

Resilient Connecticut Synthesis Report

Appendix B

Map Viewers

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The Climate Change Vulnerability Index (CCVI):

The Climate Change Vulnerability Index (CCVI) is a statewide mapping tool for flood and heat vulnerability that can be used, in conjunction with other resources, for planning and developing purposes. The CCVI combines built, social, and ecological factors to identify areas that are vulnerable to flooding and heat related impacts of climate change. Vulnerability is the propensity or predisposition to be adversely affected. Areas that are more vulnerable to climate change are ones where people, infrastructure, and/or ecological assets are more likely to experience harm as temperatures rise, floods worsen, and high winds increase. Vulnerability is a complex concept and encompasses a variety of elements including physical exposure, sensitivity or susceptibility to harm, and lack of capacity to cope and adapt. Understanding vulnerability helps us to make decisions about resource allocation, policy development, and project prioritization, siting, and design.

CIRCA developed a Climate Change Vulnerability Index (CCVI), an index-based spatial model that identifies community vulnerability to flood and heat-related impacts of climate change. The CCVI process is based on combinations of exposure, sensitivity, and adaptive capacity applied to thousands of grid cells. For example, the sensitivity component includes many different contributors that fall under three different indicators – social, built, and ecological. Each indicator has its own final “score” based on the average of the contributors. The average of the 3 indicators represents a score of sensitivity for one grid cell. This sensitivity score, along with final exposure and adaptive capacity scores, is used to calculate the vulnerability score, leading to many different gridded scores throughout a community.

The CCVI can be used to view vulnerability at both a regional scale and at specific sites to see how factors are contributing. For more information, and to access the interactive map viewers for the CCVI, please see the viewer links below. Additional fact sheets and webinars can also be found at <https://resilientconnecticut.uconn.edu/ccvi/>.

Climate Change Vulnerability Index: Flood

Link to Online CCVI Flood Viewer:

<https://experience.arcgis.com/experience/44ddea38aac34779a6a115ed6eae1db1/>

Climate Change Vulnerability Index: Extreme Heat

Link to Online CCVI Heat Viewer:

<https://experience.arcgis.com/experience/b1d7b11d8d3d45e5b6d9b753d716f4fc/>

Zones of Shared Risk

Zones of Shared Risk are regions that already face common flood or heat-related challenges, or may experience them in the future as a result of climate change. A Zone of Shared Risk (ZSR) includes land, buildings, and infrastructure as well as the hydrological, ecological, social, and institutional elements that contribute to the functioning of a place. Risks are shared among or between groups of people that may have different perspectives and priorities for resilience. There are five types of ZSR that were delineated throughout New Haven and Fairfield Counties:

- Access ZSR: Contains risks primarily derived from the ability (or lack thereof) to enter or exit an area due to flooding caused by increasing sea levels or surges associated with strong storms.
- Location ZSR: Contains risks primarily derived from a prevalence of low-lying lands within an area. These lands are vulnerable to flooding caused by increasing sea levels or surges associated with strong storms due to their low elevation.
- Proximity ZSR: Risks primarily derived from adjacency to low-lying, vulnerable lands. These lands are vulnerable by being close to areas that will experience more flooding caused by increasing sea levels or surges associated with strong storms and are likely to experience some flooding of their own.
- Natural Protection ZSR: Contains risks to lands that provide natural flooding protection. These lands can attenuate flooding and damage and flooding from storm surges, contribute to both improved water quantity and quality in non-storm events, and provide valuable habitat. This ZSR type often overlaps with the other three types.
- Underpass ZSR: While the previous four ZSR types have been developed as a result of previous efforts, the underpass ZSR type evolved organically under Resilient Connecticut as these locations are a region-wide challenge experienced by many communities. These ZSR identify the underpass locations that during heavy precipitation events often flood due to poor drainage, and are a source of either disruption due to roadway closure or stranded vehicles.

Link to Online ZSR Viewer:

<https://mminc.maps.arcgis.com/apps/webappviewer/index.html?id=af7d75549850450fb7c170b732d19488>

Connecticut Sea Level Rise and Storm Surge Viewer

This dataset shows different flood maps with sea-level rise projections (1 foot and 20 inches), above the North American Vertical Datum of 1988 (NAVD88) along the Connecticut coastline and the adjacent inland. CIRCA research recommends that planning anticipates sea level will be 20 inches higher than the national tidal datum in Long Island Sound by 2050. CIRCA's report on Connecticut sea level rise provided the basis for projections in Bill S.B. 7, which was introduced into the 2018 legislative session and was enacted into law as Public Act 18-82.

Link to Online Sea Level Rise and Storm Surge Viewer:

<https://circa.uconn.edu/sea-level-rise-and-storm-surge-viewer/>

Connecticut Coastal Towns Storm Annual Exceedance Probability/Return Interval Viewer

This map and associated dataset shows the annual exceedance probability (or return period) of storm surge water levels and significant wave height for each of Connecticut's 24 coastal towns obtained from coupled circulation-wave model (a recent Journal of Marine Science and Engineering article outlines this modeling approach). Results highlight storm surge water levels and significant wave heights, which may contribute to a better understanding of extreme storms and guide decision-makers.

Link to Online Storm Annual Exceedance Probability/Return Interval Viewer:

<https://resilientconnecticut.uconn.edu/resources/data-viewers/returnintervalviewer/>