What is Social Vulnerability?

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Social Vulnerability relates to the circumstances of a person or community that affect their capacity to anticipate, confront, repair, and recover from the effects of a disaster. Some examples of factors that might affect a person's social vulnerability include socioeconomic status, household composition, minority status, and vehicle access.

Socially Vulnerable Populations include those who have specific circumstances, such as, but not limited to, poverty, minority status, people without vehicles, people with disabilities, older adults, and people with limited English proficiency which may increase their vulnerability in the event of an emergency.

What is Community Resilience?

Community Resilience refers to a community's capacity to anticipate, confront, repair and recover from a disaster. Community resilience reflects a community's capacity to "bounce forward" after an event. While events such as hurricanes may reduce a community's resilience, strengthening social infrastructure (the number and types of organizations that help vulnerable populations) or investing in physical infrastructural improvements can increase community resilience. A key tenet of community resilience is engaging all members of the public throughout all stages of the planning for, responding to and/or recovering from events such as a coastal storm. Resilient communities intentionally develop personal and collective capacity to sustain and renew the community, and to develop new trajectories for the communities' future.

For socially vulnerable populations, resilience is a factor of individuals AND whole communities. In other words, an individual may be somewhat resilient but the condition and level of cohesion of their community may make them less resilient or not resilient at all.

Why is Understanding Social Vulnerability Important?

In the field of disaster management, risk is often defined as the interplay between a physical hazard and the difference between the vulnerability to that hazard and the resources available to address the effects of the hazard (Flanagan, 2011). Until very recently, disaster management has focused almost solely on the vulnerability of physical infrastructure with little to no consideration of how to address social vulnerability. Studies have shown that social vulnerability is inversely related to a population's ability to recover from a disaster. The higher the level of social vulnerability, the more difficult recovery becomes. Without understanding social vulnerability and incorporating it into disaster management including preparation for, responding to and recovery from disasters, we place the status of physical assets and infrastructure above that of the people in our communities. Providing a focus on attending to the needs of our most vulnerable members of our communities also helps us to begin to address the historic inequities in disaster management and to begin to work towards addressing these inequities.

Climate change has increased the frequency and severity of extreme weather events in Maine. Ensuring that our communities can bounce 'forward' to become more secure and less vulnerable after extreme events requires that we understand the factors that drive their vulnerability in the first place.

What is the Maine Social Vulnerability Index?

The Maine Social Vulnerability Index (MSVI) was developed to help identify where vulnerable populations are located and what factors drive those vulnerabilities. Until the development of the MSVI, work being done in Maine on identifying vulnerabilities to projected impacts of climate change had focused almost entirely on impacts to physical infrastructure like roads, bridges and buildings. Little had been done to assess 'social vulnerability'. The MSVI located on the Maine Coastal Risk Explorer (https://maps.coastalresilience.org/maine/#) is based on 17 socioeconomic and demographic indicators taken from US Census data. The MSVI is a customized version of a social vulnerability index developed for the US Centers for Disease Control following Hurricane Sandy. The MSVI calculates the percentage of the population within each census block group for each indicator. The Maine Coastal Risk Explorer provides a visualization of the information, shows the details for each census block group, and provides the relative level of vulnerability for each census block group within the coastal zone. The Maine Social Vulnerability Index supports communities in decision making that improves the resiliency of the whole community by addressing the needs of the underserved. We note that 'vulnerability' is often the result of the societal systems in place that create inequities in climate risk to people.

The MSVI is a tool that can be used to help inform planning processes, allocation of resources, and policy and program development by bringing the elements of social vulnerability into the calculus. It provides detail at the census block group level as well as providing a way to assess social vulnerability between census block groups and across larger regions of Maine. As a resource, the MSVI is intended to complement local level knowledge of a community's vulnerabilities.

Recovery from disasters and extreme events has historically meant a return to the conditions in place prior to the event. Recovery should be used as an opportunity to increase social and community resilience; we need to develop specific strategies including resources to support efforts that reduce vulnerabilities and increase resilience. Integrating the use of the MSVI with local knowledge provides a mechanism to bring social and community resilience into the discussions that until now have focused primarily on the resilience of physical infrastructure.

The following table provides more detailed information on categories included in the Social Vulnerability Index as well as additional categories not currently included, but that have been identified by area organizations that support the needs of vulnerable populations:

SVI Variable	Explanation
Below Poverty	Individuals experiencing poverty are less likely to have the income or assets to prepare for disasters due to limitations in purchasing supplies in advance or recover from a disaster or buying services or materials in the aftermath of an event. Individuals who are below poverty may be less likely to have stable employment which can be disrupted during storm events. Additionally, the value of homes may represent a larger proportion of overall total assets, and any loss or damage can potentially be more expensive to replace, particularly in regards to household or renter's insurance.[1]
Unemployed	Individuals who are unemployed do not benefit from employee benefit plans that can provide income and health cost assistance if individuals experience injury from a hazard[2]
Employed in a Natural Resource occupation	Rural residents may experience greater social vulnerability due to lower incomes and greater dependence on natural resources (extraction) economies. When storm events disrupt the ability to fish or farm for example, this has a direct impact on residents whose livelihood depends upon theses resources.[3]
Self-Employed	Individuals who are self-employed do not benefit from employee benefit plans that can provide income and health cost assistance if individuals experience injury from a hazard[4]
Income	Higher income individuals experience losses due to hazards but these losses may be buffered by ability to have insurance policies, unearned income from investments and stable employment. It may be more difficult for lower income workers to relocate or travel to a new job. Individuals with lower incomes may be more likely to have difficulty evacuating, need shelters or temporary housing and stay there longer[5] Lower income residents are less likely to receive funding through FEMA for housing repair or housing assistance programs[6] Wealth allows communities to recover from hazards through insurance, social safety nets and entitlement programs[7]

[1] Barry E. Flanagan et al., "A Social Vulnerability Index for Disaster Management," *Journal of Homeland Security and Emergency Management* 8, no. 1 (2011); B. H. Morrow, "Identifying and Mapping Community Vulnerability," *Disasters* 23, no. 1 (1999)..Susan L. Cutter et al., "Social Vulnerability to Environmental Hazards," *Social Science Quarterly* 84, no. 2 (2003).

[2] Flanagan et al., "A Social Vulnerability Index for Disaster Management."

[3] Cutter et al., "Social Vulnerability to Environmental Hazards."

[4] Flanagan et al., "A Social Vulnerability Index for Disaster Management."

[5] Ibid.; Morrow, "Identifying and Mapping Community Vulnerability."

[6] Rebecca Hersher, "Why Fema Aid Is Unavailable to Many Who Need It the Most _ Maine Public.," (2021).

[7] Ibid.

No High School Diploma alt Educational Attainment	Individuals with higher education are more likely to have information and act upon information on hazards from preparation to recovery. Higher education levels may lead to better employment opportunities during post-event and potentially a greater capacity in dealing with governmental entities in gaining access to assistance programs[8]
Aged 65 or over	Many older or disabled individuals have special needs that require assistance from others. Older individuals may lack physical and economic resources to respond to an event and may recover more slowly due to any health-related impacts[9]
Aged 65 or older and living alone	Individuals living alone may not have nearby family or neighbors who would look in on an older individual as these individuals may be coping with the impact of the hazard and caring for others might be beyond their abilities[10]
Aged 18 or younger	Children lack the necessary resources and knowledge to cope with disaster situations. As parents are responsible for children, the risks faced by children are not incorporated into planning exercises, as a result, the direct impact of hazards on children may not be as understood and planned for. It may be useful to have advance information on the number of children who may need special services in a shelter. After Hurricane Andrew, there was a recognition of the specific needs for children at disaster-assistance centers due to an awareness of the lack of resources for children during the event at evacuation centers[11]
Civilian with a disability	This term is used in the US Census. Similar to older residents, residents with a physical, sensory or cognitive challenge may have special needs that require assistance of others. [12]
Single parent household	Households with one parent may be more vulnerable during a disaster as all daily caretaking falls to one parent. In addition, single parent households may have a lower socioeconomic status. In looking at impacts of Hurricane Andrew, one factor attributed to higher than expected preparation rates was that warnings being broadcast over a weekend when people were not at work and had more time to secure supplies. Having an adult who can be available to get supplies and afterwards meet with representatives of agencies to access support may increase overall resilience, which is

[8] Flanagan et al., "A Social Vulnerability Index for Disaster Management."; Morrow, "Identifying and Mapping Community Vulnerability."

[9] Flanagan et al., "A Social Vulnerability Index for Disaster Management."; Morrow, "Identifying and Mapping Community Vulnerability."

[10] Flanagan et al., "A Social Vulnerability Index for Disaster Management."

[11] Ibid.; Morrow, "Identifying and Mapping Community Vulnerability."

[12] Flanagan et al., "A Social Vulnerability Index for Disaster Management."

	challenged when adults are less able to attend to these needs de to child care needs[13]
Minority/BIPOC	BiPOC (Black, Indigenous, People of Color). The impacts of structural racism particularly real estate discrimination coupled with social and economic marginalization may place individuals in these demographic groups at greater risk during all phases of a disaster[14]. A study of the aftermath of Hurricane Harvey stated that individuals in block groups with a larger percentage of minorities were less likely to receive FEMA IHP grants[15] T The term minority is used as in the SVI as it reflects the description provided in the way that the US CDC calculated the Social Vulnerability Index which incorporates all that the Maine Social Vulnerability Index is based upon. We have maintained this term for the sake of consistency with the CDC SVI but acknowledge the term BIPOC as a more respectful term in the context of population vulnerabilities.
Speaks English Less Than Well	For individuals with limited disaster proficiency, disaster communication is difficult, and availability of translators may be scarce. Immigrant populations are more likely to rely on relatives and closer friends for information[16]
Multi-Unit Structures	Individuals living in high-rise apartments are vulnerable due to risks associated with exiting stairwells or having a larger number of people exiting in the street which can affect orderly evacuation[17]
Mobile homes	Mobile homes are often not designed to withstand severe weather or flooding, and often do not have basements. They are often in areas not as accessible to public transit and in some cases may be clustered, increasing overall vulnerability due to having a higher number of individuals who may be at risk in one area. Based upon a study of Hurricane Andrew, mobile homes were 21 times more likely to be destroyed than a conventional home and in one area, all but 9 of the 6600 mobile homes were destroyed. However, effective evacuation resulted in only a few deaths.[18] In the wake of Hurricane Irene, the Vermont Department of Housing and Community Development, mobile home parks were subject to higher levels of risk due to a combination of location on flood plains and impacts from Hurricane Irene[19]

[13] Ibid.; Morrow, "Identifying and Mapping Community Vulnerability."

[14] Flanagan et al., "A Social Vulnerability Index for Disaster Management."

[15] Stephen B. Billings, Emily A. Gallagher, and Lowell Ricketts, "Let the Rich Be Flooded: The Distribution of Financial Aid and Distress after Hurricane Harvey," (SSRN, 2021).

[16] Flanagan et al., "A Social Vulnerability Index for Disaster Management."

[17] Ibid.

[18] Ibid.; Morrow, "Identifying and Mapping Community Vulnerability."

[19] Vermont Department of Housing and Community Development, "Report on the Viability and Disaster Resilience of Mobile Home Ownership and Parks," (Vermont Deparment of Housing and Community Development, 2013).

Crowding/Group Quarters	Household units with a larger number of people within the household may make evacuations during an emergency difficult. Group quarters such as dormitories, nursing homes or long-term care facilities may be more vulnerable due to specific needs of the individuals, potential understaffing and the challenges of relocating and residents that may require specialized vehicles[20]
No Vehicle	For individuals without access to cars, transportation may be more difficult when evacuation becomes necessary[21]
The following categories are not currently included in the Maine Social Vulnerability Index. We have included them as a result of our conversations with area organizations' work on Diversity, Equity and Inclusion initiatives. We acknowledge the importance of planning with these populations in addressing social vulnerabilities who are not included in current census categories.	
New Mainers	Newer residents to Maine who may be affiliated with refugee resettlement programs. To a certain extent, New Mainers may be associated with the SVI categories of BIPOC (Minorities) and Speaks English Less than Well.
LGBTQ	Lesbian, Gay, Bisexual, Transgender, Queer.
Uninsured/ Underinsured	Residents who lack any or adequate health coverage

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[20] Flanagan et al., "A Social Vulnerability Index for Disaster Management."

[21] Ibid.

Resources for more reading:

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Wilson, Barbara B. 2018. Resilience for all: Striving for Equity through Community-Driven Design. Washington, D.C: Island Press