

Southern Connecticut State University

Chapter of the Connecticut State Colleges & Universities

Multi-Campus Hazard Mitigation Plan

Prepared by Woodard & Curran



February 2016



CHAPTER 14: SOUTHERN CONNECTICUT STATE UNIVERSITY

TABLE OF CONTENTS

SECTION	PAGE NO.
EXECUTIVE SUMMARY	ES-1
1. INTRODUCTION.....	1-1
1.1 Southern Connecticut State University Campus Overview	1-1
1.1.1 Campus History	1-2
1.1.2 City of New Haven, Connecticut.....	1-2
1.1.3 Campus Location & Environment.....	1-3
1.1.4 Historic Resources	1-7
1.1.5 Emergency Services.....	1-7
1.1.6 Infrastructure & Utilities	1-8
1.1.7 Campus Development.....	1-8
1.1.8 Community Involvement.....	1-9
2. PLANNING PROCESS.....	2-1
2.1 Planning Team	2-1
2.2 Existing Data & Reports Utilized for the Plan	2-4
2.3 Stakeholder Engagement.....	2-4
2.3.1 Campus Kick-Off Meeting.....	2-4
2.3.2 Stakeholder Interviews	2-5
2.3.3 Public Meeting No. 1	2-6
2.3.4 Hazard Identification and Risk Assessment Meeting	2-8
2.3.5 Loss Estimates and Hazard Mitigation Projects Meeting	2-8
2.3.6 Presentation of Draft Multi-Campus Hazard Mitigation Plan Facilitated Review Meeting	2-9
2.3.7 Public Meeting No. 2	2-10
3. HAZARD PROFILES & RISK ASSESSMENT	3-1
3.1 Campus Key Points.....	3-1
3.2 Natural Hazards Impacting Campus	3-1
3.2.1 Coastal Storm/Nor'easter	3-3
3.2.2 Earthquake	3-6
3.2.3 Flood.....	3-13
3.2.4 Drought.....	3-17
3.2.5 Winter-Related Hazards	3-18
3.2.6 Thunderstorm/Lightning.....	3-20
3.2.7 Windstorm	3-21
3.2.8 Tornado	3-22
3.2.9 Hurricane	3-24
3.2.10 Dam Failure	3-25
3.2.11 Wildfire.....	3-26
4. VULNERABILITY AND IMPACT ASSESSMENT	4-1
4.1 Asset Inventory.....	4-1
4.1.1 Loss of Function	4-2



4.1.2	Building Vulnerability Assessment.....	4-5
5.	MITIGATION ACTIVITIES & ACTION PLAN	5-1
5.1	Mitigation Activities & Action Plan	5-1
5.2	Mitigation Project Prioritization	5-2
5.3	Potential Funding Sources	5-11
5.4	Capabilities Assessment	5-12
5.4.1	Plan & Program Capability	5-15
5.4.2	Fiscal Capability	5-16
5.4.3	Regulatory Environment	5-16
5.5	Next Steps.....	5-17

FIGURES

Figure 1-1:	New Haven, CT Location Map	1-3
Figure 1-2:	Southern Campus Map	1-4
Figure 1-3:	Southern Academic Laboratory and Science Building	1-9
Figure 2-1:	Southern Public Meeting No. 1 Advertising Efforts	2-6
Figure 2-2:	Southern Public Meeting No. 2 Advertising Efforts	2-10
Figure 3-1:	New Haven Surficial Geology.....	3-7
Figure 3-2:	Southern Earthquake Specific Building Vulnerability	3-12
Figure 3-3:	Southern Floodplain Map	3-14
Figure 4-1:	Southern Building Vulnerability Assessment – Non Hazard-Specific.....	4-9

TABLES

Table ES-1:	Southern Potential Hazard Impacts	ES-2
Table 1-1:	Climate Data for New Haven, CT 1981 – 2010	1-3
Table 1-2:	Southern Campus Building Information – East Campus	1-4
Table 1-3:	Southern Campus Building Information – West Campus	1-5
Table 1-4:	Southern Campus Building Information – North Campus.....	1-6
Table 2-1:	Southern Hazard Mitigation Planning Team.....	2-1
Table 2-2:	Stakeholders Engaged in Southern Hazard Mitigation Plan.....	2-1
Table 2-3:	Topics Reviewed During the Southern Hazard Mitigation Plan Kick-Off Meeting	2-4
Table 2-4:	Southern Interview Topics & Themes.....	2-5
Table 2-5:	Topics Reviewed During the Southern Hazard Identification and Risk Assessment Meeting	2-8
Table 2-6:	Topics Reviewed During the Southern Loss Estimates and Hazard Mitigation Project Meeting.....	2-9
Table 2-7:	Topics Reviewed During the Southern Facilitated Review Meeting of the Draft Multi-Campus Hazard Mitigation Plan and Southern Chapter	2-9
Table 3-1:	Southern Natural Hazard Susceptibility.....	3-2
Table 3-2:	Southern Natural Hazard Risk Ranking Summary	3-2
Table 3-3:	Southern Qualitative Risk Assessment Summary	3-3
Table 3-4:	Southern Coastal Storm/Nor’easter Susceptibility.....	3-4
Table 3-5:	Past Earthquakes in Proximity to New Haven	3-6
Table 3-6:	Southern Earthquake Susceptibility.....	3-8
Table 3-7:	Southern Campus Buildings – Estimated Loss to Structure & Contents Due to Earthquake	3-9
Table 3-8:	Southern Flood Susceptibility	3-14
Table 3-9:	Southern Structure Loss.....	3-16
Table 3-10:	Southern Contents Loss	3-16
Table 3-11:	Southern Structure Use and Function Loss & Total Loss for Hazard Event.....	3-16



Table 3-12: Southern Drought Susceptibility3-18

Table 3-13: Southern Winter-Related Hazard Susceptibility3-19

Table 3-14: Southern Thunderstorm/Lightning Susceptibility3-20

Table 3-15: Southern Windstorm Susceptibility.....3-22

Table 3-16: Southern Tornado Susceptibility.....3-23

Table 3-17: Southern Hurricane Susceptibility3-24

Table 3-18: Southern Dam Failure Susceptibility3-26

Table 3-19: Southern Wildfire Susceptibility3-27

Table 4-1: Southern Assets4-1

Table 4-2: Southern Loss of Function Cost4-3

Table 4-3: Southern Building Vulnerability Assessment4-6

Table 5-1: Southern Campus Preparedness Projects5-1

Table 5-2: Southern Mitigation Projects & STAPLEE Criteria Rankings5-3

Table 5-3: Potential Funding Sources5-11

Table 5-4: Southern Administrative and Technical Capabilities5-13

Table 5-5: Southern Documents Utilized During Planning Process5-15

Table 5-6: Legal and Regulatory Policies Pertaining to Southern5-16

APPENDICES

Appendix A: Bibliography of Documents Provided by Southern Connecticut State University

Appendix B: Campus Kick-Off Meeting Materials

Appendix C: Interview Questionnaire

Appendix D: Public Meeting No. 1 Meeting Materials

Appendix E: Hazard Identification and Risk Assessment Meeting Materials

Appendix F: Loss Estimates and Hazard Mitigation Projects, Presentation and Materials

Appendix G: Facilitated Draft multi-Campus Hazard Mitigation Plan Review Meeting Materials

Appendix H: Public Meeting No. 2 Meeting Materials



EXECUTIVE SUMMARY

In 2014, the Connecticut State Colleges & Universities (CSCU) began a process to develop a Multi-Campus Hazard Mitigation Plan for each of its campuses to fulfill federal, state, and local hazard mitigation planning requirements. The purpose of the Multi-Campus Hazard Mitigation Plan is to minimize the impact of natural hazards on physical assets and operations and human life by reducing or avoiding long-term vulnerabilities to identified natural hazards. The Southern Connecticut State University (Southern) Chapter addresses hazards, vulnerabilities, and mitigation actions specifically for the Southern campus. Funding for this project was provided by a grant allocated and administered by the State of Connecticut Department of Emergency Services & Public Protection Division of Emergency Management & Homeland Security (DEMHS) and funded by the Federal Emergency Management Agency (FEMA).

Southern will utilize this Multi-Campus Hazard Mitigation Plan and campus specific chapter as a guidance document targeted toward reducing its current and future risk from natural hazards by having resources, risk reduction strategies, responsible entities and historic hazard information centrally located. Southern specifically placed a focus on engaging the campus community and the public during this mitigation planning effort.

Public Participation

Southern established a planning process for this project, which included designating a member of the campus staff to serve on the Multi-Campus Hazard Mitigation Plan Steering Committee. Southern selected the Associate Vice President for Capital Budgeting & Facilities Operations to serve on this committee and establish the Southern Hazard Mitigation Planning team that included representatives from Environmental Health & Safety, Facilities Engineering, and Campus Police. This team was assembled at various times throughout the planning process to coordinate and discuss key tasks and campus-specific information contributing to the Multi-Campus Hazard Mitigation Plan. The Southern Hazard Mitigation Planning team was involved in important aspects of the planning process and data collection activities; however, other campus representatives were also involved to provide additional, important information to the plan.

Southern created several opportunities for stakeholder engagement throughout the planning process including a data gathering effort, planning meetings, interviews, conducting a public meeting as well as other opportunities to provide informal input and comment.

Natural Hazard Identification

Identifying natural hazards for Southern included using FEMA Guidance documentation and current and historical data points such as information from local, regional, and state Hazard Mitigation Plans. Information about each natural hazard was supplemented with anecdotal data points from Southern and ranked as low (L), medium (M), high (H) or severe (S) from an overall risk standpoint and operational standpoint as illustrated in **Table ES-1**.

Table ES-1: Southern Potential Hazard Impacts

	Coastal Storm, Nor'easter	Earthquake	Flood	Drought	Winter Related Hazards	Thunderstorm, Lightning	Windstorm	Tornado	Hurricane	Dam Failure	Wildfire
Risk Ranking	H	M	H	L	H	L	H	H	S	L	L
Students, Faculty & Staff	L	L	L	L	H	L	L	L	H	L	L
Existing Buildings	H	M	M	L	M	M	H	H	H	L	L
Future Buildings	L	L	L	L	M	L	L	M	M	L	L
Operations	H	M	H	L	H	L	H	H	S	L	L
Critical Infrastructure	H	M	H	L	H	M	H	H	S	L	L
Overall Risk Ranking	H	M	H	L	H	L	H	H	S	L	L

Hurricane is the only natural hazard ranked as severe for Southern, while hazards that received a high ranking include nor'easters, flood, tornadoes, windstorms, and winter-related storms. These hazards may bring with them significant amounts of precipitation and high winds and could cause loss of power on campus. A reliable power supply supports business continuity in campus operations and helps maintain refrigeration in laboratories housing animal research. Southern has generator availability for facilities, residence halls, food services, the police building, all data centers, and the power plant.

Vulnerability & Impact Assessment

The purpose of assessing risks, determining vulnerability, and estimating losses is to determine how Southern assets may be affected by various hazard events. Southern's forty-five building assets were evaluated based on a loss of function and total damage calculation using the FEMA methodology as detailed in the Multi-Campus Hazard Mitigation Plan. The specific calculations identified the cost of damage to structures and contents if impacted. Eight of the forty-four building assets were determined to have a building vulnerability ranking of high, including the Academic Science Building, Engleman Hall, Michael J. Adanti Student Center, Moore Field House, North Campus Residence Hall Complex: Mid-Rise, Jennings Hall, Buley Library, and West Campus Residence Hall. Other buildings that were determined to be highly vulnerable due to its critical functions were the Granoff Hall since it contains the campus Emergency Operations Center (EOC) and campus police headquarters; the Boiler Plant/Energy Hall because of its power generation; and residence hall buildings that house students.

Mitigation Activities & Action Plan

Based on the vulnerability and impact assessment and overall goals and objectives identified for the Multi-Campus Hazard Mitigation Plan, Southern developed a list of mitigation projects and mitigation activities. Many of the mitigation actions focused on securing equipment on rooftops, and decreasing the likelihood for wind damage on campus. The action items proposed meet the FEMA STAPLEE criteria and are generally socially acceptable to the community, technically feasible, protective of or beneficial to the environment and are backed by legal authority and consistent with current laws, consider economic benefits and costs and include environmental considerations. Each project received a qualitative high, medium, or low ranking based on these criteria.

1. INTRODUCTION

The Connecticut State Colleges & Universities (CSCU) are undertaking a system-wide effort to develop hazard mitigation plans for all of its campuses. This plan coupled with the introductory sections of the Multi-Campus Hazard Mitigation Plan represents the Hazard Mitigation Plan for Southern Connecticut State University (Southern). The purpose of this plan is to assist Southern in the identification of potential natural hazard impacts to the campus, and reduce the risk associated from applicable hazards through the development of campus-specific mitigation actions. Specifically, this plan documents hazard rankings, hazard event profiles, hazard mitigation goals and objectives, vulnerability assessments, loss estimates, campus assets, and mitigation actions.

1.1 SOUTHERN CONNECTICUT STATE UNIVERSITY CAMPUS OVERVIEW

Southern is one of four state universities in the Connecticut State College and University system, located in the City of New Haven, Connecticut (New Haven County), at 501 Crescent Street. Southern is approximately 78 miles north of New York City, and 136 miles south of Boston. Southern is 171 acres and located less than three miles from downtown New Haven. The campus buildings, including its multiple residence halls house over 3,000 students and are located on three separate campuses identified as East, North, and West.



Southern is an urban coeducational institution offering 69 undergraduate degree programs and 45 graduate degree programs. Courses are available full time, part time, and online. Southern consists of five schools – the School of Arts and Sciences, the School of Business, the School of Education, the School of Graduate Studies, and the School of Health and Human Services. Undergraduate students have the option of pursuing a science degree in education with a teacher certification and multiple undergraduate degree programs in liberal arts and in professional studies. Students in the School of Graduate studies can receive a master's degree and/or sixth year certificates in a variety of study areas from elementary education to computer science. In 2014, Southern enrolled 10,825 students (8,133 undergraduates and 2,692 graduate students)¹, and employed 433 full-time faculty members and an additional 566 part-time instructors². The Board of Regents for Higher Education governs Southern, and the New England Association of Schools and Colleges (NEASC) accredits the institution.

Southern takes pride in its sustainability efforts and commitment to achieve carbon neutrality by 2050. As a result, Princeton Review recognized Southern as one of the 332 most environmentally responsible colleges. The campus earned statewide recognition when it received the Power of Change Top Building Innovation Award. The new award recognizes state energy efficiency projects, and Southern was among seven recipients. Southern earned the award

¹ Southern Connecticut State University. *Fall 2014 Enrollment Information*. Accessed 20 May 2015.
<http://www.southernct.edu/offices/management/currentenrollment.html>

² Southern Connecticut State University. *Part-Time Faculty Headcount & FTE by Year*. Accessed. 20 May 2015.
http://ares.southernct.edu/departments/research/faculty_part_time_headcount_fte_fall.html



for its effort to reduce electricity in nine residence halls during a nationwide electricity and water reduction competition, the College Conservation Nationals (CCN)³

1.1.1 Campus History

Originally known as New Haven State Normal School, Southern was founded in 1893 as a two-year teacher training school. In 1937, the school began conferring bachelor degrees as a four-year college. The campus offered a Master of Science degree in 1947 in conjunction with Yale University's department of education, but later assumed complete ownership of the program in 1954. That year, Southern adopted the new name of New Haven State Teachers College. In 1959, the institution presented a liberal arts program resulting in a bachelor of arts and sciences, at which point the institution's name changed to Southern Connecticut State College. After several expansions and program reorganizations, the College was adopted as part of the Connecticut State University System in 1983, acquiring its current name.⁴

1.1.2 City of New Haven, Connecticut

The City of New Haven borders Connecticut's Long Island Sound and is situated along New Haven Harbor in the southern part of New Haven County (see **Figure 1-1**). The City is located at the intersection of Interstate 95 and Interstate 91. New Haven is the second-largest city in Connecticut with a 2010 population of 129,779 (US Census).

The center of downtown New Haven is comprised of a 16-acre greenspace, considered the City's epicenter and a National Historic Landmark. Founded in 1638, New Haven is identified as America's first planned city due to the intentional grid layout of the city⁵. New Haven spans a land area of 18.7 square miles. Three rivers, the West River, Mill River, and Quinnipiac River diverge into the New Haven Harbor, draining east to west. Streams, such as Belden Brook, Wintergreen Brook, and Wilmot Brook are also part of the landscape, flowing throughout the City neighborhoods. Other key physical features of the City are the sizable Quinnipiac tidal marsh and two rock ridges, deemed East Rock and West Rock. Gateway Community College is also located in New Haven.

³ Southern Connecticut State University. *Southern Earns Power of Change Award*. Accessed. 20 May 2015. <http://www.southernct.edu/news/powerofchange.html>

⁴Southern Connecticut State University. *Historical View*. Accessed May 20, 2015 <http://www.southernct.edu/about/scsu-info/history.html>

⁵ City of New Haven, Connecticut. *Community Profile*. Accessed May 18, 2015. <http://www.cityofnewhaven.com/humanresources/pdfs/Dep%20Dir%20TT&P%20MPE%20Brochure.pdf>

Figure 1-1: New Haven, CT Location Map



New Haven’s climate is characterized by moderate but distinct seasons. The average temperature is approximately 52 degrees, with summer temperatures in the mid-70s (daily average) and winter temperatures in the mid-30s (daily average). Extreme conditions raise summer temperatures to near 100 degrees and winter temperatures to below zero. Mean snowfall is approximately 52 inches per year. Mean precipitation is 44 inches, which is generally spread evenly over the course of a year. **Table 1-1** presents typical climate data for the City of New Haven.

Table 1-1: Climate Data for New Haven, CT 1981 – 2010

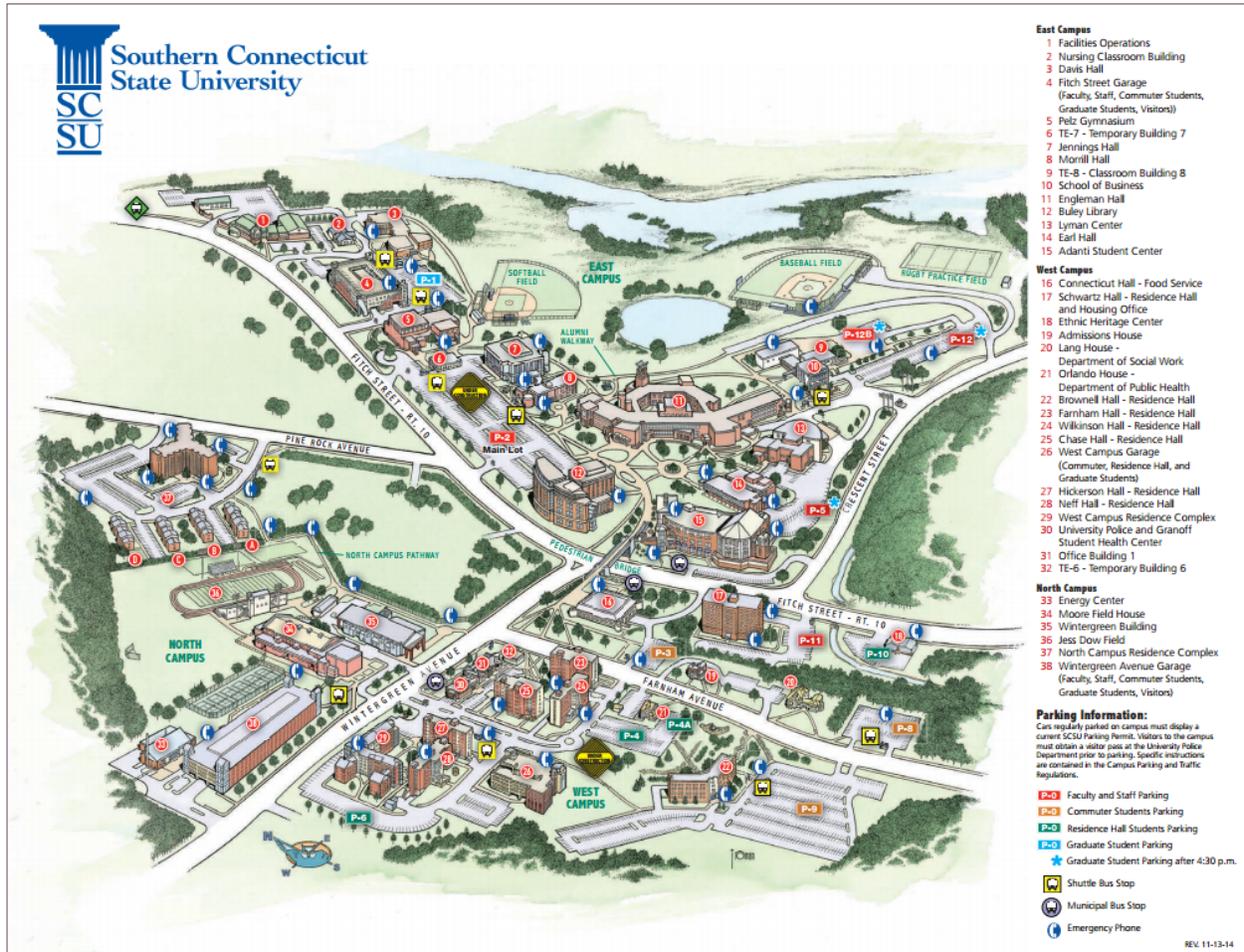
	Jan	Feb	March	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Average High (°F)	37.8	40.5	47.6	58.2	68.5	77.3	82.5	80.9	74.4	63.4	53.5	42.9
Average Low (°F)	22.2	24.9	31.2	40.2	49.3	59.7	65.5	64.9	56.1	45.0	36.6	28.4
Average Rainfall (in)	3.19	2.89	4.29	4.44	4.17	4.02	4.01	3.95	4.37	4.24	3.93	3.61

Source: NOAA Climate Data for New Haven (Tweed Airport) (1981 – 2010)

1.1.3 Campus Location & Environment

Southern consists of three campuses including East Campus, West Campus, and North Campus. The three campuses are all connected and situated along Fitch Street (Route 10), Crescent Street, Wintergreen Avenue, Farnham Avenue, and Pine Rock Avenue. Southern consists over 2.9 million square feet featuring nine high-rise residence halls, numerous other residence halls, an art center, student center, one central dining hall, one library and 31 other administrative and classroom buildings. The campus also features an athletic complex, sports fields, 12 parking lots, and three parking garages (1,200, 600, 450-space parking garages). **Figure 1-2** depicts the campus map.

Figure 1-2: Southern Campus Map



Source: Southern Connecticut State University website. (<http://www.southernct.edu/files/general/maps/scsu-map.pdf>)

A list of existing buildings on the East, West, and North campuses is located in Table 1-2, Table 1-3, and Table 1-4.

Table 1-2: Southern Campus Building Information – East Campus

Name of Building	Construction Completion Date	Gross Square Feet	Building Function
Buley Library	1968	249,412	Library, Curriculum Lab, Diversity and Equity Programs, Information and Library Sciences, Learning Resource Center, Women’s Hall of Fame
Davis Hall	1969	49,614	Counseling and School Psychology, School of Education, Elementary Education, Family Therapy Clinic, Food Services, Professional Development School, Special Education, Student Teaching
Earl Hall	1960	46,027	Art, Art History, Communication, Judaic Studies, Music



Name of Building	Construction Completion Date	Gross Square Feet	Building Function
Engleman Hall	1953	224,599	Academic Affairs, Anthropology, School of Arts and Sciences, Chief of Staff, Counseling Services, Disability Resource Center, Economics, English, Food Services, Graduate Studies, Math, Philosophy, Political Science, Psychology, Sociology, Women's Studies
Greenhouse	1990	125	Greenhouse
Grounds/Vehicle Maintenance/Facilities Garage	2000	9,855	Facilities
Jennings Hall	1982	130,026	Biology, Chemistry, Coastal and Marine Studies, Laboratory, Environmental Studies, Physics
Lyman Center for the Performing Arts	1967	53,058	Performing arts facility, consisting of two performing spaces, a lobby art gallery, and the Department of Theatre
Michael J. Adanti Student Center	2006	129,607	Bookstore, Conference Services and Special Events, Fitness Center, Information Desk, Food Services, Multicultural Affairs, Student Government, Student Life/Organizations
Morrill Hall	1959	42,050	Earth Science, Geography, Journalism, Urban Studies
New Fitch Street Parking Garage	2000	193,605	Parking Garage
New Physical Plant/Facilities Operations Building	2000	44,609	Custodial, Electrical, Grounds, Heating Plant, Building Maintenance
Nursing Building	2005	5,000	Nursing
Pelz Gymnasium (including Pelz Storage Building)	1952	77,423	Athletics, Exercise Science, Pelz Pool
School of Business	1958	43,590	School of Business, Economics and Finance, Marketing, MBA Program
Temporary Bookstore	2001	4,961	Bookstore

Table 1-3: Southern Campus Building Information – West Campus

Building Name	Original Construction Completion Date	Gross Square Feet	Building Function
Admissions Building (131 Farnham)	1900	6,299	Admissions
Brownell Hall	1982	67,157	Residence Hall
Chase Hall	1967	59,266	Residence Hall
Connecticut Hall	1973	45,569	Dining Hall



Building Name	Original Construction Completion Date	Gross Square Feet	Building Function
Farnham Hall	1964	57,047	Residence Hall
Granoff Hall/Police Station/Health Svcs	1972	10,874	Wellness Center, University Police, Health Services
Hickerson Hall	1967	59,266	Residence Hall
Lang House	1903/92A/93	10,199	Department of Social Work, School of Health and Human Services
Modular Building /Office Building OB1	2006	12,000	Office of Information Technology, Recreation and Leisure, School of Health and Education
Neff Hall	1969	48,150	Residence Hall
Orlando House	1890	4,188	Department of Public Health
Schwartz Hall	1957/95R	100,293	Residence Hall and Housing Office, Women's Center
Temporary Office Building 6	2001	6,128	Office and Administration
Warehouse 1 (Ethnic Heritage Center)	1970	7,690	Ethnic heritage archives, museum, and research center
West Campus Parking Garage	2004	148,098	Parking Garage
West Campus Residence Hall	2004	112,722	Residence Hall
Wilkinson Hall	1965	63,828	Residence Hall

Table 1-4: Southern Campus Building Information – North Campus

Name of Building	Original Construction Completion Date	Gross Square Feet	Building Function
Jess Dow Field Concession Building	1991	1,346	Field with press box, concession stands and bathrooms
Moore Field House	1976	141,563	Human Performance Lab, Fieldhouse Pool, Press Box, Athletics, Exercise Science
New Boiler Plant/Energy Hall	2003	20,000	Boiler Plant/ Energy Center
North Campus Res. Hall Complex: Mid-Rise	1985	152,360	Residence Hall
North Campus Res. Hall Complex: Town House A	1991	9,059	Residence Hall

Name of Building	Original Construction Completion Date	Gross Square Feet	Building Function
North Campus Res. Hall Complex: Town House B	1991	9,059	Residence Hall
North Campus Res. Hall Complex: Town House C	1991	9,059	Residence Hall
North Campus Res. Hall Complex: Town House D	1991	9,059	Residence Hall
Wintergreen Parking Garage	2013	394,000	Parking Garage
Wintergreen Building	1994	48,806	Student enrollment services, including the Registrar, Bursar, Financial Aid, Career Services, and Academic Advisement

1.1.4 Historic Resources

According to the Connecticut Trust for Historic Preservation and New Haven Historic Resources, no local historic districts or properties are situated on the Southern campus. However, according to the System Office, there are three historic buildings on campus that meet criteria set by the state Historic Register. These buildings include:

- Lang House
- Orlando House
- Admissions Building (131 Farnham)

1.1.5 Emergency Services

The Southern Police Department has been in operation since 1983, providing police and public safety services to the campus population. Located in Granoff Hall, the Police Department includes the Chief of Police, Deputy Chief of Police, one Lieutenant, four Sergeants, one Detective, and 19 patrol officers. Also on staff are five Dispatchers, one Building and Grounds officer, one Administrative Assistant, and 20 University Assistants. The officers are present in and around the Southern buildings and grounds and they patrol, oversee the campus shuttle service, and coordinate the Campus Escort program⁶.

Southern's comprehensive Emergency Management Plan was updated in October 2014. The Plan provides information about incident responses and delivers guidelines to follow according to possible situations, such as criminal behavior incidents, medical scenarios, and natural hazards. The University Incident Management Team, comprised of University Police, Administrators and staff, is responsible for the content of the Plan.

Should a potential emergency or hazardous situation arise, Southern will notify the campus community through several means including a siren/public address system, emergency blue phones, email, and the Southern website. The campus

⁶ Southern Connecticut State University. *Safety and Security*. Accessed May 20, 2015. <http://www.southernct.edu/student-life/safety/>



also utilizes SouthernAlert, a system that sends out notification to the subscribers through text message, voicemail, and email.

1.1.6 Infrastructure & Utilities

A dedicated Facilities Management staff oversees planning, design, construction and maintenance of Southern's campus facilities. Southern's Master Plan, the 2020 Program, the Climate Action Plan, and the Strategic Plan all help shape Facilities Management's long-term responsibilities, inclusive of preparing for new construction projects and renovations to existing infrastructure.

High temperature hot water (HTHW) and steam are distributed throughout the campus via Southern's central plant at the Energy Center, located on West Campus. Constructed in 2002, the Energy Center's four boilers provide fourteen buildings with HTHW and Steam, while other buildings are fed by electrically heated hot water storage tanks. The campus' electrical services are distributed through three separate means: directly from United Illuminating Company, through East Campus distribution or loop or through West Campus' distribution loop. The West Campus Loop is equipped with a back-up diesel generator in case of emergency. The other primary source of energy is natural gas, supplied by Southern Connecticut Gas⁷.

1.1.7 Campus Development

Over the past three years, the Southern student population has seen major campus resource enhancements with the addition of two new buildings. In April 2015, Southern opened its completed \$31 million state-of-the-art library. The 98,000 square foot renovated wing of Buley Library now houses a cyber café, art gallery, and area for media and special collections. The renovated space features a skywalk connecting the first and third floor of the building.

Also completed in 2015 is Southern's new \$49 million⁸, 103,608 square foot Science Building (see **Figure 1-3**). The building is located next to the current science building, Jennings Hall. The four-floor facility houses the Center for Nanotechnology, Werth Center for Coastal and Marine Studies, and lab space for physics, earth science, environmental science, molecular biology, and chemistry. Other amenities include a theatre, study areas, two classrooms, and a conference room.

⁷ Perkins + Will. *Southern Connecticut State University, Existing Infrastructure – Draft for Review*. 2015.

⁸ Southern Connecticut State University. *A Green and Growing Campus*. Accessed November 20, 2015. <https://www.southernct.edu/about/construction/>

Figure 1-3: Southern Academic Laboratory and Science Building



Photo: Academic Laboratory and Science Building, (Southern Connecticut State University website).

A feasibility study for a new Health & Human Services Building is in the process of completion. The study will help identify where on campus the building should be located. The campus is also in the midst of another Master Plan update to identify additional space needs. According to the previous 2006 Master Plan Update, plans for future development may include a New Fine Arts Center, a Computing Center, and consolidation of existing student services with a new Student Services Building.

1.1.8 Community Involvement

Southern serves as a meeting place in the community and in hazard mitigation planning it is important to include information about when the outside community may be on campus to adequately plan for future hazard scenarios. Southern actively engages and contributes to its community through civic engagement and hosting public lectures, awareness events and conferences. Specifically, in recognition of their exemplary community involvement, Southern was named on the 2014 President's Higher Education Community Service Honor Roll. The Corporation for National and Community Service (CNCS) presents the honor annually to higher education institutions that demonstrate model community service. Southern was specifically recognized under two categories, the General Community Service and Education Community Service.⁹

⁹ Southern Connecticut State University. *Southern Recognized at National Level for Excellence in Service*. Accessed May 18, 2015. <http://www.southernct.edu/news/service-honor-roll.html>

2. PLANNING PROCESS

The planning process for the Multi-Campus Hazard Mitigation Plan was important to develop a functional plan that was reflective of the campus. This section describes the Multi-Campus Hazard Mitigation Plan planning process at Southern and stakeholders involved. The planning process included stakeholder engagement completed through a variety of means. Opportunities for involvement consisted of planning meetings, interviews, public meetings, and opportunities to provide feedback made available throughout the planning process.

2.1 PLANNING TEAM

The Multi-Campus Hazard Mitigation Plan Steering Committee representative for Southern was the Associate Vice President for Capital Budgeting & Facilities Operations. The Associate Vice President for Capital Budgeting & Facilities Operations was closely supported by the Director of Environmental Health & Safety and established the Southern Hazard Mitigation Planning team including additional representatives from Campus Police and Facilities Engineering. The Southern Hazard Mitigation Planning team represented a focused, core group of individuals. This team assembled throughout the planning process to coordinate and discuss key tasks and campus-specific information contributing to the Multi-Campus Hazard Mitigation Plan. **Table 2-1** presents the Southern Hazard Mitigation Planning Team.

Table 2-1: Southern Hazard Mitigation Planning Team

Name	Title
Robert Sheely	Associate Vice President for Capital Budgeting & Facilities Operations
Joseph Dooley	Chief of Police
Karen Misbach	Director of Environmental Health & Safety
Philip Pessina	Deputy Chief
John Ruggiero	Director, Facilities Engineering

The Southern Hazard Mitigation Planning team was involved in various aspects of the planning process and data collection activities; however, other campus representatives were also involved to provide additional information to the plan. **Table 2-2** presents an overview of the stakeholders engaged in the Southern Chapter of the Multi-Campus Hazard Mitigation Plan. Each of the opportunities for stakeholder engagement is discussed in **Section 2.2**.

Table 2-2: Stakeholders Engaged in Southern Hazard Mitigation Plan

Person	Title	Entity	Attended December 4, 2014 Campus Interviews	Attended December 5, 2014 Campus Interviews	Attended February 24, 2015 Public Meeting #1	Attended February, 2015 Hazard ID and Ranking Meeting	Attended June 17, 2015 Loss Estimate & HMP Meeting	Attended November 10, 2015 Presentation of Draft HMP	Attended February 10, 2016 Public Meeting #2
Beaulieu, Christie	Student	Southern							X



Person	Title	Entity	Attended December 4, 2014 Campus Interviews	Attended December 5, 2014 Campus Interviews	Attended February 24, 2015 Public Meeting #1	Attended February, 2015 Hazard ID and Ranking Meeting	Attended June 17, 2015 Loss Estimate & HMP Meeting	Attended November 10, 2015 Presentation of Draft HMP	Attended February 10, 2016 Public Meeting #2
Beerman-Ahmed, Ahmed	Facilities Management Associate	System Office	X						
Bernabe, Thea	Student	Southern							X
Blake, Jim	Executive Vice President	Southern	X						
Breese, Steve	Dean of School of Arts and Sciences	Southern		X					
Christy, Chermele	Resident Director, Brownell Hall	Southern		X					
Cohone, Bill	Assistant Director, Facilities Operations	Southern		X					
Crone, Kimberly	Associate Vice President, Enrollment Management	Southern		X					
Cusato, Susan	Science Education and Environmental Studies Chair	Southern		X					
DeMezzo, Robert	Director, Resident Life	Southern	X						
Dooley, Joseph	Chief of Police	Southern	X		X				
Dorr, Thomas	Adanti Student Center	Southern			X				



Person	Title	Entity	Attended December 4, 2014 Campus Interviews	Attended December 5, 2014 Campus Interviews	Attended February 24, 2015 Public Meeting #1	Attended February, 2015 Hazard ID and Ranking Meeting	Attended June 17, 2015 Loss Estimate & HMP Meeting	Attended November 10, 2015 Presentation of Draft HMP	Attended February 10, 2016 Public Meeting #2
Dupuis, Chris	Director, Capital Projects	System Office					X	X	X
Kearney, Kristin	Student	Southern							X
Kellogg, Ray	Director, OIT Communications Technology	Southern		X					
Lesley, Gerry	Chemistry Department Chair	Southern		X					
Loescher, Paul	Director, Facilities and Planning, Arch. Services	Southern		X					
Misbach, Karen	Facilities, EH&S	Southern	X	X	X	X	X		X
Pessina, Philip	Deputy Chief	Southern	X		X				
Richards, Taylor	Student	Southern							X
Ritchie, Michelle	Facilities, Student Intern	Southern	X						
Ruggiero, John	Director, Facilities Engineering	Southern	X				X		
Seliga, Stanley	Facilities	Southern	X						
Sheeley, Robert	Associate Vice President	Southern			X	X	X	X	X
Wesley, Taylor	Student	Southern							X

2.2 EXISTING DATA & REPORTS UTILIZED FOR THE PLAN

At the start of the project, a data request was issued to Southern for existing documentation related to hazard and vulnerability risk assessments, emergency preparedness efforts, and campus assets. **Appendix A** includes a bibliography of the documents that were either provided by Southern or were collected from other publicly available sources and utilized during the planning process.

2.3 STAKEHOLDER ENGAGEMENT

There were several opportunities provided for stakeholder engagement including a request to respond to a data gathering effort, planning meetings, interviews, public meetings, and opportunities to provide input and comment outside of formal meetings. Each of the major opportunities for stakeholder engagement is documented in the following sections.

2.3.1 Campus Kick-Off Meeting

On December 4, 2014, an informal campus kick-off meeting was held at Southern with the Environmental Health & Safety Director to initiate stakeholder engagement activities. The meeting served as an orientation to the hazard mitigation planning effort and was completed prior to initiating the campus interviews. The representatives in attendance are listed in **Table 2-2**. The meeting sign-in sheet and Power Point presentation (including the meeting agenda) are provided in **Appendix B**. Topics reviewed during this meeting are listed in **Table 2-3**.

Table 2-3: Topics Reviewed During the Southern Hazard Mitigation Plan Kick-Off Meeting

Topic	Details
Project Overview	Reviewed the goals of the project, background of the grant funding, and benefits to be achieved by Southern.
Hazard Mitigation Planning	Introduced the concept of hazard mitigation planning including the planning phases, types of hazards to be included, and recent hazard events that impacted Southern and other CSCU campuses.
Approval Process and Requirements	Reviewed the requirements and expectations of FEMA/DEHMS in order to achieve plan approval. Topics included the importance for documentation, stakeholder engagement, and focus on the importance of the process. FEMA's evaluation criteria were provided as a handout.
Components of Hazard Mitigation Planning	Reviewed the planning process, hazard identification and risk assessment, mitigation strategy, and plan review, evaluation, and implementation.
Team Roles and Responsibilities	Roles and responsibilities consisted of participation in meetings, providing relevant documentation, identification, and assessment of hazards, support outreach activities, review and comment on the draft Multi-Campus Hazard Mitigation Plan and support Plan implementation.
Project Schedule	The project schedule was reviewed with interim and final deadlines. Approval by DEHMS/FEMA is necessary by January 2017 to meet the obligations of the grant.

The campus kick-off meeting provided a solid foundation for the Southern Hazard Mitigation Plan Team leadership regarding the project objectives and how the campus could support the Multi-Campus Hazard Mitigation Plan Steering Committee. The meeting outlined the expectations and process to be followed regarding how to prepare and complete the Southern Chapter of the Multi-Campus Hazard Mitigation Plan.

2.3.2 Stakeholder Interviews

On December 4th and 5th, 2014, stakeholder interviews were completed to discuss natural hazards that have or could affect Southern, potential vulnerabilities to those hazards, and assets that could be impacted. The interviews were completed on campus during a group and one-on-one interview sessions conducted by Woodard & Curran. The stakeholders interviewed are listed in **Table 2-2**.

Interviews were conducted in an open format by one interviewer. An interview questionnaire (**Appendix C**) was prepared and distributed in advance; however, this was intended only to give the interviewees a notion of the types of topics to be addressed, as opposed to a list of questions that would be strictly adhered to during the interview. The approach was instead to have the interviewee focus on the areas in which he/she had the most experience and information to share, and not to be restrictive in the discussion. As a result of the interviews, a series of themes were identified as outlined in **Table 2-4**.

Table 2-4: Southern Interview Topics & Themes

Topic	Themes
Utilities/Campus Assets	Back-up power is only available for facilities/operational systems but not available for academic and research functions.
	Generators are diesel and could be negatively impacted by a prolonged fuel shortage.
Campus Setting and Surrounding Areas	Challenge getting off campus with traffic in major weather events.
	There is poor drainage in portions of the campus and surrounding community.
Safety & Security	Sheltering in place has been necessary and challenging in the past during heavy winter storm events.
Safety & Security	It can be very windy on campus.
Campus Population	Lots of pedestrians on campus, and sidewalks/walkways can become slippery in winter weather.

All of the themes in **Table 2-4** were important considerations factored into the hazard identification and risk assessment process. Aside from these common themes, interviewees gave perspectives on hazards that had or could impact the campus and previous damages or campus impacts experienced from hazard events, including:

- During a heavy snow event two years ago, Southern had to hire a contractor to shovel off roofs. Moore Field House (large roof where wind can blow off to lower roof) weight was 25% overloaded. Students remaining on campus were consolidated in one dorm. The students could not open the doors for a period of time due to heavy snow accumulations.

- There are not many areas on campus to place large quantities of snow.
- Two hurricanes have recently impacted campus. Damages from Hurricane Sandy included tree damage, and minor flooding along West River that runs through campus. The campus was closed during Hurricane Irene.
- A tornado in the 1980s caused major damage to campus, including the loss of the Butler Building and Buley Library roof.
- Multiple flooding events have occurred on campus leading to water in buildings, garages, and pedestrian areas.

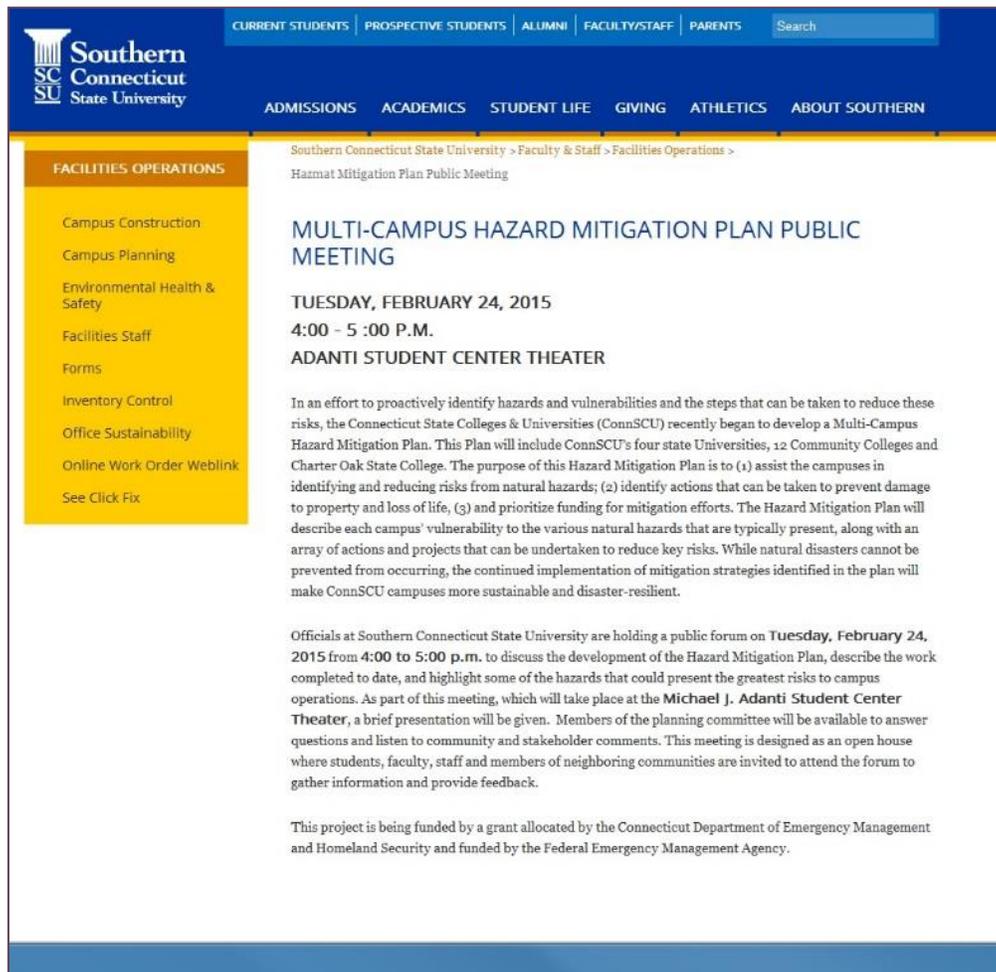
The list is not meant to be all inclusive of past events experienced on campus and only represents events mentioned during the interviews. More specific information provided is presented in **Section 3**.

2.3.3 Public Meeting No. 1

On February 24, 2015, the first public meeting regarding this hazard mitigation planning process was held at the Southern campus. The meeting was advertised in several ways (see **Figure 2-1**) including the following.

- Southern website announcement on the Facilities Operations web page
- Southern website announcement on the Calendar page
- Email announcement

Figure 2-1: Southern Public Meeting No. 1 Advertising Efforts



The screenshot shows the Southern Connecticut State University website. The top navigation bar includes links for CURRENT STUDENTS, PROSPECTIVE STUDENTS, ALUMNI, FACULTY/STAFF, PARENTS, and a Search box. Below this is a secondary navigation bar with links for ADMISSIONS, ACADEMICS, STUDENT LIFE, GIVING, ATHLETICS, and ABOUT SOUTHERN. The main content area is titled "Southern Connecticut State University > Faculty & Staff > Facilities Operations > Hazmat Mitigation Plan Public Meeting". The announcement is for a "MULTI-CAMPUS HAZARD MITIGATION PLAN PUBLIC MEETING" on "TUESDAY, FEBRUARY 24, 2015" from "4:00 - 5:00 P.M." at the "ADANTI STUDENT CENTER THEATER". The text describes the purpose of the Hazard Mitigation Plan and the details of the public forum. A sidebar on the left lists various facilities operations categories like Campus Construction, Campus Planning, Environmental Health & Safety, etc.



CSCU



MULTI-CAMPUS HAZARD MITIGATION PLAN PUBLIC MEETING

Tuesday, February 24, 2015

04:00pm - 05:00pm

Adanti Student Center - Theater

3
 Like
 1
 Tweet
 0

In an effort to proactively identify hazards and vulnerabilities and the steps that can be taken to reduce these risks, the Connecticut State Colleges & Universities (ConnSCU) recently began to develop a Multi-Campus Hazard Mitigation Plan. This Plan will include ConnSCU's four state Universities, 12 Community Colleges and Charter Oak State College. The purpose of this Hazard Mitigation Plan is to (1) assist the campuses in identifying and reducing risks from natural hazards; (2) identify actions that can be taken to prevent damage to property and loss of life, (3) and prioritize funding for mitigation efforts. The Hazard Mitigation Plan will describe each campus' vulnerability to the various natural hazards that are typically present, along with an array of actions and projects that can be undertaken to reduce key risks. While natural disasters cannot be prevented from occurring, the continued implementation of mitigation strategies identified in the plan will make ConnSCU campuses more sustainable and disaster-resilient.

Officials at Southern Connecticut State University are holding a public forum on **Tuesday, February 24, 2015 from 4:00 to 5:00 p.m.** to discuss the development of the Hazard Mitigation Plan, describe the work completed to date, and highlight some of the hazards that could present the greatest risks to campus operations. As part of this meeting, which will take place at the **Michael J. Adanti Student Center Theater**, a brief presentation will be given. Members of the planning committee will be available to answer questions and listen to community and stakeholder comments. This meeting is designed as an open house where students, faculty, staff and members of neighboring communities are invited to attend the forum to gather information and provide feedback.

LOCATION

Adanti Student Center - Theater
345 Fitch St.
New Haven, CT 06515

CATEGORIES

Events
Featured

From: Sheeley, Robert G. <rsheel@southernct.edu>
Sent: Thursday, February 26, 2015 10:06 AM
To: Mary House
Subject: FW: Multi-Campus Hazard Mitigation Plan - February 2015

For your files.

Bob

Robert G. Sheeley
Associate Vice President for Capital Budgeting & Facilities Operations Southern Connecticut State University
rsheel@southernct.edu
Phone: 203-392-6050
Fax: 203-392-6058

-----Original Message-----

From: Karyn Gilvarg [mailto:KGilvarg@newhavenct.net]
Sent: Thursday, February 19, 2015 6:27 PM
To: Sheeley, Robert G.
Cc: Michael Piscitelli; Susmitha Altota
Subject: Re: Multi-Campus Hazard Mitigation Plan - February 2015

Hi Bob, I will pass this on to Susmitha Altota, in my department and to Jennifer Pugh, Deputy CAO - they oversee Emergency Ops, and to Mike Piscitelli.
Susmitha - please forward to West side alders, including Beaver Hills.
Karyn

-----Original Message-----

From: "Sheeley, Robert G." <rsheel@southernct.edu>
To: Gilvarg, Karyn <KGilvarg@newhavenct.net>

Sent: 2/19/2015 11:46:51 AM

Subject: Multi-Campus Hazard Mitigation Plan - February 2015

Good morning Karyn! Hope all is well. I am writing because I need your help in getting the word out about a Public Hearing we are having on the development of a Multi-Campus Hazard Mitigation Plan (see attached notification).

I made the mistake in assuming that notifications had gone out to possible interested parties and I come to find out this morning that it had not.

Could you be so kind to send to the alderpersons in our area and other possible interested parties. It would be most appreciated. I am truly sorry for the late notice and my mistake in assuming notifications had gone out.

Our system received a grant from FEMA to develop this plan and Woodward & Curran out of Cheshire has been hired by our System Office to help us put the plan together.

The format of the public meeting was designed to be casual and informative and conducive to receiving input. A brief Power Point presentation outlining the project goals and hazard mitigation planning process was presented followed by an open question and answer period. Southern and Woodard & Curran representatives attended the public meeting. While there were process related questions associated with completing a hazard mitigation plan, there were no specific questions or comments associated with Southern’s specific hazards or impacts. Public meeting materials are provided in **Appendix D**.

2.3.4 Hazard Identification and Risk Assessment Meeting

On February 24, 2015 a hazard identification and risk assessment meeting was held at Southern to initiate the hazard identification and risk assessment process. The representatives in attendance are listed in **Table 2-2**. The meeting agenda and sign-in sheet are included in **Appendix E**. The topics reviewed during this meeting are presented in **Table 2-5**.

Table 2-5: Topics Reviewed During the Southern Hazard Identification and Risk Assessment Meeting

Topic	Details
Overview of Hazard Mitigation Planning Process and Meeting Goal	A brief overview of the hazard mitigation planning process was provided as a review for meeting attendees. The meeting goal was to reach consensus on a ranked list of natural hazards that could impact the campus.
Overview of Potential Hazards	Campus specific considerations associated with hazard events were presented to the stakeholders and included summaries of research completed and previous studies.
Summary of Interview discussions	Common themes shared by interviewees and specific hazard events mentioned were reviewed. Considerations resulting from the interviews were discussed as well as initial mitigation projects identified to address potential hazards.
Hazard Ranking Methodology	The hazard ranking methodology was reviewed with the stakeholders and consisted of ranking the categories of frequency, severity, duration, and intensity with a 0 to 5 scale. The categories were grouped into probability and consequence factors that could be weighted.
Group Workshop Hazard Ranking Review	The stakeholder group reviewed the list of natural hazards identified and the process to rank each category using the 0 to 5 scale. The team reviewed how each hazard was categorized in groups of severe, high, medium, and low.
Public Workshop	Stakeholders were briefed on the format and logistics associated with the first public workshop.

Upon completion of the meeting, the campus stakeholders were provided with the finalized list of ranked hazards to reflect upon and make further modifications as necessary.

2.3.5 Loss Estimates and Hazard Mitigation Projects Meeting

On June 17, 2015 a loss estimate and hazard mitigation project identification meeting was held at Southern. The representatives in attendance are listed in **Table 2-2**. The meeting agenda, sign in sheet and Power Point presentation are provided in **Appendix F**. The topics reviewed during this meeting are presented in **Table 2-6**.

Table 2-6: Topics Reviewed During the Southern Loss Estimates and Hazard Mitigation Project Meeting

Topic	Details
Hazard Mitigation Goals and Objectives	The hazard mitigation goals developed by the Multi-Campus Hazard Mitigation Steering Committee were reviewed with the stakeholder group.
Building Ratings	The methodology to assign building criticality values was reviewed with the stakeholder group as well as the initial assignment of building criticality values. As a result of discussion, select modifications were made to the building criticality values.
Loss Estimates	The methodology for developing loss estimates was reviewed and findings associated with both specific hazards and non-hazard specific events were presented.
Hazard Mitigation Projects	Specific hazard mitigation projects identified to address the various hazards that could impact campus were discussed in relation to the specific hazards addressed and plan goals and objectives.

After the meeting, revised hazard mitigation project lists, building criticality assignment and loss estimate calculations were provided to the stakeholder group for further review and comment.

2.3.6 Presentation of Draft Multi-Campus Hazard Mitigation Plan Facilitated Review Meeting

On November 10, 2015, Southern attended the Multi-Campus Hazard Mitigation Plan Steering Committee meeting, during which the written draft Multi-Campus Hazard Mitigation Plan was presented. The Southern Hazard Mitigation Planning team and other campus stakeholders subsequently met to review the draft plan. The representatives in attendance via conference call are listed in **Table 2-2**. The meeting agenda, sign-in sheet, and Power Point presentation are provided in **Appendix G**.

The written draft was issued prior to the meeting such that stakeholders would have an opportunity to review the draft prior to the meeting. During the meeting, a facilitated review of the draft was provided highlighting key areas to focus upon. Feedback on the draft was solicited and recorded for incorporation into the final version of the Plan. **Table 2-7** outlines the topics discussed at the meeting.

Table 2-7: Topics Reviewed During the Southern Facilitated Review Meeting of the Draft Multi-Campus Hazard Mitigation Plan and Southern Chapter

Topic	Details
Hazard Mitigation Plan Organization	The overall organization of the Multi-Campus Hazard Mitigation Plan and the Southern Chapter was reviewed.
Risk Assessment	Risk rankings were reviewed for any additional comments. Additional focus was placed on reviewing rankings for the categories of students, faculty and staff, existing buildings, future buildings, operations and critical infrastructure.
Mitigation Actions	Hazard mitigation projects were reviewed for any additional comments. Additional focus was placed on the estimated project cost, responsible party, and project priority ranking.
Plan Implementation, Maintenance & Adoption	The plan implementation, maintenance and adoption was reviewed so that the hazard mitigation planning team understood the process of plan implementation and the expectations of the team moving forward.

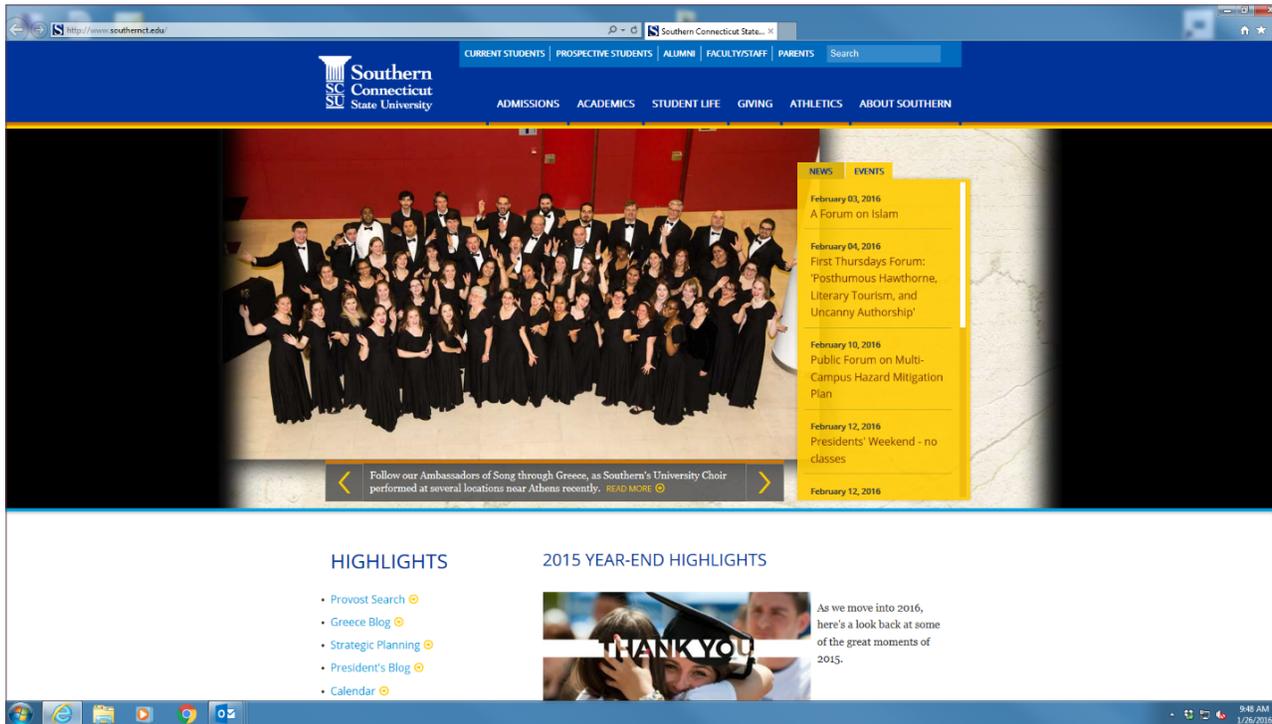
No specific comments on the draft Multi-Campus Hazard Mitigation Plan were received during the facilitated review meeting. Upon completion of the meeting, the campus stakeholders were encouraged to complete a final review of the Multi-Campus Hazard Mitigation Plan with a specific focus on the areas presented in **Table 2-7**.

2.3.7 Public Meeting No. 2

On February 10, 2016, the second public meeting presenting the draft Multi-Campus Hazard Mitigation Plan was held on the Southern campus. The meeting was advertised using a variety of venues and consisted of the following (see **Figure 2-2**):

- Posting on Southern’s web site (multiple pages).
- Memo to officials in surrounding communities.
- Press release.
- Memo to State Senator and State Representative.

Figure 2-2: Southern Public Meeting No. 2 Advertising Efforts





University Calendar						
<	Jan 2016	>				
S	M	T	W	T	F	S
03	04	05	06	07	08	09
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Advanced Search

Search Events by Keyword

+ Add Event

PUBLIC FORUM ON MULTI-CAMPUS HAZARD MITIGATION PLAN

Wednesday, February 10, 2016
04:00pm
Adami Student Center - Theater

In an effort to proactively identify hazards and vulnerabilities and the steps that can be taken to reduce these risks, the Connecticut State Colleges & Universities (CSCU) has been in the process of developing a Multi-Campus Hazard Mitigation Plan for the last 18 months. This plan includes CSCU's four state Universities, 12 Community Colleges, Charter Oak State College and the System Office. The purpose of the Multi-Campus Hazard Mitigation Plan is to (1) assist the campuses in identifying and reducing risks from natural hazards; (2) identify actions that can be taken to prevent damage to property and loss of life; (3) and prioritize funding for mitigation efforts. The Multi-Campus Hazard Mitigation Plan describes each campus' vulnerability to the various natural hazards that are typically present, along with an array of actions and projects that can be undertaken to reduce key risks. While natural disasters cannot be prevented from occurring, the continued implementation of mitigation strategies identified in the plan will make CSCU campuses more sustainable and disaster-resilient.

Officials at Southern Connecticut State University are holding a public forum on February 10, 2016, at 4 p.m. to present the draft Multi-Campus Hazard Mitigation Plan. As part of this meeting, which will take place at Adami Student Center Theater, a brief presentation will be given. Members of the Hazard Mitigation Planning Team will be available to answer questions and listen to community and stakeholder comments. This meeting is designed as an open house where students, faculty, staff and members of neighboring communities are invited to attend the forum to gather information and provide feedback. A draft of the Multi-Campus Hazard Mitigation Plan can be downloaded from the CCSU System Office web site by the following link:

- <http://www.ct.edu/hmtr>

This project is being funded by a grant allocated by the Connecticut Department of Emergency Management and Homeland Security and funded by the Federal Emergency Management Agency.

LOCATION

CATEGORIES



MEMORANDUM

TO: Interested Parties
FROM: Robert G. Sheeley
Associate Vice President for Capital Budgeting & Facilities Operations

DATE: January 26, 2016

SUBJECT: Public Forum – Multi-Campus Hazard Mitigation Plan

In an effort to proactively identify hazards and vulnerabilities and the steps that can be taken to reduce these risks, the Connecticut State Colleges and Universities (CSCU) has been in the process of developing a Multi-Campus Hazard Mitigation Plan for the last 18 months. This plan includes CSCU's four state Universities, 12 Community Colleges, Charter Oak State College and the System Office. The purpose of the Multi-Campus Hazard Mitigation Plan is to (1) assist the campuses in identifying and reducing risks from natural hazards; (2) identify actions that can be taken to prevent damage to property and loss of life; (3) and prioritize funding for mitigation efforts. The Multi-Campus Hazard Mitigation Plan describes each campus' vulnerability to the various natural hazards that are typically present, along with an array of actions and projects that can be undertaken to reduce key risks. While natural disasters cannot be prevented from occurring, the continued implementation of mitigation strategies identified in the plan will make CSCU campuses more sustainable and disaster-resilient.

Officials at Southern Connecticut State University are holding a public forum on February 10, 2016 at 4:00 pm to present the draft Multi-Campus Hazard Mitigation Plan. As part of this meeting, which will take place at Adami Student Center Theater, a brief presentation will be given. Members of the Hazard Mitigation Planning Team will be available to answer questions and listen to community and stakeholder comments. This meeting is designed as an open house where students, faculty, staff and members of neighboring communities are invited to attend the forum to gather information and provide feedback. A draft of the Multi-Campus Hazard Mitigation Plan can be downloaded from the CCSU System Office web site by the following link:

- <http://www.ct.edu/hmtr>

This project is being funded by a grant allocated by the Connecticut Department of Emergency Management and Homeland Security and funded by the Federal Emergency Management Agency.



Press Release

In an effort to proactively identify hazards and vulnerabilities and the steps that can be taken to reduce these risks, the Connecticut State Colleges & Universities (CSCU) has been in the process of developing a Multi-Campus Hazard Mitigation Plan for the last 18 months. This Plan includes CSCU's four state Universities, 12 Community Colleges, Charter Oak State College and the System Office. The purpose of the Multi-Campus Hazard Mitigation Plan is to (1) assist the campuses in identifying and reducing risks from natural hazards; (2) identify actions that can be taken to prevent damage to property and loss of life, (3) and prioritize funding for mitigation efforts. The Multi-Campus Hazard Mitigation Plan describes each campus' vulnerability to the various natural hazards that are typically present, along with an array of actions and projects that can be undertaken to reduce key risks. While natural disasters cannot be prevented from occurring, the continued implementation of mitigation strategies identified in the plan will make CSCU campuses more sustainable and disaster-resilient.

Officials at Southern Connecticut State University are holding a public forum on February 10, 2016 at 4:00 pm to present the draft Multi-Campus Hazard Mitigation Plan. As part of this meeting, which will take place at Adanti Student Center Theater, a brief presentation will be given. Members of the Hazard Mitigation Planning Team will be available to answer questions and listen to community and stakeholder comments. This meeting is designed as an open house where students, faculty, staff and members of neighboring communities are invited to attend the forum to gather information and provide feedback. A draft of the Multi-Campus Hazard Mitigation Plan can be downloaded from the CCSU System Office web site by the following link:

- <http://www.ct.edu/hmdr>

This project is being funded by a grant allocated by the Connecticut Department of Emergency Management and Homeland Security and funded by the Federal Emergency Management Agency.

From: Sheeley, Robert G. ↑ Next ↑ Last
Sent: Tuesday, January 26, 2016 11:04 AM
To: 'eh.zoning@gmail.com'; 'sadosky.lynn@town.north-haven.ct.us'
Subject: Public Forum at SCSU

Good morning! Hope you can join us on February 10th when we present the Hazard Mitigation Plan for the Connecticut State Colleges and Universities (CSCU).

Bob

From: Sheeley, Robert G. [<mailto:sheeleyr1@southernct.edu>] ↑ Next ↑ Last
Sent: Tuesday, January 26, 2016 1:14 PM
To: Winfield, Gary A. <winfieldg1@southernct.edu>; Toni.Walker@cga.ct.gov
Cc: Misbach, Karen K. <misbachk1@southernct.edu>; Mary House <mhouse@woodardcurran.com>
Subject: Public Forum

Dear Senator Winfield and Representative Walker:

Attached is notice of a Public Forum SCSU is hosting on February 10th in the Adanti Student Center to present the Connecticut State Colleges and Universities (CSCU) Multi-Campus Hazard Mitigation Plan.

Hope you can join us. The plan is posted on the SCSU website.

Bob



Message 20160126105132.pdf

From: Sheeley, Robert G. [<mailto:sheeleyr1@southernct.edu>]
Sent: Tuesday, January 26, 2016 10:52 AM
To: Karyn Gilvarg (KGilvarg@newhavenct.net) <KGilvarg@newhavenct.net>; Dkops@hamden.com; publicworksdirector@norhthaven-ct.gov; jriccio@westhaven-ct.gov; Csoto@easthaven.net; jkearns@bethany-ct.com; nanbarto@sbcglobal.net
Cc: Misbach, Karen K. <misbachk1@southernct.edu>; Mary House <mhouse@woodardcurran.com>
Subject: Public Forum, Multi-Campus Hazard Mitigation Plan

Good morning everyone!

Please see attached notice of a Public Forum to be held on the Campus of SCSU on February 10th, 2016 at the Adanti Student Center. We will be presenting the Connecticut State Colleges and Universities Multi-Campus Hazard Mitigation Plan.

Hope you are able to join us. The plan is available on the SCSU website and the CCSU System website.

The draft Multi-Campus Hazard Mitigation Plan was posted on the Southern web site prior to the meeting to provide the public with an opportunity to review and provide comment if desired. The format of the public meeting was designed to be casual and informative and conducive to receive input. A brief Power Point presentation highlighting highly ranked hazards, critical assets, and potential mitigation efforts was presented. There were no specific comments received on the draft Multi-Campus Hazard Mitigation Plan during the public meeting. Public meeting materials are provided in **Appendix H**.

3. HAZARD PROFILES & RISK ASSESSMENT

A natural hazard is an extreme weather event that may pose a risk to people, infrastructure, operations, or resources due to its potentially damaging characteristics, which vary, based on what type of hazard it is. This section identifies the natural hazards that have or could impact campus, profiles where an event has occurred historically, where it is likely to occur in the future, and how substantial the event may be.

3.1 CAMPUS KEY POINTS

Power outages can be challenging for Southern. The electrical switch behind Earl Hall/Adanti Student Center feeds all buildings on the campus side of Fitch Street. In addition, Granoff Hall is the location where all fiber comes to campus. Keeping electricity and the data centers powered is important for operations. Southern does extensive research involving laboratory animals, and the ability to maintain refrigeration is important for the campus laboratories. More than 48 hours of



power loss can result in the loss of animal-related research, which has previously occurred on campus. The academic buildings do have some emergency power capabilities, but only to maintain the elevators and lights. Facilities, residence halls, food services, the police building, all data centers, and the power plant have full generator capacity. The generators are diesel fueled, and because fuel storage may be an issue, Southern is transitioning existing generators to natural gas. The power plant is able to operate on both oil and gas.

Drainage both on campus and in the surrounding community has presented challenges. There are wetlands located near campus, and portions of the campus are in the floodplain. Several buildings, including Swartz Hall, the IT warehouse at Fitch Street, the Fitch Street Garage, Farnham Hall, Buley Library, and the Admissions House, have been impacted in the past by heavy rain events. Other campus walking areas, such as the area near Pinerock Avenue have also had drainage issues. While some of these areas have been addressed through engineering solutions, problem areas remain, some of which are out of the control of the campus and reside with the City of New Haven.

The campus has several preparedness measures in place in case of an emergency. Southern installed a siren public address system and an Everbridge communications system in 2008 to alert students, faculty, and staff in case of an emergency. Farnham Hall serves as an evacuation space, and maintains a supply of 50 mattresses. Residence Life also stockpiles batteries and flashlights. Other preparedness features include sprinklers in all buildings, including the residence halls. The campus also serves as a community gathering point. In case of emergency at the Millstone Nuclear Power Plant, Moore Field House serves as a decontamination and reception center for East Lyme, Lyme, and Old Lyme, Connecticut. One overarching concern is the challenge of getting off campus with traffic congestion in major weather events.

3.2 NATURAL HAZARDS IMPACTING CAMPUS

The natural hazards that have been identified and included in this section received their initial consideration from FEMA Guidance documentation. The hazards were filtered utilizing current and historical data points from various sources including, but not limited to, NOAA, U.S. Census, and local and state Hazard Mitigation Plans. The findings of each natural hazard were analyzed and the information was cross-referenced with anecdotal data points from Southern. A

list of natural hazards that have and may continue to impact Southern was developed. Of the natural hazards that have been considered for this project, Southern was found to be susceptible to eleven of them (see **Table 3-1**). A qualitative or quantitative analysis for each hazard was conducted which is detailed in the sections that follow.

Table 3-1: Southern Natural Hazard Susceptibility

Natural Hazard	Southern Susceptible?	Quantitative/Qualitative
Coastal Storm, Nor'easter	Yes	Qualitative
Dam Failure	Yes	Qualitative
Drought	Yes	Qualitative
Earthquake	Yes	Quantitative and Qualitative
Flood	Yes	Qualitative
Hurricane	Yes	Qualitative
Thunderstorm, Lightning	Yes	Qualitative
Tornado	Yes	Qualitative
Wildfire	Yes	Qualitative
Windstorm	Yes	Qualitative
Winter-Related Hazard (Winter Storm, Ice Storm)	Yes	Qualitative
Tsunami	No	Not Applicable
Urban Fire	No	Not Applicable
Avalanche	No	Not Applicable
Volcano	No	Not Applicable
Landslide	No	Not Applicable

Following the development of the initial list of natural hazards, Southern held on campus interviews and a follow up meeting in March 2015. The Southern Hazard Mitigation Planning Team reviewed the natural hazards identified in **Section 3.6** of the Multi-Campus Hazard Mitigation Plan and ranked each hazard according to the methodology outlined in **Section 3.3**. The ranking given for each natural hazard considered by Southern was based on background research, future development plans, knowledge of the campus, infrastructure, and past occurrences.

In general, hazards with a low estimated frequency, duration, severity, and intensity are expected to have minimal or no impact on the campus. Hazards with a high frequency, duration, severity, and intensity were given a higher mitigation priority. Higher rankings may be more likely to occur on a regular basis or within the next five years and could result in substantial impacts on campus with regard to economic damage, loss of function and operations of the campus and human injury. **Table 3-2** provides a summary of the rankings, which discussed in more detail in each specific hazard section.

Table 3-2: Southern Natural Hazard Risk Ranking Summary

Natural Hazard	Frequency 0-5	Duration 0-5	Severity 0-5	Intensity 0-5	Probability F,D,I (40%)	Consequence S (60%)	Total	Ranking L,M,H,S
Coastal Storm/Nor'easter	2	2	4	4	2.67	4.00	3.47	H
Dam Failure	1	1	1	1	1.00	1.00	1.00	L

Natural Hazard	Frequency 0-5	Duration 0-5	Severity 0-5	Intensity 0-5	Probability F,D,I (40%)	Consequence S (60%)	Total	Ranking L,M,H,S
Drought	1	1	1	1	1.00	1.00	1.00	L
Earthquake	1	1	3	3	1.67	3.00	2.47	M
Flood	3	2	4	4	3.00	4.00	3.60	H
Hurricane	1	3	5	5	3.00	5.00	4.20	S
Thunderstorm/Lightning	2	1	2	2	1.67	2.00	1.87	L
Tornado	2	2	4	4	2.67	4.00	3.47	H
Wildfire	1	1	1	1	1.00	1.00	1.00	L
Windstorm	4	2	3	3	3.00	3.00	3.00	H
Winter Related Hazards	3	3	4	4	3.33	4.00	3.73	H

After reviewing the initial ranking of low, medium, high or severe and conducting additional research, consideration was given to how each natural hazard could impact students, faculty and staff, existing buildings, future buildings and development, operations and critical infrastructure. A summary of the risk assessment is provided in **Table 3-3** and discussed individually by hazard in upcoming sections.

Table 3-3: Southern Qualitative Risk Assessment Summary

	Coastal Storm, Nor'easter	Earthquake	Flood	Drought	Winter Related Hazards	Thunderstorm, Lightning	Windstorm	Tornado	Hurricane	Dam Failure	Wildfire
Risk Ranking	H	M	H	L	H	L	H	H	S	L	L
Students, Faculty & Staff	L	L	L	L	H	L	L	L	H	L	L
Existing Buildings	H	M	M	L	M	M	H	H	H	L	L
Future Buildings	L	L	L	L	M	L	L	M	M	L	L
Operations	H	M	H	L	H	L	H	H	S	L	L
Critical Infrastructure	H	M	H	L	H	M	H	H	S	L	L
Overall Risk Ranking	H	M	H	L	H	L	H	H	S	L	L

The following sections present specifics related to the susceptibility of the campus to natural hazards.

3.2.1 Coastal Storm/Nor'easter

Southern is located approximately 5.5 miles from the Long Island Sound. Coastal areas are more vulnerable to high wind and precipitation levels associated with coastal storm/nor'easters and can lead to coastal erosion, flooding from storm surge and other costly and dangerous impacts to the community. One to three coastal storms/nor'easters typically impact the Connecticut coastline on an annual basis. Coastal storms/nor'easters are highly likely to occur in the future, and they will continue to impact the Southern campus.

3.2.1.1 Vulnerability to Coastal Storm Hazard

Southern’s location in a coastal community provides greater risk to coastal storm/nor’easter events. According to the City of New Haven Natural Hazard Mitigation Plan Update, the coastal storms that had the largest impact on New Haven occurred in the first half of the 20th century in 1938, 1944, 1954, 1955 and 1960, in addition to one in 1815. These coastal storm events were products of hurricanes and brought tremendous amounts of rain to the region. Findings from a FEMA Flood Insurance Study conducted for the City of New Haven concluded that coastal storms have the largest impact on flooding in the City. During a storm in 2011, moderate to major surge caused damage in New Haven by inundating Long Wharf Drive properties with one to two feet of water and making Longshore Drive impassable, according to the NCDC Storm Events Database. Nor’easters, specifically, have been affecting New Haven and Southern including:

- **1992 Nor’easter:** This nor’easter caused over \$4.3 million (1992 dollars) in damage, three deaths and the destruction of 26 homes. Four feet of snow was recorded in Southern Connecticut, causing power line damage and power loss to 50,000 homes. The Long Island Sound experienced an unprecedented ten-foot tide from the immense winds.
- **March 12, 1993:** Known as the Great Blizzard of 1993, as well as “1993 Storm of the Century,” the storm had a broad reach, affecting 26 states. In Connecticut, over a foot of heavy, wet snow made landfall.
- **January 8-9, 1996:** An emergency declaration was announced for the Winter Storm Ginger, which produced over two feet snow and virtually shut down the state for a 24-hour period
- **October 2011:** Southern and the surrounding region experienced a large nor’easter aptly named the Halloween Nor’easter. The event caused a paralysis across the state of Connecticut and northeast with downed trees and widespread power outages, creating the largest number of power outages in the state’s history.

As indicated by the history of coastal storms/ nor’easters in New Haven, Southern is vulnerable to future events. The campus has seen extensive impacts from recent nor’easters, including power outages, heavy snow loads, all negatively affecting the normal operations of the institution. Examples of the hazards in the campuses past are described in **Table 3-4**, along with additional susceptibility examples from state and local planning documents.

Table 3-4: Southern Coastal Storm/Nor’easter Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> • Connecticut Natural Hazards Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> • Identified in the State plan and determined to have a significant impact on the population, and built environment in CT. • CT residents can expect two or more nor’easter weather events per season.
<ul style="list-style-type: none"> • City of New Haven Natural Hazard Mitigation Plan Update (2011) 	<ul style="list-style-type: none"> • Identified as hazard of concern.

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> Anecdotal Information from Southern Connecticut State University Stakeholders 	<ul style="list-style-type: none"> In a heavy storm event in 2013, the campus had to hire a contractor to shovel off roofs. Moore Field House (large roof where wind can blow off to lower roof) weight was 25% overloaded. There are not many areas to place large quantities of snow. It can be very slippery on campus. Some students were on campus during 2011 snowstorm. All successfully moved into one residence hall. Storms deposited 40 inches of snow that year. Food service workers and trucks could not get on campus (overall concern running out of food). Wintergreen Avenue Garage's roof mechanical spaces are open to exposure. Lyman Center also has wind exposure. Had roof leaks with snow in many buildings.

A hazard ranking of high was given for Southern based on background research, future development plans, knowledge of the campus, infrastructure, and past occurrences (see **Table 3-2**).

3.2.1.2 Future Development Considerations

Southern should include coastal storm/nor'easter hazard scenario planning during their future development and redevelopment efforts and continue to implement measures to mitigate the impact of the hazard occurrences. This includes the following mitigation measures:

- When planning new development, avoid disturbing existing natural features and habitats that may provide protection from natural hazards.
- Evaluate existing building roofs on campus to ensure that their load capacities are appropriate for the potential wind loads. For future buildings, meet or exceed building code standards, as applicable, specifically to verify that projected future wind loads are considered.
- Ensure that there are multiple ingress/egress routes available for students, faculty, and staff that can be utilized during a coastal storm/nor'easter.
- Establish/continue communication with the appropriate city and/or state officials to coordinate weather and emergency information and instructions.
- Establish/continue communication with the campus population:
 - Proactively educate the campus population about preparation and appropriate response to a potential coastal storm/nor'easter event.
 - Coordinate quick and efficient outreach to convey information issued by designated national agencies such as the National Weather Service, and relevant information about the hazard and instructions on appropriate response and/or preparation.
- Coordinate emergency information with other CSCU campuses if necessary.
- Ensure backup power is supplied to facilities that are operationally dependent on power such as laboratories or public safety buildings.
- Manage campus tree maintenance to aid in mitigating impacts of downed trees.
- Evaluate coastal storm/nor'easter impacts after storm events and plan for recovery and redevelopment once existing conditions are known, including updating and revising Emergency Response & Evacuation Policies.

3.2.2 Earthquake

In general, it is difficult to quantify the overall risk or likelihood of an earthquake occurring in a region, as an event can happen suddenly and without warning. However, an event is likely to occur in a region where it has happened in the past. Given events that happened in the past near Southern, it is likely that the City of New Haven and the campus will experience some type of impact from an earthquake in the future. However, an earthquake with a magnitude of 5.0 or greater is unlikely to occur.

3.2.2.1 Vulnerability to Earthquake Hazard

While large magnitude earthquakes are of low probability, these events can pose significant risks to Southern. Impacts range from power outages to causing other hazards such as dam failure and fires. Fortunately, in the Southern Central Region’s history there were mainly earthquakes of lower magnitudes. **Table 3-5** lists some of the earthquakes on record that have affected New Haven or the region.

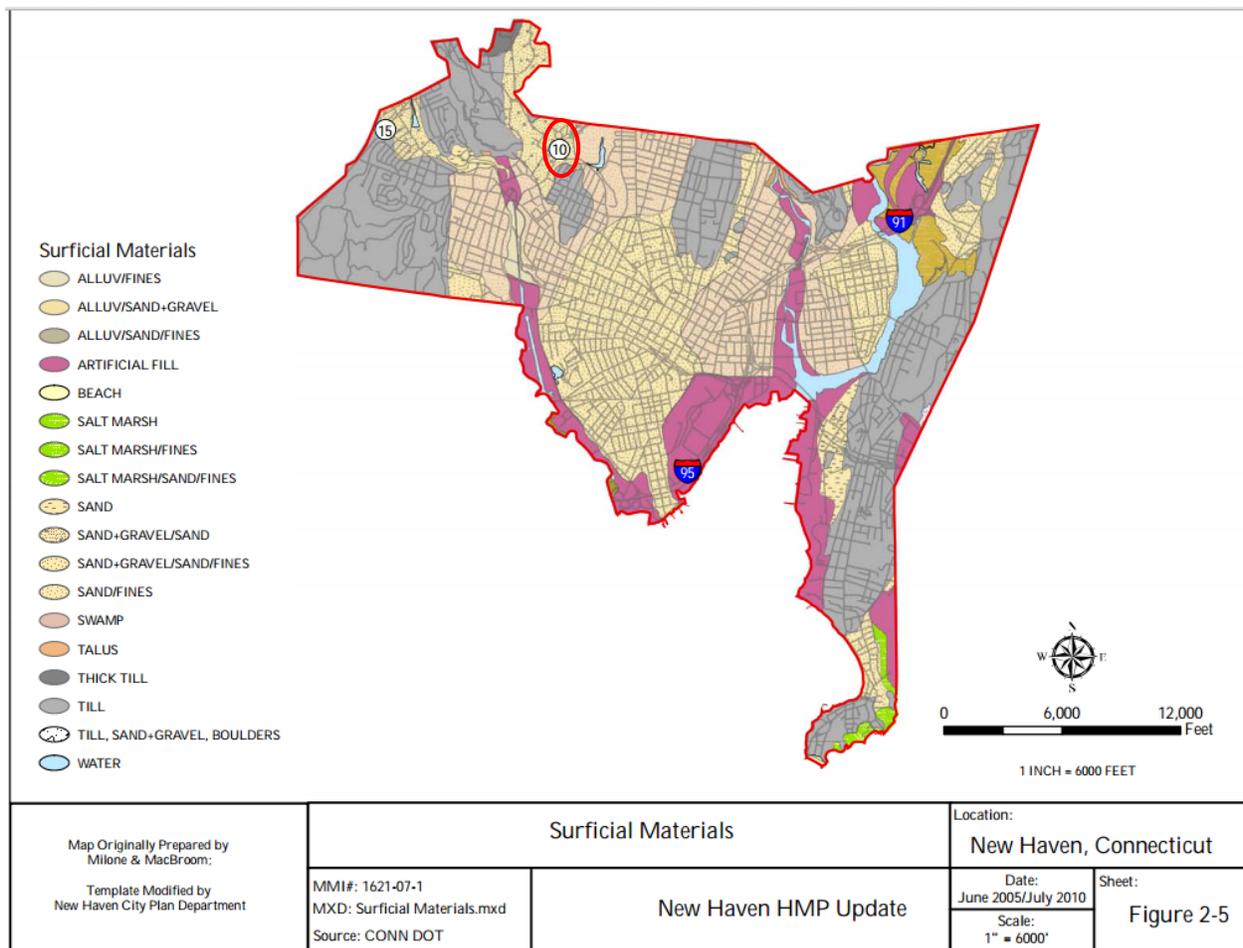
Table 3-5: Past Earthquakes in Proximity to New Haven

Date of Occurrence	Location and Magnitude
May 1791	The most severe earthquake in Connecticut on record, (epicenter was in East Haddam). One of three earthquakes in Connecticut history that had an Intensity of V (Mercalli Scale) or greater.
October 1845	Intensity V earthquake in Bridgeport.
June and July 1858	Two Intensity IV earthquakes in New Haven. The June 1858 event was described as “a moderate tremor... in which residents reported rattling of glasses and a noise ‘like a carriage crossing a bridge’.”
March 1953	Intensity V earthquakes in Stamford.
1980’s	1982: Magnitude 1.1 east of Bridgeport 1983: Magnitude 1.8 west of Bridgeport 1988: Magnitude 2.0 in New Haven 1989 (April): Two earthquakes – Magnitude 1.6 in West Haven Magnitude 2.8 near New Haven
1990	Magnitude 2.8 north of New Haven
2008	Magnitude 1.6 in Moodus Magnitude 1.8 in Norwich Magnitude 2.3 in East Haddam Magnitude 2.0 near Chester
June 2010	A magnitude 5.0 earthquake impacted Canada and did not cause damage in Connecticut, but it was felt in Hartford and New Haven counties.
June 2011	Magnitude 1.7 earthquake occurred near East Hartford.

Date of Occurrence	Location and Magnitude
August 2011	A magnitude 5.8 earthquake occurred in Virginia and was felt as far north as Maine and as far west as Chicago. Connecticut experienced buildings shaking and swaying but no damage was reported.
2012	In May, several magnitude 2.1 or less disturbances reported in Connecticut. In September, a 2.1 magnitude earthquake near Stamford occurred. No damage was reported.

Certain areas of New Haven are more vulnerable than others depending on the type of surficial materials that infrastructure is located on. Structures on unconsolidated material as sand, gravel, and fill have greater instability and are likely to react more strongly to seismic activity, amplifying the intensity of an earthquake. Most of the City is characterized by stratified sand and gravel, while many near shore areas are comprised of fill material. The Surficial Geology map in **Figure 3-1** displays that Southern is located on sand and gravel/ sand.

Figure 3-1: New Haven Surficial Geology



Structural damage and shaking from earthquakes is likely to be more pronounced on the Southern campus due to its position on unconsolidated material. Further information regarding Southern susceptibility to earthquakes can be found in **Table 3-6**.

Table 3-6: Southern Earthquake Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> Connecticut Natural Hazards Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> Identified in the State plan and determined to have a significant impact on the population and built environment in CT. Earthquake was given a medium-low hazard ranking. Between 1938 and 2009, CT has seen 138 earthquakes (according to USGS). All had magnitudes of less than 4.0.
<ul style="list-style-type: none"> City of New Haven Natural Hazard Mitigation Plan Update (2011) 	<ul style="list-style-type: none"> Identified in New Haven HMP as hazard of concern. City land use policies do not address earthquake hazards.
<ul style="list-style-type: none"> Anecdotal Information from Southern Connecticut State University Stakeholders 	<ul style="list-style-type: none"> There was an earthquake in the area in 2011. Huge windows with a lot of glass in the new building on west campus and new parking garage are of concern. Older buildings do not have ceiling and lighting systems braced.

Taking into consideration frequency, duration, severity, intensity, probability, and consequence of an earthquake hazard, the hazard ranking for an earthquake is medium, demonstrated in **Table 3-2**.

3.2.2.2 Earthquake Loss Estimate

Southern’s buildings were quantitatively evaluated to determine the extent of building losses that could occur should an earthquake event take place. To determine cost of losses for Southern, the age of construction and construction material was factored, as well as the PGA zone, following FEMA guidance document *Understanding Your Risks – Identifying Hazards and Estimating Losses (FEMA 386-2)*. An in-depth description of the methodology is located in **Section 3.6.2.6** of the multi-Campus Hazard Mitigation Plan. **Table 3-7** depicts the earthquake hazard ranking of each Southern building.

Table 3-7: Southern Campus Buildings – Estimated Loss to Structure & Contents Due to Earthquake

Existing Buildings	Date Constructed	Insurable Replacement Value	Insurable Contents Value	PGA Zone	Building Damage Ratio (%)	Estimated Building Damage Sustained (\$)	Contents Damage Ratio (%)	Estimated Contents Damage Sustained (\$)	Total Sustained Damage (\$)	Loss of Function (Days)	Ranking
Academic Science Building	1900	\$53,103,059	\$5,473,000	0.1	1.3%	\$690,340	0.65%	\$35,575	\$725,914	2	Medium
Admissions Building (131 Farnham)	2015	\$3,783,179	\$57,084	0.1	0.9%	\$34,049	0.45%	\$257	\$34,305	1	Low
Brownell Hall	1982	\$31,717,580	\$180,976	0.1	1.3%	\$412,329	0.65%	\$1,176	\$413,505	2	Low
Buley Library	1968	\$121,198,249	\$3,463,670	0.1	1.3%	\$1,575,577	0.65%	\$22,514	\$1,598,091	2	High
Chase Hall	1967	\$27,990,739	\$214,294	0.1	1.3%	\$363,880	0.65%	\$1,393	\$365,273	2	Low
Connecticut Hall	1973	\$24,320,859	\$310,447	0.1	1.3%	\$316,171	0.65%	\$2,018	\$318,189	2	Low
Davis Hall	1969	\$27,563,306	\$1,434,429	0.1	1.3%	\$358,323	0.65%	\$9,324	\$367,647	2	Low
Earl Hall	1960	\$23,434,417	\$1,524,114	0.1	1.3%	\$304,647	0.65%	\$9,907	\$314,554	2	Low
Engleman Hall	1953	\$74,388,269	\$8,677,888	0.1	1.3%	\$967,047	0.65%	\$56,406	\$1,023,454	2	High
Farnham Hall	1964	\$26,942,728	\$197,564	0.1	1.3%	\$350,255	0.65%	\$1,284	\$351,540	2	Low
Granoff Hall/Police Station/Health Svcs	1972	\$5,180,210	\$822,261	0.1	1.3%	\$67,343	0.65%	\$5,345	\$72,687	2	Low
Greenhouse	1990	\$25,000	\$0	0.1	1.3%	\$325	0.65%	\$0	\$325	2	Low
Grounds/Vehicle Maintenance/Facilities Garage	2000	\$2,690,415	\$372,280	0.1	0.9%	\$24,214	0.45%	\$1,675	\$25,889	1	Low
Hickerson Hall	1967	\$27,990,739	\$253,795	0.1	1.3%	\$363,880	0.65%	\$1,650	\$365,529	2	Low
Jennings Hall	1982	\$74,543,906	\$9,112,875	0.1	1.3%	\$969,071	0.65%	\$59,234	\$1,028,304	2	High
Jess Dow Field Concession Building	1991	\$6,880,640	\$10,000	0.1	1.3%	\$89,448	0.65%	\$65	\$89,513	2	Low
Lang House	1903	\$5,201,797	\$151,252	0.1	1.3%	\$67,623	0.65%	\$983	\$68,606	2	Low
Lyman Center for the Performing Arts	1967	\$36,646,630	\$539,148	0.1	1.3%	\$476,406	0.65%	\$3,504	\$479,911	2	Low



Existing Buildings	Date Constructed	Insurable Replacement Value	Insurable Contents Value	PGA Zone	Building Damage Ratio (%)	Estimated Building Damage Sustained (\$)	Contents Damage Ratio (%)	Estimated Contents Damage Sustained (\$)	Total Sustained Damage (\$)	Loss of Function (Days)	Ranking
Michael J. Adanti Student Center	2006	\$55,727,770	\$2,291,282	0.1	0.9%	\$501,550	0.45%	\$10,311	\$511,861	1	Medium
Modular Building /Office Building OB1	2006	\$5,765,760	\$658,010	0.1	0.9%	\$51,892	0.45%	\$2,961	\$54,853	1	Low
Moore Field House	1976	\$71,740,469	\$1,111,545	0.1	1.3%	\$932,626	0.65%	\$7,225	\$939,851	2	Medium
Morrill Hall	1959	\$23,361,088	\$1,763,298	0.1	1.3%	\$303,694	0.65%	\$11,461	\$315,156	2	Low
Neff Hall	1969	\$24,712,506	\$165,444	0.1	1.3%	\$321,263	0.65%	\$1,075	\$322,338	2	Low
New Boiler Plant/Energy Hall	2003	\$31,253,088	\$87,768	0.1	0.9%	\$281,278	0.45%	\$395	\$281,673	1	Low
New Fitch Street Parking Garage	2000	\$9,664,000	\$0	0.1	0.9%	\$86,976	0.45%	\$0	\$86,976	1	Low
New Physical Plant/Facilities Operations Building	2000	\$21,433,732	\$1,219,237	0.1	0.9%	\$192,904	0.45%	\$5,487	\$198,390	1	Low
North Campus Res. Hall Complex: Mid-Rise	1985	\$66,619,426	\$1,805,828	0.1	1.3%	\$866,053	0.65%	\$11,738	\$877,790	2	Medium
North Campus Res. Hall Complex: Town House A	1991	\$4,055,895	\$6,698	0.1	1.3%	\$52,727	0.65%	\$44	\$52,770	2	Low
North Campus Res. Hall Complex: Town House B	1991	\$4,103,354	\$9,146	0.1	1.3%	\$53,344	0.65%	\$59	\$53,403	2	Low
North Campus Res. Hall Complex: Town House C	1991	\$4,103,354	\$11,704	0.1	1.3%	\$53,344	0.65%	\$76	\$53,420	2	Low
North Campus Res. Hall Complex: Town House D	1991	\$4,055,895	\$12,105	0.1	1.3%	\$52,727	0.65%	\$79	\$52,805	2	Low
Nursing Building	2005	\$1,535,625	\$249,372	0.1	0.9%	\$13,821	0.45%	\$1,122	\$14,943	1	Low



Existing Buildings	Date Constructed	Insurable Replacement Value	Insurable Contents Value	PGA Zone	Building Damage Ratio (%)	Estimated Building Damage Sustained (\$)	Contents Damage Ratio (%)	Estimated Contents Damage Sustained (\$)	Total Sustained Damage (\$)	Loss of Function (Days)	Ranking
Orlando House	1890	\$2,515,313	\$152,559	0.1	1.3%	\$32,699	0.65%	\$992	\$33,691	2	Low
Pelz Gymnasium (including Pelz Storage Building)	1952	\$40,529,198	\$391,748	0.1	1.3%	\$526,880	0.65%	\$2,546	\$529,426	2	Medium
School of Business	1958	\$21,479,626	\$177,310	0.1	1.3%	\$279,235	0.65%	\$1,153	\$280,388	2	Low
Schwartz Hall	1957	\$44,903,182	\$630,204	0.1	1.3%	\$583,741	0.65%	\$4,096	\$587,838	2	Medium
Temporary Bookstore	2001	\$1,354,353	\$10,000	0.1	0.9%	\$12,189	0.45%	\$45	\$12,234	1	Low
Temporary Office Building 6	2001	\$1,672,944	\$142,624	0.1	0.9%	\$15,056	0.45%	\$642	\$15,698	1	Low
Warehouse 1 (Ethnic Heritage Center)	1970	\$1,574,528	\$150,000	0.1	1.3%	\$20,469	0.65%	\$975	\$21,444	2	Low
West Campus Parking Garage	2004	\$7,200,000	\$0	0.1	0.9%	\$64,800	0.45%	\$0	\$64,800	1	Low
West Campus Residence Hall	2004	\$50,775,625	\$1,494,853	0.1	0.9%	\$456,981	0.45%	\$6,727	\$463,707	1	Low
Wilkinson Hall	1965	\$30,145,326	\$232,821	0.1	1.3%	\$391,889	0.65%	\$1,513	\$393,403	2	Low
Wintergreen Building	1994	\$21,737,254	\$2,239,490	0.1	0.9%	\$195,635	0.45%	\$10,078	\$205,713	1	Low
Wintergreen Parking Garage	2013	\$18,945,000	\$0	0.1	0.9%	\$170,505	0.45%	\$0	\$170,505	1	Low

Note: Utilized FEMA 386-2. Loss estimation tables by category did not include an educational institution, so for the purposes of this analysis, the Professional Office category was utilized, which is consistent with Code as Business use. Once the category was selected, a PGA value of 0.1 was used to select the appropriate building damage ratio % and loss of function days.

Overall, Southern's buildings may suffer low to medium damages from an earthquake event. Three buildings, Buley Library, Jennings Hall and Engleman Hall, would suffer over \$1 million in damages each, partially as a result of the age of the buildings. Buley Library houses some of the Universities archives and is therefore considered a critical building, while Jennings Hall's scientific laboratory functions could be affected by an earthquake event. Engleman Hall serves as an academic space, but plays a critical function as it houses research animals in the basement. **Figure 3-2** graphically illustrates the earthquake vulnerability rankings.

3.2.2.3 Future Development Considerations

Southern should consider earthquake hazard scenario planning during future development and redevelopment of the campus to mitigate the impact of earthquake occurrences. Options include:

- Stay familiar with changes to the International Code Council (ICC) building codes (which are published every three years) and the Connecticut State Building Code. In addition, work with the City of New Haven/State, officials, as applicable, to stay informed of local/state developments that could impact campus.
- Establish/continue communication with the appropriate city and/or state officials to coordinate earthquake emergency information and instructions.
- Establish/continue communication with the campus population:
 - Proactively educate the campus about appropriate response to a potential earthquake event.
 - Coordinate quick and efficient outreach to convey information issued by designated national agencies such as USGS or FEMA, and relevant information about the hazard and instructions on appropriate response and/or preparation.
- Coordinate emergency information with other CSCU campuses if necessary.
- When new development is planned for campus, avoid disturbing existing natural features and habitats that may provide protection from secondary impacts of earthquake hazards. Examples of secondary impacts are rock fall and slope failure.
- Evaluate impacts after earthquake events and plan for recovery and redevelopment once existing conditions are known, including updating and revising Emergency Response & Evacuation Policies.

3.2.3 Flood

Flooding is the most frequent and common hazard in the state of Connecticut, and specifically in the New Haven Region. The probability of a flood incidence impacting the Southern community in the future is highly likely.

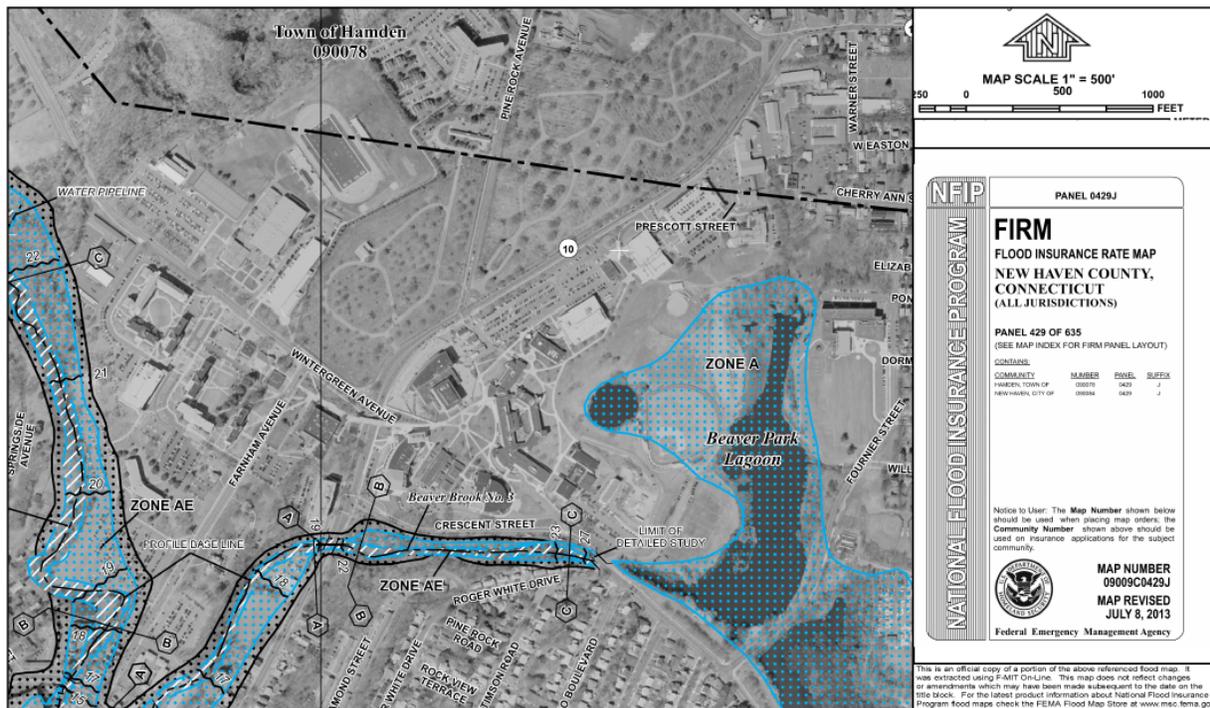
3.2.3.1 Vulnerability to Flood Hazard

Flooding in New Haven is typically the result of coastal storms with associated heavy rainfall and strong winds that cause tidal flooding. Inland flooding is caused by any storm with heavy rainfall. According to the NCDRC Storm Events database, New Haven has experienced sixteen flash flood and flood incidences since 2000, one of which was experienced countywide. Some examples of major flooding events and their impacts on New Haven between that timeframe include:

- **September 17, 2005:** Wind damage, flash flooding and lightning occurred from the advent of fierce thunderstorms in the New Haven area. The City experienced flash flooding in its streets and several rescues had to be performed for stranded motorists in cars submerged in several feet of water.
- **May 18, 2011:** Heavy rain and thunderstorms trapped several cars on the ramp of Interstates 91 and 95 in New Haven.
- **September 28, 2012:** Heavy rainfall in combination with high tide on Long Island Sound exacerbated flash flooding in New Haven County. Downtown New Haven's State Street was closed due to flooding.
- **June 13, 2014:** Flash flooding closed Humphrey St and Brewery Street in New Haven, as well as Route 34 at Interstates 91 and 95. Several cars were submerged in flood waters.

One flood prone area in the City is Beaver Bond Park, which lies adjacent to the Southern campus, as depicted in the FEMA FIRMette in **Figure 3-3**. However, the pond has historically been known to be able to handle large influxes of stormwater, according to the City of New Haven Natural Hazard Mitigation Plan Update. One property on campus, The Ethnic Heritage Warehouse, is located in a floodplain, according to the FEMA FIRMette. This property and the associated estimated losses due to damage are further discussed in the next section.

Figure 3-3: Southern Floodplain Map



The Southern campus has had multiple incidences of flooding on campus, encroaching on several buildings including Farnham Hall, Schwartz Hall, and Buley Library. The campus is also known to have drainage issues, which can exacerbate flooding scenarios. This anecdotal information describing the campus history of flood events and Southern susceptibility is listed in **Table 3-8**.

Table 3-8: Southern Flood Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> Connecticut Natural Hazards Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> Identified in the State plan and determined to have a significant impact on the population and built environment in CT. Flood was given a high hazard ranking. Historically, flooding has caused the most damage in the State.
<ul style="list-style-type: none"> City of New Haven Natural Hazard Mitigation Plan Update (2011) 	<ul style="list-style-type: none"> Beaver Pond Park (abuts campus) has been identified as a flood prone area by City Engineer. Several areas citywide have insufficient drainage which causes flash flooding and tidal events have exacerbated drainage problems. Identified in New Haven HMP as hazard of concern. Most well-documented hazard to the City.

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> Anecdotal Information from Southern Connecticut State University Stakeholders 	<ul style="list-style-type: none"> Schwartz Hall used to have flooding issues and zones of high water. Used to have water high enough that it would impact cars. Area was regraded two years ago. IT warehouse is located at 270 Fitch Street along with the Ethnical Heritage Center - both have had water. Equipment was raised to the highest shelves but it is still a problem. New parking garage is located in a floodplain. Flooding of Fitch Street Garage (behind Schwartz Hall). Beacon Pond wetlands are near campus. Lot 11 is next to stream. Created drainage swale to collect before the stream. Drainage on campus is challenging. Pinerock Avenue is a walking area between sections of campus. Half was redone, but the City of New Haven half continues to flood. Used to be large puddles going to west campus. Farnham Hall basement is prone to flooding (slightly underground). Have used sandbags outside doors. Admissions House floods during rain events (building has stone foundation). Orlando House also has a stone foundation. Buley Library has had water infiltration in the past.

The hazard ranking determined for Southern related to a flood occurrence was high, as shown in **Table 3-2**.

3.2.3.2 Flood Loss Estimate

As the Ethnic Warehouse is located in the floodplain, the building was quantitatively evaluated for losses to determine how the structure would be affected by a flood hazard event. The calculations, guided by the FEMA guidance *Understanding Your Risks – Identifying Hazards and Estimating Losses (FEMA 386-2)* were conducted for Structure Loss, Contents Loss and Structure Use and Function Loss to determine a Total Loss for the Hazard Event. The calculations are as follows:

Structure Loss

Insurable Replacement Value (provided by the System Office) x *Percent Damage* (Percent of Building estimated to be in the floodplain)

Contents Loss

Contents Replacement Value (provided by the System Office) x *Percent Damage* (Percent of Building estimated to be in the floodplain)

Structure Use and Function Loss

Average Daily Operating Budget x Functional Downtime + Displacement Cost per Day x Displacement Time

Average Daily Operating Budget: CCSU Yearly operating budget/ 365.

Functional Downtime: Number of days that the building would not be in operation due to flood impacts, assumed to be seven days.

Displacement Cost per day: According to FEMA, displacement cost per day is the dollar amount it would cost for the building service to be relocated to another structure because of a hazard event. Costs include rent for temporary building space per month, one-time displacement costs to set up operations in the new space, and other costs of displacement. Per day cost calculated from a monthly estimated displacement cost.

Displacement Downtime: Number of days that the function of the building would have to exist in another not impacted building, assumed to be seven days.

Total Loss

$$\text{Structure Loss} + \text{Contents Loss} + \text{Structure Use and Function Loss}$$

Table 3-9: Southern Structure Loss

Existing Buildings	Insurable Replacement Value \$	x	Percent Damage (%)	=	Loss to Structure (\$)
Warehouse 1 (Ethnic Heritage Center)	\$1,574,528	x	100%	=	\$1,574,528

Table 3-10: Southern Contents Loss

Existing Buildings	Replacement Value of Contents (\$)	x	Percent Damage (%)	=	Loss to Contents (\$)
Warehouse 1 (Ethnic Heritage Center)	\$150,000	x	100%	=	\$150,000

Table 3-11: Southern Structure Use and Function Loss & Total Loss for Hazard Event

Existing Buildings	Average Daily Operating Budget	x	Functional Downtime (# of Days)	+	Displacement Cost Per Day (\$)	x	Displacement Time	=	Structure Use and Function Loss	Structure Loss + Content Loss + Function Loss
Warehouse 1 (Ethnic Heritage Center)	\$11,424	x	7	+	\$822	x	7	=	\$85,718	\$1,810,246
									Total Loss for Hazard Event	\$1,810,246

Based on the loss estimate, damage from a flooding event is estimated to amount to approximately \$1.8 million.

3.2.3.3 Future Development Considerations

Southern should give consideration to flood hazards during future development and redevelopment efforts. Considerations include:

- Track, evaluate and plan for areas of the campus frequently impacted by flooding and consider drainage/engineering solutions that would minimize future occurrences.
 - May require improving mapping and data analysis capabilities, as well as undertaking engineering studies of the existing stormwater drainage systems.
- Ensure that critical infrastructure/generators are located in places on campus with minimum susceptibility for flooding impacts.
- Retrofit existing buildings in areas at risk of flooding to reduce their vulnerability to flood impact.
- Evaluate structural and nonstructural approaches to maximize flood control.
- Evaluate green infrastructure techniques that can be implemented to minimize flood occurrences.
- When planning new development, avoid disturbing existing natural features and habitats that may provide protection from the primary and secondary effects of flood hazards.
- Consider flood control/mitigation with any future New Haven development and redevelopment plans.
 - All future development shall have the lowest floor, including the basement, elevated to or above the base flood level (100 year flood level).
- Explore drainage issues and solutions prior to constructing new infrastructure.
- Continue to meet building code, and zoning code related to flooding, as applicable.
- Stay knowledgeable of the City of New Haven regulations related to flood hazards.
- Establish/continue communication with the appropriate city and/or state officials to coordinate flood emergency information and instructions.
 - Collaborate with City of New Haven officials on emergency procedures should the ingress/egress routes to campus be dramatically impacted by floodwaters including areas where bridge malfunctions could impact transportation routes.
- Establish/continue communication with the campus population:
 - Proactively educate the campus about appropriate response to a potential flood event.
 - Coordinate quick and efficient outreach to convey information issued by designated national agencies such as the National Weather Service and FEMA, and relevant information about the hazard and instructions on appropriate response and/or preparation.
- Coordinate emergency information with other CSCU campuses if necessary.
- Evaluate impacts after flooding events and plan for recovery and redevelopment once existing conditions are known, including updating and revising Emergency Response & Evacuation Policies.

3.2.4 Drought

Connecticut experiences drought conditions on occasion. Fortunately, droughts in the region are rarely severe or prolonged. In September of 2015, a large portion of New Haven County was in a state of “moderate drought” according to the U.S. Drought Monitor. Drought is not addressed in the New Haven Natural Hazard Mitigation Plan. However, based on State and New Haven County information presented in **Section 3.0** of the Multi-Campus Hazard Mitigation plan, the probability of a drought impacting the Southern campus in the future is likely.

3.2.4.1 Vulnerability to Drought Hazard

Southern is susceptible to future drought hazards. **Table 3-12** provides Information supporting this discussion.

Table 3-12: Southern Drought Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> Connecticut Natural Hazards Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> Identified in the State plan and determined to have a significant impact on the population and built environment in CT. Drought was given a medium-low hazard ranking. The entire state of CT is vulnerable and susceptible to a drought event.

Taking into consideration frequency, duration, severity, intensity, probability, and consequence of a drought hazard, the hazard ranking for a drought is low, as demonstrated **Table 3-2**.

3.2.4.2 Future Development Considerations

For future development or redevelopment on campus, the following items related to drought mitigation should be considered:

- Ensure adequate fire suppression ability for emergency response activities in drought scenarios.
- Development of emergency procedures, or a clear understanding of the City of New Haven emergency procedures for back up or interim water supply options and connections should there be inadequate amounts of usable water be deliverable to/available to the campus.
- Coordinate outreach to the campus population for drought preparation and emergency water conservation.
- Coordinate emergency information with other CSCU campuses if necessary.
- When planning new development, avoid disturbing existing natural features and habitats that may provide protection from drought hazards.
- Employ a general policy that supports sustainable water-related practices and water-use efficiency as a proactive measure against drought hazards.
 - Educate the campus population about droughts and water scarcity. Encourage the adoption of water conservation habits.
 - Explore building options such as incorporating water recycling/ gray water technologies into building designs.
 - Explore capturing and reusing rain water on campus for a variety of purposes like irrigation and gray water.
 - Require the use of water efficient plumbing fixtures (such as those recommended by EPA's WaterSense Standards) in all future development/redevelopment.
 - Utilize greenscaping practices. Select plants that are compatible with the local environment to minimize the need for watering.
- Evaluate impacts drought events and plan for recovery once existing conditions are known, including updating and revising Emergency Response Policies.

3.2.5 Winter-Related Hazards

The probability of a winter-related hazard, such as a winter storm, ice storm, or blizzard, impacting the Southern campus in the future is highly likely, as defined in **Section 3.2.1** in the Multi-Campus Hazard Mitigation Plan.

3.2.5.1 Vulnerability to Winter-Related Hazard

New Haven County has experienced 27 winter storms, blizzards, and ice storms since January 1, 2000, according to the NCDC Storm Event database. Of these events, only two were ice storms. A winter-related weather event on February 2nd, 2011 had a total of \$3.5 million of damage to the region, \$2.1 million of which was attributed specifically to the ice impacts from the storm. Ice storms can also be costly to the campus, by creating unsafe transportation conditions and greatly increasing the chances of power outages. Blizzards similarly create dangerous situations. One

blizzard event, as noted by interview sources, occurred in 2011 when heavy accumulation of snow physically prevented doors to a residence hall from opening. As a result, students were stuck in the residence hall during the duration of the event. This situation greatly puts students at risk, and can impede the campus population from getting medical help if needed and obtaining food sources. The campus does have a weeks' worth of food on campus at any given time.

The campus has also been impacted by winter storms from associated cold that has caused pipe bursts; pipes in older buildings in particular have a greater propensity to burst. Further examples of Southern's susceptibility to winter-related hazards is in **Table 3-13**.

Table 3-13: Southern Winter-Related Hazard Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> Connecticut Natural Hazards Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> Identified in the State plan and determined to have a significant impact on the population and built environment in CT. Winter storm was given a high hazard ranking. CT will experience two or more severe winter weather events per season.
<ul style="list-style-type: none"> City of New Haven Natural Hazard Mitigation Plan Update (2011) 	<ul style="list-style-type: none"> Identified as hazard of concern. Increased danger for injuries or death during event due to exposure to cold weather. 2009 ice storm caused one death and three injuries in New Haven County.
<ul style="list-style-type: none"> Anecdotal Information from Southern Connecticut State University Stakeholders 	<ul style="list-style-type: none"> Heavy snow events two years ago - had to hire contractor to shovel off roofs. Moore Field House (large roof where wind can blow off to lower roof) weight was 25% overloaded. Do not have many areas to place large quantities of snow. Last year campus was shut down six times due to snow. Definitely impacts operations. Can be very slippery on campus. Some students were on campus during 2011 snow storm. All successfully moved into one residence hall. Storms deposited 40 inches of snow that year. Food service workers and trucks could not get on campus (overall concern running out of food). Two years ago, students were stuck in a residence hall during a big snow event and could not leave the building (could not open doors due to heavy snow accumulation). Wintergreen Building's roof mechanical spaces are open to exposure. Lyman Center also has wind exposure. Had roof leaks with snow in many buildings. There have been pipe bursts from extreme cold.

Taking into consideration frequency, duration, severity, intensity, probability, and consequence of a winter-related hazard, the hazard ranking for a winter-related event is high, demonstrated in **Table 3-2**.

3.2.5.2 Future Development Considerations

Southern should include winter-related hazard scenario planning during their future development and redevelopment efforts and continue to implement measures to mitigate the impact of winter-related occurrences. This includes the following mitigation measures:

- Establish/continue communication with the appropriate city and/or state officials to coordinate winter-related hazard emergency information and instructions.
- Establish/continue communication with the campus population:
 - Proactively educate the campus about preparation and appropriate response to a potential winter-related hazard.
 - Coordinate quick and efficient outreach to convey information issued by designated national agencies such as the National Weather Service, and relevant information about the hazard and instructions on appropriate response and/or preparation.
- Coordinate emergency information with other CSCU campuses if necessary.
- Ensure backup power is supplied to facilities that are operationally depend on power such as laboratories or public safety buildings.
- Manage campus tree maintenance to aid in mitigating impacts of downed trees.
- Evaluate existing building roofs on campus to ensure that their load capacities are appropriate for the projected future snow and wind loads. For future buildings, meet or exceed local/State building code standards, as applicable, specifically to verify that projected future snow and wind loads are considered.
- Evaluate impacts after winter-related hazard events and plan for recovery and redevelopment once existing conditions are known, including updating and revising Emergency Response & Evacuation Policies.

3.2.6 Thunderstorm/Lightning

The New Haven Natural Hazard Mitigation Plan calculates that New Haven experiences an average of 27 days per year with thunderstorm activity. Lightning is more frequent than thunderstorms. The probability of a thunderstorm/lightning event impacting the Southern campus in the future is likely, as defined in **Section 3.2.1** in the Multi-Campus Hazard Mitigation Plan.

3.2.6.1 Vulnerability to Thunderstorm/Lightning Hazard

Power surges, falling trees, flooding and even in rare circumstances, death, are all possible consequences of thunderstorm/lightning events. In New Haven, two injuries were caused by an August 1998 thunderstorm and wind event, and one fatality occurred as a result of thunderstorm event in June of 2000. Twenty major lightning events have been recorded in New Haven County over the last fifteen years, causing a total of five injuries and \$90,000 in damage. Thunderstorm/lightning hazards can cause power outages, power surges, fires and in some instances, death. While Southern has not experienced major impacts from thunderstorm/ lightning hazards as drastic as bodily harm, there is some history of these events occurring, as indicated in **Table 3-14**.

Table 3-14: Southern Thunderstorm/Lightning Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> • Connecticut Natural Hazards Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> • Identified in the State plan and determined to have a significant impact on the population and built environment in CT. • Thunderstorm/lightning was given a high hazard ranking.
<ul style="list-style-type: none"> • City of New Haven Natural Hazard Mitigation Plan Update (2011) 	<ul style="list-style-type: none"> • Identified in New Haven HMP as hazard of concern. • West and East Rock areas associated with greater likelihood of lightning events due to elevation site changes.
<ul style="list-style-type: none"> • Anecdotal Information from Southern Connecticut State University Stakeholders 	<ul style="list-style-type: none"> • There was a lightning strike about 8 yrs. ago at the North Campus residence hall 6th floor. Electronics were blown out in one of the apartments.



Taking into consideration frequency, duration, severity, intensity, probability, and consequence of a thunderstorm/lightning hazard, the hazard ranking for a thunderstorm/lightning is low, demonstrated in **Table 3-2**.

3.2.6.2 Future Development Considerations

Southern should consider thunderstorm/ lightning hazard scenario planning during future development and redevelopment of the campus to mitigate the impact of thunderstorm/ lightning occurrences. Such considerations include:

- Establish/continue communication with the appropriate city and/or state officials to coordinate thunderstorm/lightning emergency information and instructions.
- Establish/continue communication with the campus population:
 - Proactively educate the campus about preparation and appropriate response to a potential thunderstorm/lightning hazard.
 - Coordinate quick and efficient outreach to convey information issued by designated national agencies such as the National Weather Service, and relevant information about the hazard and instructions on appropriate response and/or preparation.
- Ensure backup power is supplied to facilities that are operationally dependent on power such as laboratories, data centers, and public safety buildings.
- Ensure that adequate lightning protection is installed in existing and future buildings that have valuable or sensitive equipment and/or data.
- For existing and future buildings where lightning protection upgrades are not feasible, establish a response protocol that includes properly depowering sensitive equipment prior to the start of a predicted lightning hazard.
- Evaluate thunderstorm/lightning impacts after storm events and plan for recovery and redevelopment once existing conditions are known, including updating and revising Emergency Response & Evacuation Policies.

3.2.7 Windstorm

The NCDC Storm Events database maintains records of high wind and strong wind instances. Since 1950, New Haven County has experienced 61 wind events, not including the damaging wind frequently associated thunderstorms, hurricanes and other hazards. Looking into the future it is highly likely that New Haven County and Southern will continue to experience the impacts of windstorms.

3.2.7.1 Vulnerability to Windstorm Hazard

Common secondary impacts from windstorms generally involve flying debris like trees and other objects. Upon landing, further damage can be done to buildings, utility lines, and roads. Southern has historically endured instances of windstorms affecting their campus. Most recently, in 2013, the campus experienced a windstorm event that caused substantial tree damage as well as structural damage to Lang House caused by a falling tree. Repairs to the building and roof of Lang House were necessary after the event. The Wintergreen Building houses student enrollment services, which houses critical records as well as all enrollment and payroll information. The building is rated for only 80 mph winds is unable to withstand higher wind events. The campus designated the Moore Field house as a designated weather safe zone for the Wintergreen Building if a high wind event or other natural hazard may occur. **Table 3-15** indicates additional details regarding Southern's vulnerability to a windstorm event.

Table 3-15: Southern Windstorm Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> Connecticut Natural Hazards Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> Between 1955 and 2012, there were 2,470 wind events recorded in the NCDC database for CT - an average of 42.6 per year. CT will continue to experience windstorm events and have a high probability of future occurrences.
<ul style="list-style-type: none"> Anecdotal Information from Southern Connecticut State University Stakeholders 	<ul style="list-style-type: none"> In the past few years, there was wind damage to trees. A tree fell on Lang House. The back of the building and roof had to be repaired. Windows in Wintergreen Building were blown out in the past due to high winds (about 20 years ago). Moore Field House is a designated weather safe zone for Wintergreen Building residents since the building cannot withstand high winds. Generally very windy on campus. Huge windows with a lot of glass in the new building on west campus and new parking garage. Lyman Center is exposed to high winds. Portions of this rubber roof have been stripped off during high winds. This has also occurred at the Student Center.

A ranking of high was determined for a windstorm hazard, shown in **Table 3-2**.

3.2.7.2 Future Development Considerations

Southern should consider windstorm hazards during future development and redevelopment efforts. Considerations include:

- Manage campus tree maintenance to avoid or aid in mitigating impacts of downed trees.
- Any future development should be constructed or updated with regard to the most updated City of New Haven/State building codes, as applicable. Specifically verify that projected future wind loads are considered.
- Evaluate existing building roofs on campus to ensure that their load capacities are appropriate for the projected wind loads.
- Establish/continue communication with the appropriate city and/or state officials to coordinate windstorm hazard emergency information and instructions.
- Establish/continue communication with the campus population:
 - Proactively educate the campus about preparation and appropriate response to a windstorm hazard.
 - Coordinate quick and efficient outreach to convey information issued by designated national agencies such as the National Weather Service, and relevant information about the hazard and instructions on appropriate response and/or preparation.
- Coordinate emergency information with other CSCU campuses if necessary.
- Evaluate windstorm impacts after storm events and plan for recovery and redevelopment once existing conditions are known, including updating and revising Emergency Response & Evacuation Policies.

3.2.8 Tornado

Taking into consideration past history and frequency of tornado events, described further in the next section, the probability of a tornado event impacting the Southern campus in the future is likely, as defined in **Section 3.2.1** in the Multi-Campus Hazard Mitigation Plan.

3.2.8.1 Vulnerability to Tornado Hazard

Since 1950, tornadoes in New Haven County have caused costly damage to the communities in a sum of approximately \$280 million, according to the NCDCE Storm Events Database. This amount of damage was the direct result of 15 tornado occurrences. The most expensive tornado in that period occurred in July of 1989 causing \$275 million of damage. The tornado was a rare F4 event. It destroyed 40 businesses and 350 homes and caused power outages for 90,000 people in New Haven County and Hamden County. Fortunately no fatalities occurred. Since then there have been new tornado events, but of a weaker rating. The following represents a sampling of the more recent tornado events and their impacts:

- **May 31st, 2002:** The Southbury tornado produced F0 damage along Interstate 84, damaging and uprooting trees while blocking traffic.
- **July 31, 2009:** A 100 mph tornado touched down in East River. The tornado was rated EF1 on the Enhanced Fujita Scale, creating damage across its three-mile path between Acorn and Saxon roads. Hardwood trees were uprooted and the event caused \$10,000 worth of damage, no one was injured.
- **July 27, 2014:** An EF0 tornado caused damage in Wolcott. The town’s high school was impacted, and large sports equipment was strewn about as well as trees on the property. Further damage from fallen trees occurred across town, falling onto a home and a trailer. \$25,000 worth of damage was estimated.

As demonstrated by the recent tornado events, Southern is vulnerable to others in the future. The campus experienced a tornado in the 1980s, which razed their Butler building and caused vast tree damage. Since then, Southern has made strides in tornado preparedness. Southern now trains student residential advisors on tornado warnings, and where to go in an emergency. Further information about the event is outlined **Table 3-16** with additional susceptibility criteria.

Table 3-16: Southern Tornado Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> • Connecticut Natural Hazards Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> • Identified in the State plan and determined to have a significant impact on the population and built environment in CT. • Between 1950 and 2013, there have been 95 tornadoes in CT. • Connecticut averages three tornadoes every 2 years. According to the state plan, they are expected to continue most frequently in western and northwestern CT. • Tornado was given a high hazard ranking.
<ul style="list-style-type: none"> • City of New Haven Natural Hazard Mitigation Plan Update (2011) 	<ul style="list-style-type: none"> • Identified as hazard of concern. • Increased tornado activity in and around New Haven County over last decade.
<ul style="list-style-type: none"> • Anecdotal Information from Southern Connecticut State University Stakeholders 	<ul style="list-style-type: none"> • Tornado in 1980s caused major damage to campus. The entire Butler Building was lost. A steel frame from one building became embedded in another and vehicles tipped over. Tornado took roof off Buley Library and impacted trees. Campus closed for three days and lost 100 trees.

Taking into consideration frequency, duration, severity, intensity, probability, and consequence of a dam failure hazard, the hazard ranking for a tornado event is high, demonstrated in **Table 3-2**.

3.2.8.2 Future Development Considerations

Southern should consider tornado hazards during future development and redevelopment efforts. Considerations include:

- Establish/continue communication with the appropriate city and/or state officials to coordinate tornado hazard emergency information and instructions.
- Establish/continue communication with the campus population:
 - Proactively educate the campus about preparation and appropriate response to a tornado hazard.
 - Coordinate quick and efficient outreach to convey information issued by designated national agencies such as the National Weather Service, and relevant information about the hazard and instructions on appropriate response and/or preparation.
- Evaluate tornado impacts after storm events and plan for recovery and redevelopment once existing conditions are known, including updating and revising Emergency Response & Evacuation Policies.

3.2.9 Hurricane

According to the Connecticut Natural Hazards Mitigation Plan, a Category 1 hurricane may occur in/near Connecticut or make landfall once every 10 to 15 years. Thus, the probability of a hurricane event affecting the Southern campus in the future is likely, as defined in **Section 3.2.1** in the Multi-Campus Hazard Mitigation Plan.

3.2.9.1 Vulnerability to Hurricane Hazard

Hurricane events generally have a wide geographic extent, with the potential to create damage across counties and states. **Section 3.6.9.3** provides information on notable hurricanes in Connecticut’s history that have impacted New Haven County as a whole, and thus also Southern. Since 1950, there have been four Presidential Disaster Declarations resulting from hurricanes affecting New Haven County. The City of New Haven Natural Hazard Mitigation Plan Update cites hurricanes in the first half of the 1900s (1938, 1944, 1954, 1955 and 1960) as events with the most effect and damage on the City of New Haven. As New Haven is a coastal community, propensity for damage is increased by hurricane surges on the coast and inland inundation.

Fortunately, Southern is not directly on the coastline and is thus buffered from damaging influence of storm surge. Nonetheless, the campus has substantial concern over future events due to their experience with tropical storm events. One of the more recent Tropical Storms, Irene, occurred in 2011 and resulted in significant coastal flooding, damage to homes along the shoreline, downed power lines, and weeklong power outages. As a result, the Southern campus closed during the event and similarly experienced flooding. Logistically, while many students live on campus, if a storm event hit, campus personnel would need to establish where to house commuters, potentially over a period of days. The susceptibility criteria used to determine this vulnerability to hurricane hazards is displayed in **Table 3-17**.

Table 3-17: Southern Hurricane Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> • Connecticut Natural Hazards Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> • Identified in the State plan and determined to have a significant impact on the population and built environment in CT. • The entire state of CT is a hurricane susceptible region. • Hurricane was given a high hazard ranking.
<ul style="list-style-type: none"> • City of New Haven Natural Hazard Mitigation Plan Update (2011) 	<ul style="list-style-type: none"> • Identified in as a hazard of concern. • CT has not experienced a "direct hit" in decades.

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> Anecdotal Information from Southern Connecticut State University Stakeholders 	<ul style="list-style-type: none"> Two hurricanes have impacted the campus. Damage from Hurricane Sandy included tree damage, minor flooding along West River that runs partly through campus and through parking lots. Power plant generator failed for a period of time. Farnham Hall was significantly flooded (had to use shop vacuum for hours). Campus was closed during Hurricane Irene. Concern over hurricanes about how to place student who cannot be evacuated. Huge windows with a lot of glass in the new building on west campus and new parking garage.

Due to these factors, and based future development plans, knowledge of the campus, infrastructure and past occurrences a hazard ranking of severe to future hurricane hazards was established (see **Table 3-2**).

3.2.9.2 Future Development Considerations

Southern should include hurricane hazard scenario planning during their future development and redevelopment efforts and continue to implement measures to mitigate the impact of hurricanes occurrences. This includes the following mitigation measures:

- When planning new development, avoid disturbing existing natural features and habitats that may provide protection from natural hazards.
- Continue enforcement of local, state, and federal regulations that address building structural criteria and flooding, as applicable.
 - Implement building code requirements in building rehabilitations or new construction that relate to FEMA policies and guidelines that may be included in Town of Killingly regulations.
- Manage campus tree maintenance to aid in mitigating impacts of downed trees.
- Establish/continue communication with the appropriate town and/or state officials to coordinate hurricane hazard emergency information and instructions.
- Establish/continue communication with the campus population:
 - Proactively educate the campus about preparation and appropriate response to a potential hurricane hazard.
 - Coordinate quick and efficient outreach to convey information issued by designated national agencies such as the National Weather Service, and relevant information about the hazard and instructions on appropriate response and/or preparation.
- Coordinate emergency information with other CSCU campuses if necessary.
- Evaluate hurricane impacts after storm events and plan for recovery and redevelopment once existing conditions are known, including updating and revising Emergency Response & Evacuation Policies (which include instructions for sheltering in place for the campus population).

3.2.10 Dam Failure

Dam failures can result from natural hazards such as earthquakes and flooding which may lead to overtopping of structures. However, dam failures are unlikely to occur and have a low probability of impacting Southern in the future.

3.2.10.1 Vulnerability to Dam Failure Hazard

There are three major dams in New Haven: Lily Pond, Beaver Pond dam, and Conrad Pond Dam. However, as of 2013, \$162 million in federal assistance was awarded to remove Lily Pond dam. The 233-year-old dam was considered



a safety concern for residences and businesses in the Woodbridge Village District, as its failure was thought to cause major flooding.¹⁰ Other than Lily Pond dam, which is slated for removal in 2015, Conrad Pond is the only Class B dam in town, meaning that if it failed it could cause possible loss of life, minor damage to habitable structures, and significant economic damage to its surroundings. Beaver Pond presents a Class A hazard, or a low hazard potential that would only cause minimal economic loss. Further information about Southern’s vulnerability to dam failure is indicated in **Table 3-18**.

Table 3-18: Southern Dam Failure Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> Connecticut Natural Hazards Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> Dam failure was given a medium hazard ranking. Based on historical information, CT has a medium/low probability of future dam failure events. CT has experienced dam failures throughout the state in the past.
<ul style="list-style-type: none"> City of New Haven Natural Hazard Mitigation Plan Update (2011) 	<ul style="list-style-type: none"> Failure at Conrad Pond Dam (SW of campus) could result in widespread damage (to economy and surrounding structures).

Taking into consideration frequency, duration, severity, intensity, probability, and consequence of a dam failure hazard, the risk of dam failure to the campus is low, as demonstrated in **Table 3-2**.

3.2.10.2 Future Development Considerations

Southern designated campus staff should continue to communicate regularly with City officials regarding the dams located in the campus’ vicinity. Staying informed about condition, inspections and any maintenance work will be helpful to monitor for any potential impacts to the campus. In the event of dam failure, Southern should evaluate impacts and plan for recovery and redevelopment once existing conditions are known, including updating and revising Emergency Response & Evacuation Policies.

3.2.11 Wildfire

The probability of a wildfire impacting the Southern campus in the future is unlikely, as defined in **Section 3.2.1** in the Multi-Campus Hazard Mitigation Plan.

3.2.11.1 Vulnerability to Wildfire Hazard

According to sources interviewed, the campus has not experienced any wildfire impacts, and all buildings are equipped with sprinklers. Susceptibility criteria for wildfire is presented in **Table 3-19**.

¹⁰ Zaretsky, Mark. New Haven Register. *Advocates in New Haven celebrate Pond Lily Dam removal project*. Nov. 7, 2013. Accessed August 5, 2015. <http://www.nhregister.com/general-news/20131107/advocates-in-new-haven-celebrate-pond-lily-dam-removal-project>

Table 3-19: Southern Wildfire Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> Connecticut Natural Hazards Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> Identified in the State plan and determined to have a significant impact on the population and built environment in CT. Wildfire was given a low/moderate hazard ranking. Only one wildfire in CT in the past 15 years has burned more than 300 acres - the majority of the 5,415 reported events between 1991 and 2013 have burned less than five acres in area. CT typically experiences high forest fire danger between March-May.

Based on background research, future development plans, knowledge of the campus, infrastructure, and past occurrences a hazard ranking of low vulnerability to future urban wildfire hazard was established (see **Table 3-2**).

3.2.11.2 Future Development Considerations

Southern should establish certain practices to help mitigate the impacts of a future wildfire occurrence. If Southern makes development and/or redevelopment plans in the future, wildfire hazard scenario will be included as part of their planning efforts. Specifically the campus should ensure that their buildings are up to date and abide by the most current fire codes. Southern should coordinate emergency information and instructions with city and/or state officials. If a wildfire event occurs, Southern should evaluate impacts and plan for recovery and redevelopment once existing conditions are known, including updating and revising Emergency Response & Evacuation Policies.

4. VULNERABILITY AND IMPACT ASSESSMENT

Evaluating the potential impact that various hazard events may have on Southern’s assets involves assessing risks, determining vulnerability and estimating losses. Southern assessed building vulnerability based on the FEMA methodology using a loss of function and total damage calculation. An explanation of the methodology was included in **Section 3.5** of the Multi-Campus Hazard Mitigation Plan.

4.1 ASSET INVENTORY

Table 4-1 summarizes the assets that were evaluated during the hazard mitigation planning process for Southern.

Table 4-1: Southern Assets

Existing Buildings	Date Construction Completed	Gross Square Feet
Academic Science Building	2015	92,627
Admissions Building (131 Farnham)	1900	6,299
Brownell Hall	1982	67,157
Buley Library	1968	249,412
Chase Hall	1967	59,266
Connecticut Hall	1973	45,569
Davis Hall	1969	49,614
Earl Hall	1960	46,027
Engleman Hall	1953	224,599
Farnham Hall	1964	57,047
Granoff Hall/Police Station/Health Svcs	1972	10,874
Greenhouse	1990	125
Grounds/Vehicle Maintenance/Facilities Garage	2000	9,855
Hickerson Hall	1967	59,266
Jennings Hall	1982	130,026
Jess Dow Field Concession Building	1991	1,980
Lang House	1903	10,199
Lyman Center for the Performing Arts	1967	53,058
Michael J. Adanti Student Center	2006	129,607
Modular Building /Office Building OB1	2006	12,000
Moore Field House	1976	145,992
Morrill Hall	1959	42,050
Neff Hall	1969	48,150
New Boiler Plant/Energy Hall	2003	16,580
New Fitch Street Parking Garage	2000	193,605
New Physical Plant/Facilities Operations Building	2000	44,609

Existing Buildings	Date Construction Completed	Gross Square Feet
North Campus Res. Hall Complex: Mid-Rise	1985	152,517
North Campus Res. Hall Complex: Town House A	1991	9,059
North Campus Res. Hall Complex: Town House B	1991	9,165
North Campus Res. Hall Complex: Town House C	1991	9,165
North Campus Res. Hall Complex: Town House D	1991	9,059
Nursing Building	2005	5,000
Orlando House	1890	4,188
Pelz Gymnasium (including Pelz Storage Building)	1952	77,423
School of Business	1958	43,590
Schwartz Hall	1957	100,293
Temporary Bookstore	2001	4,961
Temporary Office Building 6	2001	6,128
Warehouse 1 (Ethnic Heritage Center)	1970	7,690
West Campus Parking Garage	2004	148,098
West Campus Residence Hall	2004	112,722
Wilkinson Hall	1965	63,828
Wintergreen Building	1994	48,551
Wintergreen Parking Garage	2013	399,552

In total, Southern has 44 assets that may be vulnerable to a natural hazard event.

4.1.1 Loss of Function

Southern calculated Loss of Function costs following the methodology discussed in **Section 3.5** of the Multi-Campus Hazard Mitigation Plan. Each building was assigned a criticality value depending on their importance to campus operations. Southern has many residence halls, which, in case of a hazard, would provide shelter to the campus population and be ranked as a five. The following is a list of the residence halls on campus:

- Brownell Hall
- Chase Hall
- Farnham Hall
- Hickerson Hall
- North Campus Residence Hall Complex: Mid-Rise
- North Campus Residence Hall Complex: Town House A
- North Campus Residence Hall Complex: Town House B
- North Campus Residence Hall Complex: Town House C
- North Campus Residence Hall Complex: Town House D
- Neff Hall
- West Campus Residence Hall
- Wilkinson Hall



Moore Field House also serves as a gathering point for the community in case of an emergency at the Millstone Nuclear Power Plant, in addition to providing a shelter for students, faculty, and staff in the Wintergreen Building, which is susceptible to high winds. Buildings containing HVAC equipment such as the New Boiler Plant/Energy Hall and the New Physical Plant, and ones with emergency operations, as is the case with the Granoff Hall are critical for operations and safety. Engleman Hall and the Adanti Service Center house network functions, telecommunications, and video security. On the academic side, Engleman Hall houses animals in the basement and Jennings Hall, Morrill Hall and the new science building are important research facilities. Important records and administrative functions are serviced from the Wintergreen Building, which is known to not be able to withstand high winds. **Table 4-2** presents the results of the non-hazard-specific loss of function analysis for Southern.

Table 4-2: Southern Loss of Function Cost

Existing Buildings	Date Constructed	Gross Square Feet	Building Criticality Value	Factored Square Footage	Building/Total Campus Square Footage	Per Day Loss of Function Cost	Estimated Hazard Specific Loss of Function (Days)	Loss of Function Cost Per Hazard
Academic Science Building	2015	92,627	5	463,135	0.15	\$174,622	7	\$1,222,353
Admissions Building (131 Farnham)	1900	6,299	3	18,897	0.01	\$7,125	7	\$49,875
Brownell Hall	1982	67,157	5	335,785	0.11	\$126,605	7	\$886,238
Buley Library	1968	249,412	4	997,648	0.33	\$376,156	7	\$2,633,094
Chase Hall	1967	59,266	5	296,330	0.10	\$111,729	7	\$782,104
Connecticut Hall	1973	45,569	5	227,845	0.08	\$85,907	7	\$601,352
Davis Hall	1969	49,614	3	148,842	0.05	\$56,120	7	\$392,839
Earl Hall	1960	46,027	3	138,081	0.05	\$52,062	7	\$364,437
Engleman Hall	1953	224,599	5	1,122,995	0.37	\$423,417	7	\$2,963,922
Farnham Hall	1964	57,047	5	285,235	0.09	\$107,546	7	\$752,821
Granoff Hall/Police Station/Health Svcs	1972	10,874	5	54,370	0.02	\$20,500	7	\$143,499
Greenhouse	1990	125	1	125	0.00	\$47	7	\$330
Grounds/Vehicle Maintenance/Facilities Garage	2000	9,855	4	39,420	0.01	\$14,863	7	\$104,041
Hickerson Hall	1967	59,266	5	296,330	0.10	\$111,729	7	\$782,104
Jennings Hall	1982	130,026	5	650,130	0.22	\$245,127	7	\$1,715,889



CSCU



WOODARD
& CURRAN

Existing Buildings	Date Constructed	Gross Square Feet	Building Criticality Value	Factored Square Footage	Building/Total Campus Square Footage	Per Day Loss of Function Cost	Estimated Hazard Specific Loss of Function (Days)	Loss of Function Cost Per Hazard
Jess Dow Field Concession Building	1991	1,980	1	1,980	0.00	\$747	7	\$5,226
Lang House	1903	10,199	3	30,597	0.01	\$11,536	7	\$80,755
Lyman Center for the Performing Arts	1967	53,058	3	159,174	0.05	\$60,015	7	\$420,108
Michael J. Adanti Student Center	2006	129,607	3	388,821	0.13	\$146,602	7	\$1,026,216
Modular Building /Office Building OB1	2006	12,000	5	60,000	0.02	\$22,623	7	\$158,358
Moore Field House	1976	145,992	5	729,960	0.24	\$275,226	7	\$1,926,584
Morrill Hall	1959	42,050	3	126,150	0.04	\$47,564	7	\$332,948
Neff Hall	1969	48,150	5	240,750	0.08	\$90,773	7	\$635,412
New Boiler Plant/Energy Hall	2003	16,580	5	82,900	0.03	\$31,257	7	\$218,798
New Fitch Street Parking Garage	2000	193,605	1	193,605	0.06	\$72,997	7	\$510,982
New Physical Plant/Facilities Operations Building	2000	44,609	5	223,045	0.07	\$84,098	7	\$588,683
North Campus Res. Hall Complex: Mid-Rise	1985	152,517	5	762,585	0.25	\$287,527	7	\$2,012,692
North Campus Res. Hall Complex: Town House A	1991	9,059	5	45,295	0.02	\$17,078	7	\$119,547
North Campus Res. Hall Complex: Town House B	1991	9,165	5	45,825	0.02	\$17,278	7	\$120,946
North Campus Res. Hall Complex: Town House C	1991	9,165	5	45,825	0.02	\$17,278	7	\$120,946
North Campus Res. Hall Complex: Town House D	1991	9,059	5	45,295	0.02	\$17,078	7	\$119,547

Existing Buildings	Date Constructed	Gross Square Feet	Building Criticality Value	Factored Square Footage	Building/Total Campus Square Footage	Per Day Loss of Function Cost	Estimated Hazard Specific Loss of Function (Days)	Loss of Function Cost Per Hazard
Nursing Building	2005	5,000	3	15,000	0.00	\$5,656	7	\$39,590
Orlando House	1890	4,188	3	12,564	0.00	\$4,737	7	\$33,160
Pelz Gymnasium (including Pelz Storage Building)	1952	77,423	2	154,846	0.05	\$58,384	7	\$408,685
School of Business	1958	43,590	3	130,770	0.04	\$49,306	7	\$345,141
Schwartz Hall	1957	100,293	5	501,465	0.17	\$189,074	7	\$1,323,517
Temporary Bookstore	2001	4,961	3	14,883	0.00	\$5,612	7	\$39,281
Temporary Office Building 6	2001	6,128	3	18,384	0.01	\$6,932	7	\$48,521
Warehouse 1 (Ethnic Heritage Center)	1970	7,690	4	30,760	0.01	\$11,598	7	\$81,185
West Campus Parking Garage	2004	148,098	1	148,098	0.05	\$55,839	7	\$390,875
West Campus Residence Hall	2004	112,722	5	563,610	0.19	\$212,505	7	\$1,487,537
Wilkinson Hall	1965	63,828	5	319,140	0.11	\$120,330	7	\$842,307
Wintergreen Building	1994	48,551	4	194,204	0.06	\$73,223	7	\$512,563
Wintergreen Parking Garage	2013	399,552	1	399,552	0.13	\$150,648	7	\$1,054,538
Total		3,016,582						

Engleman Hall and Buley Library present the greatest loss of function per hazard out of all of Southern's assets.

4.1.2 Building Vulnerability Assessment

Using the Loss of Function cost per hazard, a non-hazard-specific Building Vulnerability Assessment was prepared that included utilizing additional information such as Insurable Replacement Value and Insurable Contents Value for buildings. A Total Damage amount was calculated and then a building vulnerability ranking was assigned based on the dollar amount. The ranking was based on the following scale:

- Low: Less than \$15 million
- Medium: \$15 million to \$50 million



- High: Greater than \$50 million

The Loss Estimate for the Southern's campus followed the methodology in Section 3.5 of the Multi-Campus Hazard Mitigation Plan. However, as an exception to the methodology, some of the insurable content values were modified based on a building's specialty function or contents. For instance, the insurable contents estimate received from the Insurance and Risk Management Board may not have fully captured the values of unique building types such as utility buildings, power plants, and parking garages. The values that were altered from the methodology are indicated in bold (see **Table 4-3**).

Table 4-3: Southern Building Vulnerability Assessment

Existing Buildings	Insurable Replacement Value	Insurable Contents Value	Loss of Function Per Hazard	Total Damage	Building Vulnerability Ranking
Academic Science Building	\$53,103,059	\$5,473,000	\$1,222,353	\$59,798,412	High
Admissions Building (131 Farnham)	\$3,783,179	\$57,084	\$49,875	\$3,890,138	Low
Brownell Hall	\$31,717,580	\$180,976	\$886,238	\$32,784,793	Medium
Buley Library	\$121,198,249	\$3,463,670	\$2,633,094	\$127,295,013	High
Chase Hall	\$27,990,739	\$214,294	\$782,104	\$28,987,137	Medium
Connecticut Hall	\$24,320,859	\$310,447	\$601,352	\$25,232,658	Medium
Davis Hall	\$27,563,306	\$1,434,429	\$392,839	\$29,390,574	Medium
Earl Hall	\$23,434,417	\$1,524,114	\$364,437	\$25,322,968	Medium
Engleman Hall	\$74,388,269	\$8,677,888	\$2,963,922	\$86,030,078	High
Farnham Hall	\$26,942,728	\$197,564	\$752,821	\$27,893,113	Medium
Granoff Hall/Police Station/Health Svcs	\$5,180,210	\$822,261	\$143,499	\$6,145,971	Low
Greenhouse	\$25,000	\$0	\$330	\$25,330	Low
Grounds/Vehicle Maintenance/Facilities Garage	\$2,690,415	\$372,280	\$104,041	\$3,166,736	Low
Hickerson Hall	\$27,990,739	\$253,795	\$782,104	\$29,026,638	Medium
Jennings Hall	\$74,543,906	\$9,112,875	\$1,715,889	\$85,372,670	High
Jess Dow Field Concession Building	\$6,880,640	\$10,000	\$5,226	\$6,895,866	Low
Lang House	\$5,201,797	\$151,252	\$80,755	\$5,433,803	Low
Lyman Center for the Performing Arts	\$36,646,630	\$539,148	\$420,108	\$37,605,886	Medium
Michael J. Adanti Student Center	\$55,727,770	\$2,291,282	\$1,026,216	\$59,045,267	High



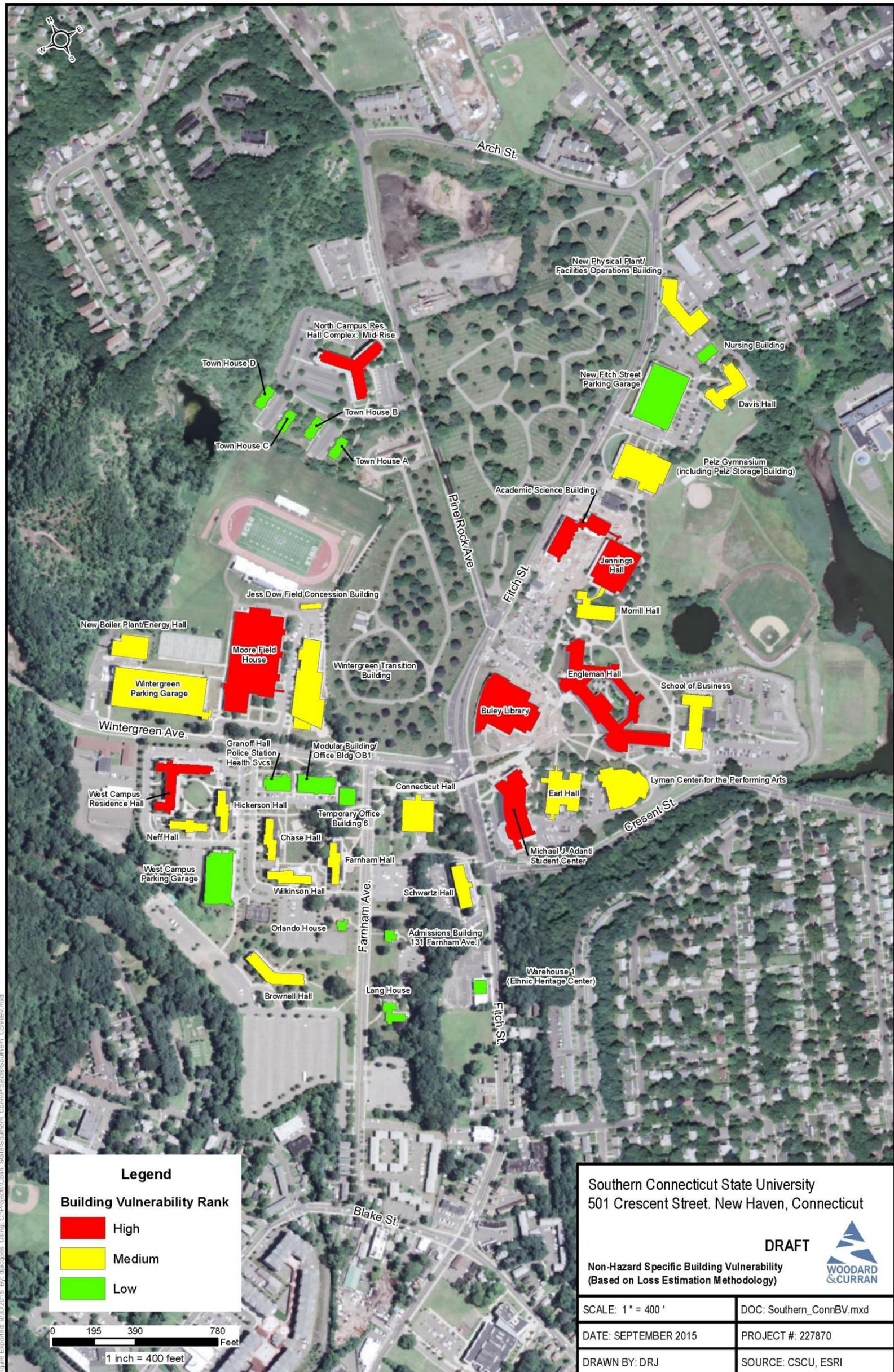
Existing Buildings	Insurable Replacement Value	Insurable Contents Value	Loss of Function Per Hazard	Total Damage	Building Vulnerability Ranking
Modular Building /Office Building OB1	\$5,765,760	\$658,010	\$158,358	\$6,582,128	Low
Moore Field House	\$71,740,469	\$1,111,545	\$1,926,584	\$74,778,598	High
Morrill Hall	\$23,361,088	\$1,763,298	\$332,948	\$25,457,334	Medium
Neff Hall	\$24,712,506	\$165,444	\$635,412	\$25,513,362	Medium
New Boiler Plant/Energy Hall	\$31,253,088	\$87,768	\$218,798	\$31,559,654	Medium
New Fitch Street Parking Garage	\$9,664,000	\$0	\$510,982	\$10,174,982	Low
New Physical Plant/Facilities Operations Building	\$21,433,732	\$1,219,237	\$588,683	\$23,241,652	Medium
North Campus Res. Hall Complex: Mid-Rise	\$66,619,426	\$1,805,828	\$2,012,692	\$70,437,945	High
North Campus Res. Hall Complex: Town House A	\$4,055,895	\$6,698	\$119,547	\$4,182,141	Low
North Campus Res. Hall Complex: Town House B	\$4,103,354	\$9,146	\$120,946	\$4,233,446	Low
North Campus Res. Hall Complex: Town House C	\$4,103,354	\$11,704	\$120,946	\$4,236,003	Low
North Campus Res. Hall Complex: Town House D	\$4,055,895	\$12,105	\$119,547	\$4,187,547	Low
Nursing Building	\$1,535,625	\$249,372	\$39,590	\$1,824,586	Low
Orlando House	\$2,515,313	\$152,559	\$33,160	\$2,701,032	Low
Pelz Gymnasium (including Pelz Storage Building)	\$40,529,198	\$391,748	\$408,685	\$41,329,632	Medium
School of Business	\$21,479,626	\$177,310	\$345,141	\$22,002,078	Medium
Schwartz Hall	\$44,903,182	\$630,204	\$1,323,517	\$46,856,903	Medium
Temporary Bookstore	\$1,354,353	\$10,000	\$39,281	\$1,403,634	Low
Temporary Office Building 6	\$1,672,944	\$142,624	\$48,521	\$1,864,089	Low
Warehouse 1 (Ethnic Heritage Center)	\$1,574,528	\$150,000	\$81,185	\$1,805,712	Low
West Campus Parking Garage	\$7,200,000	\$0	\$390,875	\$7,590,875	Low



Existing Buildings	Insurable Replacement Value	Insurable Contents Value	Loss of Function Per Hazard	Total Damage	Building Vulnerability Ranking
West Campus Residence Hall	\$50,775,625	\$1,494,853	\$1,487,537	\$53,758,014	High
Wilkinson Hall	\$30,145,326	\$232,821	\$842,307	\$31,220,454	Medium
Wintergreen Building	\$21,737,254	\$2,239,490	\$512,563	\$24,489,307	Medium
Wintergreen Parking Garage	\$18,945,000	\$0	\$1,054,538	\$19,999,538	Medium
Note: <i>Building Vulnerability Ranking is based on Replacement Value + Insurable Contents Value + Loss of Function Value</i>					

Based on total damage, eight buildings received a high building vulnerability ranking, including the Academic Science Building, Engleman Hall, Michael J. Adanti Student Center, Moore Field House, North Campus Residence Hall Complex: Mid-Rise, Jennings Hall, Buley Library, and West Campus Residence Hall. After evaluating the outcome of the building vulnerability ranking, the Southern Planning Team determined that based strictly on the calculations, some of the resulting rankings did not truly reflect the vulnerability. For instance, the Granoff Hall building calculation resulted in a low ranking; however, it contains the campus Emergency Operations Center (EOC) and campus police headquarters. Medium rankings were calculated for the Boiler Plant/Energy Hall; however, as the power generating facility on campus, impacts to this building would have a broader effect in power loss to the campus. As such, the Southern Planning Team considers these buildings as having a high vulnerability during a hazard event regardless of the calculated ranking. In addition, the team determined that all residence hall buildings, and any buildings that received a high building criticality ranking, should have a having high building vulnerability as well. **Figure 4-1** illustrates the high, medium, and low building vulnerability rankings for the campus buildings, as calculated.

Figure 4-1: Southern Building Vulnerability Assessment – Non Hazard-Specific





5. MITIGATION ACTIVITIES & ACTION PLAN

This section describes the mitigation activities identified for Southern designed to proactively reduce risk and potential losses experienced from natural hazard events. The Hazard Mitigation Planning Team used applicable FEMA guidance to identify and review mitigation activities, and ranked mitigation projects according to the STAPLEE criteria. The campus Planning Team also assigned a responsible party for each project identified. In addition to mitigation activities, other preparedness projects were identified in the course of the plan development and are documented here. Mitigation actions were prioritized and reviewed for a variety of factors in accordance with the prescribed FEMA requirements.

5.1 MITIGATION ACTIVITIES & ACTION PLAN

Southern has identified mitigation actions and projects based on the goals and objectives that were prepared during the planning process for this Multi-Campus Hazard Mitigation Plan. In addition, Southern took into consideration previous natural hazard occurrences and impacts.

Southern remains committed to working closely with students, faculty, staff, local residents, and City officials to focus on safety and preparedness. Southern discussed and identified projects that focused on campus preparedness efforts (see **Table 5-1**). While these are not specifically mitigation projects, they have been documented and included in this plan. These projects will be considered as part of future planning and budgeting efforts.

Table 5-1: Southern Campus Preparedness Projects

Project	Responsible Department
Implement cogeneration on campus (in process) - conceptual design has been completed.	Facilities Operations
Have a dedicated Police Building.	University Police
Install one central button on campus to open communications to all buildings. This will require fiber in all buildings.	IT/Facilities Operations
Transition older cameras to new platform. Purchase enough storage to handle another 450 cameras.	University Police
Install electronic locking on all doors and add means to communicate in all buildings.	IT/Facilities Operations
Develop a regional radio hotline that would include one transmit button to go out to the region.	IT/Facilities Operations
Consider plans to make the campus more pedestrian friendly.	Facilities Operations
Provide training to faculty to conduct more classes remotely.	Academic Affairs
Increase signage to identify locations to evacuate.	Facilities Operations
Improve communications in residence halls and off-campus about weather events.	Academic Affairs
Examine campus plowing and snow piling areas to maintain visibility.	Facilities Operations



5.2 MITIGATION PROJECT PRIORITIZATION

Each project and mitigation activity identified by Southern was ranked using the FEMA STAPLEE criteria. The STAPLEE criteria evaluates projects and activities for their ability to be socially acceptable to the community, technically feasible, protective of or beneficial to the environment, backed by legal authority, consistent with current laws, consider economic benefits and costs and include environmental considerations. **Table 5-2** summarizes a list of mitigation projects identified for Southern and indicates the project number, responsible party and whether or not the project meets each individual STAPLEE criteria at a high, medium or low level. After considering this information, each project was given a qualitative high, medium, or low ranking.

Table 5-2: Southern Mitigation Projects & STAPLEE Criteria Rankings

No.	Hazard Addressed	Project Description	Responsible Party	Objectives Addressed	Estimated Cost	STAPLEE Criteria						Project Priority	Potential Funding Source	Duration
						Cost Effectiveness of Activity	Socially Acceptable	Technically Feasible	Protect/Benefit Environment	Legal	Economic Benefit			
1	All	Add hazard mitigation to campus orientation materials.	EHS	1C, 1D, 2C, 4A, 4B, 4C	\$5,000	Medium	High	Medium	Low	Low	Low	Medium	6, 8	2 months
2	All	Increase generator capacity.	Facilities Operations	1B, 2A, 2B, 5B, 5D	\$300,000	High	Medium	High	Low	Low	Medium	High	6, 7, 8	1 year
3	All	Develop a policy for buildings with animals and a plan to transport animals to an alternate location if necessary.	Facilities Operations	1A, 1C, 3B, 4A	\$30,000	Medium	High	High	Low	Low	Low	Medium	8	6 months
4	All	Develop recommendations for further construction standards that incorporate hazard resiliency measures	Facilities Operations	5F	\$10,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months
5	All	Put in switch w/UI to put something at source of dirty power.	Facilities Operations	1A, 1B, 2A, 2D, 5B	\$25,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months
6	Earthquake	Incorporate structural and non-structural seismic strengthening actions into ongoing building plans and activities in the capital improvement plan to ensure that facilities remain operational for years to come and complete activities such as bracing ceiling and lighting systems.	Facilities Operations	1B, 5B, 5F	\$30,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months
7	Earthquake	Install blast film on windows in residence halls that have evacuation zones downstairs.	Facilities Operations	1A, 1B, 3A, 5B	\$50,000	Medium	High	Medium	Low	Low	Low	Medium	8	6 months

No.	Hazard Addressed	Project Description	Responsible Party	Objectives Addressed	Estimated Cost	STAPLEE Criteria						Project Priority	Potential Funding Source	Duration
						Cost Effectiveness of Activity	Socially Acceptable	Technically Feasible	Protect/Benefit Environment	Legal	Economic Benefit			
8	Flood	Flood-proof stone foundation at Admissions House such as with the use of membranes and other sealants.	Facilities Operations	1A, 1B, 5B	\$65,000	High	Medium	Medium	Low	Low	Low	Medium	8	5 months
9	Flood	Evaluate and enlarge Crescent Street drainage system (New Haven side).	Facilities Operations	1A, 1B, 5B	\$800,000	Medium	Medium	Medium	High	Low	Low	Medium	8	1 year
10	Flood	Evaluate separation of storm and sewer systems to alleviate flooding potential.	Facilities Operations	1A, 1B, 5B	\$75,000	Medium	Medium	Medium	Low	Low	Low	Medium	8	8 months
11	Flood	Demolish Fitch Street building due to past flooding.	Facilities Operations	1A, 1B, 5B, 5C	\$150,000	Low	Medium	Medium	Low	Low	Low	Low	8	1 year
12	Flood	Relocate generator at Jennings Hall that is currently below grade.	Facilities Operations	1A, 1B, 5B	\$60,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months
13	Flood	Study the use of pervious/porous pavement to help reduce flooding on campus.	Facilities Operations	1A, 1B, 5B	\$40,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months
14	Flood, Hurricane	Incorporate rain water systems in new buildings (rain garden).	Facilities Operations	1A, 1B, 5B	\$40,000	Medium	Medium	Medium	Low	Low	Low	Low	8	as needed
15	Flood, Winter-Related Hazard	Evaluate and implement increased roof flashing and raising mechanical units on roofs.	Facilities Operations	1A, 1B, 5A, 5B	\$75,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months

No.	Hazard Addressed	Project Description	Responsible Party	Objectives Addressed	Estimated Cost	STAPLEE Criteria						Project Priority	Potential Funding Source	Duration
						Cost Effectiveness of Activity	Socially Acceptable	Technically Feasible	Protect/Benefit Environment	Legal	Economic Benefit			
16	Flood, Winter-Related Hazard	Require new standards for new buildings for higher flashings.	Facilities Operations	1B, 5B, 5C, 5D, 5F	\$5,000	High	Medium	Medium	Low	Low	Low	Medium	8	3 months
17	Lightning/Thunderstorm	Add transient surge suppression to block large voltage spikes in Adanti Student Center.	Facilities Operations	1A, 1B, 2A, 2D, 5B	\$30,000	Medium	Medium	Medium	Low	Low	Low	Low	8	4 months
18	Earthquake, Windstorm, Hurricane, Tornado	Discontinue use and demolish Wintergreen Building due to inability to handle high winds and relocate critical functions.	Facilities Operations	1A, 1B, 5B, 5C	\$150,000	Low	Medium	Medium	Low	Low	Low	Low	8	10 months
19	Earthquake, Windstorm, Hurricane, Tornado	Improve the roof cover securement for the North Campus Residence Hall roof.	Facilities Operations	1A, 1B, 5A, 5B	\$30,000	Medium	Medium	Medium	Low	Low	Low	Low	8	4 months
20	Earthquake, Windstorm, Hurricane, Tornado	Enclose the uncompleted wall section of the Buley Library Addition.	Facilities Operations	1A, 1B, 5A, 5B	\$90,000	Medium	Medium	High	Low	Low	Low	Medium	8	8 months
21	Earthquake, Windstorm, Hurricane, Tornado	Evaluate and upgrade the flat lower and middle roofs of Moore Fieldhouse.	Facilities Operations	1A, 1B, 5A, 5B	\$175,000	Medium	Medium	Medium	Low	Low	Low	Low	8	10 months
22	Earthquake, Windstorm, Hurricane, Tornado	Improve the roof cover securement for the pitched roof of Moore Fieldhouse.	Facilities Operations	1A, 1B, 5A, 5B	\$90,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months

No.	Hazard Addressed	Project Description	Responsible Party	Objectives Addressed	Estimated Cost	STAPLEE Criteria						Project Priority	Potential Funding Source	Duration
						Cost Effectiveness of Activity	Socially Acceptable	Technically Feasible	Protect/Benefit Environment	Legal	Economic Benefit			
23	Earthquake, Windstorm, Hurricane, Tornado	Improve the roof cover securement of Farnham Hall.	Facilities Operations	1A, 1B, 5A, 5B	\$90,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months
24	Earthquake, Windstorm, Hurricane, Tornado	Install purlin braces in the exterior bays of the facilities warehouse.	Facilities Operations	1A, 1B, 5A, 5B	\$65,000	Medium	Medium	Medium	Low	Low	Low	Low	8	7 months
25	Earthquake, Windstorm, Hurricane, Tornado	Evaluate and upgrade Davis Hall roof covering.	Facilities Operations	1A, 1B, 5A, 5B	\$90,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months
26	Earthquake, Windstorm, Hurricane, Tornado	Provide adequate roof deck securement for the Old Student Center.	Facilities Operations	1A, 1B, 5A, 5B	\$90,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months
27	Earthquake, Windstorm, Hurricane, Tornado	Evaluate and upgrade the roof cover securement of Chase Hall.	Facilities Operations	1A, 1B, 5A, 5B	\$90,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months
28	Earthquake, Windstorm, Hurricane, Tornado	Evaluate and upgrade the roof cover securement of Hickerson Hall.	Facilities Operations	1A, 1B, 5A, 5B	\$90,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months
29	Earthquake, Windstorm, Hurricane, Tornado	Improve the roof cover securement of Neff Hall.	Facilities Operations	1A, 1B, 5A, 5B	\$90,000	Medium	Medium	Medium	Low	Low	Low	Low	8	6 months



No.	Hazard Addressed	Project Description	Responsible Party	Objectives Addressed	Estimated Cost	STAPLEE Criteria						Project Priority	Potential Funding Source	Duration
						Cost Effectiveness of Activity	Socially Acceptable	Technically Feasible	Protect/Benefit Environment	Legal	Economic Benefit			
30	Earthquake, Windstorm, Hurricane, Tornado	Provide storm water and leak protection for Earl Hall.	Facilities Operations	1A, 1B, 5A, 5B	\$40,000	Medium	Medium	Medium	Low	Low	Low	Low	8	8 months
31	Earthquake, Windstorm, Hurricane, Tornado	Improve securement for rooftop HVAC units on Farnham Hall.	Facilities Operations	1A, 1B, 5A, 5B	\$80,000	Medium	Medium	Medium	Low	Low	Low	Low	8	5 months
32	Earthquake, Windstorm, Hurricane, Tornado	Improve securement for rooftop HVAC units on Connecticut Hall.	Facilities Operations	1A, 1B, 5A, 5B	\$80,000	Medium	Medium	Medium	Low	Low	Low	Low	8	5 months
33	Earthquake, Windstorm, Hurricane, Tornado	Improve securement for rooftop HVAC units on Moore Field House.	Facilities Operations	1A, 1B, 5A, 5B	\$80,000	Medium	Medium	Medium	Low	Low	Low	Low	8	5 months
34	All	Develop campus GIS to map hazard areas, at-risk structures, and associated hazards to assess high-risk areas.	Facilities Operations	1C, 1D, 2C	\$30,000	High	Medium	High	Medium	Low	Low	Medium	6, 7, 8	5 months
35	All	Increase signage capacity on campus to alert campus community before hazards	EHS	1B, 1D, 2C, 4A, 4C	\$45,000	Medium	High	High	Low	Low	Low	Medium	6, 7, 8	5 months
36	All	Provide training for students, faculty, and staff associated with natural hazards.	EHS	1C, 1D, 4A	\$35,000	Medium	High	Medium	Low	Low	Low	Low	6, 7, 8	6 months
37	All	Construct safe rooms for extreme weather events and provide associated training	EHS	1B, 3B, 5C	\$150,000	Medium	Medium	Medium	Low	Low	Low	Low	6, 7, 8	1 Year

No.	Hazard Addressed	Project Description	Responsible Party	Objectives Addressed	Estimated Cost	STAPLEE Criteria						Project Priority	Potential Funding Source	Duration
						Cost Effectiveness of Activity	Socially Acceptable	Technically Feasible	Protect/Benefit Environment	Legal	Economic Benefit			
38	Earthquake	Retrofit building veneers to prevent failure during earthquake	Facilities Operations	1A, 1B, 5A, 5B, 5D, 5F	\$2,500,000	Low	Medium	Medium	Low	Low	Low	Low	6, 7, 8	14 months
39	Earthquake, Windstorm, Hurricane, Tornado	Install window film in critical areas to prevent injuries from shattered glass.	Facilities Operations	1A, 1B, 1D, 5B	\$60,000	Medium	High	High	Low	Low	Low	Low	6, 7, 8	7 months
40	Flood	Conduct study for flood control and stormwater management and structural flood control projects in key areas and implement engineered solutions.	Facilities Operations	1A, 1C, 1F, 2B, 5B	\$80,000	Medium	High	Medium	Low	Low	Low	Medium	6, 7, 8	10 months
41	Flood	Relocate Ethnic Heritage Center that has been impacted by flooding in the past	Facilities Operations	1B, 1C, 5B, 5D	\$2,000,000	Low	Medium	Medium	Low	Low	Low	Low	6, 7, 8	1 year
42	Flood	Develop a floodplain management plan	Facilities Operations	1C, 5C, 5D	\$30,000	Medium	Medium	Medium	Low	Low	Low	Low	6, 7, 8	6 months
43	Flood	Elevate building structure so that the lowest level is above the flood zone or raise utilities or other mechanical devices above the flood zone	Facilities Operations	1B, 2B, 5A, 5B, 5D, 5F	\$750,000	Medium	Medium	Medium	Low	Low	Low	Medium	6, 7, 8	1 year
44	Flood	Wet proof/dry proof areas above the base flood elevation	Facilities Operations	1B, 2B, 5A, 5B, 5D, 5F	\$50,000	Medium	Medium	Medium	Low	Low	Low	Low	6, 7, 8	7 months
45	Flood, Hurricane	Prepare a stormwater management master plan	Facilities Operations	1C	\$100,000	Medium	Medium	High	Low	Low	Low	Low	6, 7, 8	6 months

No.	Hazard Addressed	Project Description	Responsible Party	Objectives Addressed	Estimated Cost	STAPLEE Criteria						Project Priority	Potential Funding Source	Duration
						Cost Effectiveness of Activity	Socially Acceptable	Technically Feasible	Protect/Benefit Environment	Legal	Economic Benefit			
46	Flood, Hurricane	Create a floodplain management plan	Facilities Operations	4A, 4C	\$60,000	Medium	Medium	High	Medium	Low	Medium	Medium	6, 7, 8	9 months
47	Flood, Hurricane	Complete a stormwater drainage study for known problem areas	Facilities Operations	1C, 5B	\$75,000	Medium	Medium	Medium	Medium	Low	Low	Medium	6, 7, 8	7 months
48	Hurricane	Install hurricane shutters in critical areas	Facilities Operations	1A, 1B, 1D, 5B	\$100,000	Medium	Medium	Medium	Low	Low	Low	Low	6, 7, 8	8 months
49	Thunderstorm/ Lightning	Install and maintain surge protection on critical electronic equipment.	Facilities Operations	1A, 1B, 2A, 2B, 2D, 5B, 5F	\$30,000	High	High	High	Low	Low	Medium	Medium	6, 7, 8	4 months
50	Windstorm	Improve building envelopes	Facilities Operations	1A, 1B, 5A, 5B, 5D, 5F	\$1,600,000	Low	Medium	Medium	Low	Low	Low	Low	6, 7, 8	1 year
51	Windstorm, Hurricane, Tornado	Develop a debris management plan.	Facilities Operations	1B, 1C, 5F	\$65,000	Medium	Medium	Medium	Medium	Low	Low	Medium	6, 7, 8	8 months
52	Windstorm, Hurricane, Tornado	Bury power lines to provide uninterrupted power after severe winds	Facilities Operations	1B, 5B, 5F	\$2,000,000	Low	Medium	Medium	Low	Low	Low	Low	6, 7, 8	1.5 years
53	Windstorm, Hurricane, Tornado, Winter-Related Hazard/ Blizzard	Establish standards regarding tree pruning including incorporating inspection and management of hazardous trees. Survey and tag all trees and prune/trim/remove branches and trees to reduce risk of tree damage.	Facilities Operations	1A, 1B, 1C, 5C, 5F	\$30,000	Medium	Medium	High	Low	Low	Low	Low	6, 7, 8	6 months

No.	Hazard Addressed	Project Description	Responsible Party	Objectives Addressed	Estimated Cost	STAPLEE Criteria						Project Priority	Potential Funding Source	Duration
						Cost Effectiveness of Activity	Socially Acceptable	Technically Feasible	Protect/Benefit Environment	Legal	Economic Benefit			
54	Winter-Related Hazard	Assess vulnerabilities of snow and ice storm loads on the roofs of the critical buildings.	Facilities Operations	1A, 1B, 5A, 5B	\$75,000	Medium	Medium	Medium	Low	Low	Low	Low	6, 7, 8	10 months
55	Winter-Related Hazard	Increase public awareness of storm mitigation activities, including severe storm warnings and advisories.	EHS	1C, 1D, 2C, 3A, 4A, 4B, 4C	\$5,000	Medium	High	High	Low	Low	Low	Medium	6, 7, 8	3 months
56	Winter-Related Hazard	Add building insulation prevent burst pipes and other winter-related impacts.	Facilities Operations	1A, 1B, 5A, 5B, 5D	\$35,000	High	Medium	High	Low	Low	Low	Medium	6, 7, 8	5 months
57	Winter-Related Hazard, Windstorm, Hurricane, Tornado	Conduct an assessment of roof construction, wind conditions, infrastructure, vulnerabilities, drainage speed, and capacity and implement engineered solutions.	Facilities Operations	1A, 1B, 2B, 5A, 5B	\$75,000	Medium	Medium	High	Low	Low	Low	Low	6, 7, 8	6 months

5.3 POTENTIAL FUNDING SOURCES

There may be various funding sources available for the CSCU campuses to potentially pursue as they consider implementing various action items from this planning effort. **Table 5-3** details various federal, state, and local agencies and programs that may be available.

Table 5-3: Potential Funding Sources

Funding Source Number	Agency	Program	Description	More Information
FEDERAL				
1	U.S. Economic Development Administration	Economic Development Assistance Programs	Road and water infrastructure upgrades and other potential projects. Grants and cooperative agreements made under these programs are designed to leverage existing regional assets and support the implementation of economic development strategies that advance new ideas and creative approaches to advance economic prosperity in distressed communities. Institutes of higher education are eligible.	http://www.eda.gov/funding-opportunities/ or http://www.grants.gov/search-grants.html?eligibilities%3D06%7CPublic%20and%20State%20controlled%20institutions%20of%20higher%20education
2	US Department of Agriculture (USDA) - National Resources Conservation (NRCS) Watersheds and Wetlands Division	Watershed Surveys and Planning	Surveys and Planning Studies for appraising water and related resources, and service formulating alternative plans for conservation use and development. Grants and advisory/counseling services to assist with planning and implementation improvement.	http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/landscape/wsp/?cid=stelprdb1042175
3	FEMA	National Flood Insurance Program	Formula grants to States to assist FEMA communities to comply with NFIP floodplain management requirements (Community Assistance Program). Campus would need to apply through/work with the community in which they are located.	http://www.fema.gov/national-flood-insurance-program
4	FEMA; DOI-USGS USGS	National Earthquake Hazards Reduction	Training, planning, and technical program assistance under grants to states or local jurisdictions. Campus would need to apply through/work with the community in which they are located.	http://www.fema.gov/national-earthquake-hazards-reduction-program



Funding Source Number	Agency	Program	Description	More Information
5	USDA-NRCS	Emergency Watershed Protection (EWP)	Provides technical and financial assistance program for relief from imminent hazards in small watersheds, and to reduce vulnerability of life and property in small watershed areas damaged by severe natural hazard events (typically available after emergency situation). Public and private landowners are eligible but they must have a project sponsor (city, county, etc.).	http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/
6	US Department of Education	Emergency Management for Higher Education (<i>this program was last funded in 2010</i>)	The Emergency Management for Higher Education (EMHE) grant program supports institutions of higher education (IHE) projects designed to develop, or review and improve, and fully integrate campus-based all-hazards emergency management planning efforts.	http://www2.ed.gov/programs/emergencyhighered/funding.html
STATE				
7	FEMA, CT DEMHS	Hazard Mitigation Grant Program	Allows for the completion of post-disaster mitigation projects that will reduce and/or eliminate losses due to natural hazards. Private non-profit entities are eligible to apply for HMGP only.	http://www.ct.gov/demhs/cwp/view.asp?a=4062&q=515030&demhsNav=
OTHER				
8	CSCU/BOR	Various	<ul style="list-style-type: none"> • Annual Operating Budgets • Staff/Department Time • CSCU Bond Financing 	

5.4 CAPABILITIES ASSESSMENT

Southern has policies, procedures, and action plans in place as well as available qualified staff who assist in implementing this Multi-Campus Hazard Mitigation Plan. The capability assessment focuses on identifying where the campus has existing mechanisms and staff in place that can be used directly or modified to support mitigation activities. Southern departments and offices, and System Office departments, that either have been or may need to be involved with mitigation activities in the future include:

- Human Resources
- Academic Affairs
- Enrollment Management
- Institutional Effectiveness
- Management Information and Research
- Finance & Administration
- University Police
- Institutional Advancement
- Student Affairs
- President's Office

- Information Technology
- Facilities Department System Office

Within these departments, various levels of staff perform regular job duties as well as special projects when assigned. **Table 5-4** provides more detail about Southern’s administrative and technical capabilities to implement hazard mitigation activities.

Table 5-4: Southern Administrative and Technical Capabilities

Department	Campus Offices Within Department	Function	Staff Types Available
Organizational Development	<ul style="list-style-type: none"> • Human Resources 	Maintain employee records and contact information, provide guidance in labor law, provide benefits and litigation support	Vice President Chief of Staff, Chief Human Resources Officer, University Personnel Administrators, Associates in Human Resources, Assistant in Human Resources, Administrative Operations Assistant
Academic Affairs	<ul style="list-style-type: none"> • Enrollment Management • Institutional Effectiveness • Management Information and Research 	Oversee academic operations on campus, maintain student enrollment information and class lists, provide timely information to support operation and decision making of the University	Provost and Vice President for Academic Affairs, Associate Vice President for Institutional Effectiveness, Associate Vice President for Enrollment Management, Director of Admissions, Registrar, Assistant Director, Administrative Assistant, Director of Assessment, Planner/Analyst, Research Associate,
Finance & Administration	<ul style="list-style-type: none"> • Accounting • Accounts Payable • Administrative Support Services • Controller • Duplicating • Executive Vice President’s Office • Facilities Operations • Procurement Services • Records & Information Management 	Provide accounting services to Southern, disburse non-payroll payments, serve as liaison for procurement and contract compliance with Connecticut State University System Office, Attorney General and Department of Administrative Services, provide reproduction and printing services, maintain physical facilities and grounds, oversight of purchasing, safeguard official records and informational assets, and switchboard service	Director of Administrative Support Services, Procurement Card Project Administrator, University Records Specialist, Manager Contract Compliance & Procurement Services, Purchasing Assistant, Acquisition Specialist, Secretary, Controller, Accounts Payable Coordinator, Office Assistants, Payroll Coordinator, Payroll Officer, Payroll Clerk, Director of Accounting Services, Accountant, Financial Analyst, Director of Financial Planning, Financial Information Systems Support Specialist, Bursar, Director of Financial Business Applications



Department	Campus Offices Within Department	Function	Staff Types Available
University Police	<ul style="list-style-type: none"> University Police 	Provide policing services to Southern to promote safety and security of students, faculty, and staff	Director of Public Safety, Associate Director of Public Safety, Police Chief, Deputy Chief of Police, Lieutenant, Sergeants, Detective, Patrol Officer, Dispatcher, Buildings and Grounds Officer, University Assistants
Institutional Advancement	<ul style="list-style-type: none"> Business Manager Public Affairs 	Coordinate media interviews, develop and maintain University website, serve as liaison with off-campus community	Vice President for Institutional Advancement, Business Manager, Assistant to the Business Manager, Director of Public Affairs, University Writers/Editors, Director of Marketing and Publications, Assistant Director of Website Information, Webmaster, Assistant Director of Graphics, Coordinator of Graphic Services, Assistant Director for Design
Student Affairs	<ul style="list-style-type: none"> Residence Life Counseling Services Health and Wellness Center Disability Resource Center 	Provide support to students including counseling services, ambulatory medical needs assessment, resources for students with disabilities, and lists of students living on campus and with disabilities	Vice President for Student Affairs, Director of Residence Life, Associate Directors, Assistants to the Directors, Director of Counseling Services, Director of Health and Wellness Center, Director of Disability Resource Center, Physician, Nurse Practitioners, Nurses
President's Office	<ul style="list-style-type: none"> President's Office 	Oversight of Southern	President, Chief Information Officer, Director of Diversity & Equity Programs, Administrative Assistant
Information Technology	<ul style="list-style-type: none"> Systems & Infrastructure Communication Technologies Enterprise Associations Support Services 	Provide support, technical assistance, and maintain the information technology infrastructure at Southern	Chief Information Officer; Director of Data Integrity, Security & Compliance; Directors; Secretary; Programmer Specialists, Web Application Developer, Enterprise Infrastructure Database, Support Specialists, Enterprise Infrastructure Administrator, Administrators
Facilities Department System Office Staff	<ul style="list-style-type: none"> Facilities Department 	Provides capital project assistance for the CSCU campuses	Associate Director Project Management & Engineering and Director of Capital Projects

5.4.1 Plan & Program Capability

The following documents were either reviewed as a part of this mitigation planning process or identified as having relevance to implementation of mitigation activities for Southern’s campus (see **Table 5-5**).

Table 5-5: Southern Documents Utilized During Planning Process

Name of Plan	State, Regional, Local, Campus Plan/Program	Relevance to Hazard Mitigation Planning Effort
Annual Report of the President – 2013	Campus	Provide background information on Southern, including number of students, financial information, and recent building projects.
Achieving Climate Neutrality: Foundations for a Sustainable Future - 2009	Campus	Provides information about building square footage on campus and energy efficiency upgrades.
Emergency Preparedness Plan – 2007	Campus	Provides response actions for students, faculty, and staff for scenarios such as evacuation, fires, tornadoes, floods, and utility outages.
Student Handbook 2013 – 2014	Campus	Provides campus history information and other background information about Southern.
Southern Connecticut State University Self-Study Report – 2011	Campus	Provides information about the organization, governance, and financial resources at Southern.
Southern Connecticut State University Campus Master Plan – August 2006	Campus	Provides information about campus development projects.
City of New Haven Natural Hazard Mitigation Plan Update – June 2011	Local	Lists the types of natural hazards that could affect the City of New Haven, including historic instances, hazard assessment, vulnerabilities, and potential mitigation measures, strategies, and alternatives.
Connecticut Drought Preparedness and Response Plan – August 4, 2003	State	Provides guidance to assess and minimize the impacts of a drought on the State of Connecticut and describes drought stage criteria.
Connecticut Natural Hazards Mitigation Plan Update – 2014	State	Guidance for natural hazard mitigation planning in Connecticut, including natural hazard identification, risk assessment, and hazard mitigation strategies for the State of Connecticut.
Connecticut Guide to Emergency Preparedness – Spring 2013	State	Provides an overview of natural disasters that may occur in Connecticut.



5.4.2 Fiscal Capability

Southern’s fiscal year 2015 operating budget is approximately \$415 million. The operating budget is inclusive of total revenue, expenditures, and additional funds. Southern’s Controller’s Office is responsible for budget and financial planning, accounting services and management of fiscal policies at the campus. The main revenue sources for Southern come from 1) tuition and fees and 2) state appropriations. Other revenue sources typically include:

- Auxiliary Sales & Services
- Federal Grant Revenues
- Private & Local Grant Revenues
- Other Sources of Revenue

As of 2015, Southern’s endowment is \$13.3 million. In 2013, the Werth Family Foundation donated a \$3 million gift to Southern. The contribution will be paid over ten years and includes a \$1.5 million endowment for the Center for Coastal and Marine Studies, \$750,000 for equipment and stipends for Southern’s Center for Coastal and Marine Studies, and two initiatives combining science education and real-world experience through internships, seminars, and research opportunities.

5.4.3 Regulatory Environment

Additional legal and regulatory policies are in place that may pertain to Southern and could have an impact on the implementation of mitigation activities. These policies are listed in **Table 5-6**.

Table 5-6: Legal and Regulatory Policies Pertaining to Southern

Regulation/Policy	Purpose
Transform CSCU 2020 – Public Act 14-48	Initiative to unite the 17 CSCU institutions as one interdependent system, including development of a system-wide academic and facilities master plan for CSCU and address deferred maintenance
Connecticut General Statute 10-321(b)(2) – Connecticut Environmental Policy Act	This act requires the State Historical Preservation Office to determine if an undertaking on a state-listed historic place may have an effect on cultural resources.
Connecticut House Bill 7432	Certain building projects with a projected cost of at least \$5 million and building renovation projects with a projected cost of at least \$2 million must achieve LEED silver rating unless the Institute for Sustainable Energy provides a written analysis that the cost of compliance outweighs the benefits
Connecticut Environmental Policy Act (CEPA), Connecticut General Statutes (CGS) Section 22a-1 to 22a-1h	Construction in excess of 100,000 square feet of floor space and more than 200 parking spaces requires an Environmental Impact Evaluation
State Traffic Commission Certificate	Permit required for existing state traffic commission facilities with more than 50 parking spaces or more than 1 square foot of new construction

Regulation/Policy	Purpose
CGS Section 22a-174-3	Stationary source permits are required for equipment with a capacity greater than 5 million British thermal units (BTU) per hour, 1 million BTU/hour for residual oil or solid fuel, or 11 million BTU/hour for natural gas and/or with potential emissions of any individual air pollutant greater than 5 tons per year
Inland Wetlands and Watercourses Section 22a-39(h) and City of New Haven Inland Wetlands and Watercourses Regulations	Requires a permit for all regulated activities (including clearing, grubbing, filling, grading, paving, excavating, constructing, depositing, or removal of material and discharging of stormwater) occurring or proposed within wetlands, watercourses, and the associated upland review area. Portions of Southern’s campus are designated as inland wetlands

5.5 NEXT STEPS

By participating in the CSCU Multi-Campus Hazard Mitigation Planning effort, Southern is more informed and prepared to address natural hazards when and if they should occur. As a key part of this project, Southern engaged the campus and key stakeholders in order to improve their understanding of potential hazards and how mitigation actions can help reduce the risk or severity associated with these events. The mitigation activities, action plan, project prioritization, and capabilities assessment provided in **Section 5.1** through **5.4** offer a clear direction for the campus and a connection to the complete CSCU Multi-Campus Hazard Mitigation Plan.



APPENDIX A: BIBLIOGRAPHY OF DOCUMENTS PROVIDED BY SOUTHERN CONNECTICUT STATE UNIVERSITY



BIBLIOGRAPHY (Southern Connecticut State University)

- Board of Regents for Higher Education, Hartford, CT. *Meeting of the Finance & Infrastructure Committee*. October 7, 2014. Accessed October 19, 2015. <http://www.ct.edu/images/uploads/Finance-Agenda-12-09-2014.pdf?74800>
- City of New Haven, Connecticut, Department of Engineering. *City of New Haven Inland Wetlands and Watercourses Map*. September 28, 2004.
- City of New Haven, Connecticut, New Haven City Plan Department. *City of New Haven Natural Hazard Mitigation Plan Update*. Revised and adopted June 15, 2011.
- City of New Haven, Connecticut. *Community Profile*. Accessed 18 May 2015. <http://www.cityofnewhaven.com/humanresources/pdfs/Dep%20Dir%20TT&P%20MPE%20Brochure.pdf>
- Connecticut Department of Public Health. *Connecticut Guide to Emergency Preparedness -Spring 2013*. 2013. http://www.ct.gov/dph/lib/dph/communications/preparedness/emer_prep_guide.pdf
- Interagency Drought Work Group. *Connecticut Drought Preparedness and Response Plan*. Aug. 4, 2003. Accessed October 22, 2015. <http://www.drought.state.ct.us/drtwkpln.pdf>
- National Climatic Data Center, National Oceanic and Atmospheric Administration. *Storm Events Database*. Accessed October 19, 2015. <https://www.ncdc.noaa.gov/stormevents/>
- National Oceanic and Atmospheric Administration. *Climate Data for New Haven (Tweed Airport) (1981 – 2010)*. Accessed October 22, 2015. <http://www.ncdc.noaa.gov/cdo-web/>
- Perkins & Will. *Energy and Infrastructure* [pp. 59-62 excerpted from unnamed report, draft for review]. 2015
- Perkins & Will. *Energy and Infrastructure* [pp. 140-144 excerpted from unnamed report, draft for review]. 2015
- Southern Connecticut State University. *A Green and Growing Campus*. Accessed November 20, 2015. <https://www.southernct.edu/about/construction/>
- Southern Connecticut State University. *Achieving Climate Neutrality: Foundations for a Sustainable Future*. Dec. 18, 2009. http://reporting.secondnature.org/site_media/uploads/cap/391-cap.pdf
- Southern Connecticut State University. *2013 Annual Report of the President: A Year in Review*. 2013. <http://issuu.com/scsu/docs/annualreport2013>
- Southern Connecticut State University. *Emergency Preparedness - Evacuation Plan*. October 1, 2007.
- Southern Connecticut State University. *Emergency Preparedness Plan*. October 1, 2007.
- Southern Connecticut State University. *Fall 2014 Enrollment Information*. Accessed 20 May 2015. <http://www.southernct.edu/offices/management/currentenrollment.html>
- Southern Connecticut State University. *Historical View*. Accessed 20 May 2015. <http://www.southernct.edu/about/scsu-info/history.html>



- Southern Connecticut State University. *Part-Time Faculty Headcount & FTE by Year*. Accessed. 20 May 2015. http://ares.southernct.edu/departments/research/faculty_part_time_headcount_fte_fall.html
- Southern Connecticut State University. *Safety and Security*. Accessed 20 May 2015. <http://www.southernct.edu/student-life/safety/>
- Southern Connecticut State University. *Self-Study Report 2011*. September 1, 2011.
- Southern Connecticut State University. *Southern Earns Power of Change Award*. Accessed 20 May 2015. <http://www.southernct.edu/news/powerofchange.html>
- Southern Connecticut State University. *Southern Recognized at National Level for Excellence in Service*. Accessed May 18, 2015. <http://www.southernct.edu/news/service-honor-roll.html>
- Southern Connecticut State University. *Student Handbook 2015 -2016*.
- State of Connecticut, Department of Administrative Services, Division of Construction Services. *Additions & Renovations to Buley Library - Phase 2, Southern Connecticut State University* [RFQ Web advertisement]. September 21, 2011. Accessed September 11, 2015. http://www.biznet.ct.gov/scp_Documents/Bids/23377/Web_AD_for_Posting_9-21-11_BI-RS-225B-OR.pdf
- Symmes Maini & McKee Associates. *Southern Connecticut State University Campus Master Plan*. August 2006.
- U.S. Department of Homeland Security, Federal Emergency Management Agency. *Flood Insurance Rate Map, New Haven County, Connecticut, (All Jurisdictions)* [map]. Panel 429 of 635, Map Number 09009C0429J. Revised July 8, 2013.
- Zaretsky, Mark. *New Haven Register*. *Advocates in New Haven celebrate Pond Lily Dam removal project*. Nov. 7, 2013. Accessed August 5, 2015. <http://www.nhregister.com/general-news/20131107/advocates-in-new-haven-celebrate-pond-lily-dam-removal-project>



APPENDIX B: CAMPUS KICK-OFF MEETING MATERIALS

MEETING SIGN-IN SHEET -- SCSU HAZARD MITIGATION PLANNING CAMPUS KICK-OFF MEETING - Interviews

Project: ConnSCU -- Multi-Campus Hazard Mitigation Plan	Meeting Date: December 4, 2014
Facilitator: Woodard & Curran	Campus: Southern CT State University

Name	Campus	Department/Title	Phone	E-Mail
John Register	SCSU	Facilities	203 392-6053	registerj@SouthernCT.edu
Stanley Szluga	SCSU	FACILITIES	203- 392-6069	SZLUGAS1@SOUTHERNCT.EDU
R. J. T. Perrin				
A. Beckwith	BOY	FACILITIES		
Karen Misbach	SCSU	Facilities/EHS	203-392- 7073	misbachk1@southernct.edu
Joseph Donohy	SCSU	Southern PD	203 392 6334	donohy.j1@southernct.edu
Jim Blake	SCSU	Finance Admin	203 392-5456	blakej2@southernct.edu
Michelle Ritchie	SCSU	Facilities - Student Intern	860 967-9171	ritchiem2@owls.southernct.edu
Robert Damico	SCSU	Residence Life	203-392 -5686	damico.r@SouthernCT.edu
Mary House	Woodard & Curran	PM	508-424 4262	mhouse@woodardcurran.com

MEETING SIGN-IN SHEET – SCSU HAZARD MITIGATION PLANNING CAMPUS KICK-OFF MEETING - Interviews

Project: ConnSCU – Multi-Campus Hazard Mitigation Plan
Meeting Date: December 5, 2014
Facilitator: Woodward & Curran
Campus: Southern CT State University

Name	Campus	Department/Title	Phone	E-Mail
Paul Laecher	SCSU	Director of Facilities Planning	860-395 1917	laeche@scsu.edu
Laren Misbach	SCSU	Dir. of EIT+5		
STEVE BREZZE	SCSU	Dean of Arts	757-535-8746	BREZZE@SOUTHERNCT.SDU
Gerry Lesley	SCSU	Chair / Chemistry	203-392-6262	lesley@scsu.edu
Kimberly Crone	SCSU	AVP for Enrollment Mgt	203-392-9999	cronek1@southernct.edu
Susan Cusanto	SCSU	Sci Env Ed	203-392-6610	Cusanto@scsu.edu
RAY KELLOGG	SCSU	Dir. Telecom + Ops	203-392-6781	KELLOGG@SOUTHERNCT.EDU
Charmelle Chazy	SCSU	Residence Life	203-392-6070	qrcance1@southernct.edu
Mary House	Woodward Curran	PM	860-404-1107	Mhouse@woodwardcurran.com

Multi-Campus Hazard Mitigation Plan



Connecticut State Colleges & Universities (ConnSCU)
Campus Planning Committee Kick-Off Meeting
Fall, 2014



COMMITMENT & INTEGRITY DRIVE RESULTS

Introductions



MARY HOUSE
PROJECT MANAGER



MARYKRISTIN IVANOVICH
TECHNICAL LEAD



COMMITMENT & INTEGRITY DRIVE RESULTS

Meeting Agenda



- Project Overview
 - Background and Goals
 - Roles and Responsibilities
- Requirements of FEMA/DEMHS
 - Strategy, process, engagements
 - Documentation
- Multi-Hazard Mitigation Planning Process
 - Hazard identification and risk assessment
 - Mitigation strategy
- Project Implementation
 - Schedule and communications
 - Review process
- Open Discussion/Questions and Comments



Project Overview





Project Background

- The Disaster Mitigation Act was signed by the President in October 2000.
 - Incentive for states and local governments to undertake natural hazard mitigation planning.
 - Promotes sustainability as a strategy for disaster resistance.
 - Encourages state and local governments to work together, and facilitates cooperation between state and local authorities.
 - Results in faster allocation of funding and more effective risk reduction projects.
 - Colleges and Universities can plan in concert with similar planning efforts in their community.



COMMITMENT & INTEGRITY DRIVE RESULTS



Phases of Emergency Management



- **Mitigation** – long-term reduction of vulnerability
- **Preparedness** – plans and preparations to save lives and property and facilitate response operations
- **Response** – actions taken to provide emergency assistance, save lives and minimize property damage
- **Recovery** – actions taken to return to normal conditions.



COMMITMENT & INTEGRITY DRIVE RESULTS



Hazard Mitigation Overview

- Hazard mitigation is defined as “any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.”
- Hazard mitigation activities may be implemented prior to, during, or after an event; however, it is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs.
- Hazard mitigation is often focused on reducing repetitive loss, as many damaging events tend to occur in the same locations over time (e.g. flooding).



COMMITMENT & INTEGRITY DRIVE RESULTS



Benefits of Hazard Mitigation Planning



- Campuses benefit from Mitigation Planning by:
 - Identifying cost effective actions for risk reduction that are agreed upon by stakeholders
 - Focusing resources on the greatest risks and vulnerabilities
 - Building partnerships by involving the campus community, organizations, local government and businesses
 - Increasing education and awareness of hazards and risk
 - Communicating priorities to local, state and federal officials
 - Aligning risk reduction with other University objectives



COMMITMENT & INTEGRITY DRIVE RESULTS



Project Background



- ConnSCU received a grant of \$950K from DESPP/DEMHS to develop a multi-campus hazard mitigation plan
- Plan will help identify cost effective mitigation measures to reduce or eliminate long-term risk to life and property from hazards
- Allows the campuses to be eligible to receive non-emergency disaster assistance, including state and federal funding for mitigation and recovery projects
- **Projects must be pre-identified in the hazard mitigation plan to receive future funding**



COMMITMENT & INTEGRITY DRIVE RESULTS



Project Goals



- Fulfill Federal, State, Local and University Hazard Mitigation Planning Requirements
- Promote the Safety of Students, Faculty, Staff and Visitors
- Minimize Hazard Impacts to Physical Assets and Operations
- Reduce or Avoid Long-Term Vulnerabilities from Hazards
- University Eligibility for Future Funding



COMMITMENT & INTEGRITY DRIVE RESULTS

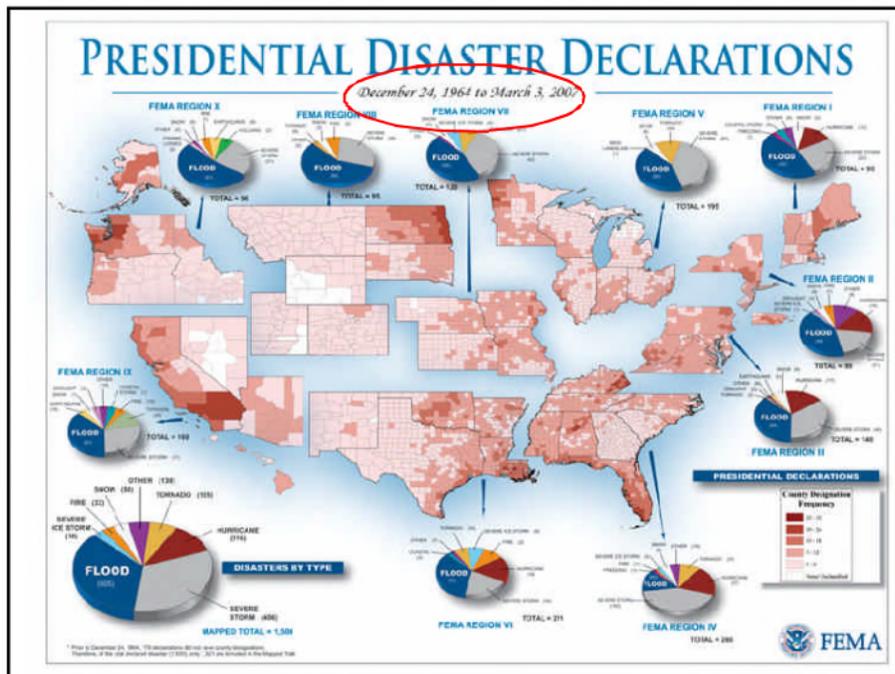
Examples of Types of Hazards

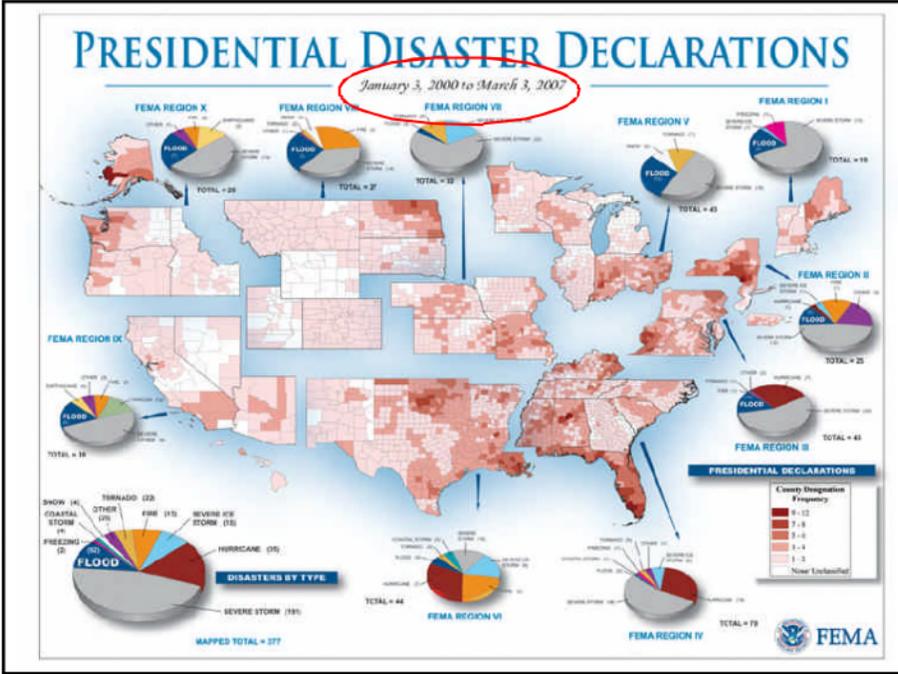


- Avalanche
- Earthquake
- High winds
- Hurricanes
- Tornadoes
- Urban Fire
- Floods
- Extreme Heat/Cold
- Drought
- Winter storm
- Ice storm
- Hailstorm
- Tsunami
- Thunder/Lightning



COMMITMENT & INTEGRITY DRIVE RESULTS





Recent State Disaster Declarations

Date	Disaster #	Description
2/8/13	DR-4106	Severe Winter Storm & Snowstorm
10/27/12	DR-4087	Hurricane Sandy
10/29/11	DR-4046	Severe Storm
8/27/11	DR-4023	Tropical Storm Irene
1/11/11	DR-1958	Snowstorm
3/12/10	DR-1904	Severe Storms & Flooding
4/15/07	DR-1700	Severe Storms & Flooding

WOODARD SCURRAN

COMMITMENT & INTEGRITY DRIVE RESULTS



FEMA Funding

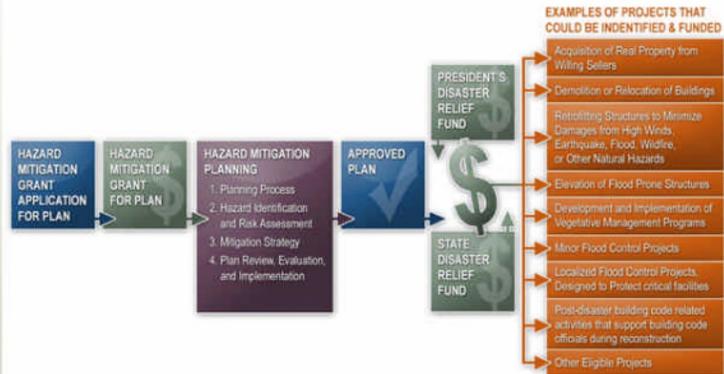
- Existing funding secured is for the hazard mitigation planning
- Funding is from FEMA but administered locally
- University of Massachusetts laid the groundwork for college & university systems in the northeast to access this funding
- ConnSCU is leading the way in Connecticut
- ConnSCU must contribute 25% match (elected to match via in-kind labor) and administer the grant
- Future Presidential Disaster Declarations will result in additional HMGP funding (most of which is allocated for mitigation projects)
- Many other funding programs are also available!!



COMMITMENT & INTEGRITY DRIVE RESULTS



FEMA Funding



COMMITMENT & INTEGRITY DRIVE RESULTS

Project Team

CONNECTICUT STATE COLLEGE OF UNIVERSITIES
Office of Research and Public Services

WOODARD & CURRAN

COMMITMENT & INTEGRITY DRIVE RESULTS



Roles and Responsibilities of Hazard Mitigation Planning Committee



- Participate in 3-6 meetings/workshops over the course of the two-year project
- Supply information associated with past hazard mitigation planning or related efforts
- Help identify applicable hazards and develop mitigation actions
- Support internal and external outreach activities
- Review and provide comments on the multi-hazard mitigation plan and campus specific appendix
- Support the implementation of the plan when an event occurs and be actively involved in continuous improvements



COMMITMENT & INTEGRITY DRIVE RESULTS



Hazard Mitigation Planning



COMMITMENT & INTEGRITY DRIVE RESULTS

Comprehensive Methodology



1. Planning Process

- Community engagement
- Building upon existing information

2. Hazard Identification and Risk Assessment

- Systematically identifying hazards through the use of GIS and other tools to assess/prioritize risk

3. Mitigation Strategy

- Reach across broad skill sets to identify hazard mitigation goals
- Draw upon broad campus experience to develop mitigation strategies

4. Plan Review, Evaluation, and Implementation

- Work collaboratively and proactively with regulators



COMMITMENT & INTEGRITY DRIVE RESULTS

Hazard Mitigation Planning Process



- The CSCU planning process will closely follow FEMA's recommended four-stage approach.
- Initial and ongoing community support is critical to the planning process.



COMMITMENT & INTEGRITY DRIVE RESULTS



Hazard Mitigation Planning Process

- **Phase 1** – Organize Resources – identifies the resources available and necessary to complete the process:
 - Assess community support
 - Build the planning team
 - Identify and organize interested members of the community (stakeholders – on and off campus)
 - Identify the necessary technical expertise
 - Establish a steering committee
 - Develop a mission statement
 - Hold a project kick-off meeting
 - Establish a meeting schedule and goals
 - Engage the public



COMMITMENT & INTEGRITY DRIVE RESULTS



Hazard Mitigation Planning Process

- **Phase 2** – Assess risks – identify the hazards that present risks to the campuses and the assets that are vulnerable to those hazards.
 - Gather historical information, review existing university plans/reports, communicate with local planning experts, DEMHS and FEMA.
 - Determine which hazards present the greatest risk to the campus community
 - Assess vulnerability
 - Create a base map to profile potential hazard events
 - Inventory campus assets
 - Show how hazard events could impact campus (physically and operationally)
 - Estimate losses



COMMITMENT & INTEGRITY DRIVE RESULTS



Hazard Identification





Natural Hazard	Frequency (25)	Duration (55)	Severity (25)	Intensity (0-5)	Probability P(2)(40%)	Consequence C (8%)	Total	Ranking L/M/K/S
Coastal Storm	3	3	3	3	300	300	300	H
Earthquake	1	2	4	4	233	400	317	H
Hurricane	2	2	4	4	207	400	335	H
Tornado	1	1	4	4	200	400	300	H
Flood	2	2	2	2	200	200	200	M
Onset	1	2	1	1	133	100	117	L
Winter Storm	3	2	2	2	233	200	217	M
Thunderstorm/Lightning	3	2	2	2	233	200	217	M
Hailstorm	1	2	3	2	107	300	233	M
Wildfire	1	3	2	2	200	200	200	M
Extreme Heat	2	2	1	1	107	100	133	L
Dam Failure	1	1	3	1	100	300	200	M
Windstorm	2	1	2	1	133	200	167	L
Ice Storm	2	2	3	2	200	300	250	M



Hazard Mitigation Planning Process



- **Phase 3** – Develop the mitigation plan – lays out in detail the proposed mitigation actions.
 - Establish priorities
 - Compare System mission with the results of the hazard identification and risk assessment
 - Develop hazard mitigation goals
 - Minimize interruption to campus operations and mission
 - Protect research
 - Determine appropriate mitigation actions
 - Prioritize mitigations actions
 - Prepare an implementation strategy



COMMITMENT & INTEGRITY DRIVE RESULTS





Hazard Mitigation Plan Contents

- Executive Summary
 - Purpose, Process, Major Recommendations
- Goals and Objectives
- Hazard Identification and Risk Assessment
 - Hazard Background, Asset Inventory, Loss Estimation
- Mitigation Strategy
 - Identification of Mitigation Actions, Prioritization of Actions and Methodology, Timeline
- Implementation and Plan Maintenance
 - Responsibilities, Integration with Other Plans, Schedule



COMMITMENT & INTEGRITY DRIVE RESULTS



Hazard Mitigation Planning Process

- **Phase 4** – Implement the plan and monitor progress
 - Formally adopt the Hazard Mitigation Plan
 - Implement mitigation measures
 - Monitor, evaluate and update the plan as needed
 - Continue to engage stakeholders from the campus and community



COMMITMENT & INTEGRITY DRIVE RESULTS



Requirements of DEMHS/FEMA



COMMITMENT & INTEGRITY DRIVE RESULTS



What is FEMA Interested In?

- **Focus on Mitigation Strategy** – Emphasize Actions and Implementation of the Hazard Mitigation Strategy
- **Review for Intent, as well as Compliance** – Does the Plan Meet the Intent of the law and regulation
- **Process is as important as the Plan Itself** – Planning Process to be Defined by the System
- **This is Your Plan** – Must be Reflective of your Campuses, Stakeholders and Community
- **Foster Relationships** – The relationships are as important as the Words in the Plan



COMMITMENT & INTEGRITY DRIVE RESULTS

Documentation is Critically Important



- ConnSCU Labor in Kind
- Meetings
 - Agenda
 - Attendees List
 - Meeting Minutes
- Campus Visits
 - Data Gathered and Data Sources
 - Interview Summaries
- Stakeholder Workshops
 - Agenda
 - Attendees List
 - Workshop Summaries



COMMITMENT & INTEGRITY DRIVE RESULTS

SECTION 1: REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed to identify the location of relevant or applicable Element/Sub-element and to determine if each requires the Required Revision/summary at the bottom of each FEMA to provide a clear explanation of the revisions that Required revisions must be explained for each plan sub-element should be referenced in each summary by volume, etc.), where applicable. Requirements for each Element detail in this Plan Review Guide in Section 2, Regulation 1.

1. REGULATION CHECKLIST
 Requirement (44 CFR 201.6 Local Mitigation Plan)

ELEMENT A. PLANNING PROCESS

A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 101.6(a)(1))

A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement 101.6(a)(2))

A3. Does the Plan document how the public was involved in the planning process during the planning stage? (Requirement 101.6(a)(3))

A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 101.6(a)(4))

A5. Is there discussion of how the community(ies) will continue joint participation in the plan-revision process? (Requirement 101.6(a)(5))

A6. Is there a description of the method and schedule for seeking of plan updates, monitoring, re-evaluating and updating the mitigation plan within a 5-year cycle? (Requirement 101.6(a)(6))

ELEMENT B. HAZARD IDENTIFICATION

1. REGULATION CHECKLIST
 Requirement (44 CFR 201.6 Local Mitigation Plan)

ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT

B1. Does the Plan include a description of the type, location, and extent of natural hazards that can affect each jurisdiction? (Requirement 101.6(b)(1))

B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement 101.6(b)(2))

B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement 101.6(b)(3))

B4. Does the Plan address VPP program structures within the jurisdiction that have been negatively impacted by hazard? (Requirement 101.6(b)(4))

ELEMENT C. MITIGATION STRATEGY

C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and feasibility to expand on and improve those existing policies and programs? (Requirement 101.6(c)(1))

C2. Does the Plan assess each jurisdiction's participation in the VPP and continued compliance with VPP requirements, as appropriate? (Requirement 101.6(c)(2))

C3. Does the Plan include goals to reduce/avoid long-term consequences to the identified hazard? (Requirement 101.6(c)(3))

C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and programs for each jurisdiction using consistent to reduce the effects of hazards, with emphasis on new and existing building and infrastructure? (Requirement 101.6(c)(4))

C5. Does the Plan estimate an action plan that identifies how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement 101.6(c)(5))

C6. Does the Plan describe a process to consult local governments and agencies the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or local government plans, when appropriate? (Requirement 101.6(c)(6))

ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION

1. REGULATION CHECKLIST
 Requirement (44 CFR 201.6 Local Mitigation Plan)

ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION

D1. Was the plan revised to reflect changes in development? (Requirement 101.6(d)(1))

D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement 101.6(d)(2))

D3. Was the plan revised to reflect changes in priorities? (Requirement 101.6(d)(3))

ELEMENT E. PLAN ADOPTION

E1. Does the plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement 101.6(e)(1))

E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documents formal plan adoption? (Requirement 101.6(e)(2))

ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS & NOT TO BE COMPLETED BY FEMA)

F1:

F2:

F3:

ELEMENT F. REQUIRED REVISIONS

R:

A-2

Local Mitigation Plan Review Tool

A-4

Local Mitigation Plan Review

A-4

Local Mitigation Plan Review

<http://www.fema.gov/media-library/assets/documents/23194>

COMMITMENT & INTEGRITY DRIVE RESULTS



Project Implementation



COMMITMENT & INTEGRITY DRIVE RESULTS



Timeline

- Project Planning/Data Gathering – Spring/Fall 2014
- Campus Kick-Off Meetings – September/October 2014
- Hazard Identification and Risk Assessment – January 2015
- 1st Public Meeting – January/February 2015
- Mitigation Projects Workshop – April 2015
- Present Draft Plan to ConnSCU & 2nd Public Meeting – Fall 2015
- Review and Finalize Plan – Nov/Dec 2015
- Submit Draft to State/FEMA – January 2016
- Obtain Approval and Complete Final Presentations – Jan. 2017



COMMITMENT & INTEGRITY DRIVE RESULTS



Plan Review Process

- Initial review by Steering Committee
- Distribution of initial draft to Campus Hazard Mitigation Planning Committee for review and comment
 - Steering Committee representative to coordinate electronic comments
 - Look at Schedule – facilitated review meeting
- Distribution of second draft to Campus Hazard Mitigation Planning Committee for review and comment
 - Steering Committee representative to coordinate electronic comments
- Final review and approval by Steering Committee
- Submit draft to DEHMS



COMMITMENT & INTEGRITY DRIVE RESULTS



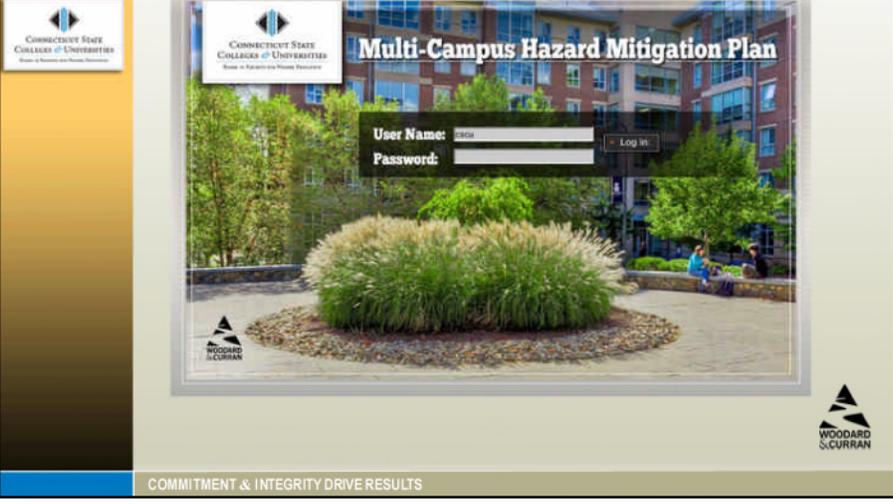
Project Web Site

- Secure, for Campus Teams and Steering Committee Only
- Will Provide:
 - Campus Teams and Contact Information
 - Background Information
 - Meeting Materials
 - Quarterly Reports
- <https://eis.woodardcurran.com/CSCUHMP/>
 - Username: cscu
 - Password: mitigation2014

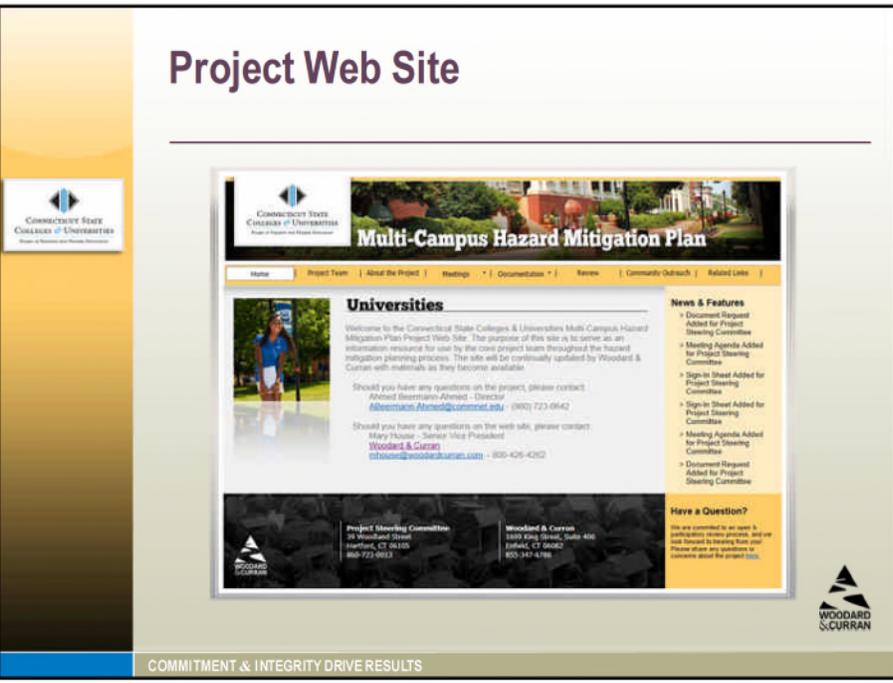


COMMITMENT & INTEGRITY DRIVE RESULTS

Project Web Site



Project Web Site



Questions?



COMMITMENT & INTEGRITY DRIVE RESULTS



APPENDIX C: INTERVIEW QUESTIONNAIRE

CONNSCU MULTI-CAMPUS HAZARD MITIGATION PLAN



ON-CAMPUS INTERVIEW QUESTIONS

- 1) What are the natural hazards that occur/impact this campus? Have there been any resulting damages from these hazard events?
- 2) Do you know the frequency and magnitude of past and possible future hazard events?
- 3) What is your level of concern regarding how susceptible this ConnSCU Campus is to a natural hazard?

No Concern Somewhat Concerned Very Concerned

Why, or why not?

- 4) What hazard do you think are of the highest threats to this ConnSCU Campus? Please circle the most serious threat and just check the other hazards that you think have potential.
 - Coastal Storm
 - Coastal Erosion
 - Hurricane
 - Tornado
 - Flood
 - Drought
 - Winter Storm
 - Thunderstorm/Lightning
 - Hailstorm
 - Urban or Wildfire
 - Tsunami
 - Extreme Heat
 - Windstorm
- 5) In your experience, has hazard mitigation been a part of any discussions at this ConnSCU campus during Master Planning or Strategic Planning?
- 6) Has any work been done to make this ConnSCU Campus more resistant to natural hazards?
- 7) What do you think this ConnSCU campus could do to minimize its level of vulnerability to a natural hazard?
- 8) Are some parts of the campus (buildings, utilities, operations, research, people) particularly vulnerable to damages, or is the entire campus?



- 9) What buildings on campus, in your opinion, are the most critical to protecting the safety of the public and to the continuity of a high functioning campus (where is emergency management, fire/safety, medical facilities, information storage, utilities)?
- 10) Could the campus be closed down for a significant period of time because of possible disaster losses?
- 11) Do you have any other "owned" satellite buildings that are not a part of your campus?
- 12) Do you have any GIS data available?

MITIGATION ACTIVITIES

- 13) Please identify any mitigation actions that could be completed to reduce the impacts from natural hazard events.

Mitigation activities can generally be grouped into several categories including:

- **Public Education and Awareness** (information campaigns about how people can prepare and protect themselves during a natural disaster)
- **Emergency Services** (actions that protect people like emergency alerts, evacuation planning, etc.)
- **Structural Projects** (upgrades that lessen the impact of a hazard such as dams, seawalls, storm sewers, etc.)
- **Natural Resource Protection** (preserve and restore natural habitat areas so that they can function in their natural state during a natural hazard)
- **Protection of Property** (modifying a building/property to protect it from a natural hazard)



APPENDIX D: PUBLIC MEETING NO. 1 MEETING MATERIALS

MEETING SIGN-IN SHEET -- MULTI-CAMPUS HAZARD MITIGATION PLAN-PUBLIC MEETING-NO. 1

Project: ConnSCU - Multi-Campus Hazard Mitigation Plan

Meeting Date: February 24, 2015

Facilitator: Woodard & Curran

Campus: SCSU

Name	Address	Phone	Email	Group Represented (Self or Organization's Name)
Karen Misbach	SCSU	203-392-7073	misbachakie@southernct.edu	SCSU
RJ Sheehey	SCSU	203 392-6060	sheeheyr@southernct.edu	SCSU
Joseph Daubny	SCSU	203 392-6334	daubnyj@southernct.edu	SCSU
Phil Perrina	SCSU P.D	203 392-6324	CPerrina@scsu.edu	SCSU
Thomas Pace	SCSU	203 392-8969	DoreTTI	SCSU

Multi-Campus Hazard Mitigation Plan



Connecticut State Colleges & Universities (ConnSCU)
First Public Meeting
February 2015



COMMITMENT & INTEGRITY DRIVE RESULTS

Meeting Agenda



- Project Background
 - Natural Hazards
 - Project Goals
- Multi-Hazard Mitigation Planning Process
 - Hazard Identification and Risk Assessment
 - Mitigation Strategy
- Regional Hazards
 - State and Local Hazard Mitigation Plans
 - Susceptible Areas
- Open Discussion/Questions and Comments



COMMITMENT & INTEGRITY DRIVE RESULTS



Examples of Types of Hazards

- Avalanche
- Earthquake
- High winds
- Hurricanes
- Tornadoes
- Urban Fire
- Floods
- Extreme Heat/Cold
- Drought
- Winter storm
- Ice storm
- Hailstorm
- Tsunami
- Thunder/Lightning



COMMITMENT & INTEGRITY DRIVE RESULTS



Public Engagement

- Why are We Having this Workshop?
 - Public Engagement of both on and off campus stakeholders is a critical component of hazard mitigation planning
- What do We Want from You?
 - Your questions, thoughts, ideas, suggestions on how to make this the best possible plan to:
 - (1) assist the University in identifying and reducing its risk from natural and human-caused hazards; and
 - (2) identify actions that can be taken to prevent damage to property and loss of life



COMMITMENT & INTEGRITY DRIVE RESULTS



Project Background

- The Disaster Mitigation Act was signed by the President in October 2000.
 - Incentive for states and local governments to undertake natural hazard mitigation planning.
 - Promotes sustainability as a strategy for disaster resistance.
 - Encourages state and local governments to work together, and facilitates cooperation between state and local authorities.
 - Results in faster allocation of funding and more effective risk reduction projects.
 - Colleges and Universities can plan in concert with similar planning efforts in their community.



COMMITMENT & INTEGRITY DRIVE RESULTS



Project Background



- ConnSCU received a grant of \$950K from DESPP/DEMHS to develop a multi-campus hazard mitigation plan
- Plan will help identify cost effective mitigation measures to reduce or eliminate long-term risk to life and property from hazards
- Allows the campuses to be eligible to receive non-emergency disaster assistance, including state and federal funding for mitigation and recovery projects
- **Projects must be pre-identified in the hazard mitigation plan to receive future funding**



COMMITMENT & INTEGRITY DRIVE RESULTS



Benefits of Hazard Mitigation Planning



- Campuses benefit from Mitigation Planning by:
 - Identifying cost effective actions for risk reduction that are agreed upon by stakeholders
 - Focusing resources on the greatest risks and vulnerabilities
 - Building partnerships by involving the campus community, organizations, local government and businesses
 - Increasing education and awareness of hazards and risk
 - Communicating priorities to local, state and federal officials
 - Aligning risk reduction with other University objectives



COMMITMENT & INTEGRITY DRIVE RESULTS



Project Goals



- Fulfill Federal, State, Local and University Hazard Mitigation Planning Requirements
- Promote the Safety of Students, Faculty, Staff and Visitors
- Minimize Hazard Impacts to Physical Assets and Operations
- Reduce or Avoid Long-Term Vulnerabilities from Hazards
- University Eligibility for Future Funding



COMMITMENT & INTEGRITY DRIVE RESULTS



Hazard Mitigation Overview

- Hazard mitigation is defined as “any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.”
- Hazard mitigation activities may be implemented prior to, during, or after an event; however, it is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs.
- Hazard mitigation is often focused on reducing repetitive loss, as many damaging events tend to occur in the same locations over time (e.g. flooding).



COMMITMENT & INTEGRITY DRIVE RESULTS



Hazard Mitigation Planning Process



- The ConnSCU planning process will closely follow FEMA’s recommended four-stage approach.
- Initial and ongoing community support is critical to the planning process.



COMMITMENT & INTEGRITY DRIVE RESULTS



Comprehensive Methodology

- 1. Planning Process**
 - Community engagement
 - Building upon existing information
- 2. Hazard Identification and Risk Assessment**
 - Systematically identifying hazards through the use of GIS and other tools to assess/prioritize risk
- 3. Mitigation Strategy**
 - Reach across broad skill sets to identify hazard mitigation goals
 - Draw upon broad campus experience to develop mitigation strategies
- 4. Plan Review, Evaluation, and Implementation**
 - Work collaboratively and proactively with regulators



COMMITMENT & INTEGRITY DRIVE RESULTS



Hazard Mitigation Planning Process

- **Phase 1 – Organize Resources** – identifies the resources available and necessary to complete the process:
 - Assess community support
 - Build the planning team
 - Identify and organize interested members of the community (stakeholders – on and off campus)
 - Identify the necessary technical expertise
 - Establish a steering committee
 - Develop a mission statement
 - Hold a project kick-off meeting
 - Establish a meeting schedule and goals
 - Engage the public



COMMITMENT & INTEGRITY DRIVE RESULTS



Hazard Mitigation Planning Process

- **Phase 3** – Develop the mitigation plan – lays out in detail the proposed mitigation actions.
 - Establish priorities
 - Compare System mission with the results of the hazard identification and risk assessment
 - Develop hazard mitigation goals
 - Minimize interruption to campus operations and mission
 - Protect research
 - Determine appropriate mitigation actions
 - Prioritize mitigations actions
 - Prepare an implementation strategy



COMMITMENT & INTEGRITY DRIVE RESULTS



Hazard Mitigation Plan Contents

- Executive Summary
 - Purpose, Process, Major Recommendations
- Goals and Objectives
- Hazard Identification and Risk Assessment
 - Hazard Background, Asset Inventory, Loss Estimation
- Mitigation Strategy
 - Identification of Mitigation Actions, Prioritization of Actions and Methodology, Timeline
- Implementation and Plan Maintenance
 - Responsibilities, Integration with Other Plans, Schedule



COMMITMENT & INTEGRITY DRIVE RESULTS

Hazard Mitigation Planning Process



- **Phase 4** – Implement the plan and monitor progress
 - Formally adopt the Hazard Mitigation Plan
 - Implement mitigation measures
 - Monitor, evaluate and update the plan as needed
 - Continue to engage stakeholders from the campus and community



COMMITMENT & INTEGRITY DRIVE RESULTS

Recent State Disaster Declarations



Date	Disaster #	Description
2/8/13	DR-4106	Severe Winter Storm & Snowstorm
10/27/12	DR-4087	Hurricane Sandy
10/29/11	DR-4046	Severe Storm
8/27/11	DR-4023	Tropical Storm Irene
1/11/11	DR-1958	Snowstorm
3/12/10	DR-1904	Severe Storms & Flooding
4/15/07	DR-1700	Severe Storms & Flooding



COMMITMENT & INTEGRITY DRIVE RESULTS

Thunderstorm Hazard Ranking – State Plan



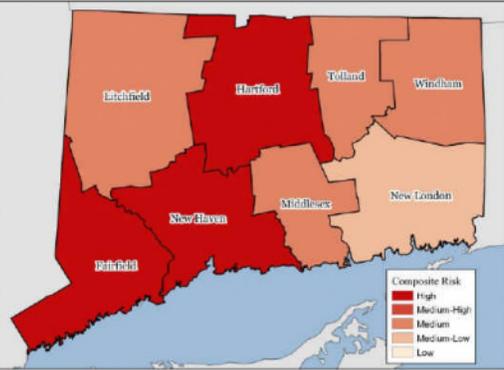
Connecticut State Natural Hazard Mitigation Plan 2013 Update

Thunderstorm Hazard Ranking and Risk Parameters

Description
A number of factors have been considered in this risk assessment to be able to compare between counties and hazards. The factors have been added together to create the overall composite risk for each hazard impacting the State of Connecticut. Several factors were weighted based on input from the steering committee members. The hazard mitigation report explains each of the factors in detail.

Factors and Weighting include:

- Population Density (0.5)
- Population Projections to 2025 (0.5)
- Building Permits Issued (0.5)
- Annualized Damage (1.0)
- Annualized Events (1.0)
- Injuries and Deaths (1.0)



COMMITMENT & INTEGRITY DRIVE RESULTS

Hurricanes/Tropical Cyclones Ranking – State Plan



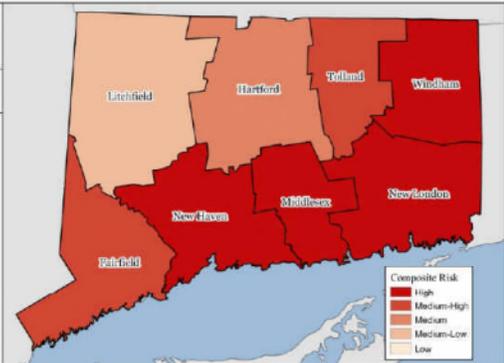
Connecticut State Natural Hazard Mitigation Plan 2013 Update

Tropical Cyclone Hazard Ranking and Risk Parameters

Description
A number of factors have been considered in this risk assessment to be able to compare between counties and hazards. The factors have been added together to create the overall composite risk for each hazard impacting the State of Connecticut. Several factors were weighted based on input from the steering committee members. The hazard mitigation report explains each of the factors in detail.

Factors and Weighting include:

- Population Density (0.5)
- Population Projections to 2025 (0.5)
- Building Permits Issued (0.5)
- Annualized Damage (1.0)
- Annualized Events (1.0)
- Injuries and Deaths (1.0)



COMMITMENT & INTEGRITY DRIVE RESULTS

Tornado Hazard Ranking – State Plan



Connecticut State Natural Hazard Mitigation Plan 2013 Update

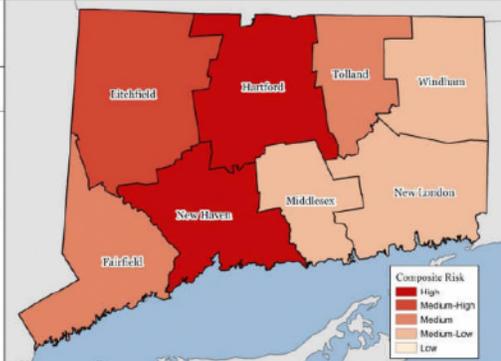
Tornado Hazard Ranking and Risk Parameters

Description

A number of factors have been considered in this risk assessment to be able to compare between counties and hazards. The factors have been added together to create the overall composite risk for each hazard impacting the State of Connecticut. Several factors were weighted based on input from the steering committee members. The hazard mitigation report explains each of the factors in detail.

Factors and Weighting Include:

- Population Density (0.5)
- Population Projections to 2025 (0.5)
- Building Types Based (0.5)
- Annualized Damage (1.0)
- Annualized Events (1.0)
- Injuries and Deaths (1.0)



COMMITMENT & INTEGRITY DRIVE RESULTS

Winter Storm Historical Maximum Snow Depth



Connecticut State Natural Hazard Mitigation Plan 2013 Update

Winter Storm Maximum Snow Depth

Legend

- Snow Depth in Inches
- 30.0 - Normal
- 37.5
- 45.0 - Shallow

— State Boundaries

□ County Boundaries

Description

Historical maximum daily snow depth. Derived from National Climate Data Center Snow Climatology.

Data Sources

Historical Snow Depth (1950-2012) County by County. Source: National Climate Data Center, Snow Climatology (2012).

Prepared by

Connecticut State Plan 1001



WOODARD SCURRAN: The analysis of the data shown in this map is based on the best available data and is not intended to be a substitute for professional engineering or other services.

Scale: 1 inch = 50 miles

North Arrow

Long Island Sound

Map showing historical maximum snow depth by county in Connecticut. The map uses a color scale from blue (30.0 inches) to red (45.0 inches).



COMMITMENT & INTEGRITY DRIVE RESULTS

Winter Storm Hazard Ranking – State Plan



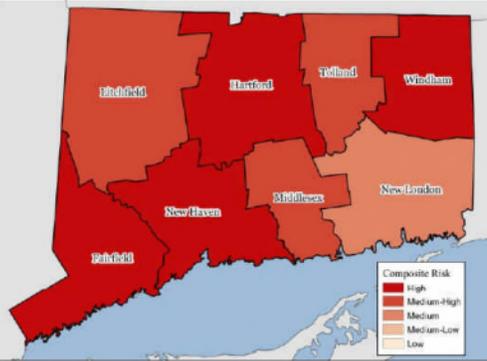
Connecticut State Natural Hazard Mitigation Plan 2013 Update

Winter Storm Hazard Ranking and Risk Parameters

Description
A number of factors have been considered in this risk assessment to be able to compare between counties and hazards. The factors have been added together to create the overall composite risk for each hazard impacting the State of Connecticut. Several factors were weighted based on input from the steering committee members. The hazard mitigation report explains each of the factors in detail.

Factors and Weighting include:

- Population Density (0.5)
- Population Projections to 2025 (0.5)
- Building Permits Issued (0.5)
- Annualized Damage (1.0)
- Annualized Events (1.0)
- Injuries and Deaths (1.0)



COMMITMENT & INTEGRITY DRIVE RESULTS

Flood Hazard Ranking – State Plan



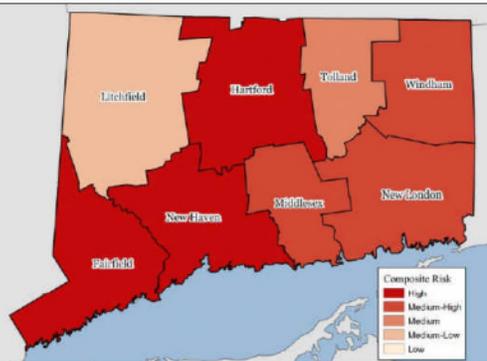
Connecticut State Natural Hazard Mitigation Plan 2013 Update

Flood Hazard Ranking and Risk Parameters

Description
A number of factors have been considered in this risk assessment to be able to compare between counties and hazards. The factors have been added together to create the overall composite risk for each hazard impacting the State of Connecticut. Several factors were weighted based on input from the steering committee members. The hazard mitigation report explains each of the factors in detail.

Factors and Weighting include:

- Population Density (0.5)
- Population Projections to 2025 (0.5)
- Building Permits Issued (0.5)
- Annualized Damage (1.0)
- Annualized Events (1.0)
- Injuries and Deaths (1.0)



COMMITMENT & INTEGRITY DRIVE RESULTS

Wildfire Hazard Ranking – State Plan



Connecticut State Natural Hazard Mitigation Plan 2013 Update

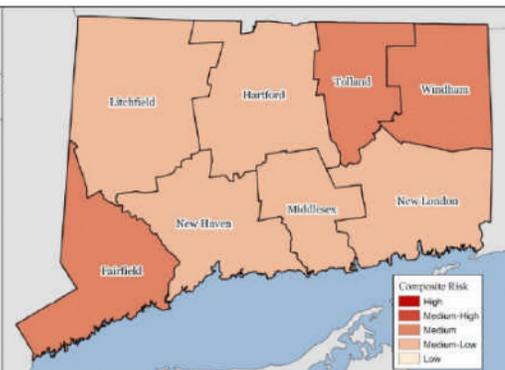
Wildland Fire Hazard Ranking and Risk Parameters

Description

A number of factors have been considered in this risk assessment to be able to compare between counties and hazards. The factors have been added together to create the overall composite risk for each hazard impacting the State of Connecticut. Several factors were weighted based on input from the steering committee members. This hazard mitigation report explains each of the factors in detail.

Factors and Weighting Include:

- Population Density (0.5)
- Population Projections to 2025 (0.5)
- Building Permits Issued (0.5)
- Annualized Damage (1.0)
- Annualized Events (1.0)
- Injuries and Deaths (1.0)



COMMITMENT & INTEGRITY DRIVE RESULTS

Next Steps.....



- Continue plan development
- Discuss hazard identification and rankings
- Complete loss estimate calculations
- Develop goals, objectives and mitigation projects
- Have a draft plan available for public review and comment in late 2015
- Submit draft plan in early 2016

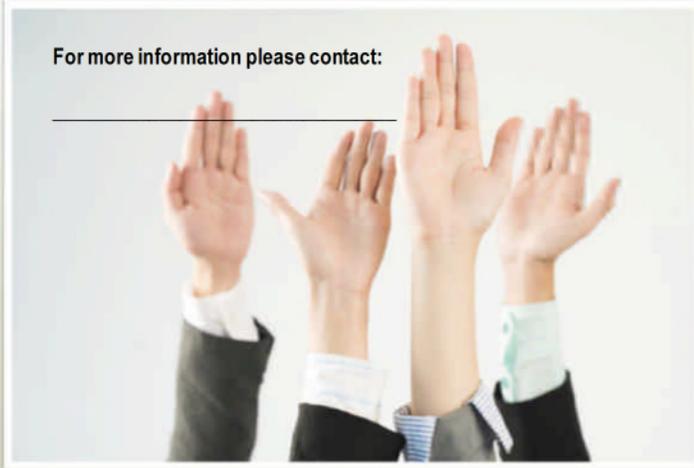


COMMITMENT & INTEGRITY DRIVE RESULTS

Questions?



For more information please contact:



COMMITMENT & INTEGRITY DRIVE RESULTS



APPENDIX E: HAZARD IDENTIFICATION AND RISK ASSESSMENT MEETING MATERIALS



MULTI-CAMPUS HAZARD MITIGATION PLAN
HAZARD IDENTIFICATION MEETING AGENDA
CONNECTICUT STATE COLLEGES & UNIVERSITIES (CSCU)
FEBRUARY 2015

- I. Project Overview
 - a. Examples of Hazard Events
 - b. Hazard Event Background Information
- II. Hazard Ranking
 - a. Hazard Ranking Scale and Criteria
 - b. Hazard Ranking Workshop (see handout of draft ranked hazards)
- III. Next Steps
 - a. Public Meeting
 - b. Loss Estimate Calculations
- IV. Open Discussion/Questions and Comments



APPENDIX F: LOSS ESTIMATES AND HAZARD MITIGATION PROJECTS MEETING MATERIALS



AGENDA

LOSS ESTIMATE CALCULATIONS AND HAZARD MITIGATION PROJECT IDENTIFICATION MEETING

CONNECTICUT STATE COLLEGES & UNIVERSITIES (CSCU)
MULTI-CAMPUS HAZARD MITIGATION PLAN

SOUTHERN CONNECTICUT STATE UNIVERSITY
JUNE 17, 2015

- I. Revisit Project Goals
- II. Multi-Hazard Mitigation Planning
 - a. Asset Criticality Ranking
 - b. Asset Loss Estimates – Loss of Function
 - c. Vulnerability Assessment Ranking
 - d. Hazard Mitigation Project Identification
- III. Next Steps
- IV. Open Discussion / Questions and Comments

MEETING SIGN-IN SHEET – CSCU HAZARD MITIGATION PLANNING MEETING

Project: CSCU – Multi-Campus Mitigation Plan **Meeting Date:** June 17, 2015
Facilitator: Woodard & Curran **Campus:** Southern CT State University

Name	Department/Title	Title	Phone	E-Mail
CHRIS DUPUIS	BUR - FACILITIES	DIR. OF CAPITAL PROJECTS	860-723-0315	DUPUIS@CT.EDU
John Ruggiero	SCSU - Facilities		203 392 7073	
Karen Misbach	SCSU - facilities	DR ETHS	203 392 7073	
R.G. Stealey	SCSU	Assoc. Vice Pres.	203 392-6080	

Multi-Campus Hazard Mitigation Plan



Connecticut State Colleges & Universities (ConnSCU)
Third Campus Meeting
June/July, 2015



COMMITMENT & INTEGRITY DRIVE RESULTS

Meeting Agenda

- Revisit Project Goals
- Multi-Hazard Mitigation Planning
 - Asset Criticality Ranking
 - Asset Loss Estimates- Loss of Function
 - Vulnerability Assessment Ranking
 - Hazard Mitigation Project Identification
- Next steps
- Open Discussion/Questions and Comments



COMMITMENT & INTEGRITY DRIVE RESULTS



Project Goals

Goal	Explanation
Goal 1	Protect existing and future assets from known hazards by implementing mitigation projects to minimize potential losses.
Goal 2	Maintain a continuity of campus business operations during and after a hazard event.
Goal 3	Create and maintain a safe, secure environment for the campus population before, during and after a hazard event.
Goal 4	Communicate natural hazard information to the campus community and improve education and outreach efforts regarding their potential impact.
Goal 5	Proactively protect existing and future campus assets from known hazards by incorporating mitigation activities into capital improvement and infrastructure planning.



Asset Criticality Ranking

Buildings are ranked based on the critical functions they serve:

Criticality Ranking	Ranking Criteria
Level 5	Buildings critical to campus operations and likely to shelter students/faculty: <ul style="list-style-type: none"> • Dining Area/Food Service • Dormitories • Laboratories and animal research facilities • Critical Infrastructure (including IT)
Level 4	Buildings that are less critical but serve a support function: <ul style="list-style-type: none"> • Records/document locations • Archives • Non-critical but important infrastructure
Level 3	Buildings that are administrative, academic or multi-use.
Level 2	Buildings used for recreational purposes such as Campus Centers.
Level 1	Buildings that are non-essential such as maintenance buildings, storage sheds, etc.



Asset Loss Estimates- Loss of Function



- Calculate Loss of function per hazard based on:
 - GSF
 - Assigned Building Criticality Value
 - Factored square footage
 - Building/total campus square footage
 - Per day loss of function cost
 - Estimated hazard specific loss of function days

Existing Buildings	Date Construction Completed	Gross Square Feet	Building Criticality Value	Factored Square Footage	Building/Total Campus Square Footage	Per Day Loss of Function Cost	Estimated Hazard Specific Loss of Function Days	Loss of Function Cost Per Hazard
Student Center	1984	155,582	3	466,746	1.62	\$155,545	7	\$1,088,817
Dining Hall	2002	132,600	5	663,000	2.30	\$220,948	7	\$1,546,635

COMMITMENT & INTEGRITY DRIVE RESULTS

Vulnerability Assessment



To assess vulnerability, **Total Damage** is needed.

Total Damage is determined based on:

- List of existing buildings
- Insurable replacement value
- Insurable contents value
- Loss of function

Vulnerability Ranking of Low, Medium or High is given based on Total Damage dollar value.

Existing Buildings	Insurable Replacement Value	Insurable Contents Value	Loss of Function Per Hazard	Total Damage	Building Vulnerability Ranking
Student Center	\$32,000,000	\$48,000,000	\$1,088,817	\$81,088,817	Medium
Dining Hall	\$56,000,000	\$84,000,000	\$1,546,635	\$141,546,635	High

COMMITMENT & INTEGRITY DRIVE RESULTS

Hazard Mitigation Project Identification



- *Projects must be pre-identified in the hazard mitigation plan to receive future funding*



COMMITMENT & INTEGRITY DRIVE RESULTS

Next Steps...



- Prioritize hazards (use STAPLEE Criteria)
- Identify responsible party for each project
- Identify funding sources
- Determine order of magnitude cost

Further out...

- Second Public Meeting



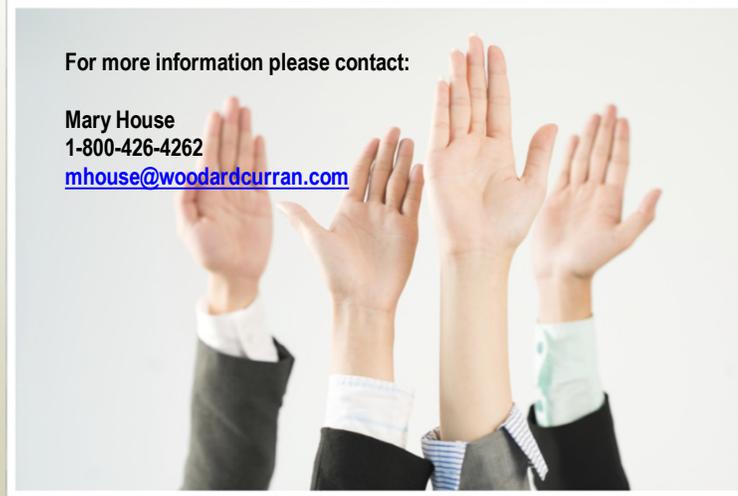
COMMITMENT & INTEGRITY DRIVE RESULTS

Questions?



For more information please contact:

Mary House
1-800-426-4262
mhouse@woodardcurran.com



WOODARD
& CURRAN

COMMITMENT & INTEGRITY DRIVE RESULTS



APPENDIX G: DRAFT HAZARD MITIGATION PLAN FACILITATED REVIEW MEETING MATERIALS

MULTI-CAMPUS HAZARD MITIGATION PLAN
STEERING COMMITTEE MEETING AGENDA
CONNECTICUT STATE COLLEGES & UNIVERSITIES (CSCU)
System Office, 61 Woodland Street, Hartford or via Conference Call

NOVEMBER 10, 2015 10:00 AM – 11:00 AM



Meeting Agenda:

- I. Overview of Project Schedule
- II. Facilitated Review of Draft Multi-Campus Hazard Mitigation Plan
 - a. Multi-Campus Hazard Mitigation Plan Overview (methodology, stakeholder engagement)
 - b. Campus Specific Chapters (relationship to overview, specific areas of focus)
- III. Review Schedule Plan
- IV. Public Meeting Review
- V. Open Discussion/Questions and Comments

SIGN-IN SHEET – CSCU STEERING COMMITTEE MEETING

Project:	CSCU – Hazard Mitigation Plan	Meeting Date:	November 10, 2015, 10am – 11am
Facilitator:	Woodard & Curran	Campus:	System Office

Name (attended by phone)	Campus	Department/Title	Phone	E-Mail
Shirley Tyler	Asnuntuck	Secretary, Maintenance	860-253-3155	styler@asnuntuck.edu
Dom Forcella,	Central	Director of Environmental Health & Safety	860-832-2499	ForcellaD@ccsu.edu
Rob Gagne	Central	Plant Facilities Management Engineer 2	860-832-2313	Gagne@ccsu.edu
Sal Cintonino	Central	Assistant Chief Administrative Officer/Director Administrative Affairs	860-832-1889	Cintonino@ccsu.edu
Cliff Williams	Charter Oak	Chief Financial and Administrative Officer	860-515-3760	cwilliams@charteroak.edu
Jim Fielding	Eastern	Coordinator of University Construction	860-465-0239	fieldingj@easternct.edu
Brian Higney	Gateway	Facilities Services Coordinator	203-285-2246	bhigney@gatewayct.edu
Cary Broderick	Gateway	Campus Police Officer	203-285-2246	cbroderick@gatewayct.edu
Richard Hennessey	Housatonic	Director, Facilities	203-332-5079	RHennessey@hcc.comnet.edu
Chris Gough	Housatonic	Director, Department of Public Safety	203-332-5024	CGough@hcc.comnet.edu
Ann Cross	Housatonic	Lab Coordinator	203-332-5198	across@hcc.comnet.edu
Tony Pappantoniou	Housatonic	Professor of Science	203-332-5146	APappantoniou@hcc.comnet.edu
Mike Davis	Manchester	Lieutenant, Manchester Police Department	860-512-3682	

SIGN-IN SHEET – CSCU STEERING COMMITTEE MEETING

Project: CSCU – Hazard Mitigation Plan	Meeting Date: November 10, 2015, 10am – 11am
Facilitator: Woodard & Curran	Campus: System Office

Name (attended by phone)	Campus	Department/Title	Phone	E-Mail
Kristin Mesick	Manchester	Manchester PD/Dispatch/ Clery Compliance Officer	860-512-3000	
Mike Lopez	Middlesex	Visiting Dean of Administration		MLopez@trcc.comnet.edu
Rose Ellis	Norwalk	Dean of Administration	203-857-7202	REllis@ncc.comnet.edu
Martin Charette	Quinebaug	Maintenance Department, Building Maintenance Supervisor	860-932-4157	mcharette@qvcc.edu
Bob Sheeley	Southern	Associate V.P for Capital Budgeting & Facilities Operations		sheeleyr1@southernct.edu
Arnie DeLaRose	Three Rivers	Director, Facilities	860-215-9236	adelarosa@threerivers.edu

Multi-Campus Hazard Mitigation Plan



Connecticut State Colleges & Universities (CSCU)
Facilitated Multi-Campus Hazard Mitigation Plan Review
November 10, 2015



COMMITMENT & INTEGRITY DRIVE RESULTS

Agenda



- Project Schedules
- Multi-Campus Hazard Mitigation Plan Overview
- Review of Each Chapter Section
- Advertisement Requirements
- Next steps
- Open Discussion/Questions and Comments



COMMITMENT & INTEGRITY DRIVE RESULTS

Schedule for Review – Chapters Distributed



Plan Section	Date Sent to Campuses	Date Comments Due
Multi-Campus Hazard Mitigation Plan Overview	10/14	10/30/15
Asnuntuck Community College	10/20	11/3/15
Capital Community College	10/26	11/20/15
Gateway Community College	10/29	11/20/15
Housatonic Community College	11/6/15	11/20/15
Manchester Community College	11/9/15	11/23/15
Middlesex Community College	11/16/15	11/30/15

Reminder: Comments are due two weeks after plans are received



COMMITMENT & INTEGRITY DRIVE RESULTS

Schedule for Review- Plans to Send



Plan Section	Delivery to Campuses	Date Comments Due
Naugatuck Community College	11/16/15	11/30/15
Northwestern Connecticut Community College	11/18/15	12/2/15
Norwalk Community College	11/18/15	12/2/15
Quinebaug Valley Community College	11/20/15	12/4/15
Three Rivers Community College	11/20/15	12/4/15
Tunxis Community College	11/20/15	12/4/15
Central Connecticut State University	11/25/15	12/11/15
Charter Oak State College	11/25/15	12/11/15
Eastern Connecticut State University	11/25/15	12/11/15
Southern Connecticut State University	12/7/15	12/21/15
Western Connecticut State University	12/7/15	12/21/15
System Office	12/7/15	12/21/15

COMMITMENT & INTEGRITY DRIVE RESULTS

Overall Project Schedule



Milestone	Date
Public Meetings	January 2016
Multi-Campus Hazard Mitigation Plan Final Draft	January 2016
Multi-Campus Hazard Mitigation Plan Submission	February 2016
Date Grant Ends	January 2017



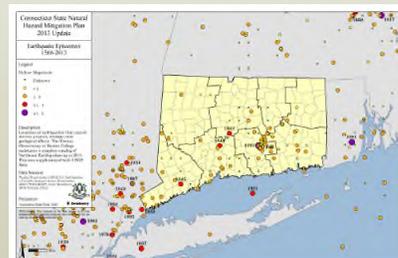
COMMITMENT & INTEGRITY DRIVE RESULTS

Multi-Campus Hazard Mitigation Plan (MCHMP) Components



- CSCU System and State Perspective
- Overview of all Campuses
- CSCU MCHMP Steering Committee
- Background on Hazards Profiled
- Plan Implementation, Maintenance and Adoption

Connecticut Earthquake Epicenters



COMMITMENT & INTEGRITY DRIVE RESULTS

MCHMP Hazard Profile

- Includes:
 - Description of the hazard,
 - Its location and extent,
 - Previous occurrences,
 - Probability of future events,
 - Risk assessment, and
 - Future development considerations



COMMITMENT & INTEGRITY DRIVE RESULTS

MCHMP Definition of Probability

The Plan considers the probability for natural hazards to occur in the future. Each hazard's probability can be defined as:

- **Highly likely** – Hazard event occurs every 1-10 years
- **Likely** – Hazard event occurs every 10-50 years
- **Unlikely** – Hazard event occurs infrequently and greater than every 50 years

This probability is applied to each hazard in each campus chapter (Section 3).



COMMITMENT & INTEGRITY DRIVE RESULTS

Multi-Campus Hazard Mitigation Plan(MCHMP) and Campus Chapter Comparison



MCHMP: State and overall CSCU System information



Campus Chapter: City/Town and Campus specific information



COMMITMENT & INTEGRITY DRIVE RESULTS



Campus Plan Review



COMMITMENT & INTEGRITY DRIVE RESULTS



Section 1 - Introduction

- Contains specifics about the campus:
 - History
 - Town/City information
 - Campus development
 - Emergency Services and utility information
 - Future campus development projects



Please pay particular attention to:

Future Campus Development to verify dates and projects.



Section 2 - Planning Process

- Contains information on:
 - The Planning Team
 - Campus Meetings
 - Stakeholder Interviews



Please pay particular attention to:

Table 2-4 Interview Topics & Themes



Section 3 - Hazard Profiles & Risk Assessment

- Contains information on:
 - Key Hazard-Related Points that were Identified at Campus Interviews
 - Natural Hazard Ranking Summaries



Natural Hazard	Frequency 0-5	Duration 0-5	Severity 0-5	Intensity 0-5	Probability F.D.I (40%)	Consequence S (60%)	Total	Ranking L,M,H,S
Coastal Storm/Nor easter	2	1	3	2	1.67	3.00	2.47	M
Dam Failure	1	1	1	1	1.00	1.00	1.00	L
Drought	1	1	2	1	1.00	2.00	1.60	L
Earthquake	1	1	3	3	1.67	3.00	2.47	M
Flood	2	1	2	2	1.67	2.00	1.87	L
Hurricane	1	3	5	4	2.67	5.00	4.07	S
Thunderstorm/Lightning	3	1	1	1	1.67	1.00	1.27	L
Tornado	1	1	3	3	1.67	3.00	2.47	M
Wildfire	1	2	2	2	1.67	2.00	1.87	L
Windstorm	2	2	3	2	2.00	3.00	2.60	M
Winter Related Hazards	3	2	4	4	3.00	4.00	3.60	H

- Earthquake Loss Estimation Tables
- Future Development Considerations for each question



COMMITMENT & INTEGRITY DRIVE RESULTS

Section 3 - Hazard Profiles & Risk Assessment

- Contains information on:
 - Each hazard from planning documents and interviews:



Table 3-5: Eastern Earthquake Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> • Connecticut Natural Hazard Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> • Between 1955-2012, there were 2,470 wind events recorded in the NCDC database for CT - an average of 42.6 per year. • CT will continue to experience windstorm events and have a high probability of future occurrences.
<ul style="list-style-type: none"> • WINCOG Region Pre-Disaster Natural Hazards Mitigation Plan (2007) 	<ul style="list-style-type: none"> • Not identified as a standalone hazard in the WINCOG Regional HMP.
<ul style="list-style-type: none"> • Anecdotal Information from Eastern Connecticut State University Stakeholders 	<ul style="list-style-type: none"> • Have had past issues with roof of J. Eugene Smith Library during heavy rains. Have had flashing fall at Webb Hall during windstorm. • Some concern over windows in high winds (especially in High Rise Apartments). High winds can occur at the top of the hill.

Please pay particular attention to:

Campus-specific information about each hazard, Table 3-6 earthquake hazard ranking tables.



COMMITMENT & INTEGRITY DRIVE RESULTS

Section 4 - Vulnerability and Impact Assessment

- Contains Information on:
 - List of Assets
 - Loss of Function Cost
 - Criticality Ranking
 - Building Vulnerability Assessment Ranking

Criticality Ranking	Ranking Criteria
Level 5	Buildings critical to campus/BOR operations and likely to shelter students/faculty: <ul style="list-style-type: none"> • Residence Halls • Dining Halls/Food Service • Athletic Complexes that may provide shelter • Laboratories and animal research facilities • Critical Infrastructure (including IT) • Daycare
Level 4	Buildings that are less critical but serve a support function: <ul style="list-style-type: none"> • Records/document locations • Archives • Libraries/museums • Non-critical but important infrastructure
Level 3	Buildings that are administrative, academic, or multi-use.
Level 2	Buildings used for recreational purposes such as Campus Centers or gymnasiums
Level 1	Buildings that are non-essential such as maintenance buildings, storage sheds, etc.



COMMITMENT & INTEGRITY DRIVE RESULTS

Reminder

Asset Criticality Ranking

- Buildings are ranked based on the critical functions they serve:

Criticality Ranking	Ranking Criteria
Level 5	Buildings critical to campus operations and likely to shelter students/faculty: <ul style="list-style-type: none"> • Dining Area/Food Service • Dormitories • Laboratories and animal research facilities • Critical Infrastructure (including IT)
Level 4	Buildings that are less critical but serve a support function: <ul style="list-style-type: none"> • Records/document locations • Archives • Non-critical but important infrastructure
Level 3	Buildings that are administrative, academic or multi-use.
Level 2	Buildings used for recreational purposes such as Campus Centers.
Level 1	Buildings that are non-essential such as maintenance buildings, storage sheds, etc.



COMMITMENT & INTEGRITY DRIVE RESULTS

Reminder

Asset Loss Estimates- Loss of Function

- Calculate Loss of function per hazard based on:
 - GSF
 - Assigned Building Criticality Value
 - Factored square footage
 - Building/total campus square footage
 - Per day loss of function cost
 - Estimated hazard specific loss of function days



Existing Buildings	Date Construction Completed	Gross Square Feet	Building Criticality Value	Factored Square Footage	Building/Total Campus Square Footage	Per Day Loss of Function Cost	Estimated Hazard Specific Loss of Function Days	Loss of Function Cost Per Hazard
Student Center	1984	155,582	3	466,746	1.62	\$155,545	7	\$1,088,817
Dining Hall	2002	132,600	5	663,000	2.30	\$220,948	7	\$1,546,635

Reminder

Vulnerability Assessment

- To assess vulnerability, **Total Damage** is needed.
- Total Damage is determined based on:
 - List of existing buildings
 - Insurable replacement value
 - Insurable contents value
 - Loss of function
- Vulnerability Ranking of Low, Medium or High is given based on Total Damage dollar value.



Existing Buildings	Insurable Replacement Value	Insurable Contents Value	Loss of Function Per Hazard	Total Damage	Building Vulnerability Ranking
Student Center	\$32,000,000	\$48,000,000	\$1,088,817	\$81,088,817	Medium
Dining Hall	\$56,000,000	\$84,000,000	\$1,546,635	\$141,546,635	High

COMMITMENT & INTEGRITY DRIVE RESULTS

Section 5 - Mitigation Activities & Action Plan



- Contains information on:
 - Preparedness Projects
 - STAPLEE Rankings and Hazard Project Identification
 - Potential Funding Sources
 - Capabilities Assessment
 - Fiscal Resources

Please pay particular attention to:
Table 5-2 STAPLEE Rankings



Reminder

Section 5 – STAPLEE Mitigation Projects vs. Preparedness Projects

STAPLEE Mitigation Projects

Hazard Addressed	Project Description	Responsible Party	Objectives Addressed	Estimated Cost	STAPLEE Criteria						
					Cost Effectiveness of Activity	Socially Acceptable	Technically Feasible	Protect/Benefit Environment	Legal	Economic Benefit	Project Priority
All	Expand emergency generator capacity.	Administration	2B, 3B, 5B	\$200,000	Medium	High	High	Medium	Low	Low	High
Flood	Implement drainage improvements to Administration & Data Center Building.	Administration	1B, 5A, 5B	\$40,000	Medium	Medium	High	Low	Low	Low	Medium
All	Develop campus GIS to map hazard areas, at-risk structures, and associated hazards to assess high-risk areas.	Administration	1C, 1D, 2C	\$15,000	High	Medium	High	Medium	Low	Low	Medium

Mitigation projects aid in reducing or eliminating risks prior to a hazard. Preparedness aids a campus in emergency response once an event occurs.

Preparedness Projects

Project	Responsible Department
Increase redundancy in communications systems.	Administration
Install outdoor public address system.	Administration





Campus Maps

- Maps can be found in:
 - Figure 3-1
 - Figure 4-1
 - And Figure 3-3 or Figure 3-4 (Flood Vulnerability Assessment), as applicable.



Please pay particular attention to:
 Review of all maps for building placement



Reminder

Public Meeting Advertising Requirements

- Provide at least one week advanced notice

Forms of Suggested and Required Advertisements

Type	Campus Advertising	Local Advertising	Personal E-Mail
Required	Main Page or Event Section of Website	Announcement, Article or PR in local newspaper	Email to planners, administrative and/or EMS personnel in surrounding towns and cities; and satellite campus locations
Strongly Suggested	-	-	Invitations to local business or community groups
Suggested	Social Media	-	-
	Announcement, Article or PR in campus newspaper	-	-
	Bulletin Boards, Flyers	-	-

- Provide documentation of each advertisement completed (required)



FEMA Review Checklist (ex.)



1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))				
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))				
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))				
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))				
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))				
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))				

COMMITMENT & INTEGRITY DRIVE RESULTS

FEMA Review Checklist (ex.)



1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))				
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))				
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))				
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))				

COMMITMENT & INTEGRITY DRIVE RESULTS



Next Steps...

- Finalize the Plan/Chapter Review
- Schedule More Detailed Meeting/Call if Necessary
- Coordinate with your Campus Teams/Administration for Future Adoption

Further out...

- Second Public Meeting
- Plan Submittal to DEHMS and FEMA Region 1



COMMITMENT & INTEGRITY DRIVE RESULTS



Questions?

For more information please contact:

Mary House
1-800-426-4262
mhouse@woodardcurran.com



COMMITMENT & INTEGRITY DRIVE RESULTS



APPENDIX H: PUBLIC MEETING NO. 2 MEETING MATERIALS

MEETING SIGN-IN SHEET – MULTI-CAMPUS HAZARD MITIGATION PLAN PUBLIC MEETING NO. 2

Project: CSU – Multi-Campus Hazard Mitigation Plan

Meeting Date: 2/10/16

Facilitator: Woodard & Curran

Campus: Southern CT State Univ.

Name	Address	Phone	Email	Group Represented (Self or Organization's Name)
Karen Misbach	SCSU Facilities			
Taylor Wesley	student			
Thea Bernabe	student			
Bob Sheehey	SCSU			
KRISTIN KEAHEY	student			
Taylor Richards	Fifth St			
Christie Beaulieu	off campus			
Marilyn Irwinovich	Woodard & Curran		m111111@woodardcurran.com	

Multi-Campus Hazard Mitigation Plan



Connecticut State Colleges & Universities (CSCU)
Second Public Meeting
February 2016



COMMITMENT & INTEGRITY DRIVE RESULTS

Agenda



- Multi-Campus Hazard Mitigation Plan Overview
- Review of Each Chapter Section
- Open Discussion/Questions and Comments



COMMITMENT & INTEGRITY DRIVE RESULTS



Public Engagement

- Why are We Having this Workshop?
 - Public Engagement of both on and off campus stakeholders is a critical component of hazard mitigation planning
- What do We Want from **You**?
 - Your questions, thoughts, ideas, suggestions on revisions to make this the best possible plan!



COMMITMENT & INTEGRITY DRIVE RESULTS



Examples of Types of Hazards

- Avalanche
- Earthquake
- High winds
- Hurricanes
- Tornadoes
- Urban Fire
- Floods
- Extreme Heat/Cold
- Drought
- Winter storm
- Ice storm
- Hailstorm
- Tsunami
- Thunder/Lightning



COMMITMENT & INTEGRITY DRIVE RESULTS



Project Background

- The Disaster Mitigation Act was signed by the President in October 2000.
 - Incentive for states and local governments to undertake natural hazard mitigation planning.
 - Promotes sustainability as a strategy for disaster resistance.
 - Encourages state and local governments to work together, and facilitates cooperation between state and local authorities.
 - Results in faster allocation of funding and more effective risk reduction projects.
 - Colleges and Universities can plan in concert with similar planning efforts in their community.



COMMITMENT & INTEGRITY DRIVE RESULTS



Project Background



- CSCU received a grant of \$950K from DESPP/DEMHS to develop a multi-campus hazard mitigation plan
- Plan identifies cost effective mitigation measures to reduce or eliminate long-term risk to life and property from hazards
- Allows the campuses to be eligible to receive non-emergency disaster assistance, including state and federal funding for mitigation and recovery projects
- **Projects must be pre-identified in the hazard mitigation plan to receive future funding**



COMMITMENT & INTEGRITY DRIVE RESULTS



CSCU
CONNECTICUT STATE
COLLEGES & UNIVERSITIES

Benefits of Hazard Mitigation Planning



- Campuses benefit from Mitigation Planning by:
 - Identifying cost effective actions for risk reduction that are agreed upon by stakeholders
 - Focusing resources on the greatest risks and vulnerabilities
 - Building partnerships by involving the campus community, organizations, local government and businesses
 - Increasing education and awareness of hazards and risk
 - Communicating priorities to local, state and federal officials
 - Aligning risk reduction with other campus objectives



COMMITMENT & INTEGRITY DRIVE RESULTS



CSCU
CONNECTICUT STATE
COLLEGES & UNIVERSITIES

Project Goals



- Fulfill Federal, State, Local and Campus Hazard Mitigation Planning Requirements
- Promote the Safety of Students, Faculty, Staff and Visitors
- Minimize Hazard Impacts to Physical Assets and Operations
- Reduce or Avoid Long-Term Vulnerabilities from Hazards
- Campus Eligibility for Future Funding

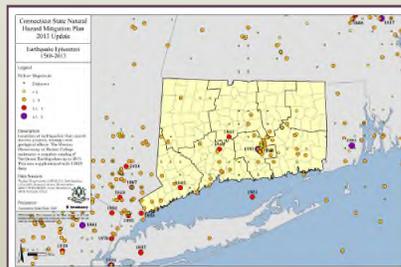


COMMITMENT & INTEGRITY DRIVE RESULTS



Multi-Campus Hazard Mitigation Plan (MCHMP) Components

1. CSCU System and State Perspective
2. Overview of all Campuses
3. CSCU MCHMP Steering Committee
4. Background on Hazards Profiled
5. Plan Implementation, Maintenance and Adoption



COMMITMENT & INTEGRITY DRIVE RESULTS



Plan Written Goals

Goal	Explanation
Goal 1	Protect existing and future assets from known hazards by implementing mitigation projects to minimize potential losses.
Goal 2	Maintain a continuity of campus business operations during and after a hazard event.
Goal 3	Create and maintain a safe, secure environment for the campus population before, during, and after a hazard event.
Goal 4	Communicate natural and human hazard information to the campus community and improve education and outreach efforts regarding their potential impact.
Goal 5	Proactively protect existing and future campus assets from known hazards by incorporating mitigation activities into capital improvement and infrastructure planning.



COMMITMENT & INTEGRITY DRIVE RESULTS

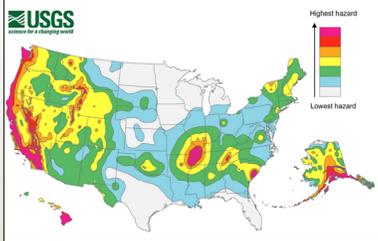


Hazard Profiles

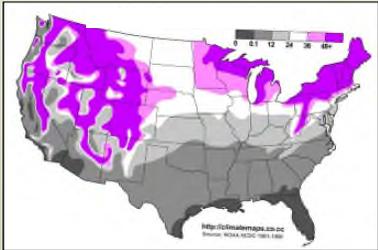
Includes:

- Description of the hazard
- Its location and extent
- Previous occurrences
- Probability of future events
- Risk assessment, and
- Future development considerations

USGS United States Seismic Hazard Map (2014)



Average Annual Snowfall



MCHMP Definition of Probability

The Plan considers the probability for natural hazards to occur in the future. Each hazard’s probability can be defined as:

- **Highly likely** – Hazard event occurs every 1-10 years
- **Likely** – Hazard event occurs every 10-50 years
- **Unlikely** – Hazard event occurs infrequently and greater than every 50 years

This probability is applied to each hazard in each campus chapter (Section 3).



Multi-Campus Hazard Mitigation Plan (MCHMP) and Campus Chapter Comparison



MCHMP: State and overall CSCU System information



Campus Chapter: City/Town and Campus specific information



COMMITMENT & INTEGRITY DRIVE RESULTS



Campus Plan Review



COMMITMENT & INTEGRITY DRIVE RESULTS



Section 1 - Introduction

- Contains specifics about the campus:
 - History
 - Town/City information
 - Campus development
 - Emergency services and utility information
 - Future campus development projects



Photo: Three Rivers Community College



COMMITMENT & INTEGRITY DRIVE RESULTS



Section 2 - Planning Process



Planning Team



Campus Meetings



Stakeholder Interviews



COMMITMENT & INTEGRITY DRIVE RESULTS

Section 3 - Hazard Profiles & Risk Assessment

- Contains information on:
 - Key Hazard-Related Points that were Identified at Campus Interviews
 - Natural Hazard Ranking Summaries



Natural Hazard	Frequency 0-5	Duration 0-5	Severity 0-5	Intensity 0-5	Probability F.D.I (40%)	Consequence S (60%)	Total	Ranking L,M,H,S
Coastal Storm/Nor easter	2	1	3	2	1.67	3.00	2.47	M
Dam Failure	1	1	1	1	1.00	1.00	1.00	L
Drought	1	1	2	1	1.00	2.00	1.60	L
Earthquake	1	1	3	3	1.67	3.00	2.47	M
Flood	2	1	2	2	1.67	2.00	1.87	L
Hurricane	1	3	5	4	2.67	5.00	4.07	S
Thunderstorm/Lightning	3	1	1	1	1.67	1.00	1.27	L
Tornado	1	1	3	3	1.67	3.00	2.47	M
Wildfire	1	2	2	2	1.67	2.00	1.87	L
Windstorm	2	2	3	2	2.00	3.00	2.60	M
Winter Related Hazards	3	2	4	4	3.00	4.00	3.60	H

- Earthquake Loss Estimation Tables
- Future Development Considerations for each question



COMMITMENT & INTEGRITY DRIVE RESULTS

Section 3 - Hazard Profiles & Risk Assessment

Contains information on each hazard from planning documents and interviews:



Table 3-5: Eastern Windstorm Susceptibility

How Susceptibility Was Determined	Susceptibility Criteria
<ul style="list-style-type: none"> • Connecticut Natural Hazards Mitigation Plan Update (2014) 	<ul style="list-style-type: none"> • Between 1955 and 2012, there were 2,470 wind events recorded in the NCDC database for CT - an average of 42.6 per year. • CT will continue to experience windstorm events and have a high probability of future occurrences.
<ul style="list-style-type: none"> • WINCOG Region Pre-Disaster Natural Hazards Mitigation Plan (2007) 	<ul style="list-style-type: none"> • Not identified as a standalone hazard in the WINCOG Regional HMP.
<ul style="list-style-type: none"> • Anecdotal Information from Eastern Connecticut State University Stakeholders 	<ul style="list-style-type: none"> • Have had past issues with roof of J. Eugene Smith Library during heavy rains. Have had flashing fall at Webb Hall during windstorm. • Some concern over windows in high winds (especially in High Rise Apartments). High winds can occur at the top of the hill. • Had tree damage in the past from heavy winds. There is an effort to keep trees maintained. Large trees are located in Town - these downed trees would impact campus accessibility.

COMMITMENT & INTEGRITY DRIVE RESULTS

Section 4 - Vulnerability and Impact Assessment

Contains Information on:

- Building assets
- Costs to replace a damaged building
- Criticality Ranking
- Overall ranking on the vulnerability of building to hazards (high, medium, low)



COMMITMENT & INTEGRITY DRIVE RESULTS

Asset Criticality Ranking

- Buildings are ranked based on the critical functions they serve:



Criticality Ranking	Ranking Criteria
Level 5	Buildings critical to campus operations and likely to shelter students/faculty: <ul style="list-style-type: none"> • Dining Area/Food Service • Dormitories • Laboratories and animal research facilities • Critical Infrastructure (including IT)
Level 4	Buildings that are less critical but serve a support function: <ul style="list-style-type: none"> • Records/document locations • Archives • Non-critical but important infrastructure
Level 3	Buildings that are administrative, academic or multi-use.
Level 2	Buildings used for recreational purposes such as Campus Centers.
Level 1	Buildings that are non-essential such as maintenance buildings, storage sheds, etc.



COMMITMENT & INTEGRITY DRIVE RESULTS



Asset Loss Estimates- Loss of Function

- Calculate Loss of function per hazard based on:
 - Gross Square Feet
 - Assigned Building Criticality Value
 - Factored square footage
 - Building/total campus square footage
 - Per day loss of function cost
 - Estimated hazard specific loss of function days

Existing Buildings	Date Construction Completed	Gross Square Feet	Building Criticality Value	Factored Square Footage	Building/Total Campus Square Footage	Per Day Loss of Function Cost	Estimated Hazard Specific Loss of Function Days	Loss of Function Cost Per Hazard
Student Center	1984	155,582	3	466,746	1.62	\$155,545	7	\$1,088,817
Dining Hall	2002	132,600	5	663,000	2.30	\$220,948	7	\$1,546,635



Vulnerability Assessment

- To assess vulnerability, **Total Damage** is needed.
- Total Damage is determined based on:
 - List of existing buildings
 - Insurable replacement value
 - Insurable contents value
 - Loss of function
- Vulnerability Ranking of Low, Medium or High is given based on Total Damage dollar value.

Existing Buildings	Insurable Replacement Value	Insurable Contents Value	Loss of Function Per Hazard	Total Damage	Building Vulnerability Ranking
Student Center	\$32,000,000	\$48,000,000	\$1,088,817	\$81,088,817	Medium

COMMITMENT & INTEGRITY DRIVE RESULTS

Section 5 - Mitigation Activities & Action Plan



- Contains information on:
 - Preparedness Projects
 - STAPLEE Rankings and Hazard Project Identification
 - Potential Funding Sources
 - Capabilities Assessment
 - Fiscal Resources



COMMITMENT & INTEGRITY DRIVE RESULTS

Section 5 – STAPLEE Mitigation Projects vs. Preparedness Projects

STAPLEE Mitigation Projects

Hazard Addressed	Project Description	Responsible Party	Objectives Addressed	Estimated Cost	STAPLEE Criteria						
					Cost Effectiveness of Activity	Socially Acceptable	Technically Feasible	Protect/Benefit Environment	Legal	Economic Benefit	Project Priority
All	Expand emergency generator capacity.	Administration	2B, 3B, 5B	\$200,000	Medium	High	High	Medium	Low	Low	High
Flood	Implement drainage improvements to Administration & Data Center Building.	Administration	1B, 5A, 5B	\$40,000	Medium	Medium	High	Low	Low	Low	Medium
All	Develop campus GIS to map hazard areas, at-risk structures, and associated hazards to assess high-risk areas.	Administration	1C, 1D, 2C	\$15,000	High	Medium	High	Medium	Low	Low	Medium

Mitigation projects aid in reducing or eliminating risks prior to a hazard. Preparedness aids a campus in emergency response once an event occurs.

Preparedness Projects

Project	Responsible Department
Increase redundancy in communications systems.	Administration
Install outdoor public address system.	Administration



COMMITMENT & INTEGRITY DRIVE RESULTS

Example Mitigation Project Categories



Type of Natural Hazard Addressed	Representative Project Category
All	Redundant power opportunities and generator availability/capacity
All	Conduct more detailed mapping to better understand natural hazard impacts to structures and areas
All	Conduct training and drills associated with power outages or a shelter in place situation
Flooding, Hurricane, Nor'easter, Winter Related Hazards	Drainage improvements
Winter Related Hazards	Improvements for snow removal and snow management
All	Improve and reinforce roofs and windows that may sustain damage from a natural hazard event
All	Increase or improve electronic messaging signage capacity to alert campus community before hazards
All	Building retrofits to better prevent damage from natural hazards.
All	Evaluate utilities and their location in reference to floodplains.
All	Create additional plans for debris management, stormwater management, tornado management, hurricane response policies, etc.

COMMITMENT & INTEGRITY DRIVE RESULTS

Next Steps...



- Incorporate changes from public comments
- Plan Submittal to the Connecticut Division of Emergency Management & Homeland Security (DEHMS) and Federal Emergency Management Agency (FEMA) Region 1



COMMITMENT & INTEGRITY DRIVE RESULTS

Questions?

For more information please contact:

Mary House
1-800-426-4262
mhouse@woodardcurran.com



COMMITMENT & INTEGRITY DRIVE RESULTS