided valuable lessons that can be transferred to students who are interested in pursuing a career in the study of natural hazards and disasters. Overall, I have over twenty years of research experience in the field, so I am well integrated into this area of study. Finally, the Certificate Program provides an opportunity for students at NCSU to take certificate-based courses in this field that they would otherwise not be exposed to.

I look forward to working with you on this exciting program

Sincerely,



Thomas A. Birkland, Ph.D.  
Associate Dean for Research and Engagement and  
William T. Kretzer Professor of Public Policy, School of Public and International Affairs



February 20, 2015

Dr. Stephanie Schmitt  
Associate Dean for Academics  
Graduate School  
200 Bynum Hall, CB 4010

Dear Dr. Schmitt:

The School of Government strongly supports the Department of City and Regional Planning's proposed graduate certificate program focused on the study of natural hazards and disasters. The certificate will provide a valuable opportunity to Master of Public Administration (MPA) students, according to current MPA Program Director Professor Bill Rivenbark. Also, the program fits well with the expertise of Norma Houston, an SOG faculty member who specializes in emergency management law, among other things. Houston has worked extensively with Dr. Gavin Smith (coordinator of the certificate program) in both state government following Hurricanes Fran and Floyd and as a guest lecturer in one of the proposed certificate courses this semester. The program offers an interdisciplinary opportunity for her and the chance for other students on campus to benefit from her knowledge.

We look forward to exploring additional collaboration with this certificate program. Possible examples of where we may be able to cooperate include School of Government faculty offering guest lectures, co-listing courses taught by School of Government faculty as certificate program electives, and encouraging MPA students to consider enrolling in the program.

Sincerely,

Thomas H. Thornburg  
Senior Associate Dean  
Director, North Carolina Judicial College  
Professor of Public Law and Government  
University of North Carolina School of Government



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March 3, 2015

To the Administrative Boards of the College of Arts and Sciences:

I write to express my support for the proposal for a graduate certificate in the study of natural hazards and disasters.

This multi-disciplinary program effectively blends scholarship and practice across an area of study that represents a crucial challenge facing our nation. We will continue to face the challenges of disasters and as a society we need to do all we can to prepare for, mitigate against, respond to, and recover from extreme events in ways that lessen their future impacts and incorporate lessons learned from previous responses into effective policy.

Faculty at UNC-Chapel Hill are well-suited to address these critical issues, and this certificate program will enable them to teach and mentor the next generation of scholars and policymakers who will address these issues. This aligns with our university's mission to create knowledge and translate that knowledge into practice through public engagement. The certificate program also provides a collaborative, interdisciplinary venue for participating faculty to engage with new colleagues and explore new research partnerships with them.

In an era of shrinking university budgets and the closely associated value of strategically leveraging scarce resources, this effort comes at no cost to the College, as courses are drawn from those already developed and taught. The certificate program also builds on identified strengths and areas of expertise found in the College of Arts and Sciences and other programs across campus. The combined value of the certificate program's educational, research, and larger societal benefits stands to further the university's broader mission. I am pleased to express support for this new proposed graduate certificate.

Sincerely,

Jonathan Hartlyn

Senior Associate Dean for Social Sciences and Global Programs

Kenneth J. Reckford Professor of Political Science