

APPENDIX C: HAZARD IDENTIFICATION, RISK ASSESSMENT AND CONSEQUENCE ANALYSIS

UConn's campuses are vulnerable to natural hazards, technological and human-caused many threats and hazards. UConn identified threats and hazards, assessed risks, and looked at consequences using several tools and through numerous key activities. These include:

- School Safety and Security Audit

Per the State of Connecticut Public Act 13-3 each institution of higher education was required to conduct an audit to determine the safety and security characteristics of each campus and any building or structure thereon. The audit for UConn was conducted between November 19, 2014 and December 21, 2014 and submitted to the CT Department of Emergency Services and Public Protection. The results of this audit were shared with the Connecticut General Assembly and are on file with the UConn Office of Emergency Management. This audit looked at safety and security issues as they related to environmental design, campus police and security operations, emergency management, information technology security, facilities, environmental health and safety, university policies, communications, residential facilities, and resources. Findings from this audit were used to determine both physical and procedural safety threats and hazards as they relate UConn.

Frequency – once.

Evaluation – Submitted to the State of Connecticut Department of Emergency Services and Public Protection (DESPP). Reported to the Connecticut General Assembly through DESPP.

- Adoption of the State of Connecticut's Hazard Identification and Risk Assessment (HIRA) and Consequence Analysis

The purpose of the State of Connecticut HIRA and Consequence Analysis is to identify the natural and human-caused hazards that potentially impact the State. It assesses the hazards that pose a risk to people, property, the environment, and impacts to the State's emergency operations. In addition, a consequence analysis was conducted for hazards identified and takes into consideration the impact on the public, responders, continuity of operations including continued delivery of services, property, facilities, and infrastructure, the environment, the economic condition of the jurisdiction, and public confidence in state governance. UConn adopted the State HIRA and Consequence Analysis document due to the comprehensive review of local, regional, and state emergency operations plans, hazard mitigation plans, and other applicable plans and the detailed analysis of the hazards identified. UConn has campuses across the state and would be potentially vulnerable to many if not hazards listed in this document.

See pages C-2 through C-14 for more information.

Frequency – as determined by the State Division of Emergency Management and Homeland Security. UConn OEM reaches out to State DEMHS during the annual EOP review to get their current HIRA and Consequence Analysis.

Evaluation - as determined by State Division of Emergency Management and Homeland Security.

- Threat and Hazard Identification and Risk Assessment (THIRA)

See pages C-15 through C-16 for more information.

Frequency – initial THIRA completed in 2018. OEM will review the THIRA during the annual review of the EOP. The THIRA will be revised if there have been changes to demographic factors, capabilities targets, resources, and or preparedness, mitigation, or protection efforts.

Evaluation – OEM considers the threats and hazards of concern identified in the THIRA when deciding what scenarios to evaluate during training and exercises.

- Collaborative gathering of institutional knowledge and stakeholder involvement.

See pages C-17 through C-18 for more information.

Frequency – A collaboration of University emergency management stakeholders was conducted in conjunction with the development of the UConn EOP in 2016. During regular or ad hoc meetings of the Executive Policy Group, new or emerging issues are discussed along with their potential impact to the University. Two recent examples include the coronavirus and avian influenza. OEM conducted regional collaboration meeting with several of the Regional Campuses to discuss campus specific threats and hazards. These collaboration efforts were paused during the pandemic but will resume beginning the Fall of 2022.

Evaluation – OEM consider the threats and hazards identified and listed in the EOP when deciding what scenarios to evaluate during training and exercises, especially as they relate to the regional campuses. OEM will resume the Regional Campus TTX program that was paused during the pandemic.

- Hazard Vulnerability Assessment (HVA) for UConn Health

UConn Health completes a Hazard Vulnerability Assessment (HVA) for John Dempsey Hospital (JDH) and the applicable UConn Health satellite offices as required by regulatory agencies having jurisdiction. The HVA for JDH covers hazards applicable to the entire UConn Health Farmington campus. This document is under separate cover.

Frequency - At a minimum these assessments are conducted every two years.

Evaluation – The Joint Commission reviews this assessment during their regularly scheduled assessment period for JDH.

Adoption of the State of Connecticut's Hazard Identification & Risk Assessment (HIRA)

State of Connecticut

Dept. of Emergency Services & Public Protection/Div. of Emergency Management & Homeland Security Connecticut's Hazard Identification, Risk Assessment and Consequence Analysis

DEMHS Version Date 08.15.14 Rev 2019

(Editorial Note: This appendix includes the CT HIRA in full with only minor formatting changes.)

1.1 PURPOSE

The purpose of this document is to identify the natural and human-caused hazards that potentially impact the State of Connecticut. This document assesses the hazards that pose a risk to people, property, the environment, and impacts to the State's emergency operations. In addition, a consequence analysis was conducted for the hazards identified and takes into consideration the impact on the public, responders, continuity of operations including continued delivery of services, property, facilities, and infrastructure, the environment, the economic condition of the jurisdiction, and public confidence in the state's governance.

This analysis was conducted by managers and program staff of Department of Emergency Services and Public Protection/ Division of Emergency Management and Homeland Security (DESPP/DEMHS). Subsequent updates have been completed by the Planning Coordinator with input from Subject Matter Experts (SMEs).

1.2 BACKGROUND

2014 HIRA: The list of potential hazards was developed by the Emergency Management Accreditation Program (EMAP) Committee of DEMHS, after reviewing the following plans: State of Connecticut Natural Hazard Mitigation Plan (2014), the Department of Homeland Security (DHS) required Threat and Hazard Identification Risk Assessment (THIRA) (2012), The State of Connecticut Natural Disaster Plan (2009), other state agency plans, Local Emergency Operation Plans for the Connecticut's municipalities, State of Connecticut Catastrophic Disaster Plan (2009), DEMHS Web Site, Regional Emergency Support Plans, State of Connecticut Disaster Debris Management Plan (2013), Connecticut Climate Change Preparedness Plan (2011), State of Connecticut Dam Safety Program, and DHS 2013 Fusion Center Assessment Individual Report: Connecticut Intelligence Center. The Committee then consolidated the hazards from these documents. 2019 Update: Table 2-107: Hazard Ranking by County for All Hazards (2019 State Natural Hazard Mitigation Plan) was reviewed and is included in the 2019 HIRA. A HIRA Update Excel Tool was developed. The Excel tool walks the SME through the HIRA update steps for the particular hazard they were asked to review. DEMHS staff also reviewed the HIRA tool with some SMEs and recorded the results.

2019 Update: With the input received from SMEs, the following tables were updated:

- Table 1.1 Identified hazards and potential for the hazard to occur using assigned rankings of "likely", "possible", and "not likely"
- Table 1.2.1 Hazard Identification and Risk Assessment (HIRA)
- Table 1.3 State of Connecticut Hazard and Vulnerability Assessment

1.3 DISCUSSION: IDENTIFIED HAZARDS AND POTENTIAL FOR THE HAZARD TO OCCUR

2014 HIRA: A review of all the hazards listed in the documents above resulted in an initial list of over 50 possible hazards. This list was presented to the DEMHS staff and through discussion this list was further refined and grouped into similar hazards and then determined to be considered "likely," "possible," or "not likely" to have an impact on the State of Connecticut. Table 1.1 provides a listing of the 28 ranked hazards. Of the total, there were 21 that were ranked "likely," six ranked "possible" and one ranked "not likely." It should be noted that some planning documents have listed "Lost/missing

persons,” “mass evacuation incident,” and “space weather” as possible hazards, however these are not included in the further analysis that was conducted for tables 1.2.2 and 1.3. For example, “Lost/missing persons” and “mass evacuation incident” are considered a secondary action that may be tied to one or more of the hazards listed below. The term “space weather” refers to the variable conditions on the sun and in space that can influence the performance of technology used on Earth. Therefore, for purposes of this hazard analysis “space weather” is included under cyber incident.

2019 Update: Table 1.1 was updated based on the Hazard Rankings included in the 2019 update of the State Natural Hazard Mitigation Plan (NHMP) and input from Subject Matter Experts (SMEs).

**TABLE 1.1 IDENTIFIED HAZARDS AND POTENTIAL FOR THE HAZARD TO OCCUR
USING ASSIGNED RANKINGS OF “LIKELY”, “POSSIBLE” AND “NOT LIKELY”**

Identified Hazards (Natural & Human Caused)	May Include	Potential for Hazard	Rationale
Cyber Incident	Cyber incidents can include the theft of government, private, financial, or other sensitive data. Cyber-attacks that damage computer systems are capable of causing lasting harm to entities and individuals.	Likely	Real and constantly emerging threat.
Dam Failure	CT dams are defined by hazard class. The classification is as follows: C – High Hazard (# of Dams – 267); B – Significant Hazard (277); BB –Moderate Hazard (717), A – Low Hazard (1788); and AA – Negligible Hazard (1496).	Possible	2019 NHMP (p.124) – dam failure events are infrequent in CT and while considered an unlikely occurrence, the potential is a significant concern given the large number of dams across the state and numerous dam failure events in the past.
Drought Related Hazards	Meteorological, hydrological, agricultural, socioeconomic.	Likely	Per CT’s NHMP, the State has assigned a medium/high probability for this type of event. Changes in precipitation patterns in Connecticut are likely to amplify flood and drought impacts. (Climate change impacts, p. 183.
Flood Related Hazards	Coastal flooding (coastal storms), riverine flooding, flood, flash flooding, shallow flooding (urban flooding).	Likely	Per CT’s 2019 NHMP, flooding is one of the most frequent natural hazards that impacts CT. Changes in precipitation patterns in Connecticut are likely to amplify flood and drought impacts. (Climate change impacts, p. 183.
Food and Agricultural Disaster/Incident	Biological or chemical agents, avian influenza, catastrophic animal mortalities, catastrophic vegetative waste.	Likely	Has occurred within the past decade, aquaculture impacted by natural disaster (Long Island Sound), barn collapse, and tomato blight.
Hazardous Materials Incidents/Accident (in transit)	Highway, rail freight incidents.	Likely	Significant releases annually, captured databases DEEP, CT is a major transportation corridor within the region (freight).
Industrial Incidents	Hazardous materials releases whether intentional or accidental.	Likely	CT has experienced a number of events dealing with hazardous materials being released to the environment and loss of life as a result of industrial incident.
Lost / Missing Persons	Large number of unaccounted people after a disaster.	Likely	Local level, state would support local efforts.
Fixed Nuclear Facility Incident	Millstone Power Station (active); CT Yankee Station (decommissioned).	Possible	Strong federal, state, and local partnerships addressing nuclear and radiological safety.

Port Incidents	Mass rescue, major marine casualty/disaster.	Likely	Per Port-wide Long Island Sound Zone area maritime security assessment.
Power Failure	Transit, impacts to homes, businesses, and institutions.	Likely	The grid is shown to be not reliable as a result of aging infrastructure.
Sea Level Rise	Severe coastal erosion along the State's shoreline severely impacting homes, infrastructure, and the environment.	Possible	Per CT's NHMP, the hazard risk ranking for New Haven county is High, Fairfield, Middlesex and New London are Med-High p.214.
Significant Criminal Acts	Terrorism incidents, law enforcement and investigation incidents, sabotage, school violence, conventional weapons, Weapons of Mass Destruction, a terrorist event in a contiguous state or major city, Radiological release/dirty bomb, biological and chemical incidents, workplace violence, active shooter.	Likely	Potential impact of any of these events could be great, including but limited to loss or life, disruption of government, and adverse economic impacts to the public and private sectors.
Special Events	Road races, concerts, marathons, fireworks, festivals, UCONN football games (mass gatherings).	Likely	These events track large numbers of people and occur throughout the seasons.
Temperature Extremes	Extreme cold, extreme hot.	Likely	Overall ranking in the 2019 NHMP for Extreme Heat/Cold is Med. State of CT activates the Cold Weather Protocol as needed.
Thunderstorm Related Hazards	High winds, severe thunderstorms.	Likely	Per CT's 2019 NHMP, the State has assigned a high probability to this type of hazard. (See Table 2-107).
Tornadoes	Two types of tornadoes – those that develop from super- cell thunderstorms and those that do not.	Likely	Per CT's 2019 NHMP, the State has assigned a medium – high probability to this type of event. (See Table 2-107 attached). The pattern of occurrence and potential locations for tornadoes to occur in Connecticut is expected to remain relatively unchanged in the 21st Century, p.270.
Transportation Accidents	Train derailment, highway incident, port incident, air incident, the transportation of radiological material.	Likely	Past incidents include, Metro-North disruption, aging infrastructure, daily highway incidents, fire in New Haven Port, Bridgeport oil truck, plane crashes.
Tropical Cyclone	Hurricanes, tropical storms.	Likely	Per CT's 2019 NHMP, the hazard is ranked medium, medium-high.
Widespread Infectious Disease	Virus/epidemic/ disease outbreak/ pandemic.	Likely	Surveillance programs are place to help mitigate/prevent widespread infectious disease.
Winter Related Hazards	Blizzard, freezing rain, ice storm, Nor'easter, sleet, snow, winter storm, and ice jams.	Likely	Per CT's 2019 NHMP, CT has assigned a medium- high probability of this type of event in most counties with the New London and Middlesex counties as Medium. Ice Jams are discussed in the 2019 Update of the NHMP due to the events in Jan. 2018.

Earthquakes	CT may be categorized as having a low or moderate risk for an earthquake greater than or equal to 3.5 occurring in the future and a moderate risk of an earthquake less than or equal to 3.0 occurring in the future.	Possible	Per CT's NHMP, the State has assigned a medium/low probability, high consequence for earthquake events.
Energy/ Fuel Shortages	Low supply of propane, gasoline, electricity, heating oil.	Likely	Resulting from a natural disaster or other disaster, less likely as a standalone event.
Major Fire	Per the State's Natural Hazard Mitigation Plan a wildland fire is defined as any non-structure fire, other than prescribed fire that occurs in the wildland. In addition, a wildland-urban interface is defined as the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.	Likely	Per the State's NHMP the State has assigned a medium-low ranking for wildland fires. (See Table 2-107). There have been a number of significant structural fires – commercial, industrial, and historic mills
Mass Evacuation Incident	Evacuations could occur due to both natural and human-caused actions.	Possible	State level (Unlikely), local or regional level (Likely).
Water Contamination	Impacts to public water supply and private wells can be the result of natural disasters, accidents, and deliberate acts of vandalism or terrorism.	Likely	Localized events have occurred. DPH issues boil advisories as needed. Can be secondary hazard to flooding.
Civil Disturbance	Protests, breach of peace, marches.	Possible	Civil disturbances.
Landslide	Unstable soils at construction sites, post-flood/storm erosion, and as a result of earthquakes.	Not Likely	Per CT's 2019 Hazard Mitigation Plan landslides are referenced as a secondary hazard to dam failures, earthquakes, etc.

Discussion: Hazard Identification and Risk Assessment (HIRA)

In addition to identifying natural and human-caused hazards, the DEMHS staff conducted a risk assessment to determine the potential impact of the hazards. A risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from potential hazards. The focus of the risk assessment is to identify what natural and human caused hazards are present in the state and the potential impacts of those hazards and threats. Each hazard was evaluated individually and given a numerical value, as shown in the table below, to assess and quantify the hazard that may impact the state. The table provides definitions in their associated point value system that was created by the DEMHS staff during the evaluation process. Table 1.2.1 shows the category, description, and point system that were used in creating Table 1.2.2.

2019 Update: The same category, description and point system were utilized.

**TABLE 1.2.1 CATEGORY, DESCRIPTION, AND ASSIGNED VALUES FOR HAZARD IDENTIFICATION AND RISK ASSESSMENT.
DEMHS, MARCH 2014, (AND 2019 UPDATE)**

Category	Description	Assigned Values				
		One (1)	Two (2)	Three (3)	Four (4)	Five (5)
Frequency	How often has the hazard occurred in the past.	Never occurred locally.	Since historical record (400 yrs)	Once in past one hundred years.	Once in past 50 years.	Nearly every decade.
Geographic Extent	Size of the affected area. Includes areas not damaged, but strongly affected by the incidents. For example, areas backed up by a transportation accident.	Single site. One or two towns.	In one county.	In multiple counties.	Statewide.	Multi-State or national.
Duration	How long does the acute crisis part of the disaster last.	Less than 24 hrs.	1-3 days.	4-7 days.	7-30 days.	30+ days.
Environmental	How damaging is the disaster for the natural environment.	No damage/temporary minor damage.	Degradation of the ecosystem that will repair itself.	Degradation of the ecosystem that requires intervention.	Functional loss of ecosystem, but restoration possible.	Permanent loss of ecosystem.
Health Effects	How dangerous is the hazard to human health and safety.	No deaths or injuries.	1-10 deaths and/or 1-100 injuries.	11-50 deaths and/or 101-250 injuries.	51-250 deaths and or 250-1000 injuries.	Over 250 deaths and or 1000+ injuries.
Displacement	How likely is the hazard to negatively impact the exposed population in terms of displacement and personal property loss.	No displaced people/minor inconveniences.	Displaced people. Vulnerable population begins to have problems with access to essential supplies.	Displaced people. Vulnerable populations have serious difficulties. General population starting to have problems.	251-1000 people displaced. 5%-30% of population experiencing acute shortages of supplies.	1000+ people displaced. More than 30% of population facing acute shortages of basic supplies and access to services.
Economic Impacts	How does the hazard affect the local economy.	No measurable impacts.	No impacts to overall economy, but isolated businesses experience hardships.	Entire sectors experiencing loss of revenue and capital.	Sectors of economic base affected & unable to generate revenue. Losses range between 1-10% of assessed value.	Physical losses equal to 10% of assessed value. Loss of ability to generate revenue.

Built Environment	How does the hazard affect buildings and physical infrastructure.					
	A: Property	A: No effects	A: 1 to 10 structures damaged	A: 11 to 250 structures damaged	A: 251 to 1000 Structures damaged. Multiple utilities affected up to 25% - 50% loss	A: 1000+ structures damaged. At least two major utilities impacted by 50%+ loss.
	B: Infrastructure (water supply, wastewater, communications)	B: No effects.	B: 1 to 5 public water supplies systems, 1-5 wastewater treatment facilities report failure. Communications.	B: 5 to 10 public water supplies systems.	B: Not applicable.	B: Not applicable.
	C: Power (energy)	C: No effects	C: Power Utilities	C: Multiple utilities affected up to 25% loss.	C: Not applicable.	C: Not applicable.
Transportation	How does the hazard affect the ability of residents and workers to access the resources they need?	No effects on mobility	All critical services accessible*, but delays reaching work or non-essential services. Critical services is critical life sustaining facilities, life sustaining facilities, critical community support facilities, critical infrastructure facilities, and long term sustaining facilities.	One critical service inaccessible. Major state corridors open, but local streets impacted or impassible.	Many critical services inaccessible. One major state corridor inoperable.	Most state corridors inaccessible. Most corridors impassible.
Critical Services (Includes COOP and Responders)	How likely is the hazard to reduce the ability of government business to provide critical services?	Little impairment on critical services	Temporary degradation of 1 critical service	Temporary degradation of multiple critical services. Long-term degradation of 1 critical service.	Temporary degradation of most critical services. Long-term degradation of multiple critical services.	Unable to deliver the most critical services.
Confidence In Government	Would public's confidence in government be shaken?	No	Not applicable	Somewhat	Not applicable	Yes

Based on Table 1.2.1, DEMHS staff undertook the process of assigning values (1 through 5) to each of the hazards and performed calculations to determine a relative ranking (risk) as shown in Table 1.2.2. The calculations were based on the following:

The formula used to find the base score was the sum of the previous 10 parameters of the identified hazards ($BS = \text{SUM}(\text{parameters})/10$).

- The multiplier is the sum of the frequency and the cascading effects ($M = F + CE$).
- The subtotal is the base score multiplied by the multiplier ($S = BS \times M$).
- The Relative Ranking (Risk) is the sum of the subtotal and the future emphasis ($RR = S + FE$).

Listed in Table 1.2.2 are the 26 hazards that have been identified. Of the total, there is only one hazard that has a relative ranking of 54; there are three hazards that have relative ranking in the 30's; there are ten hazards that have relative ranking in the 20's; there are 11 hazards that have relative ranking in the teens; and there is one hazard ranked below ten.

2019 Update: Based on input from SMEs the calculations were finalized. Although, the ranked order of the hazards did not change, the relative ranking number for two hazards changed. 1- Nuclear Facility Incident (from **28** in 2014 to **27.6** in 2019), 2-Food and Agricultural Disaster/Incident (from **24.6** in 2014 to **23.9** for 2019). The changes were based on SME input on and built environment for Food/Agriculture and Health effects for Nuclear Safety Incident based on planning and training.

TABLE 1.2.2 HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA)

Identified Hazards	Category										Base Score (BS)	Frequency (F)	Cascading Effects (®)	Multiplier(M) (F + CE)	Subtotal (BS*M)	Future Emphasis (FE)	Relative Ranking (Risk)
	Geographic extent	Duration	Environment	Health Effects	Displacement	Econ Impacts	Built Environment	Transportation	Critical Services	Confidence in government							
Cyber Incident (H)	5	5	4	5	5	5	5	5	5	5	4.9	5	5	10	47	5	54
Tropical cyclone (N)	5	2	4	3	4	3	4	4	3	3	3.5	5	4	9	31.5	5	36.5
Widespread Infectious Disease (N/H)	5	5	1	4	4	4	1	2	4	5	3.5	5	3	8	28	5	33
Flood Related Hazards (N)	5	3	3	2	3	3	4	3	2	3	3.1	5	4	9	27.9	3	30.9
Significant Criminal Acts (H)	4	3	3	3	2	3	2	3	2	2	2.7	5	4	9	24.3	5	29.3
Nuclear Facility Incident (RERP) (H)	5	5	4	1	5	5	4	4	3	5	4.1	1	5	6	24.6	3	27.6

Energy/ Fuel Shortages (N/H)	4	3	2	2	2	3	3	3	3	3	2.8	5	3	8	22.4	5	27.4
Winter Related Hazards (N)	5	2	2	3	2	2	3	3	2	3	2.7	5	4	9	24.3	3	27.3
Transportation Accidents (H)	2	2	3	2	2	2	2	4	3	3	2.5	5	3	8	20	5	25
Food and Agricultural Disaster/Incident (N/H)	5	5	3	2	1	4	2	1	1	3	2.7	5	2	7	18.9	5	23.9
Sea Level Rise (N)	3	2	3	2	3	2	3	3	3	1	2.5	5	3	8	20	3	23
Port Incidents (H)	3	2	3	2	2	3	2	2	2	3	2.4	5	3	8	19.2	3	22.2
Industrial Incidents (H)	1	2	3	2	2	2	2	3	2	3	2.2	5	3	8	17.6	3	20.6
Temperature Extremes (N)	4	4	2	3	3	2	2	2	2	1	2.5	5	2	7	17.5	3	20.5
Power Failure (N/H)	3	3	1	2	3	2	2	2	2	3	2.3	5	2	7	16.1	3	19.1
Dam Failure (N/H)	1	2	3	2	2	2	2	2	2	3	2.1	4	3	7	14.7	3	17.7
Hazardous Materials Incidents/Accident (in transit) (H)	1	2	3	2	2	2	2	3	2	1	2	5	2	7	14	3	17
Water Contamination (N/H)	2	3	3	2	1	2	2	1	1	3	2	5	2	7	14	3	17
Drought Related Hazards (N)	4	5	3	1	1	2	1	1	1	1	2	5	2	7	14	3	17
Earthquake (N)	2	1	2	2	2	2	2	3	3	1	2	5	2	7	14	3	17
Major fire (N/H)	2	2	2	2	2	2	2	2	1	1	1.8	5	2	7	12.6	3	15.6
Tornado (N)	1	1	3	2	2	2	2	2	2	1	1.8	5	2	7	12.6	3	15.6
Civil Disturbance (H)	1	1	1	2	2	2	2	2	1	3	1.7	5	1	6	10.2	3	13.2
Thunderstorm Related Hazards (N)	3	1	1	2	1	1	1	1	1	1	1.3	5	1	6	7.8	3	10.8
Special Events (H)	1	1	1	1	1	1	1	2	1	1	1.1	5	2	7	7.7	3	10.7
Landslide (N)	1	1	3	2	2	2	2	2	2	1	1.8	1	2	3	5.4	3	8.4

Discussion: State of Connecticut Hazard and Vulnerability Assessment, DEMHS 2014

Table 1.3 provides a State of Connecticut Hazard and Vulnerability Assessment and ranks the likely hazards to aid in determining which hazards are of greatest risk to the state. The relative threat was determined by factoring the following:

- Probability of Occurrence
- Severity of Impact:
 - Potential Loss of Life or Injuries
 - Potential Damages (Property and Business)
 - Operations (Interruption of Services)
- Mitigating Activities:
 - Current Status of Preparedness
 - Internal Response/Resource Capability
 - External Response/Resources Capability

The formula used to determine the Relative Threat Percent is: $SUM ((Probability/3)*Human Impact + Property Impact + Operations Impact + Preparedness + Internal Response + External Response)/18$).

Note: Kaiser Permanente developed a Hazard Vulnerability Analysis tool which was used by DEMHS to develop this table.

TABLE 1.3 STATE OF CONNECTICUT HAZARD AND VULNERABILITY ASSESSMENT

EVENT	PROBABILITY	MAGNITUDE/SEVERITY			MITIGATION			HAZARD RATING
		HUMAN IMPACT	PROPERTY IMPACT	OPERATIONS IMPACT	PREPAREDNESS	INTERNAL RESPONSE	EXTERNAL RESPONSE	Relative threat*
	Likelihood this will occur	Possibility of death or injury	Physical losses and damages (financial)	Interruption of services	Preplanning	Time, effectiveness, resources	Community/ Mutual Aid staff and supplies	
	1 = Low 2 = Moderate 3 = High	1 = Low 2 = Moderate 3 = High	1 = Low 2 = Moderate 3 = High	1 = Low 2 = Moderate 3 = High	1 = High 2 = Moderate 3 = Low or none	1 = High 2 = Moderate 3 = Low or none	1 = High 2 = Moderate 3 = Low or none	0 - 100%
Cyber Incident	3	2	3	3	2	3	2	83%
Tornado	3	3	3	2	2	2	1	72%
Dam failure	3	3	3	3	1	1	1	67%
Tropical Cyclone	3	3	3	3	1	1	1	67%
Flood Related hazards	3	3	3	3	1	1	1	67%
Significant Criminal Acts	3	3	3	3	1	1	1	67%
Winter Related Hazards	3	3	3	3	1	1	1	67%
Transportation Accidents	3	3	3	3	1	1	1	67%
Power failure	3	2	2	3	1	1	2	61%
Sea Level Rise	2	2	2	2	3	3	3	56%
HazMat Incidents Accident (in transit)	3	3	2	2	1	1	1	56%
Industrial Incidents	3	3	2	2	1	1	1	56%
Energy/Fuel Shortages	3	1	1	2	2	2	2	56%
Temperature Extremes	3	3	1	1	1	1	1	44%
Port Incidents	2	2	3	3	1	1	1	41%

Thunderstorm Hazards	3	2	1	1	1	1	1	39%
Special Events	3	2	1	1	1	1	1	39%
Widespread Infectious Disease	2	3	1	3	1	1	1	37%
Food and Agricultural Disaster/Incident	2	2	2	2	1	1	1	33%
Water Contamination	3	1	1	1	1	1	1	33%
Major Fire	2	2	2	2	1	1	1	33%
Earthquake	1	1	1	1	3	3	3	22%
Nuclear Facility Incident	1	2	3	3	1	1	1	20%
Drought Hazards	1	1	2	2	2	2	2	20%
Landslide	1	1	1	1	3	2	2	19%
Civil Disturbance	1	1	1	1	1	1	1	11%

2014 REFERENCES:

- Climate Change Vulnerabilities, A Report by the Governor’s Committee on Climate Change (GSC) Adaptation Subcommittee (2011)
- CT Climate Change Preparedness Plan: Adaptation Strategies for Agriculture, Infrastructure, Natural Resources and Public Health
- DEMHS Regional Emergency Support Plans
- Kaiser Permanente - Hazard Vulnerability Analysis tool
- Local Emergency Operation Plans for the Connecticut’s municipalities
- State of Connecticut, 2014 Connecticut Natural Hazards Mitigation Plan Update
- State of Connecticut, Consequence Management Plan for Deliberately Caused Incidents involving Chemical Agents
- DHS 2013, Fusion Center Assessment Individual Report, Connecticut Intelligence Center (CTIC) / Interviews with DESPP/DEMHS CTIC
- State of Connecticut – websites:
 Dept. of Emergency Services and Public Protection, Division of Emergency Management and Homeland Security, : <http://www.ct.gov/demhs>
 Department of Energy and Environmental Protection, website: <http://www.ct.gov/deep>
 Department of Public Health website: <http://www.ct.gov/dph>
- State of Connecticut, Department of Homeland Security required Threat and Hazard Identification and Risk Assessment (THIRA)
- State of Connecticut, Disaster Debris Management Plan
- State of Connecticut Dam Safety Program (2014)

2019 Update: Subject Matter Experts input, 2019 State Natural Hazard Mitigation Plan, Kaiser Permanente - Hazard Vulnerability Analysis tool

Attachments: 2019 Update to the State Natural Hazard Mitigation Plan, p. 378, Figure 2-67 and p. 379, Table 2-107

2019 Update: Prepared by R. Stewart, Reviewed by Planning Coordinator: B. Bergeron and State Emergency Management Director: W. Hackett



Table 2-107 provides more detail on the individual hazard rankings for each county. Across all counties, winter weather and thunderstorms are notably higher risk hazards, with tornado, flood, and tropical cyclone having a slightly lower, but still significant risk. Dam failure and wildland fire have particularly low risk across all counties.

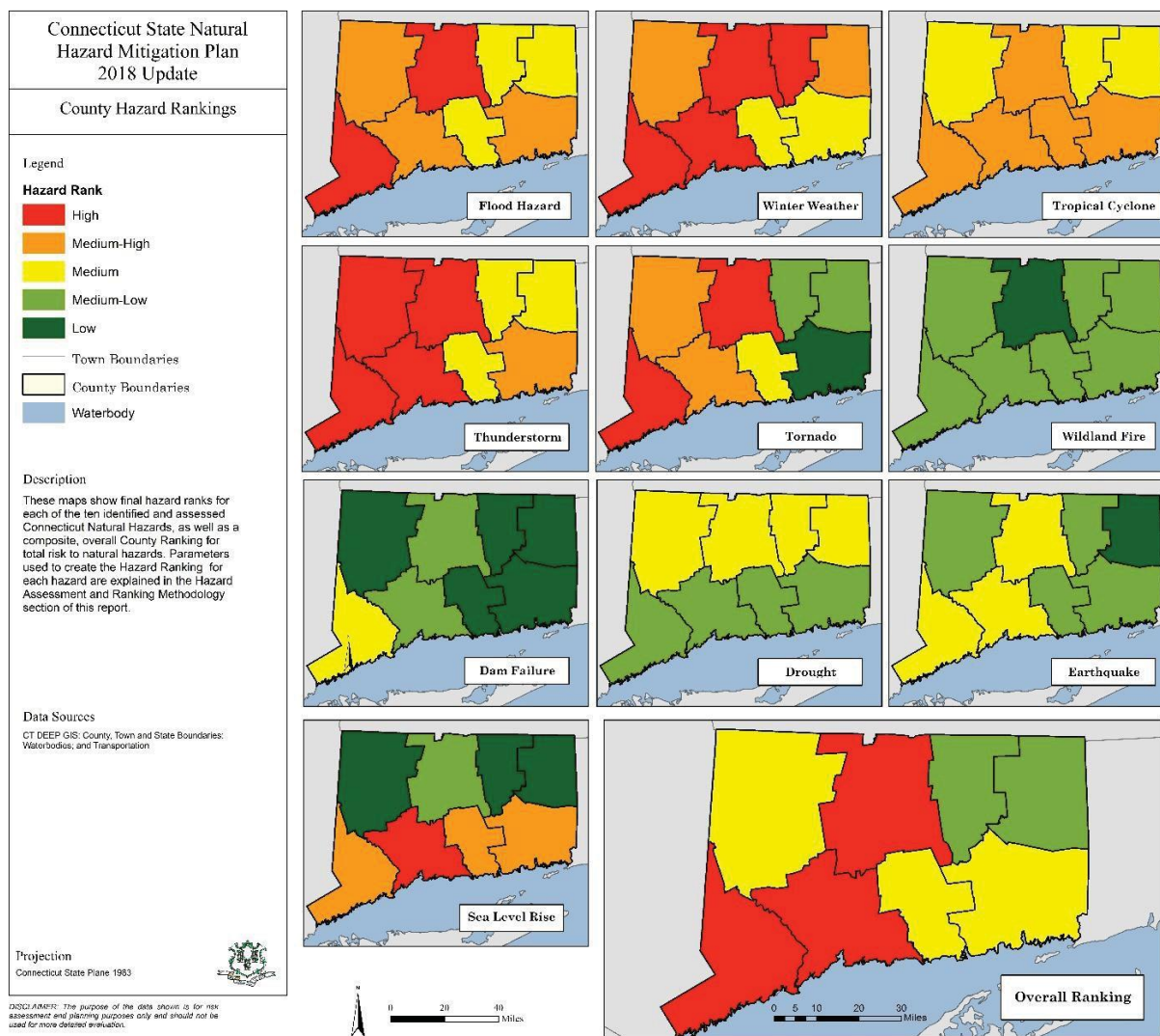


Figure 2-67: Composite County Hazard Ranking



Table 2-107: Hazard Ranking by County for all Hazards

County	Dam Failure Hazard Ranking	Drought Hazard Ranking	Earthquake Hazard Ranking	Flood Hazard Ranking	Sea Level Rise Hazard Ranking	Thunderstorm Hazard Ranking	Tornado Hazard Ranking	Tropical Cyclone Hazard Ranking	Wildland Fire Hazard Ranking	Winter Weather Hazard Ranking
Fairfield	Medium	Medium-Low	Medium	High	Medium-High	High	High	Medium-High	Medium-Low	High
Hartford	Medium-Low	Medium	Medium	High	Medium-Low	High	High	Medium-High	Low	High
Litchfield	Low	Medium	Medium-Low	Medium-High	Low	High	Medium-High	Medium	Medium-Low	Medium-High
Middlesex	Low	Medium-Low	Medium-Low	Medium	Medium-High	Medium	Medium	Medium-High	Medium-Low	Medium
New Haven	Medium-Low	Medium-Low	Medium	Medium-High	High	High	Medium-High	Medium-High	Medium-Low	High
New London	Low	Medium-Low	Medium-Low	Medium-High	Medium-High	Medium-High	Low	Medium-High	Medium-Low	Medium
Tolland	Low	Medium	Medium-Low	Medium	Low	Medium	Medium-Low	Medium	Medium-Low	High
Windham	Low	Medium	Low	Medium	Low	Medium	Medium-Low	Medium	Medium-Low	Medium-High

UConn Threat and Hazard Identification and Risk Assessment (THIRA)

This is a summary of UConn's THIRA process. The actual THIRA is a separate document on file at the UConn Office of Emergency Management.

UConn developed a Threat and Hazard Identification and Risk Assessment (THIRA) to accomplish the following:

- Identify the potential threats and hazards to UConn.
- Determine goals for building UConn's capabilities to deal with such threats and hazards.
- Identify the challenges that could hinder UConn from attaining its capabilities goals.
- List the resources that would be needed to detect threats and respond to the hazards that could impact UConn.

The THIRA development process involved four steps: (1) identify the threats and hazards; (2) specify how those threats and hazards could impact UConn; (3) establish capability targets for detecting, mitigating and responding to the threats and (4) apply the results by identifying the resources that will be needed to achieve those capability targets.

University staff representing various departments led by the Office of Emergency Management took part in development of the THIRA. Development of the THIRA was conducted in accordance with guidance as set forth in the Homeland Security Grant Program Guidance and Comprehensive Preparedness Guide 201: Threat and Hazard Identification and Risk Assessment Guide (CPG-201) Second Edition, August 2013.

The group identified 31 threats and hazards that were divided into three categories: natural, technological, and intentional (human-caused).

Natural

• Animal Disease Outbreak	• Food and Agriculture Disease	• Sea-level rise
• Drought	• Human Disease Outbreak	• Severe winter storm
• Earthquake	• Hurricane	• Vegetation fire
• Extreme Temperatures	• Residential Fire	
• Flooding	• Severe Thunderstorms/High Winds	

Technological

• Communications Failure	• Hazardous Materials (HAZMAT) Incident	• Transportation Failure
• Dam Failure	• Nanotechnology Release - Laboratory	• Radiologic Release
• Laboratory Fire	• Nuclear Facility Incident	

Intentional (Human-Caused)

• Active Shooter	• Civil Disturbance	• Eco-Terrorism (Animal Theft/Animal Release)
• Biological Release	• Cyber Attack	• Improvised Explosive Device (IED)
• Chemical Release	• Vehicle Ramming	• Vehicle-Borne Improvised Explosive Device (VBIED)

After identifying the 31 threats and hazards, the group then narrowed the list of threats to the 6 threats considered to be of primary concern to UConn. While all the threats are a concern, the following 6 threats were selected for the risk they pose to life safety, and/or UConn's critical infrastructure. The threats of primary concern consist of the following:

- Hurricane
- Severe Storm
- Cyber Incident
- Radiological Release
- VBIED
- Vehicle Ramming

Following the identification of the 6 threats of primary concern, the group established the desired outcomes and target capabilities that UConn would like to achieve for each of the 32 core capabilities listed in the National Preparedness Goal. The group also identified the potential impacts or challenges to achieving those target capabilities.

In the final step, the group combined the hazard context statements and the target capability to the resources needed to address the threats of primary concern. In addition, the group identified a number of recommendations to aid UConn in enhancing its ability to detect, mitigate and respond to threats and hazards. These recommendations included the following:

- Look for gaps in staffing or other resources that could leave UConn vulnerable to one of the threats or hazards identified in the THIRA. Collaborate with other organizations to share resources to respond to threats or hazards.
- Ensure plans and procedures address the threats of primary concern and clearly outline the roles and responsibilities of staff with a role in response.
- Acquire necessary software, equipment, supplies and personal protective equipment (PPE) to address and respond to the threats and hazards identified in the THIRA.
- Train staff, faculty and students in their roles and responsibilities in the response plans and procedures.
- Conduct periodic exercises to test the ability of UConn to identify, respond to and recover from the threats and hazards identified in the THIRA.

Collaborative gathering of institutional knowledge and stakeholder involvement.

Over several meetings with university officials across UConn' campuses a threat and hazard vulnerability assessment was conducted to determine the hazards that would potentially impact each UConn campus. During this collaboration stakeholders identified a list of threats and hazards shown in the second column in the chart below. These threats and hazards were then compared to the ones identified in the State HIRA. Each threat and hazard were discussed to determine whether or not they impacted a specific campus. Most of the natural, technological, and human-made hazards identified may impact any or all UConn campuses. The UConn Emergency Operations Plan is an all-hazards plan with the flexibility to address campus-specific threats and hazards.

UCONN HAZARDS

	STATE HIRA	UConn Identified Threats & Hazards	Avery Point	Hartford	School of Law	Stamford	Storrs	Waterbury	UConn Health	
Natural Hazards	Tropical Cyclone	Tropical Cyclone	X	X	X	X	X	X	X	
	Winter Related Hazards	Severe Winter Storm	X	X	X	X	X	X	X	
	Flood Related Hazards	Flooding	X	X	X	X	X	X	X	
	Tornado	Tornado	X	X	X	X	X	X	X	
	Earthquake	Earthquake	X	X	X	X	X	X	X	
	Thunderstorm Related Hazards	Thunderstorm & High Winds	X	X	X	X	X	X	X	
	Widespread Infectious Disease	Human Disease Outbreak	X	X	X	X	X	X	X	X
		Animal Disease Outbreak	X					X		X
	Major fire	Vegetation Fire	X	X	X	X	X	X	X	X
		Residential Fire	X	X	X	X	X	X	X	X
		Laboratory Fire	X	X	X	X	X	X	X	X
	Drought Related Hazards	Drought	X	X	X	X	X	X	X	
	Sea Level Rise		X			X				
	Temperature Extremes		X	X	X	X	X	X	X	
Food and Agriculture Disaster/Incident						X		X		
Landslide										

Technological Incidents	Cyber Incident		X	X	X	X	X	X	X
	HazMat Incident /Industrial Incidents	HazMat Release	X	X	X	X	X	X	X
	Power Failure	Power Failure	X	X	X	X	X	X	X
	Dam Failure	Dam Failure	X	X	X	X	X	X	X
		Water Failure	X	X	X	X	X	X	X
		Sewer Failure	X	X	X	X	X	X	X
		Gas Failure		X	X		X		
		Building Failure	X	X	X	X	X	X	X
		Telecommunications Failure	X	X	X	X	X	X	X
	Nuclear Facility Incident	Radiological Release	X	X	X	X	X	X	X
	Transportation Accidents	Transportation System Failure	X	X	X	X	X	X	X
		Nanotechnology Release - Laboratory					X		
		High Density Off-Campus Housing					X		
		Plant Based Research				X			
		Tangential Building System Failure		X	X				
	Energy/Fuel Shortages								
Human made Hazards	Significant Criminal Acts	Active Shooter	X	X	X	X	X	X	X
		IED man-Portable	X	X	X	X	X	X	X
		VBIED	X	X	X	X	X	X	X
		Chemical Release	X	X	X	X	X	X	X
		Biological Release	X	X	X	X	X	X	X
		Vehicle Ramming	X	X	X	X	X	X	X
	Civil Disturbance	Civil Disturbance	X	X	X	X	X	X	X
		Theft and Robbery	X	X	X	X	X	X	X
		Unlawful Presence	X	X	X	X	X	X	X
		Eco-Terrorism	X			X			
		Port Incidents	X						
	Special Events								