



Business Resiliency and Recovery Plan



Lower Connecticut River Valley
Council of Governments

Comprehensive Economic Development Strategy

September 2023

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Business Guide under separate cover

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INTRODUCTION

The Comprehensive Economic Development Strategy (CEDS) Business Resilience and Recovery Plan will serve as a preliminary tool for the Lower Connecticut River Valley Council of Governments (RiverCOG) towns to identify risks and vulnerabilities of businesses that are most critical for the short-term resiliency of their communities and businesses before a natural disaster event. It provides guidance on next steps to help these critical and essential businesses survive and remain viable, not only for the sake of the business entities, but for their communities as well.

In April 2023, RiverCOG adopted a CEDS for the Lower Connecticut River Valley (LCRV) region. The CEDS is a regional economic development plan, which is developed through a process created by the US Economic Development Administration and intended to support economic resiliency and growth across a region. The creation of this Business Resilience and Recovery Plan emerged as a recommendation of the CEDS in order to support the region's economic resiliency following a natural disaster event.

The recommendation was intended to build upon the 2021 regional update process for 15 of the 17 LCRV communities' Natural Hazard Mitigation Plan (NHMP).

“Hazard mitigation is defined as the use of long and short-term strategies to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster. It involves strategies such as planning, policy changes, programs, projects, and other activities that can mitigate the impacts of hazards. The responsibility for hazard mitigation lies with many, including private property owners; business and industry; and local, state and federal government.

The federal Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390) and implementing regulations (Title 44 CFR, Part 206, Subpart N) required state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. Prior to 2000, federal disaster funding focused on disaster relief and recovery, with limited funding for hazard mitigation planning. The DMA increased the emphasis on planning for disasters before they occur.

The DMA encourages state and local authorities to work together on pre-disaster planning, and it promotes sustainability for disaster resistance. Sustainable hazard mitigation includes the sound management of natural resources and the recognition that hazards, and mitigation, must be understood in the largest possible social and economic context. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk reduction projects.”

From RiverCOG conversations with municipal staff during the NHMP planning process one of many themes that emerged was how private businesses play a significant role in the short-term recovery of a community during and after a natural hazard event. This preliminary plan seeks to provide a model of how to identify where these businesses are located and how vulnerable they are to a chosen natural hazard which has been identified in the NHMP as one LCRV communities agree they are concerned about and one most likely to occur.

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ECONOMIC CONTEXT

Economic Context

Quick facts about the economy

- The local economy has returned to pre-pandemic levels in terms of GDP, jobs and income.
- Employment has grown steadily, but at a much slower pace than in previous decades.
- The key sectors of employment have not changed since 2014, but the top four sectors have lost more than 2,300 jobs since 2019.
- Self-employment continues to gain importance.
- The Lower Connecticut River Valley imports the majority of its workers from other parts of Connecticut.
- The workforce is growing older and more diverse as is the local population.

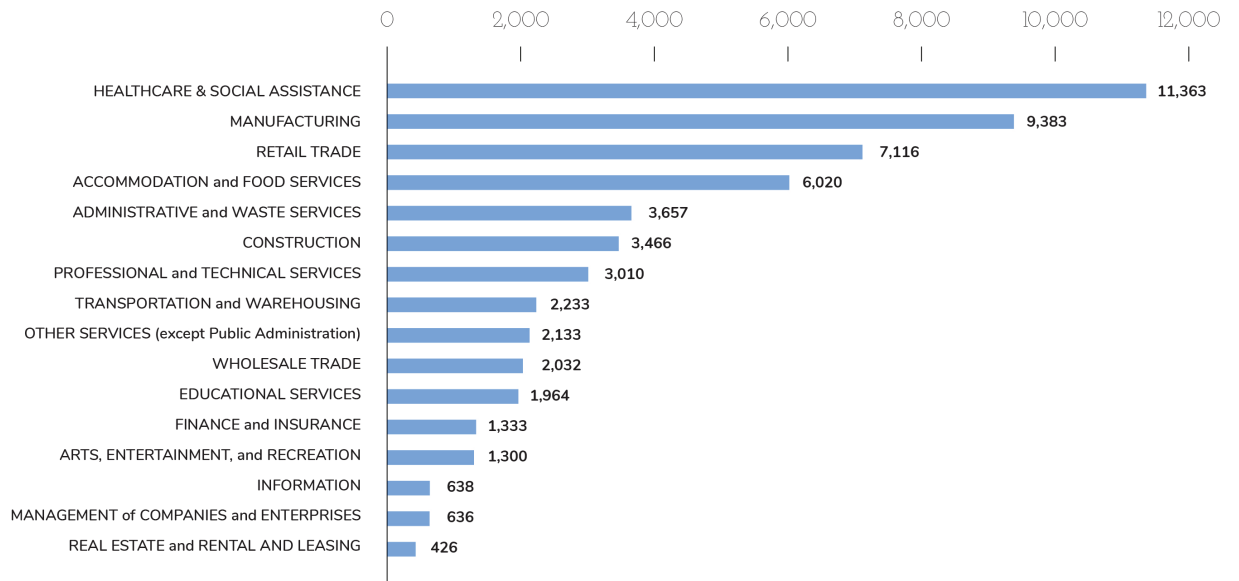
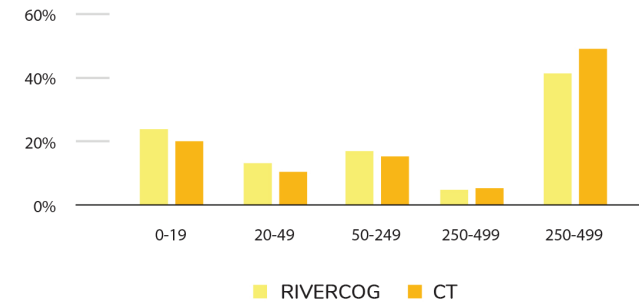
Employment and Jobs

Currently, the region hosts approximately 100,000 jobs. Healthcare and social services, manufacturing, retail and hospitality are the key contributors to employment in the LCRV region. Self-employment and employment in smaller firms represent more than 20% of total employment.

The importance of healthcare and social assistance related jobs, the tourism industry as well as the high level of self-employment place an increase emphasis on understanding which sectors are most exposed to natural hazard risk.

Employment by Size of Firm

Source: LEHD Q3 2021



Private wage and salary employment

Source: NP calculations from BLS.gov & BEA.gov

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NATURAL HAZARDS



2018 flooding in Chester



2018 Liberty Street bridge collapse in Chester

Resilience and hazard mitigation

In 2020 RiverCOG updated the region’s Natural Hazard Mitigation Plan (NHMP) and conducted an assessment of the resilience of 15 of its 17 communities to natural hazards and disasters (access the plan here: <https://www.rivercog.org/plans/natural-hazard-mitigation-plan/>.)

A number of natural hazards were identified and ranked in terms of potential impact on the region (NHMP, Table 2-7). The highest score was 50.8; the lowest score 14.3. The four highest for additional consideration and planning emphasis included:

Hazard Type	Score	Hazard Planning Consideration
Winter Storms	50.8	Significant
Flood / Storm Surge	43.6	Significant
Severe Weather	33.87	Significant
Hurricanes (wind)	35.07	Significant

As part of the NHMP, economic impacts were calculated using value of property at risk methodologies (VAR) based on the **FEMA HAZUS model** (for more information, see <https://www.fema.gov/flood-maps/tools-resources/flood-map-products/hazus/about>). The Lower Connecticut River Valley CEDs examined the four threats considered significant to understand the potential impacts based on the value of property at risk methodology.

For some of these categories there can be tremendous differences to potential losses based on the risk category, location and severity of the event. For example, the winter storm VAR estimates \$7.6b in building value at risk. Alternatively, a riverine flooding situation is measured against the type of event ranging from a 10 year flood even to a 500 year flood event. A 10 year flood event may impact 15 communities with a potential loss level of \$460m (2020) and a 500 year flood event totaling over \$1.4b. Similarly, losses from hurricanes show a range from \$2.6m to more than 1.4b for a 1000 year wind event. A 100 year wind event estimates losses at \$144m with approximately 2800 buildings sustaining damage based on the model.

Natural Hazards

Floods, nor'easters and hurricanes are among the region's most significant natural hazard risks. The potential for economic losses from these various hazards is critical.

Projected Sea Level Rise

In the long term, sea level rise will also have a significant impact. Based on a [2019 report on Sea Level Rise in Connecticut](#) developed by the Department of Marine Sciences and the Connecticut Institute for Resilience and Climate Adaptation (CIRCA) at the University of Connecticut, the region is projected to experience two feet of sea level rise by 2050.

The coastal communities of Old Lyme, Old Saybrook, Westbrook, and Clinton will be most vulnerable to the effects of sea level rise. However, properties along the Connecticut River can also expect significant impacts due to the river's tidal influence.



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EXPOSURE ANALYSIS

Relevance of Flood and Storm Surge Exposure Analysis and Business Impact

As noted earlier, the LCRV hosts more than 100,000 employees. However, the distribution of these jobs are spread across the region’s communities each of which have different levels of exposure to natural hazards. Middletown, Old Saybrook, Clinton and Westbrook contain more than 40% of jobs in the region and also possess some of the highest risk from floods and storm surge.

All businesses are critical businesses. However, recovering from a natural disaster means ensuring that vital critical businesses upon which other businesses depend either for personal services such as child care, healthcare, food, energy and power are able to come back online quickly is the basic building block of a resilient, local economy.

Employees and Establishments within the LCRV area

Source: State of Connecticut Department of Labor Quarterly Census of Employment and Wages (QCEW).

Town	QCEW Establishments	QCEW Employees
Middletown	1,564	29,006
Cromwell	550	6,871
Old Saybrook	678	5,889
Clinton	504	4,163
Essex	432	3,650
Westbrook	281	3,311
Durham	259	2,617
Portland	324	2,489
Old Lyme	342	2,242
East Hampton	323	2,111
Middlefield	176	1,919
East Haddam	215	1,494
Haddam	241	1,348
Killingworth	177	865
Lyme	66	206

Note: Deep River is not included in the CT LMI city and town data. For more information, visit https://www1.ctdol.state.ct.us/lmi/202/202_quarterlyaverage.asp

Critical businesses within the Lower Connecticut River Valley

Critical business types were selected from the list on the premise that they were the business types that would be most useful in the short term recovery of a community after a natural disaster.

The critical business types identified include:

- Grocery stores and other food retailers.
- Pharmacies.
- Service gasoline stations and fuel retailers.
- Medical, child care, and senior care providers.
- Utilities and support services.
- Telecommunications, broadcasting and content providers
- Computing Infrastructure Providers
- Libraries and other Information Services
- Insurance Carriers
- Educational services.
- Hotels and motels.
- Restaurants and food service.
- Laundry services (excluding janitorial services).
- Religious organizations, community and social services.
- Construction (material suppliers, specialty contractors, etc).
- Wholesale and retail merchants (excluding clothing, furniture, general merchandise, and sports goods retailers).

- Public transportation facilities and support services (excluding pipeline transportation, postal service, courier service, and warehouse and storage).
- Government and public safety.
- Environmental clean-up and restoration.

Methodology for compiling business data

Sources: CT Business Inventory Master List (1,048,575 records), Retail Gasoline Dealers, CT Gasoline and Fuel Dealers, and CT Grocery Stores / Pharmacies / Senior Centers.

Steps:

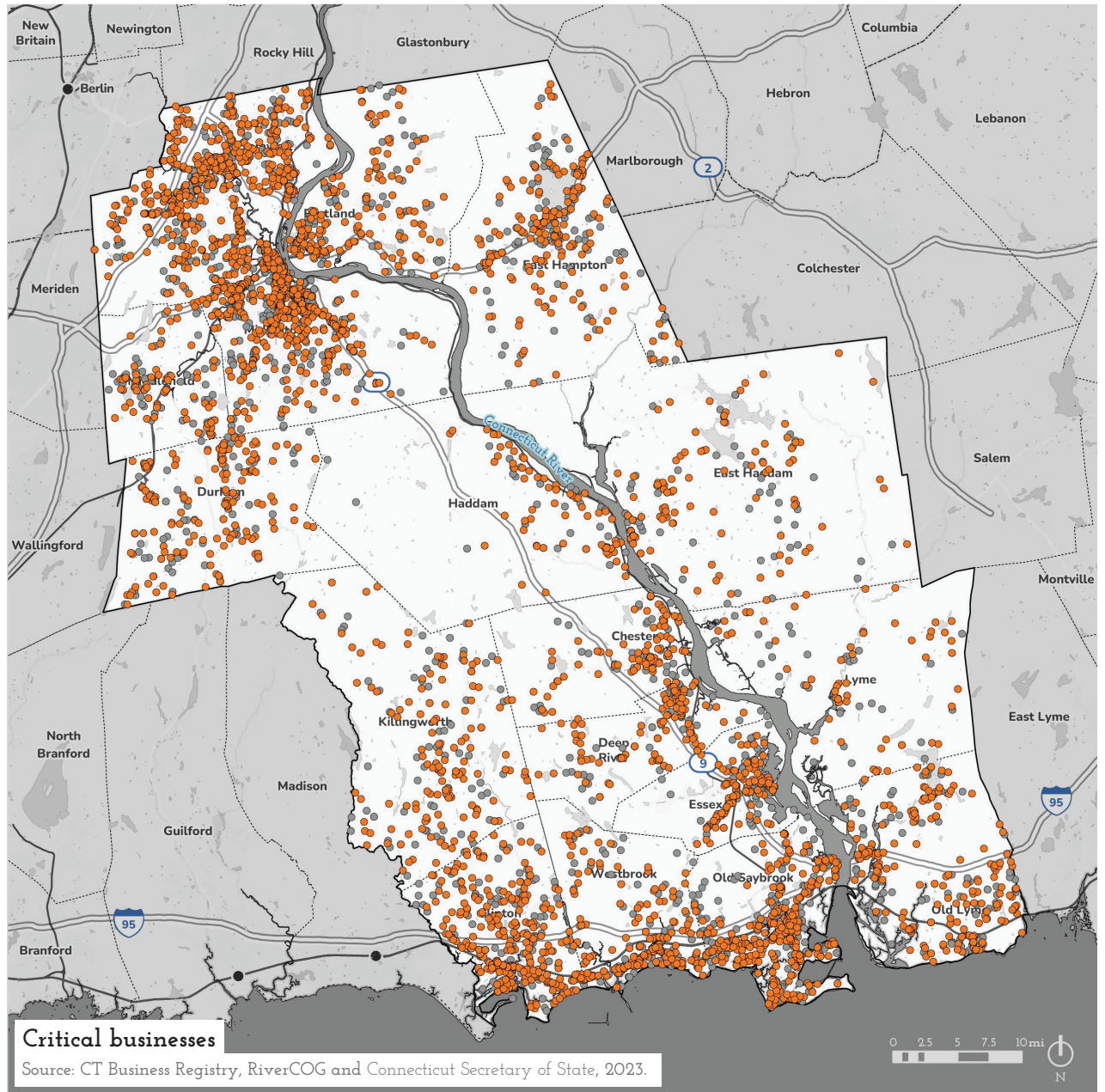
1. All businesses were compiled in a single list. These were filtered by geographic location and, subsequently, by business license status. Only businesses within the Lower Connecticut Valley Region with an active business license were selected.
2. Businesses were filtered by business type, selecting only businesses deemed critical to protect in the event of flooding:
 - Businesses with available NAICS codes were further standardized to show NAICS code number and Business Type.
 - Businesses without available NAICS codes were categorized manually based on business names containing critical keywords.

- Businesses without NAICS codes and without a critical keyword identifier were labeled as “Unknown”.
3. Critical businesses with their corresponding NAICS code and business category label were mapped in ArcGIS using Address Geocoding to ensure as close of a match between the business address and its geographic location as possible. The match was made using address point locations, which are often centered on the building or the parcel centroid.

It is important to note that while address geocoding can provide highly accurate results, this depends on many factors, including the quality of the address databases, and should always be verified on the field with the most current business records available.

On the map to the right, the critical businesses are clustered mainly in the northern and shoreline areas of the Lower Connecticut River Valley.

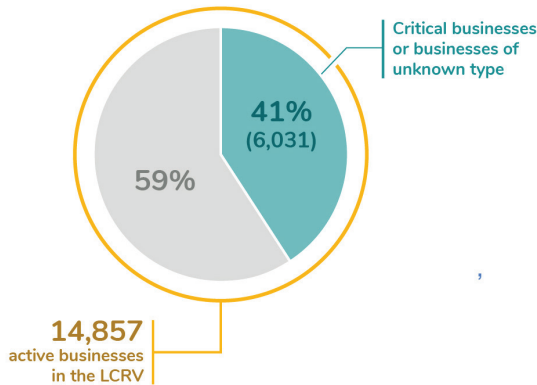
Businesses of unknown type are also included in the mapping and analysis as some may be identified as critical upon further analysis at the town level.



Critical businesses by town

There are 14,857 companies with an active business license in the LCRV. Out of these, 6,031 businesses were identified as critical or potentially critical, representing 41% of all businesses in the LCRV.

2,223 businesses could not be classified by the type of business and are marked “unknown.” These businesses will need further investigation at the town level to determine if they fall into the critical business category.



Breakdown of establishments with active business licenses in the LCRV area

Source: Interface Studio with data from RiverCOG and CT Secretary of State Business Inventory.

Note: Additional information regarding impacted businesses of unknown type can be found in the appendix.

Town	CRITICAL		UNKNOWN		TOTAL Critical Businesses and Businesses of Unknown Type by TOWN	
	Count	% region	Count	% region	Total count	% region
Chester	91	1.5%	48	0.8%	139	2.3%
Clinton	316	5.2%	159	2.6%	475	7.9%
Cromwell	330	5.5%	151	2.5%	481	8.0%
Deep River	114	1.9%	69	1.1%	183	3.0%
Durham	171	2.8%	95	1.6%	266	4.4%
East Haddam	100	1.7%	65	1.1%	165	2.7%
East Hampton	202	3.3%	144	2.4%	346	5.7%
Essex	161	2.7%	106	1.8%	267	4.4%
Haddam	68	1.1%	35	0.6%	103	1.7%
Killingworth	153	2.5%	73	1.2%	226	3.7%
Lyme	61	1.0%	35	0.6%	96	1.6%
Middlefield	83	1.4%	85	1.4%	168	2.8%
Middletown	987	16.4%	588	9.7%	1575	26.1%
Old Lyme	218	3.6%	131	2.2%	349	5.8%
Old Saybrook	399	6.6%	239	4.0%	638	10.6%
Portland	171	2.8%	91	1.5%	262	4.3%
Westbrook	183	3.0%	109	1.8%	292	4.8%
TOTAL LCRV	3,808	63.1%	2,223	36.9%	6,031	100%

Essential businesses within the Lower Connecticut River Valley

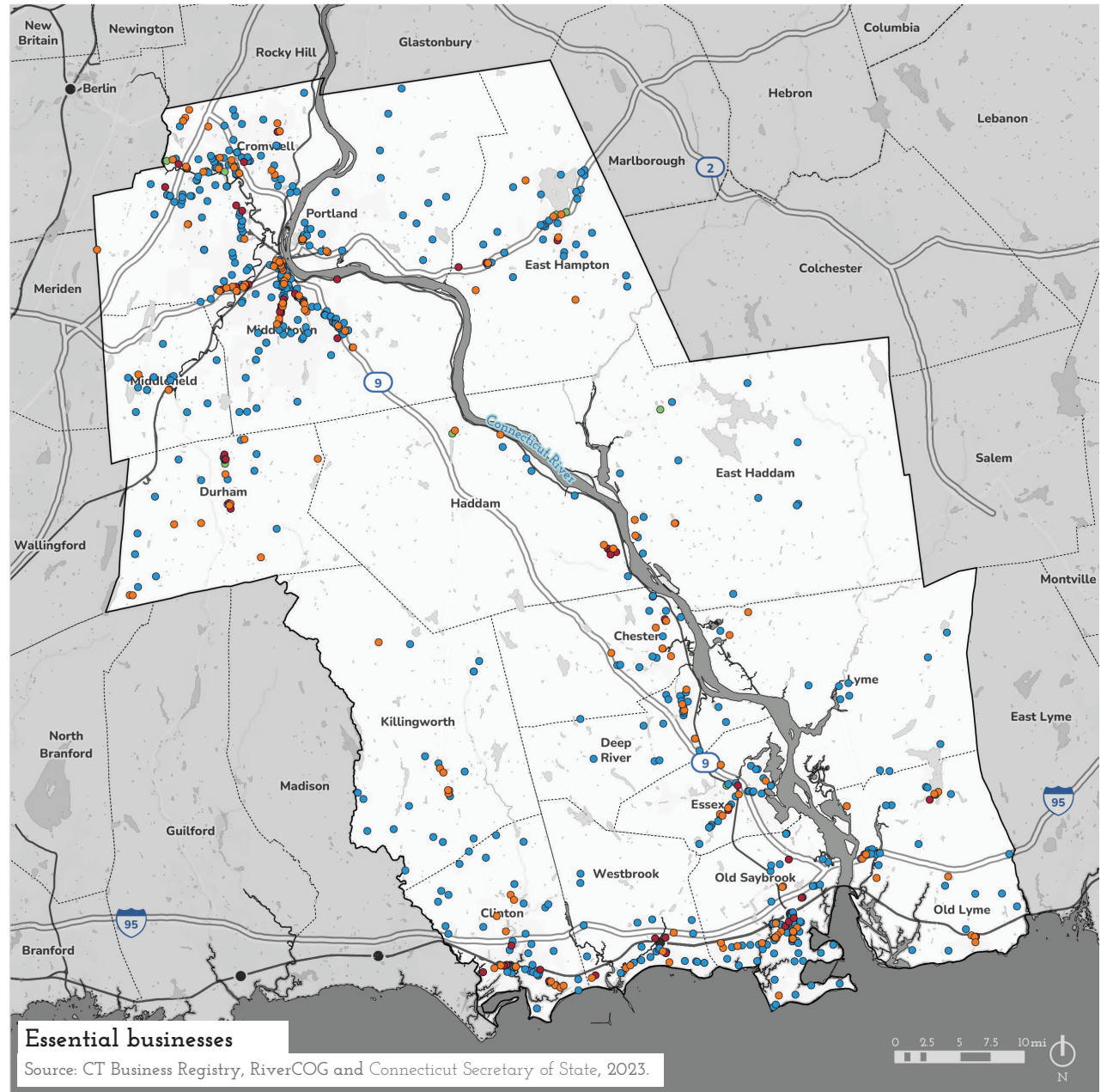
RiverCOG further identified essential businesses that are priorities for maintaining functionality during and after a natural disaster.

Essential business types were chosen as most critical for a community to maintain food, fuel, and immediate medical needs during and immediately after a natural disaster.

Essential business types were chosen as those that were most important for a community to ensure the continuity of operations of during and after a natural disaster to ensure the health and safety of residents and emergency responders. Protecting them from flooding could be part of this continuity of operations planning for these businesses by a community but it is not the only concern.

The essential businesses identified include:

- Gas stations
- Groceries
- Health care/hospitals
- Pharmacies



Essential businesses by town

Town	ESSENTIAL	TOTAL by town	
	Count	% essential businesses	% all critical businesses
Chester	25	2.6%	0.4%
Clinton	68	7.0%	1.1%
Cromwell	104	10.7%	1.7%
Deep River	26	2.7%	0.4%
Durham	33	3.4%	0.5%
East Haddam	17	1.8%	0.3%
East Hampton	50	5.2%	0.8%
Essex	46	4.7%	0.8%
Haddam	16	1.7%	0.3%
Killingworth	28	2.9%	0.5%
Lyme	13	1.3%	0.2%
Middlefield	19	2.0%	0.3%
Middletown	284	29.3%	4.7%
Old Lyme	49	5.1%	0.8%
Old Saybrook	123	12.7%	2.0%
Portland	33	3.4%	0.5%
Westbrook	35	3.6%	0.6%
TOTAL LCRV	969	100%	16%

Of the 6,031 businesses identified as critical or potentially critical but of unknown type, 969 (16%) were considered most essential, indicating that these businesses are vital to a community's ability to meet food, fuel, and immediate medical needs in the event of a natural disaster or its aftermath.

Exposure analysis by flood hazard areas

The Federal Emergency Management Agency (FEMA) works with communities to identify flood hazards, assess flood risks, and provide accurate data for flood maps that support the National Flood Insurance Program (NFIP). The NFIP offers coverage for physical losses to structure and belongings, and different flood insurance and building requirements apply to different flood hazard areas.

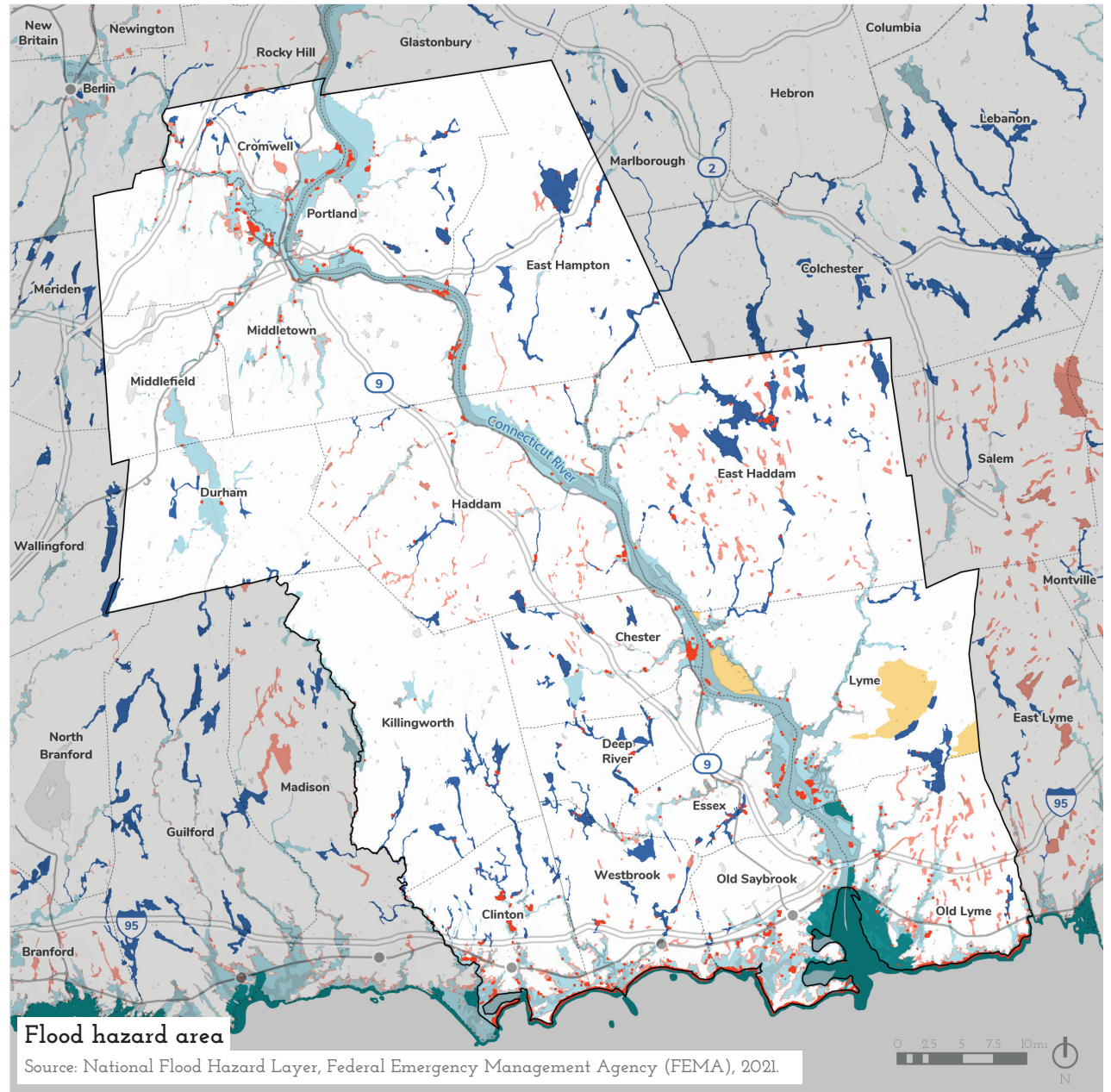
For the purposes of the exposure analysis, critical and essential businesses that fell into the High Risk Flood Areas were mapped and counted by town.

High Risk Flood Areas - Special Flood Hazard Areas (SFHA):

- A - 1% annual chance of flooding (without Base Flood Elevation)
- AE - 1% annual chance of flooding (with Base Flood Elevation)
- AH/AO - 1% or greater change of shallow annual flooding
- VE - 1% or greater chance of flooding with storm waves (High Risk Coastal Flood Hazard)

Low to Moderate Risk Flood Areas - Non-Special Flood Hazard Areas (NSFHA):

- B - 0.2% annual chance of flood hazard
- X - greater than 0.2% annual chance flood hazard (Minimal Flood Hazard)



Flood hazard area

Source: National Flood Hazard Layer, Federal Emergency Management Agency (FEMA), 2021.

High Risk Flood Areas - Special Flood Hazard Areas (SFHA)

- 100-year Floodplain Land Cover
- A
- AE / AH / AO
- VE

Low to Moderate Risk Flood Areas - Non-Special Flood Hazard Areas (NSFHA)

- B - 0.2% Annual Chance Flood Hazard
- Area Not Included

Flooding impact on critical businesses

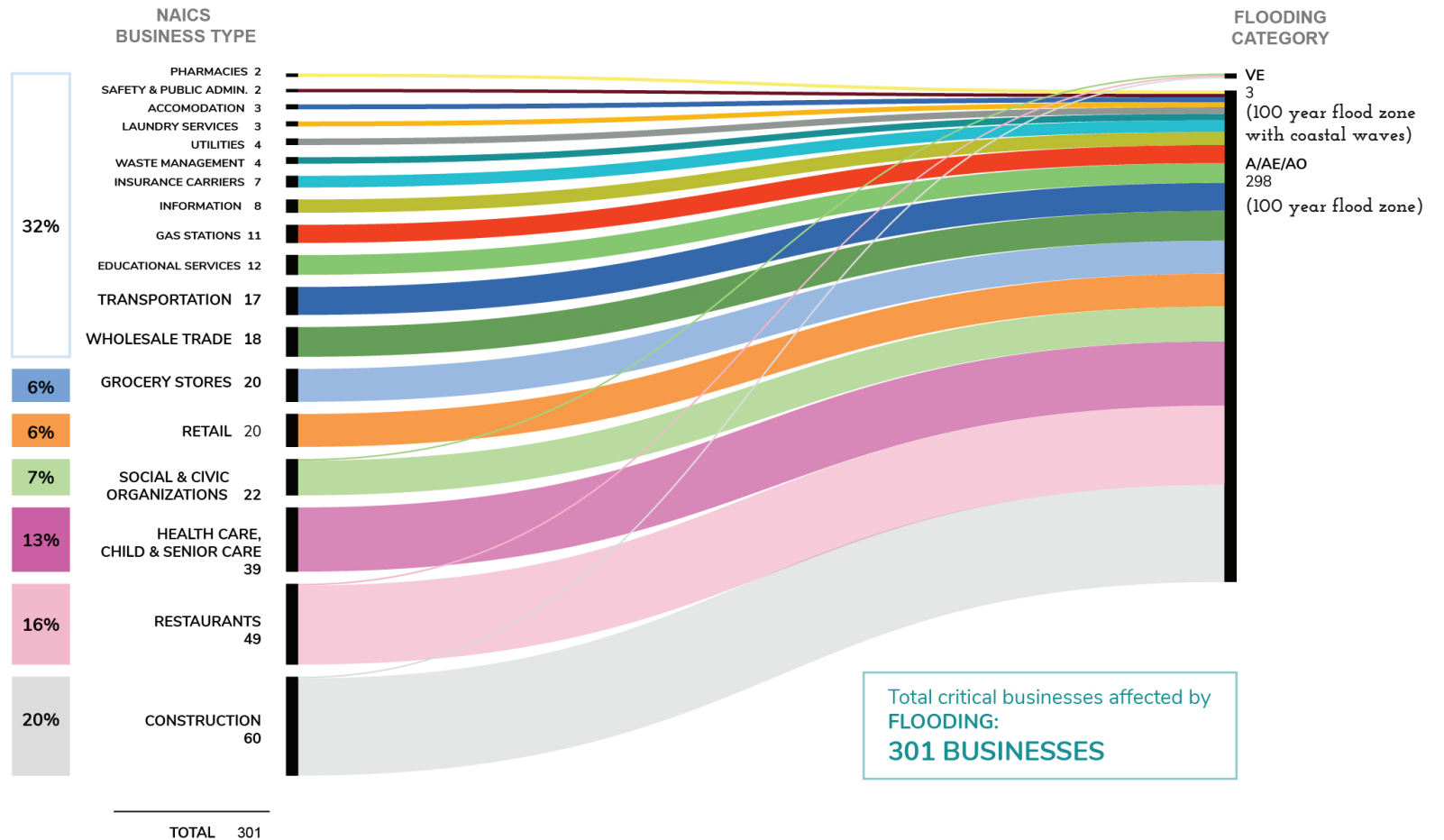
301 critical businesses are exposed to flood, representing 8% all critical businesses within the LCRV region.

Towns most impacted:

- Old Saybrook
- Middletown
- Cromwell
- Clinton

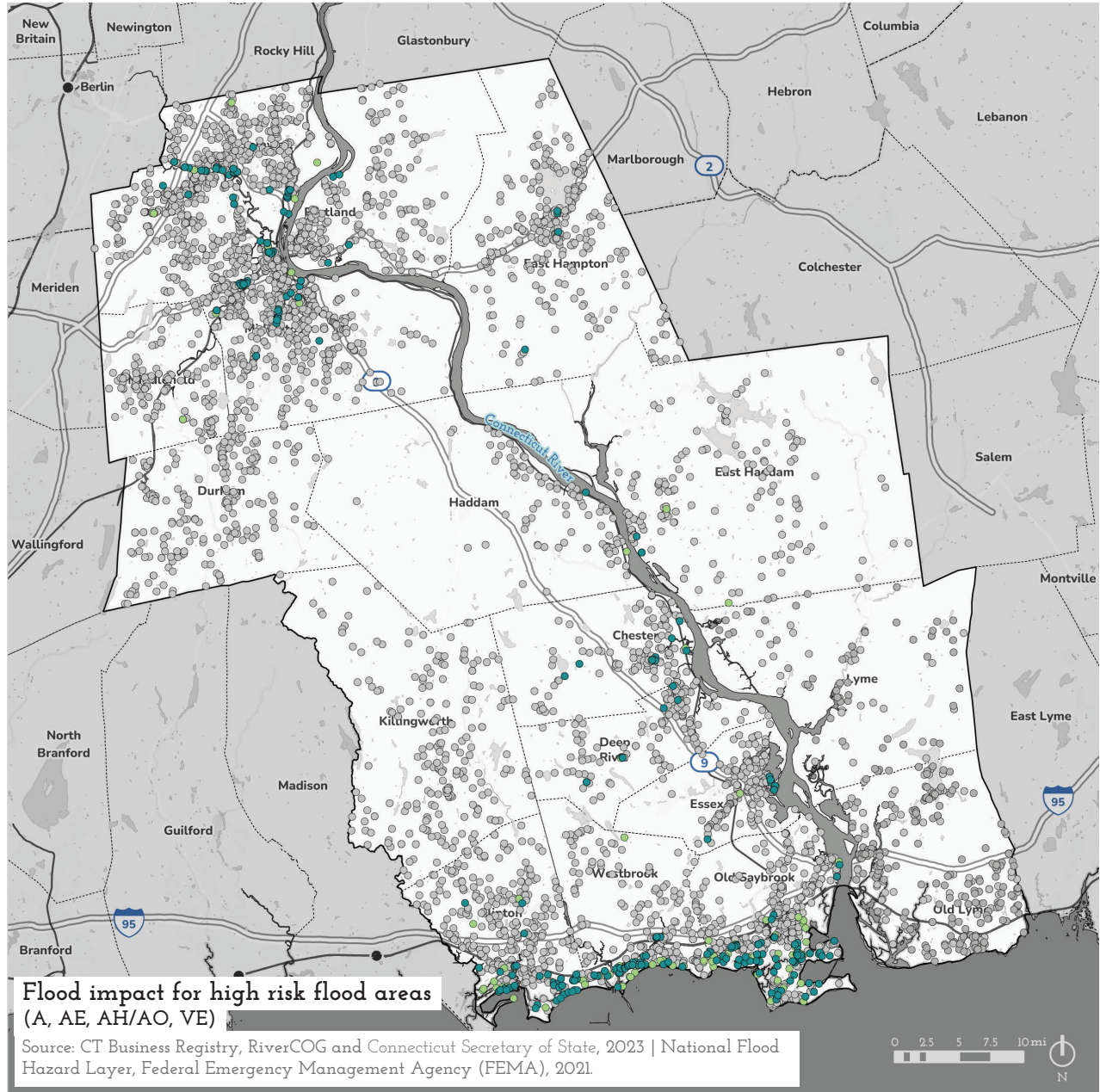
Industries most impacted:

- Building and construction
- Restaurants
- Health care, child care, and senior care.



Exposure to flooding by town

Town	CRITICAL	UNKNOWN	TOTAL by town
Chester	10	7	17
Clinton	48	23	71
Cromwell	52	31	83
Deep River	6	3	9
Durham	0	0	0
East Haddam	4	2	6
East Hampton	5	1	6
Essex	13	4	17
Haddam	1	1	2
Killingworth	0	0	0
Lyme	0	0	0
Middlefield	0	5	5
Middletown	55	21	76
Old Lyme	0	0	0
Old Saybrook	72	46	118
Portland	4	0	4
Westbrook	31	32	63
TOTAL region	301	176	477



Exposure to flooding by town - critical businesses (within High Risk Flood Areas A, AE, AH/AO, VE)

Town	High Risk Flooding	High Risk Coastal Flooding	Subtotal impacted	% impacted within town	Minimal or no flooding impact	TOTAL critical
	A, AE, AH/AO	VE				
Chester	10	0	10	11%	81	91
Clinton	45	3	48	15%	268	316
Cromwell	52	0	52	16%	278	330
Deep River	6	0	6	5%	108	114
Durham	0	0	0	0%	171	171
East Haddam	4	0	4	4%	96	100
East Hampton	5	0	5	2%	197	202
Essex	13	0	13	8%	148	161
Haddam	1	0	1	1%	67	68
Killingworth	0	0	0	0%	153	153
Lyme	0	0	0	0%	61	61
Middlefield	0	0	0	0%	83	83
Middletown	55	0	55	6%	932	987
Old Lyme	0	0	0	0%	218	218
Old Saybrook	72	0	72	18%	327	399
Portland	4	0	4	2%	167	171
Westbrook	31	0	31	17%	152	183
TOTAL region	298	3	301	8%	3,507	3,808

301 critical businesses are exposed to flood impact, representing 8% all critical businesses within the LCRV region.

The most heavily impacted towns are Old Saybrook, where 18% of critical businesses are impacted; Westbrook, where 17% of critical businesses are impacted; Cromwell, where 16% of critical businesses are impacted; and Clinton, where 15% of critical businesses are impacted.

Note: subarea maps of exposure to flood and hurricane surge inundation and counts by town can be found in the appendix.

Exposure to flooding by town - businesses of unknown type (within High Risk Flood Areas A, AE, AH/AO, VE)

Town	High Risk Flooding	High Risk Coastal Flooding	Subtotal impacted	% impacted within town	Minimal or no flooding impact	TOTAL unknown
	A, AE, AH/AO	VE				
Chester	7	0	7	15%	41	48
Clinton	22	1	23	14%	136	159
Cromwell	31	0	31	21%	120	151
Deep River	3	0	3	4%	66	69
Durham	0	0	0	0%	95	95
East Haddam	2	0	2	3%	63	65
East Hampton	1	0	1	1%	143	144
Essex	4	0	4	4%	102	106
Haddam	1	0	1	3%	34	35
Killingworth	0	0	0	0%	73	73
Lyme	0	0	0	0%	35	35
Middlefield	5	0	5	6%	80	85
Middletown	21	0	21	4%	567	588
Old Lyme	0	0	0	0%	131	131
Old Saybrook	44	2	46	19%	193	239
Portland	0	0	0	0%	91	91
Westbrook	28	4	32	29%	77	109
TOTAL region	169	7	176	8%	2,047	2,223

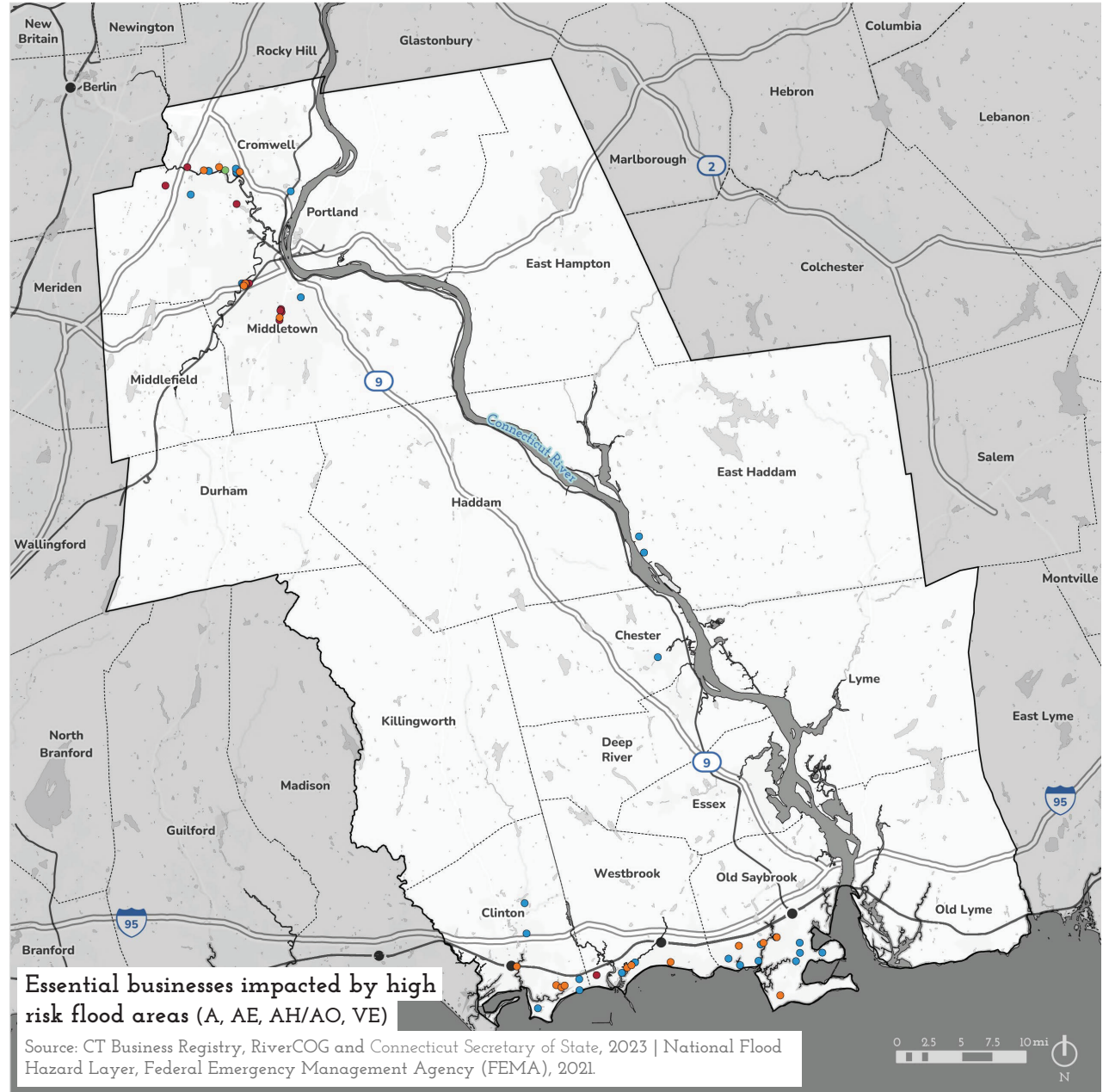
176 businesses of unknown type are exposed to flood impact, representing 8% of the total businesses of unknown type within the LCRV region.

The subarea maps and tables in this section provide counts and general locations of businesses impacted by hurricane surge inundation to help guide towns in conducting a finer-grained identification of impacted businesses of unknown type to determine which may in fact be categorized as critical or essential.

Essential businesses impacted by flooding

Shoreline businesses are most impacted by flooding and represent the most important businesses in the region. **Old Saybrook is home to nearly 30% of the impacted essential businesses**, followed by Middletown (22%), Cromwell (21%), and Clinton (17%).

Town	ESSENTIAL
Chester	1
Clinton	12
Cromwell	15
Deep River	0
Durham	0
East Haddam	2
East Hampton	0
Essex	0
Haddam	0
Killingworth	0
Lyme	0
Middlefield	0
Middletown	16
Old Lyme	0
Old Saybrook	20
Portland	0
Westbrook	6
TOTAL region	72

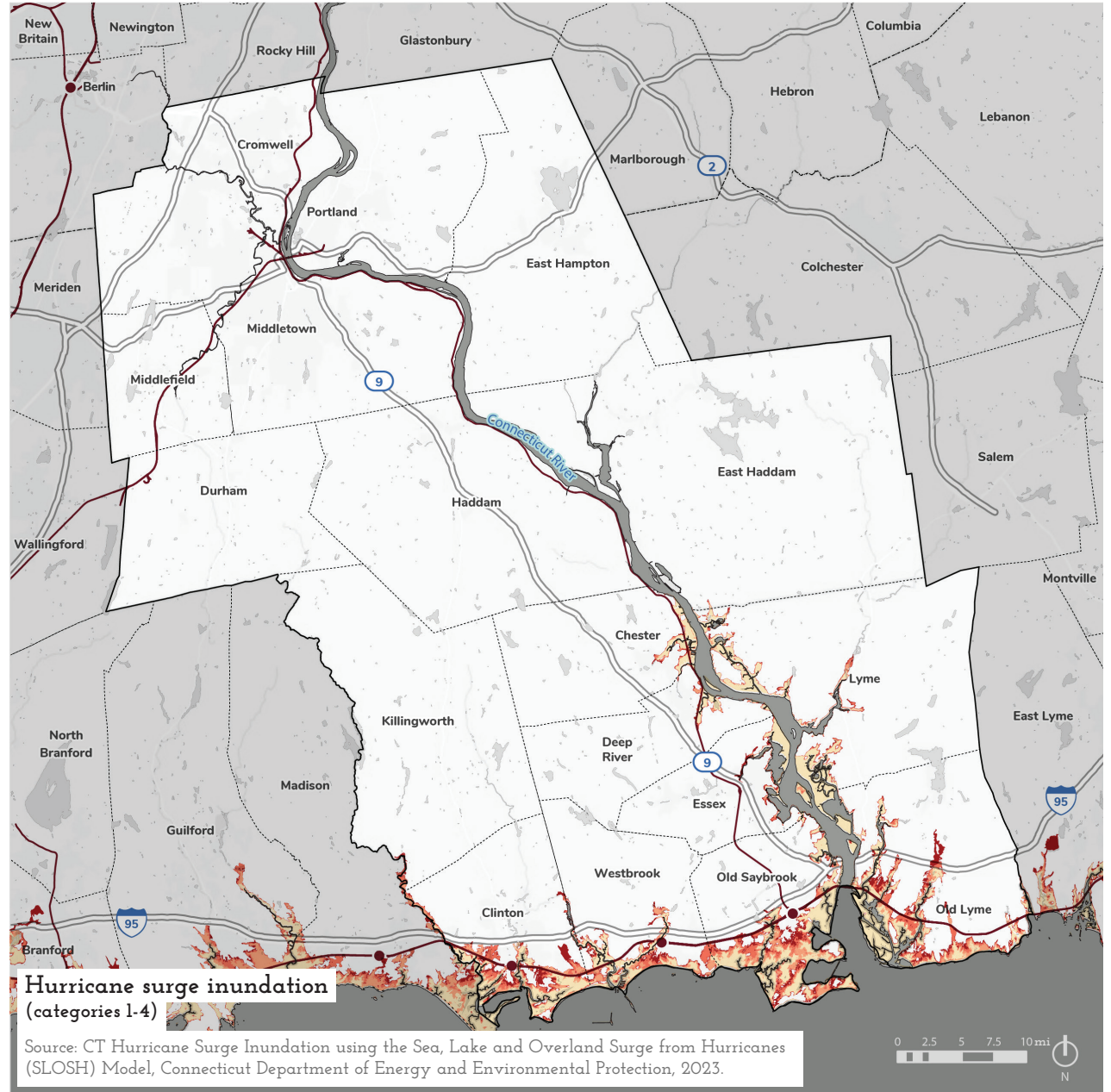


- Study Area
- Town Boundaries
- Passenger Rail
- Gas stations
- Groceries
- Health care/hospitals
- Pharmacies

Exposure analysis by hurricane surge inundation

Storm surge inundation is the term used when referencing storm surge heights as height above ground level. The Sea, Lake and Overland Surges from Hurricanes (SLOSH) model was developed by the National Weather Service to estimate storm surge heights.

For the exposure analysis, critical and essential businesses that fell into categories 1 through 4 are considered at-risk of inundation and were mapped and counted by town.



Hurricane storm surge impact on critical businesses

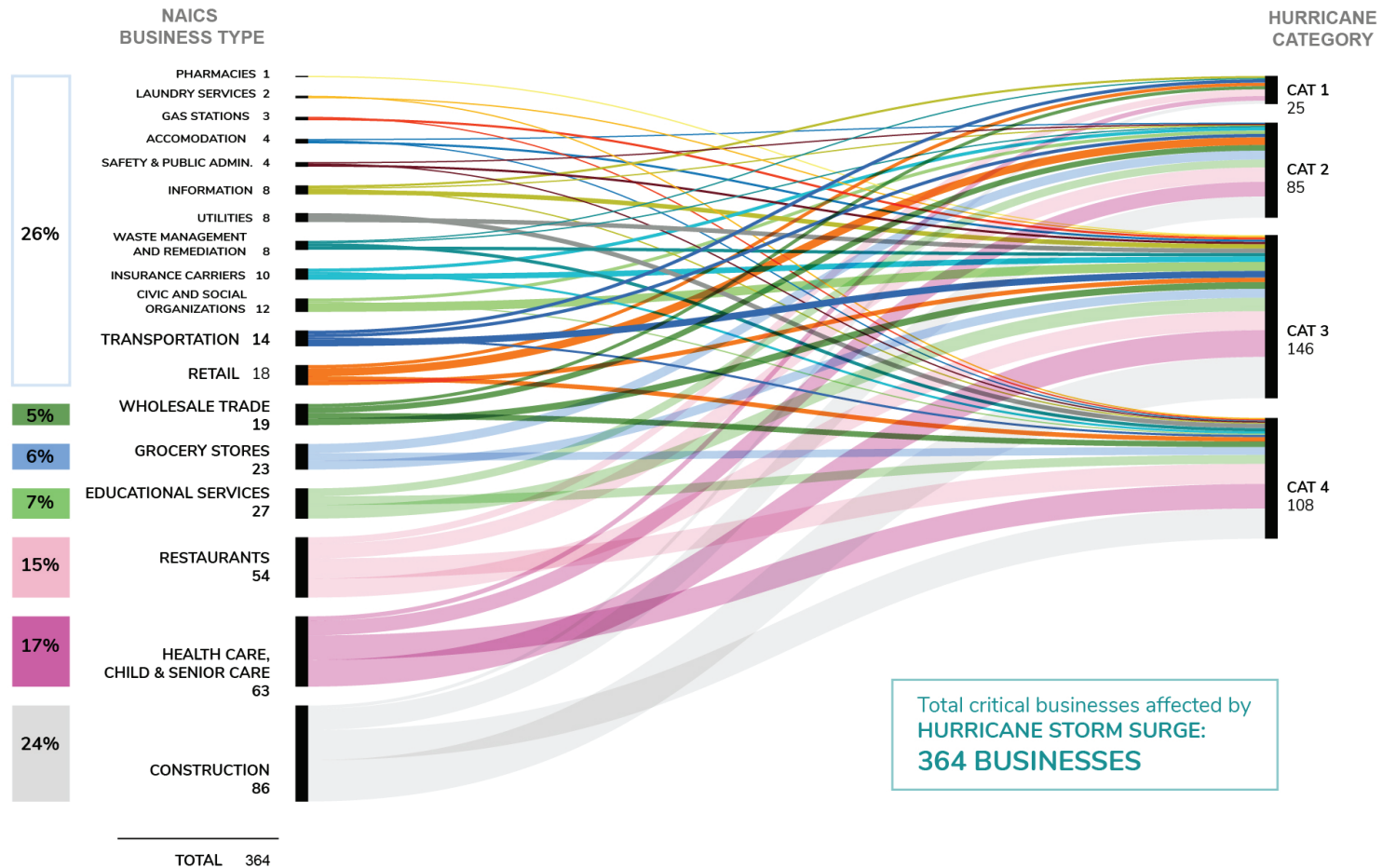
364 critical businesses are exposed to hurricane surge inundation, representing 10% all critical businesses within the LCRV region.

Town most impacted:

- Old Saybrook
- Middletown
- Cromwell
- Clinton

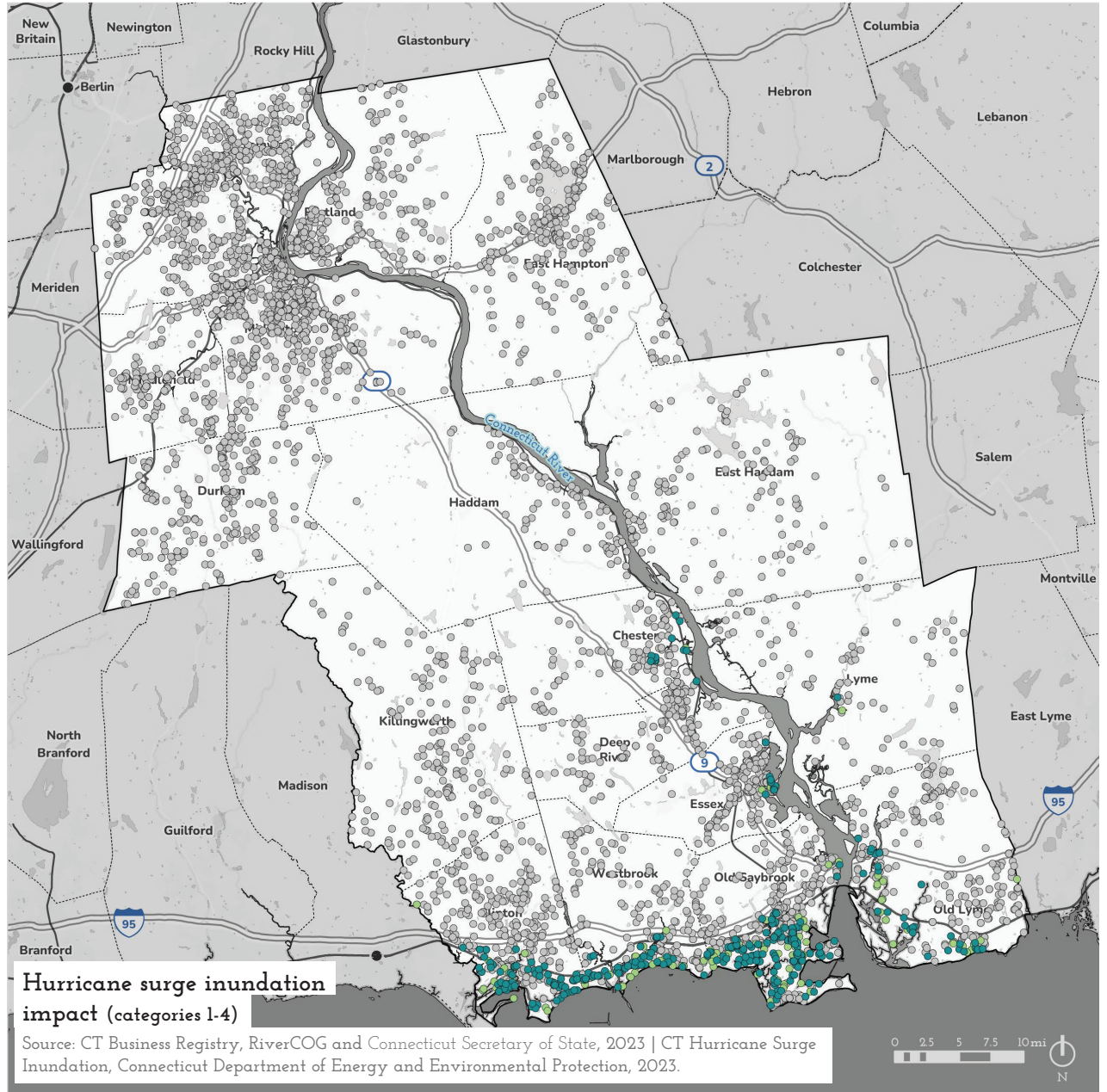
Industries most impacted:

- Building and construction
- Health care, child care, and senior care.
- Restaurants



Exposure to hurricane surge inundation by town

Town	CRITICAL	UNKNOWN	TOTAL by town
Chester	12	9	21
Clinton	89	35	124
Cromwell	0	0	0
Deep River	1	1	2
Durham	0	0	0
East Haddam	0	0	0
East Hampton	0	0	0
Essex	17	14	31
Haddam	0	0	0
Killingworth	0	0	0
Lyme	1	1	2
Middlefield	0	0	0
Middletown	0	0	0
Old Lyme	40	30	70
Old Saybrook	156	81	237
Portland	0	0	0
Westbrook	48	41	89
TOTAL region	364	212	576



- Study Area
- Town Boundaries
- Passenger Rail
- Critical businesses impacted
- Businesses of unknown type impacted
- Unaffected businesses

Exposure to hurricane surge inundation by town - critical businesses (Categories 1-4)

Town	Hurricane Category				Subtotal impacted	% impacted within town	Not impacted	TOTAL critical
	1	2	3	4				
Chester	1	2	5	4	12	13%	79	91
Clinton	7	22	37	23	89	28%	227	316
Cromwell	0	0	0	0	0	0%	330	330
Deep River	0	0	0	1	1	1%	113	114
Durham	0	0	0	0	0	0%	171	171
East Haddam	0	0	0	0	0	0%	100	100
East Hampton	0	0	0	0	0	0%	202	202
Essex	0	1	13	3	17	11%	144	161
Haddam	0	0	0	0	0	0%	68	68
Killingworth	0	0	0	0	0	0%	153	153
Lyme	0	0	0	1	1	2%	60	61
Middlefield	0	0	0	0	0	0%	83	83
Middletown	0	0	0	0	0	0%	987	987
Old Lyme	2	7	13	18	40	18%	178	218
Old Saybrook	10	37	59	50	156	39%	243	399
Portland	0	0	0	0	0	0%	171	171
Westbrook	5	16	19	8	48	26%	135	183
TOTAL region	25	85	146	108	364	10%	3,444	3,808

364 critical businesses are exposed to hurricane surge inundation impact, representing 10% all critical businesses within the LCRV region.

The most heavily impacted towns are Old Saybrook, where 39% of critical businesses are impacted; Clinton, where 20% of critical businesses are impacted; and Westbrook, where 26% of critical businesses are impacted.

Note: subarea maps of exposure to flood and hurricane surge inundation and counts by town can be found in the appendix

Exposure to hurricane surge inundation by town - businesses of unknown type (Categories 1-4)

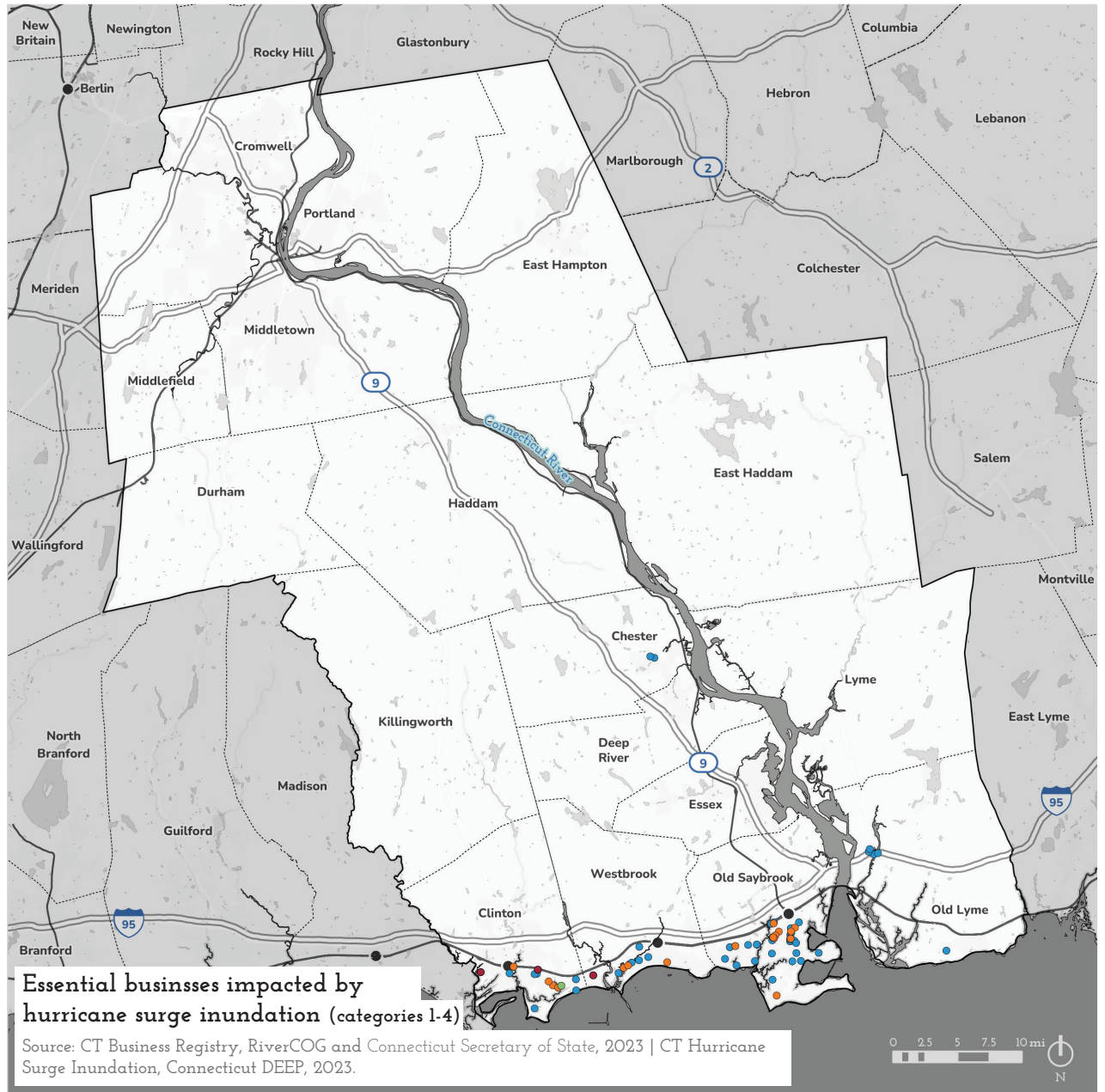
Town	Hurricane Category				Subtotal impacted	% impacted within town	Not impacted	TOTAL unknown
	1	2	3	4				
Chester	0	2	2	5	9	19%	39	48
Clinton	4	13	11	7	35	22%	124	159
Cromwell	0	0	0	0	0	0%	151	151
Deep River	0	0	0	1	1	1%	68	69
Durham	0	0	0	0	0	0%	95	95
East Haddam	0	0	0	0	0	0%	65	65
East Hampton	0	0	0	0	0	0%	144	144
Essex	1	1	2	10	14	13%	92	106
Haddam	0	0	0	0	0	0%	35	35
Killingworth	0	0	0	0	0	0%	73	73
Lyme	0	0	1	0	1	3%	34	35
Middlefield	0	0	0	0	0	0%	85	85
Middletown	0	0	0	0	0	0%	588	588
Old Lyme	0	9	7	14	30	23%	101	131
Old Saybrook	7	26	25	23	81	34%	158	239
Portland	0	0	0	0	0	0%	91	91
Westbrook	4	8	19	10	41	38%	68	109
TOTAL region	16	59	67	70	212	10%	2,011	2,223

212 businesses of unknown type are exposed to flood impact, representing 10% of all businesses of unknown type within the LCRV region.

The subarea maps and tables in this section provide counts and general locations of businesses impacted by hurricane surge inundation to help guide towns in conducting a finer-grained identification of impacted businesses of unknown type to determine which may in fact be categorized as critical or essential.

Essential businesses impacted by hurricane surge inundation

Town	ESSENTIAL
Chester	2
Clinton	18
Cromwell	0
Deep River	0
Durham	0
East Haddam	0
East Hampton	0
Essex	0
Haddam	0
Killingworth	0
Lyme	0
Middlefield	0
Middletown	0
Old Lyme	8
Old Saybrook	53
Portland	0
Westbrook	9
TOTAL region	90



- Study Area
- Town Boundaries
- Passenger Rail
- Gas stations
- Groceries
- Health care/hospitals
- Pharmacies

5

BUSINESS RESPONSE

Business response and preparation for natural hazards

Businesses prepare for natural hazards through emergency preparedness and insurance coverage. Statewide private commercial flood insurance has significantly increased since 2018.

The data does not allow a specific analysis for LCRV, however, the federal National Flood Insurance Program (NFIP) does provide insight into levels of insurance by community. It does not separate commercial coverage from homeownership. LCRV has nearly 3,100 policies with coverage values over \$856m. LCRV represents about 10% of Connecticut's activity (PIF and coverage value). Old Saybrook represents 31% of the NFIP program in LCRV.

As noted earlier, it is not possible with existing data to ascertain the level of private flood insurance for businesses in the LCRV. However, given that there are nearly 3100 NFIP policies across residential and commercial in force for the LCRV and nearly 6000 businesses alone were identified as being at risk the region may be underinsured for flood related events.

Year	Policies in Force CT	Average Premium
2018	78,127	\$2,826
2019	92,049	\$3,527
2020	154,685	\$3,286
2021	202,612	\$3,416
2022	221,879	\$3,839

Town	Policy in Force (6/30/23)	Total Coverage
Old Saybrook	969	\$ 271,893,000
Unknown	482	\$ 122,587,000
Clinton	408	\$ 107,282,000
Westbrook	375	\$ 108,868,000
Old Lyme	355	\$ 104,018,000
Middletown	171	\$ 44,106,000
Cromwell	56	\$ 15,524,000
Essex	51	\$ 18,227,000
Chester	40	\$ 11,740,000
Lyme	35	\$ 9,854,000
Portland	33	\$ 8,349,000
Haddam	29	\$ 7,089,000
East Haddam	24	\$ 6,657,000
Deep River	17	\$ 4,856,000
Fenwick, Borough	15	\$ 5,052,000
Killingworth	15	\$ 4,562,000
East Hampton	9	\$ 3,534,000
Durham	8	\$ 2,034,000
Middlefield	3	\$ 474,000
TOTAL	3,095	\$ 856,706,000

Insurance Coverage by Community (above)

Source: NFIP Policy Information by State and Community, 6/30/23

Statewide private commercial flood insurance in force (left)

Source: National Association of Insurance Commissioners Private Flood Insurance Data Collection.

Recovery Capacity based on National Risk Index Score

The National Risk Index (<https://hazards.fema.gov/nri/>) is a tool created by the Federal Emergency Management Agency (FEMA) to help communities assess their risk to 18 different natural hazards and understand their capacity to prepare, adapt and recover based on social and community characteristics.

The Risk Index is calculated at the county and census tract levels. The closer the index score is to 100, the higher the level of risk. Middlesex County has a Risk Index score of 78.36 and is considered relatively low risk. It has the lowest Index score among Connecticut's coastal counties. However, census tracts in Cromwell, Middletown, Old Saybrook, Clinton, and Westbrook are considered moderate risk. One of the census tracts in Old Saybrook (670200) has one of the highest risk index scores (83.08) along the Connecticut shoreline.

Part of the scoring of the index is based on Community Resilience measures. The Community Resilience Index is based on work done by the University of South Carolina Hazards Vulnerability and Resilience Institute to create the Baseline Resilience Indicators for Communities (BRIC). These are intended to be indicators of a community's ability to respond and recover.

For more information on BRIC: https://www.sc.edu/study/colleges_schools/artsandsciences/centers_and_institutes/hvri/data_and_resources/bric/index.php

BRIC Categories and Sample Variables

- **Human Well-Being/Cultural/Social**—physical attributes of populations, values and belief systems (educational attainment equality, pre-retirement age, personal transportation access, communication capacity, English language competency, non-special needs populations, health insurance, mental health support, food security, access to physicians)
- **Economic/Financial**—economic assets and livelihoods (homeownership, employment rate, racial/ethnic income inequality, non-dependence on primary/tourism sector employment, gender income inequality, business size, large retail with regional/national distribution, federal employment)
- **Infrastructure/Built Environment/Housing**—buildings and infrastructure (sturdier housing types, temporary housing availability, medical care capacity, evacuation routes, housing stock construction quality, temporary shelter availability, school restoration potential, industrial re-supply potential, high-speed internet infrastructure)
- **Institutional/Governance**—access to resources and the power to influence their distribution (mitigation spending, flood insurance coverage, governance performance regimes, jurisdictional fragmentation, disaster aid experience, local disaster training, population stability, nuclear accident planning, crop insurance coverage)
- **Community Capacity**—social networks and connectivity among individuals and groups (volunteerism, religious affiliation, attachment to place, political engagement, citizen disaster training, civic organizations)
- **Environmental/Natural**—natural resource base and environmental conditions (local food supplies, natural flood buffers, energy use, perviousness, water stress).

BRIC Reports at the County Level

The different elements described above are combined to create the BRIC index. Based on this index, Middlesex County has been the most resilient county in Connecticut since 2015. **However, since 2015, Middlesex County, like the rest of Connecticut, has become slightly less resilient.** 65% of the county's decline can be attributed to the environmental (35% of the decline) and institutional (30% of the decline) components of the index. Additional details on the underlying variables of each component were not available, so a determination of what specifically has changed is not possible at this time.

FEMA translates the BRIC Index into its own Community Resiliency Score, which becomes part of the overall National Risk Index score. **The LCVR region has one of the highest community resilience scores in the country at 92.97** and the highest along the Connecticut coast.

For more information on the National Risk Index: <https://hazards.fema.gov/nri/map>

Supporting Planning And Recovery

One of the important considerations for LCRV is that its member communities are divided into three DEHMS regions (2, 3, 4). These regions are responsible for all FEMA responses, including disaster assistance. Another resource is the Army Corp of Engineers Silver Jacket program, which provides flood planning and assistance to communities and local emergency management professionals. Assistance includes the Silver Jacket Flood Toolkit. Included in the toolkit is a checklist of actions and assigned responsibilities.

Continued coordination among agencies and building the capacity of businesses and institutions to manage the impacts of natural disasters is critical for the LCRV region to maintain its current high level of resilience.

For more information on Silver Jacket Flood Toolkit: https://portal.ct.gov/-/media/DEMHS/_docs/Plans-and-Publications/EHSP0097-Flood-Toolkit-Dashboard.pdf

County	BRIC index 2015	BRIC index 2020
Middlesex County	2.94	2.79
Litchfield County	2.94	2.72
Windham County	2.93	2.66
Tolland County	2.91	2.70
New London County	2.90	2.76
New Haven County	2.86	2.72
Hartford County	2.86	2.69
Fairfield County	2.75	2.66

HAVRI BRIC Scores by County

Source: County-level Composite BRIC scores for 2015 and 2020. Hazards, Vulnerability and Resilience Institute (HVRI), University of South Carolina.

6

RECOMMENDATIONS

RECOMMENDATIONS ON RESILIENCY

Based on this analysis the Lower Connecticut River Valley has some critical economic exposures to flooding and storm surge events. The recommendations for the LCRV region fall into three distinct categories:

- Planning and zoning
- Informing and educating
- Increasing coordination and communication between the public and private sectors

Planning and Zoning

The planning and zoning recommendations include ideas on land use to support resiliency and zoning changes to mitigate risk and potential damage caused by a severe weather event that causes flooding.

Encourage retention and development of flood storage capacity and storm surge capacity in LCVR communities

This could include identifying locations and sites for this capacity development; providing information regarding the range of options such as stormwater parks, constructed wetlands, eelgrass restoration where applicable, among other options. These ideas should include how these concepts can also serve as public amenities/parks.

Limit and, where feasible, remove critical businesses in high risk zones

RiverCOG should encourage the most impacted communities identified in the exposure analysis to limit or ban critical businesses as identified in this analysis from being located in these areas. Many communities already have flood plain management regulations. Based on this analysis flood plain management regulations should be reviewed to determine if critical businesses are an allowed use. Secondly, options should be explored to relocate these businesses where practical, and acquire the at-risk properties with state and federal resources

Strategically target buy out programs to limit risk

Encourage federal, state and potentially local funds to buy out the most at-risk properties, such as repeat flood impacted sites.

Informing and Educating

A core competency of RiverCOG is the ability to inform and educate government officials, community organizations and the businesses and citizens of LCRV on key issues and opportunities in the region.

Provide and support awareness campaigns on preparation and recovery for business and community organizations with particular emphasis on communities that have the most exposure

This could be built around the hurricane season as an annual education and information session. This could be done in conjunction with local community's Emergency Management functions and build upon the DEMHS Flood Workshops targeted at local officials. <https://portal.ct.gov/DEMHS/Emergency-Management/Resources-For-Officials/Planning-For-All-Hazards/2023-Flood-Awareness-Workshops>

Increasing coordination and communication between the public and private sectors

Create a regional Business Resiliency Advisory Committee

As noted in the National Risk Index, the LCRV is one of the most resilient areas in Connecticut despite its risk level because of the region's socio-economic makeup and the strength of its community level institutions. To maintain this high level of resilience will require monitoring resiliency efforts, changes in development patterns, and promoting communication between the various communities across the region.

Moreover, because LCRV sits among 3 different DEMHS regions, a committee of this type can help provide coordination for an event that impacts the RIVERCOG communities and businesses.

7 APPENDIX

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Exposure to flooding - critical businesses in Northern subarea

Cromwell:

- A, AE, AH/AO: 52
- VE: 0

East Hampton:

- A, AE, AH/AO: 5
- VE: 0

Middlefield:

- A, AE, AH/AO: 0
- VE: 0

Middletown:

- A, AE, AH/AO: 55
- VE: 0

Portland:

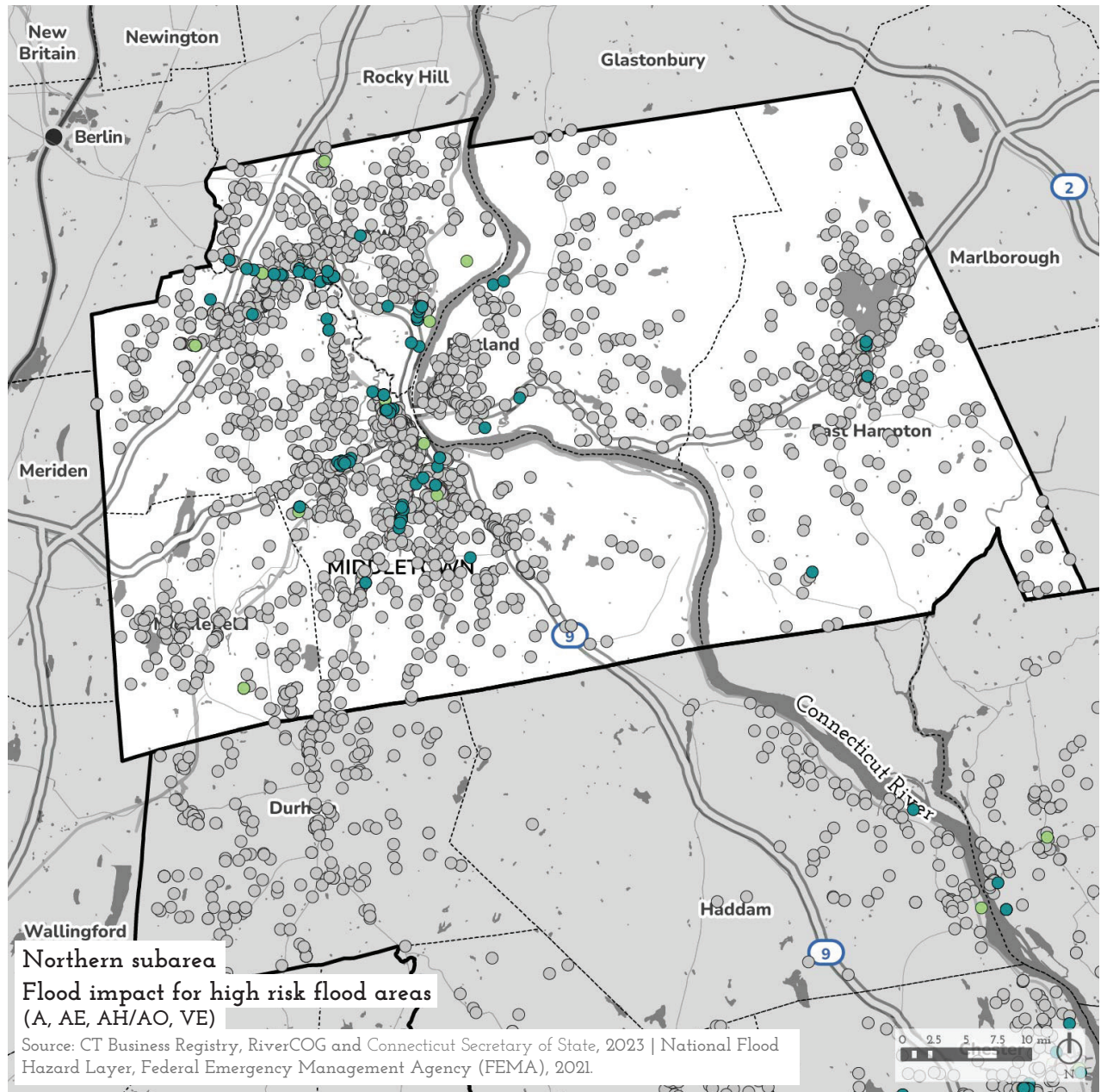
- A, AE, AH/AO: 4
- VE: 0

A - 1% annual chance of flooding (without Base Flood Elevation)

AE - 1% annual chance of flooding (with Base Flood Elevation)

AH/AO - 1% or greater change of shallow annual flooding

VE - 1% or greater chance of flooding with storm waves (High Risk Coastal Flood Hazard)



- Study Area
- Town Boundaries
- Passenger Rail
- Critical businesses impacted
- Businesses of unknown type impacted
- Unaffected businesses

Exposure to flooding - critical businesses in Interior subarea

Chester:

- A, AE, AH/AO: 10
- VE: 0

Deep River:

- A, AE, AH/AO: 6
- VE: 0

Durham:

- A, AE, AH/AO: 0
- VE: 0

East Haddam:

- A, AE, AH/AO: 4
- VE: 0

Haddam:

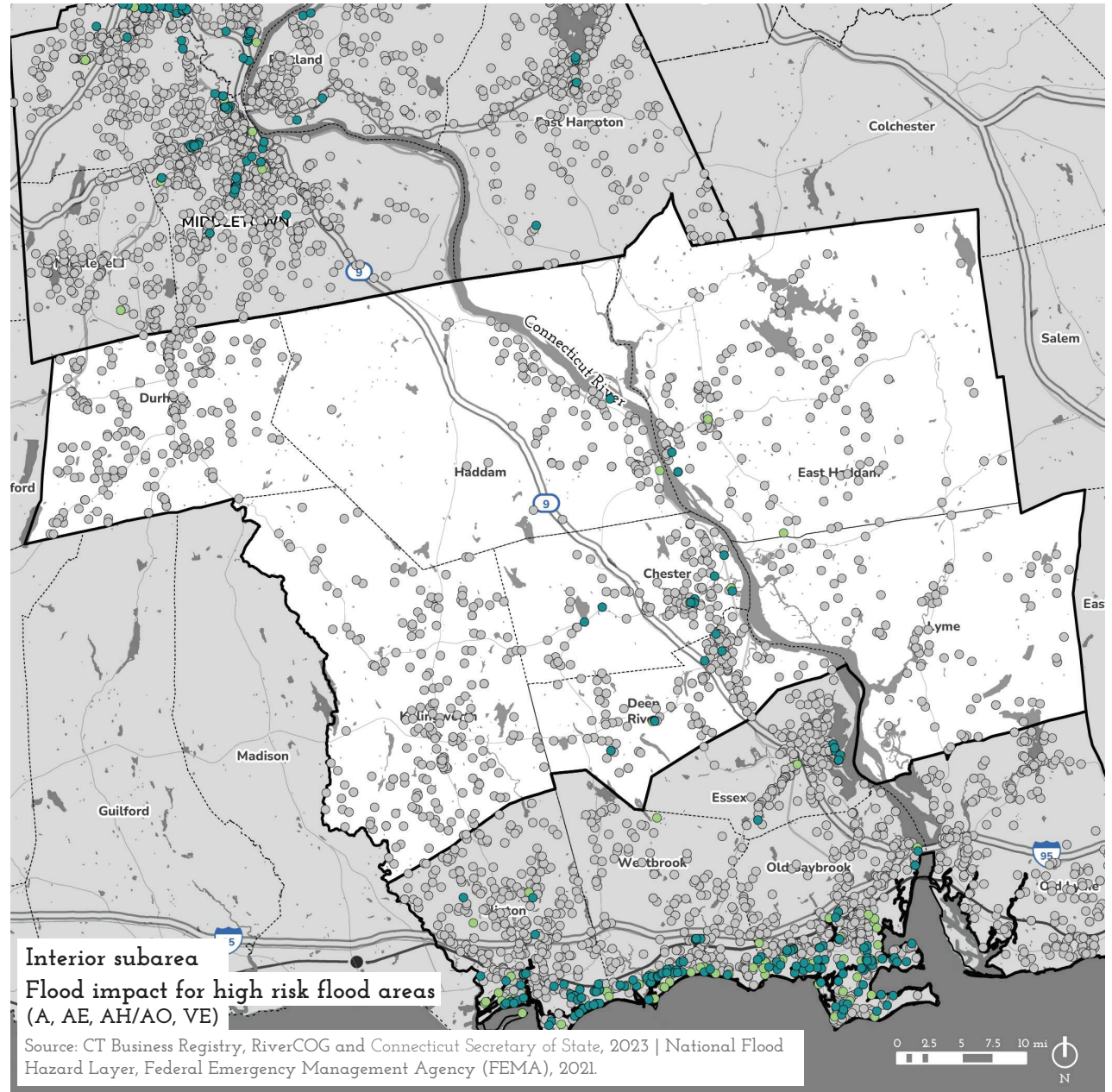
- A, AE, AH/AO: 1
- VE: 0

Killingworth:

- A, AE, AH/AO: 0
- VE: 0

Lyme:

- A, AE, AH/AO: 0
- VE: 0



- | | |
|-----------------|-------------------------------------|
| Study Area | Critical businesses impacted |
| Town Boundaries | Businesses of unknown type impacted |
| Passenger Rail | Unaffected businesses |

Exposure to flooding - critical businesses in Shoreline subarea

Clinton:

- A, AE, AH/AO: 45
- VE: 3

Essex:

- A, AE, AH/AO: 13
- VE: 0

Old Lyme:

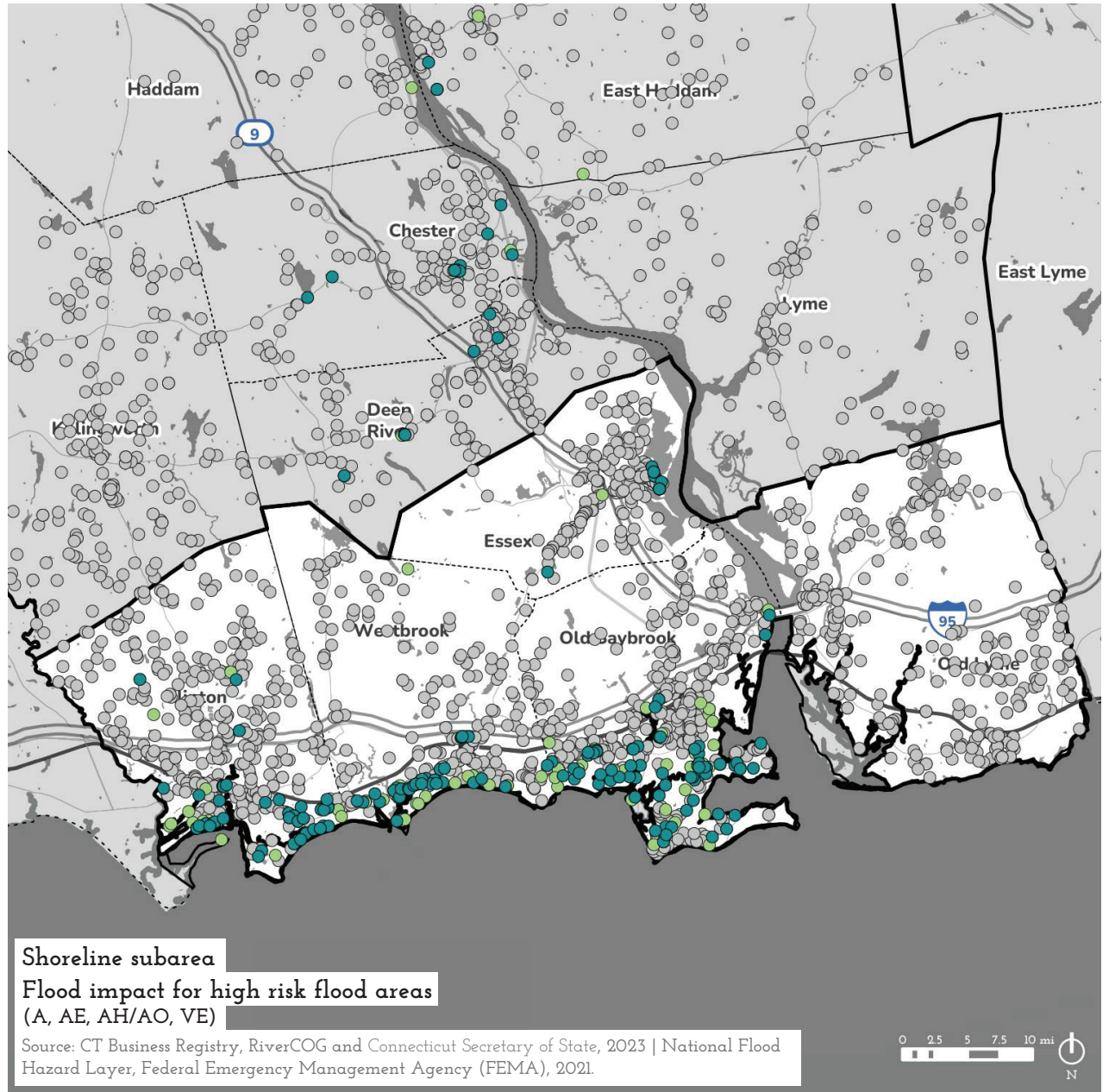
- A, AE, AH/AO: 0
- VE: 0

Old Saybrook:

- A, AE, AH/AO: 72
- VE: 0

Westbrook:

- A, AE, AH/AO: 31
- VE: 0



Exposure to flooding - essential businesses in Northern subarea

Cromwell:

- A, AE, AH/AO: 15
- VE: 0

East Hampton:

- A, AE, AH/AO: 0
- VE: 0

Middlefield:

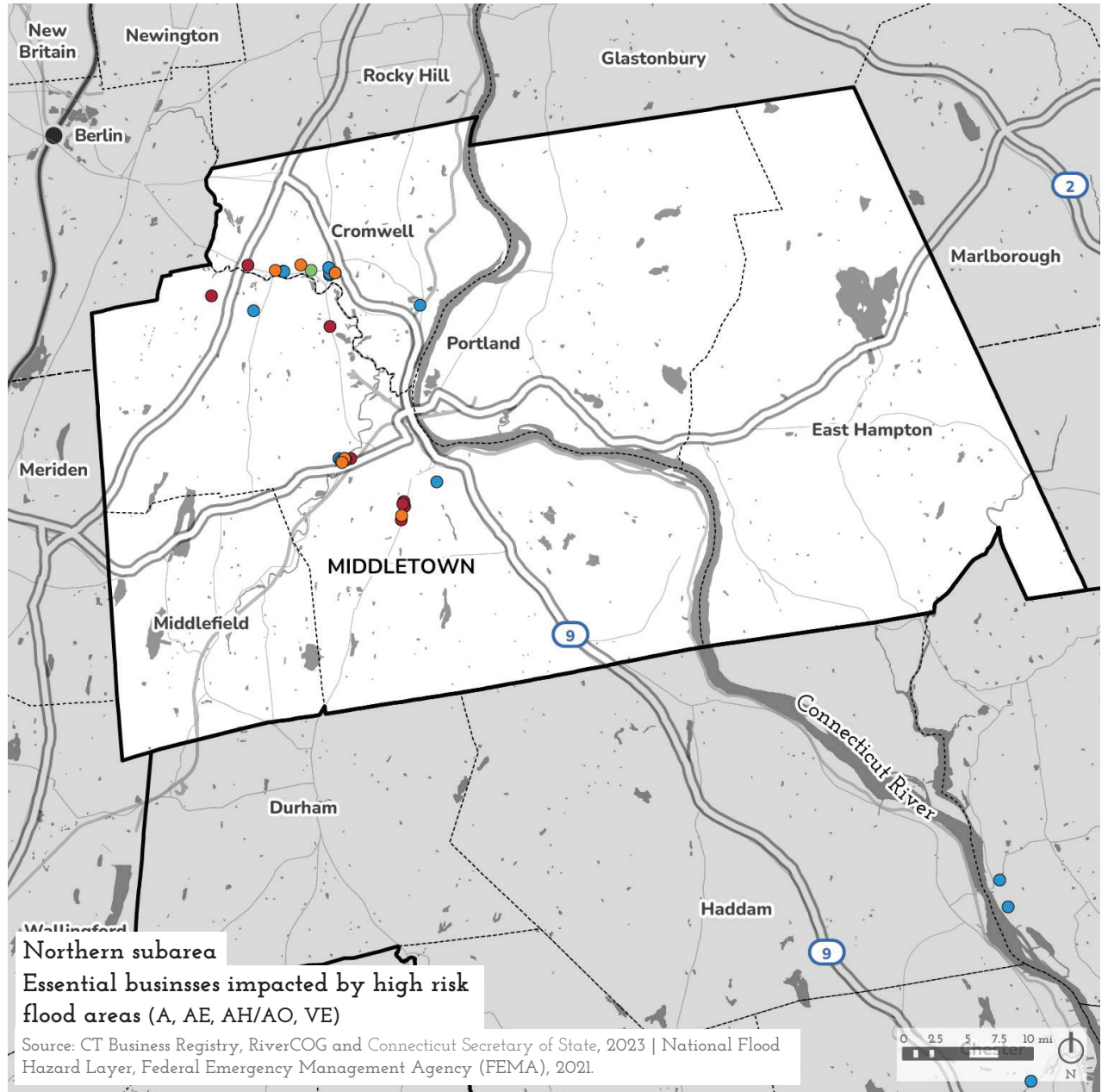
- A, AE, AH/AO: 0
- VE: 0

Middletown:

- A, AE, AH/AO: 16
- VE: 0

Portland:

- A, AE, AH/AO: 0
- VE: 0



- | | |
|--------------------|-------------------------|
| □ Study Area | ● Gas stations |
| □ Town Boundaries | ● Groceries |
| —●— Passenger Rail | ● Health care/hospitals |
| | ● Pharmacies |

Exposure to flooding - essential businesses in Interior subarea

Chester:

- A, AE, AH/AO: 1
- VE: 0

Deep River:

- A, AE, AH/AO: 0
- VE: 0

Durham:

- A, AE, AH/AO: 0
- VE: 0

East Haddam:

- A, AE, AH/AO: 2
- VE: 0

Haddam:

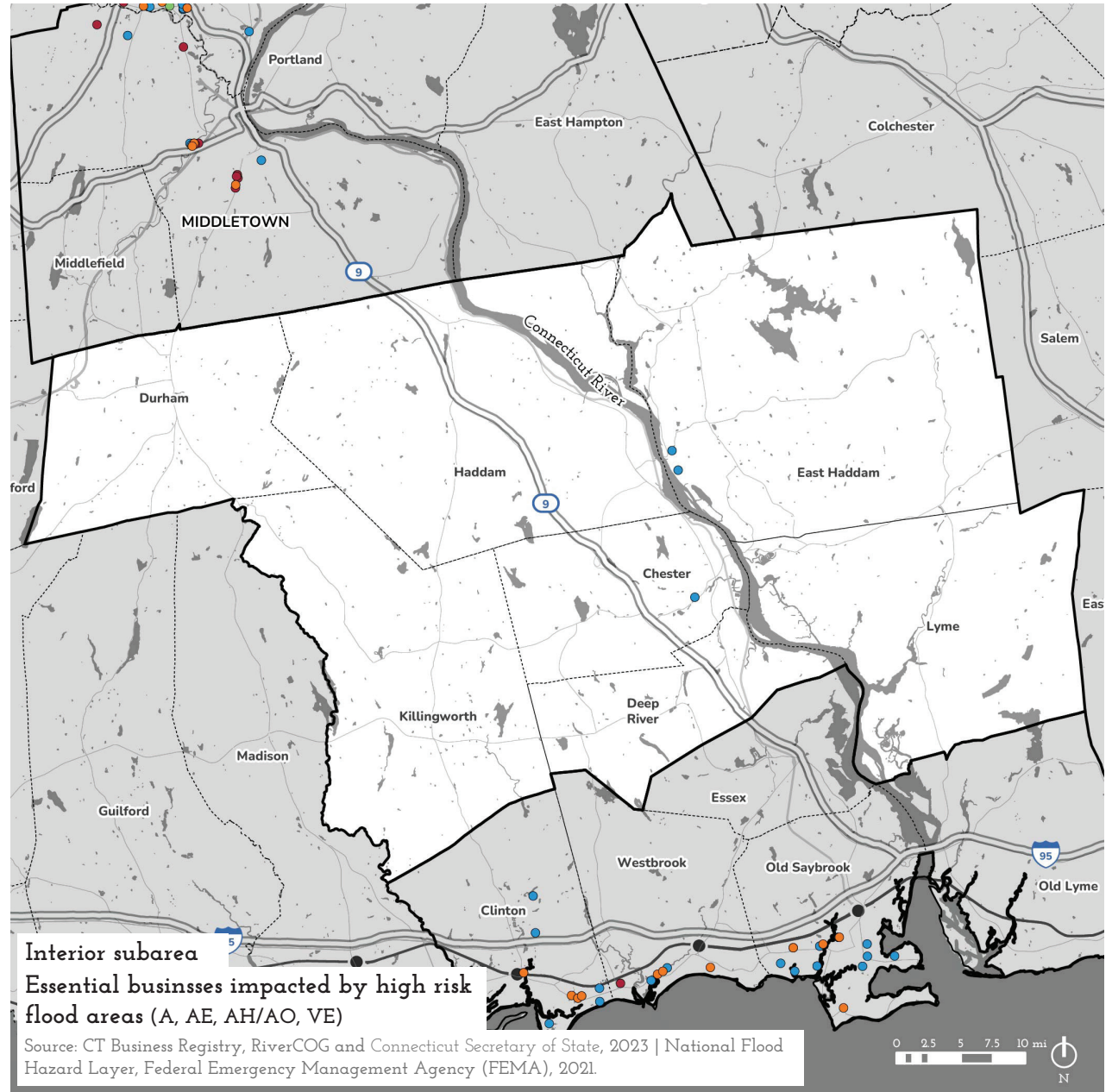
- A, AE, AH/AO: 0
- VE: 0

Killingworth:

- A, AE, AH/AO: 0
- VE: 0

Lyme:

- A, AE, AH/AO: 0
- VE: 0



- | | |
|--------------------|-------------------------|
| □ Study Area | ● Gas stations |
| ⋯ Town Boundaries | ● Groceries |
| —●— Passenger Rail | ● Health care/hospitals |
| | ● Pharmacies |

Exposure to flooding - essential businesses in Shoreline subarea

Clinton:

- A, AE, AH/AO: 12
- VE: 0

Essex:

- A, AE, AH/AO: 0
- VE: 0

Old Lyme:

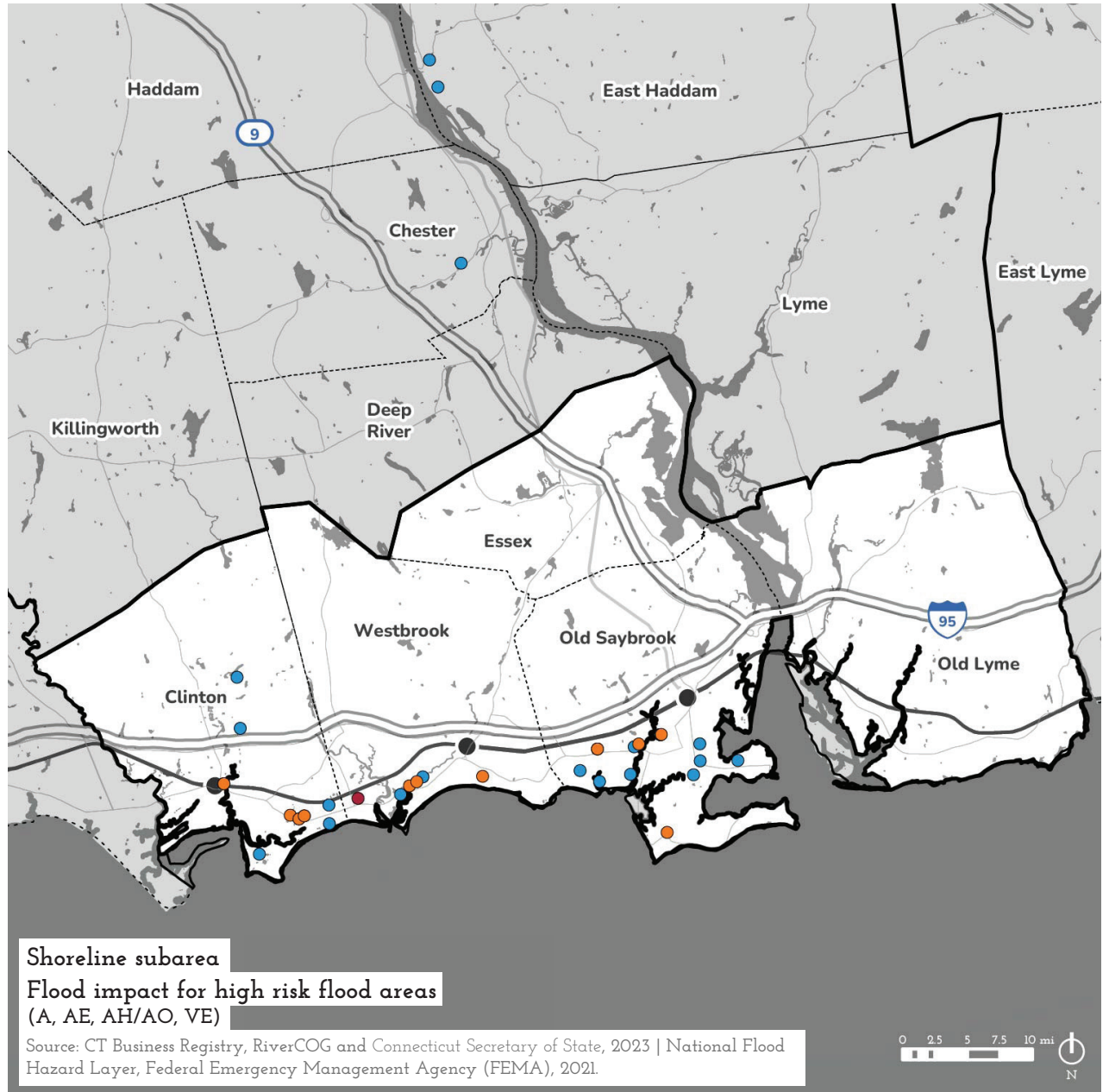
- A, AE, AH/AO: 0
- VE: 0

Old Saybrook:

- A, AE, AH/AO: 20
- VE: 0

Westbrook:

- A, AE, AH/AO: 6
- VE: 0



- | | |
|-----------------|-----------------------|
| Study Area | Gas stations |
| Town Boundaries | Groceries |
| Passenger Rail | Health care/hospitals |
| | Pharmacies |

Exposure to hurricane surge inundation - critical businesses in Interior subarea

Chester:

- Categories 1-4: **12**
- Not impacted: **79**

Deep River:

- Categories 1-4: **1**
- Not impacted: **113**

Durham:

- Categories 1-4: **0**
- Not impacted: **171**

East Haddam:

- Categories 1-4: **0**
- Not impacted: **100**

Haddam:

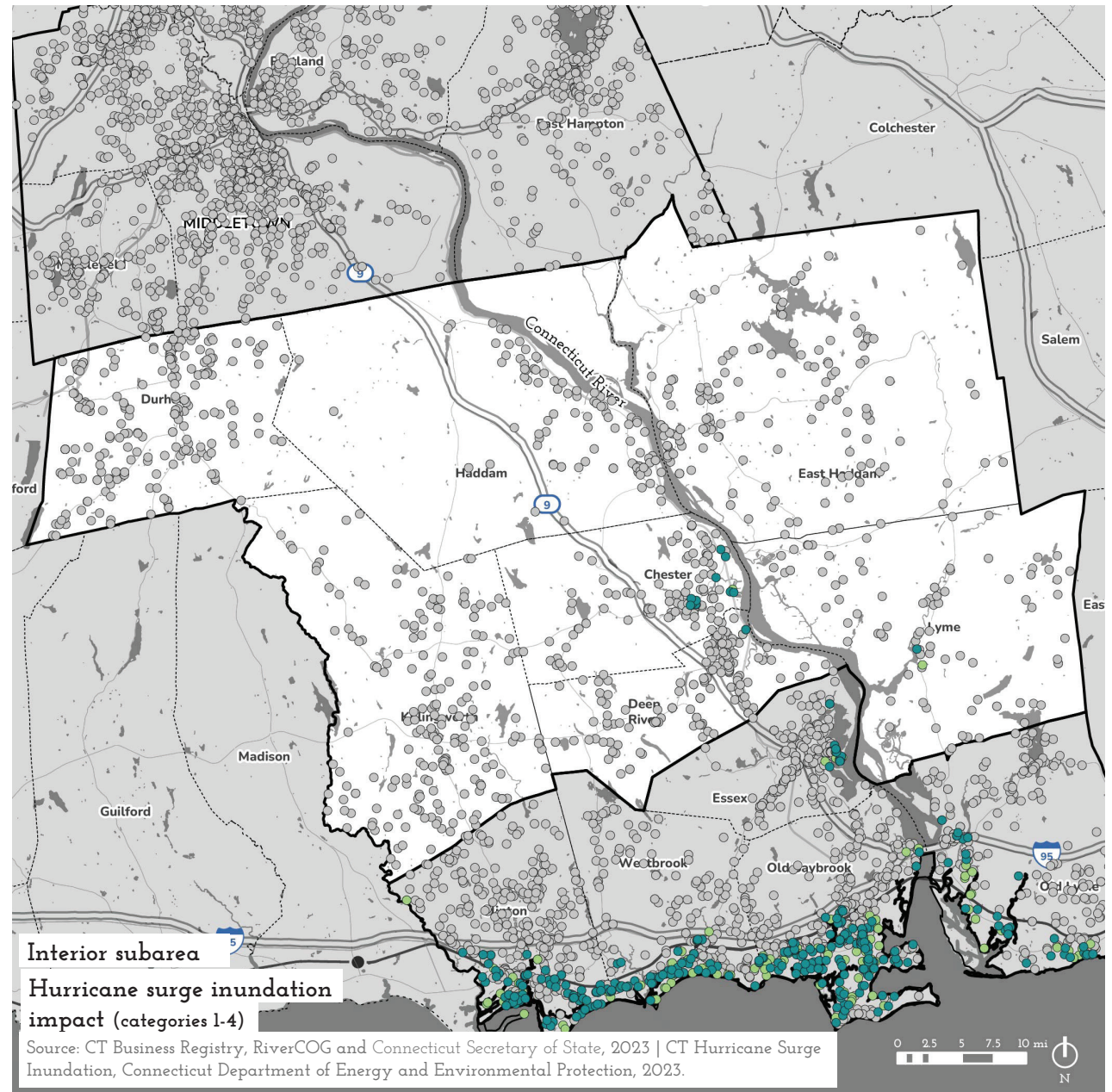
- Categories 1-4: **0**
- Not impacted: **68**

Killingworth:

- Categories 1-4: **0**
- Not impacted: **153**

Lyme:

- Categories 1-4: **1**
- Not impacted: **60**



Note: There are no impacted businesses in the Northern subarea.

Exposure to hurricane surge inundation - critical businesses in Shoreline subarea

Clinton:

- Categories 1-4: **89**
- Not impacted: **227**

Essex:

- Categories 1-4: **17**
- Not impacted: **144**

Old Lyme:

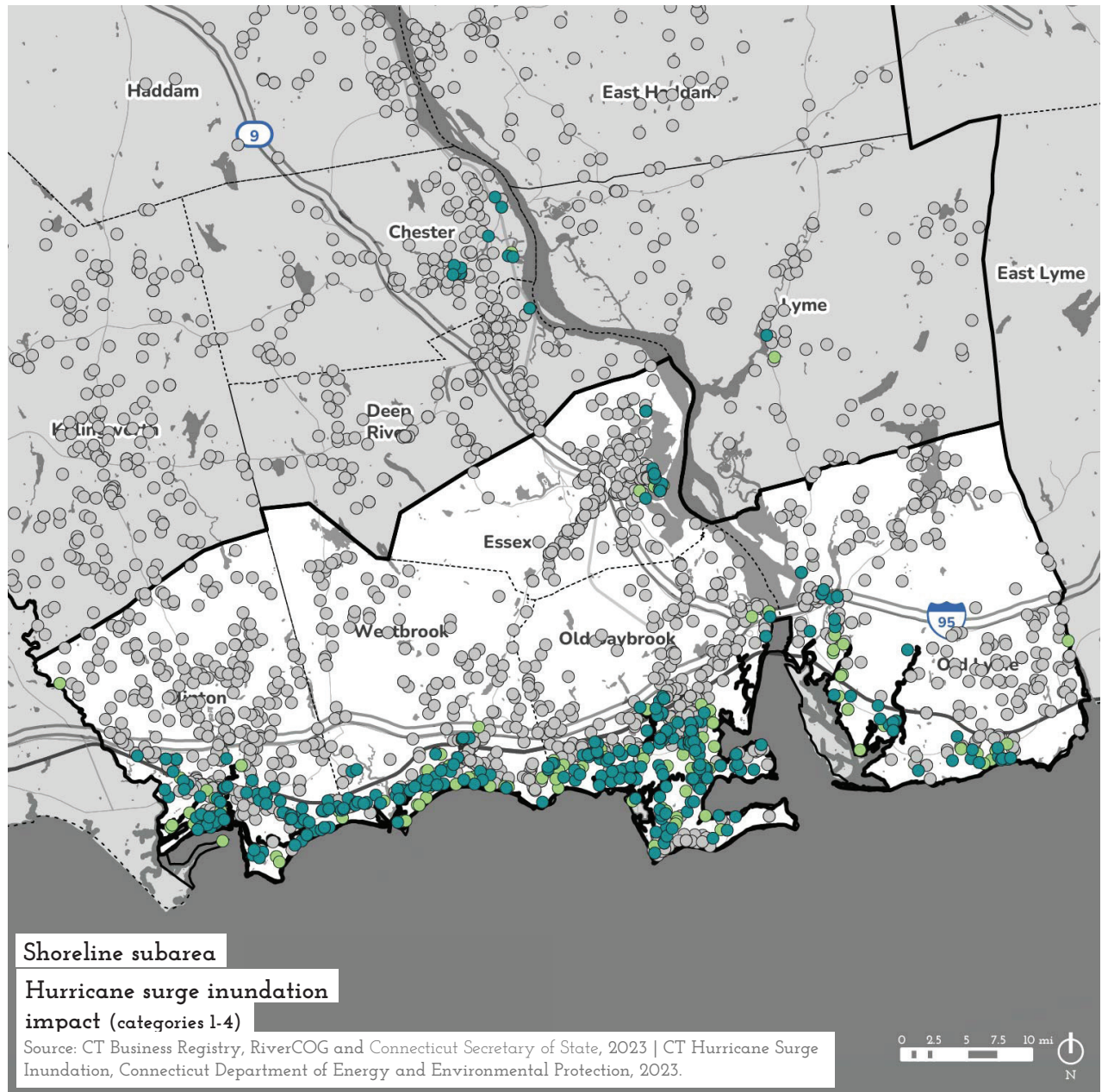
- Categories 1-4: **40**
- Not impacted: **178**

Old Saybrook:

- Categories 1-4: **156**
- Not impacted: **243**

Haddam:

- Categories 1-4: **48**
- Not impacted: **135**



Exposure to hurricane surge inundation - essential businesses in Interior subarea

Chester:

- Categories 1-4: 2
- Not impacted: 23

Deep River:

- Categories 1-4: 0
- Not impacted: 26

Durham:

- Categories 1-4: 0
- Not impacted: 33

East Haddam:

- Categories 1-4: 0
- Not impacted: 17

Haddam:

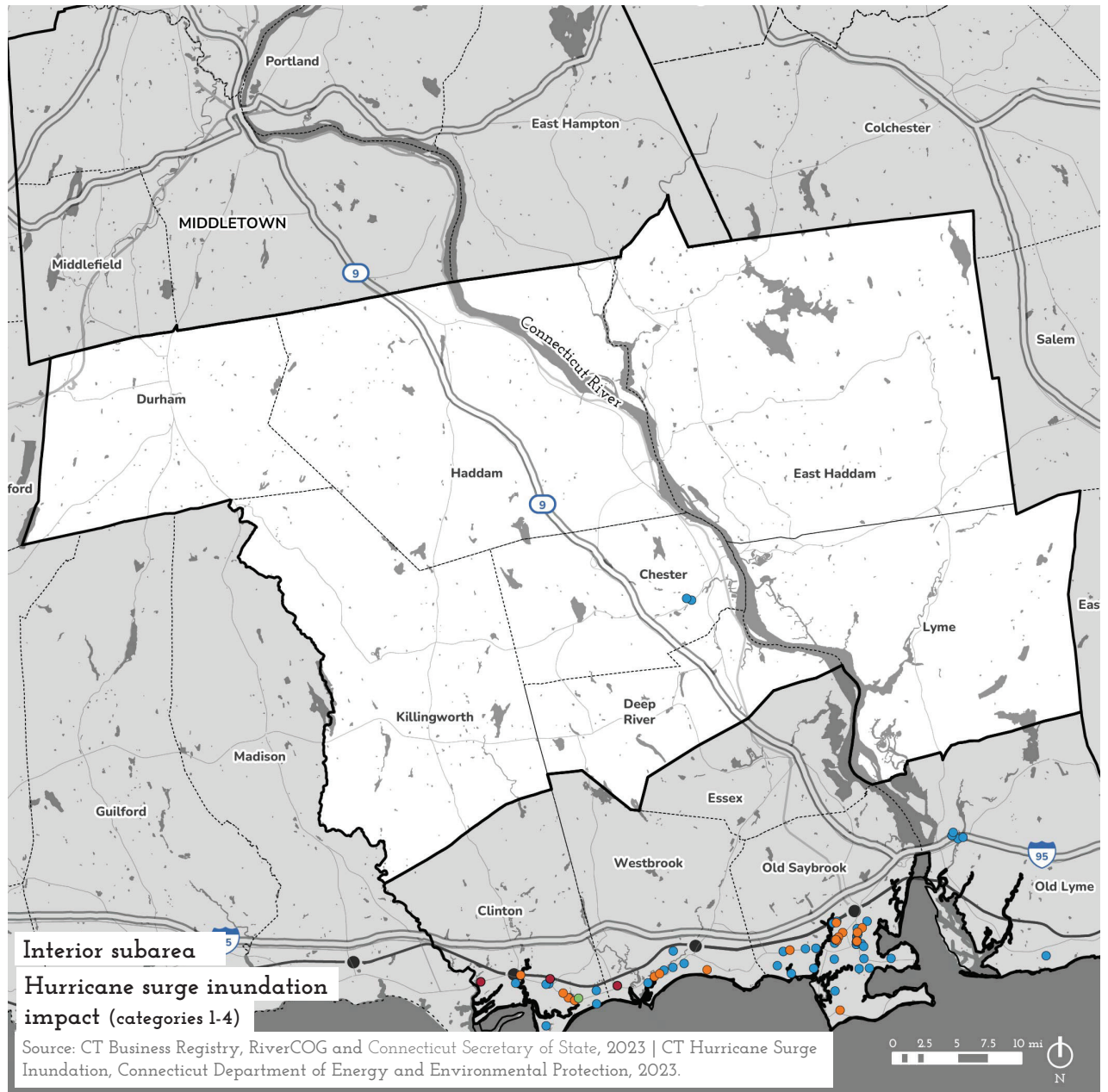
- Categories 1-4: 0
- Not impacted: 16

Killingworth:

- Categories 1-4: 0
- Not impacted: 28

Lyme:

- Categories 1-4: 0
- Not impacted: 13



- Study Area
- ▭ Town Boundaries
- Passenger Rail
- Gas stations
- Groceries
- Health care/hospitals
- Pharmacies

Note: There are no impacted businesses in the Northern subarea.

Exposure to hurricane surge inundation - essential businesses in Shoreline subarea

Clinton:

- Categories 1-4: **18**
- Not impacted: **50**

Essex:

- Categories 1-4: **0**
- Not impacted: **46**

Old Lyme:

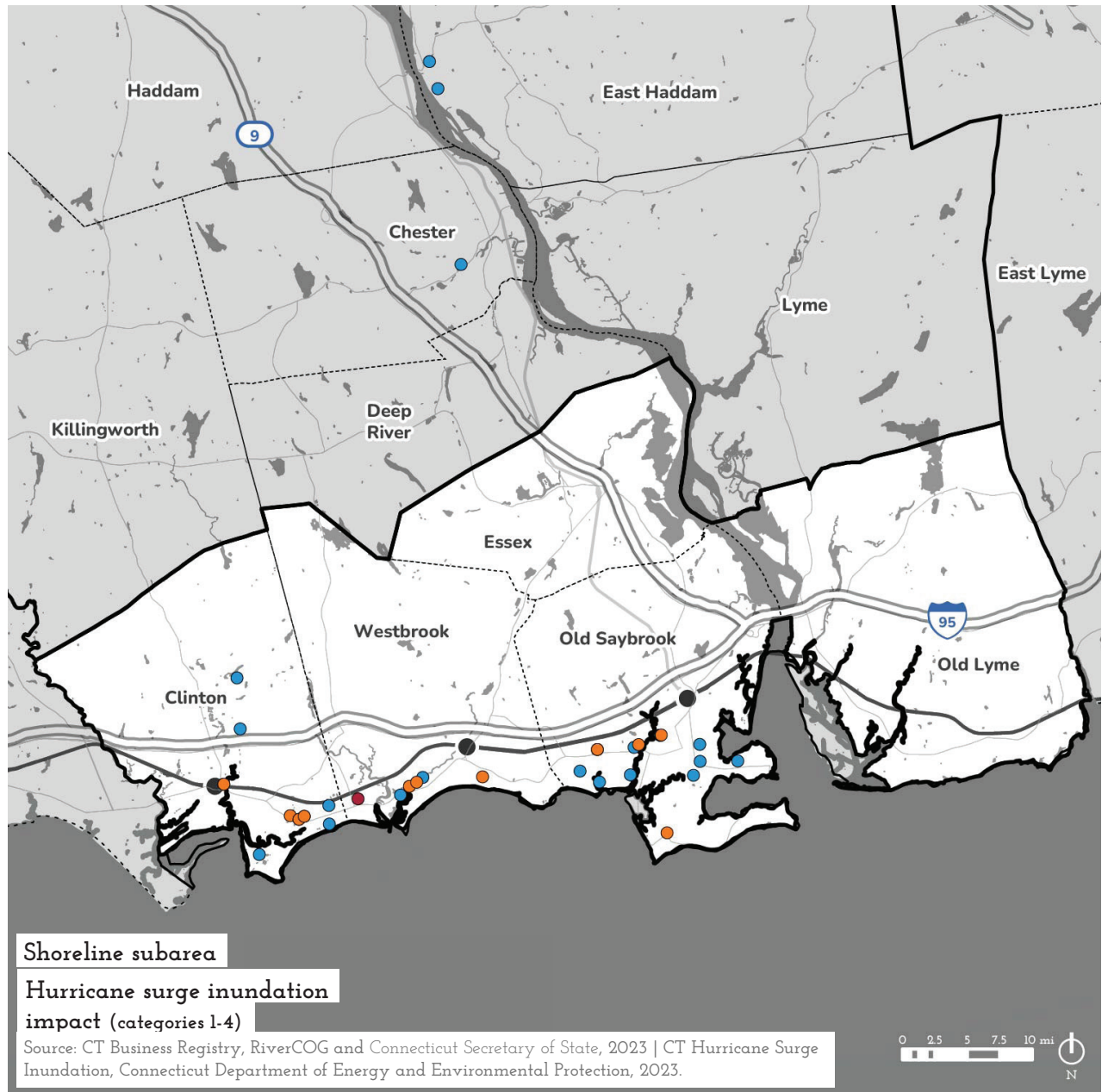
- Categories 1-4: **8**
- Not impacted: **41**

Old Saybrook:

- Categories 1-4: **53**
- Not impacted: **70**

Haddam:

- Categories 1-4: **9**
- Not impacted: **26**



- | | |
|-----------------|-----------------------|
| Study Area | Gas stations |
| Town Boundaries | Groceries |
| Passenger Rail | Health care/hospitals |
| | Pharmacies |



Lower Connecticut River Valley
Council of Governments

***Comprehensive Economic
Development Strategy***