Addressing Disaster Preparedness-Disparity in Connecticut: Cultivating trust and increasing resilience through effective and equitable risk communication:
Connecticut Institute for Resilience and Climate Adaptation UConn Faculty Climate Research Seed Grants: Track 2

FINAL REPORT

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I. Executive Summary

This study was part of an interdisciplinary effort to assess disaster preparedness and identify the roots and repercussions of preparedness disparity across socioeconomic groups in Connecticut by juxtaposing the results of ethnographic interviews with Emergency Managers in four counties in Connecticut with survey data collected among CT residents examining issues of trust, preparedness, and information sufficiency in regards to local emergency services. The results highlight the ways in which state-level systems of disaster management may be exacerbating preparedness disparity and leaving Connecticut towns ill-equipped to manage the growing threats of climate change induced disasters facing southern New England. This applied research sought to provide guidance on the types and form of hazard-related information most desired and sought after by residents, particularly minoritized and impoverished residents, for policy-makers and state, regional, and municipal disaster management personnel; as well as underline the needs of increasingly overburdened emergency management directors across the state.

This research to date indicates that longtime state and regional preparedness practices have yet to update to reflect current climate forecasts, effectively equip local emergency volunteers, or improve communication services to the extent necessary to properly equip first responders or community members in times of threat or crisis. Further, our research demonstrates that the Planning Assumptions of the CT State Response Framework are imprecise based on the reality of the on-the-ground situation and local towns and populations are vulnerable to be disproportionately and unnecessarily impacted by disasters due to lack of available resources and knowledge.

Key Takeaways

- CT's State Response Framework depends upon a declining number of aging EMDs who are overburdened in light of increasingly frequent and severe weather-related hazard events.

- There are widespread issues with inadequate communication systems between EMDs and community members.
- There is an overall sense that residents lack risk awareness and preparedness knowledge.
- The state is not providing adequate financial resources to support EMD responsibilities, the development of emergency plans, or attract much needed additional employees/volunteers.
- The general lack of diversity (gender, race, age, etc.) among EMDs in Connecticut lies in sharp contrast to increasing numbers of low-income residents who may be linguistically isolated, ethnically diverse, or otherwise marginalized.

Resident survey data furthermore indicates that racially minoritized and impoverished residents, those that score higher on social vulnerability indices and that may be differentially susceptible to loss or harm from hazard events:

- Seek more preparedness information than less vulnerable residents.
- Prefer person-person sources of emergency and disaster-related information, ideally from friends, family, church, libraries, schools, etc.
- Are less likely to be aware of their community's emergency management plan.
- Are more likely to feel as though their needs are not being served by their town's emergency services.

II. Project background and context

Many Connecticut municipalities are unprepared to address the socioeconomic, environmental, and infrastructural challenges brought about by the combination of increasingly frequent extreme weather events and the socioeconomic disparity that characterizes the state. Between 1980 and 2021, there were 35 major weather-related disaster events in Connecticut with 19 of those storm events occurring in the last decade (NOAA 2023). These 19 events alone cost over $30 billion and left hundreds of thousands of households without power for days to weeks at a time. In addition, approximately 11% of Connecticut residents live under the poverty line and over 27% of households qualify as ALICE (Asset limited, Income Constrained, Employed), a metric used by the United Way to discuss the challenges facing households earning above the Federal Poverty Level yet struggling to afford basic expenses. In addition, over 47% of seniors, 57% of Black households, and 63% of Hispanic households live under the ALICE threshold (United Way, 2020). This collision of hazard events, the state's reliance on volunteers for emergency services, and increasing socioeconomic disparity is creating a disconnect between state- and municipal level emergency preparedness/response and Connecticut residents, many of whom are already coping with intersectional societal assaults lodged by systemic racism and lack of equitable institutional support in education, healthcare, food access, and basic needs.

This project sought to assess preparedness and preparedness-disparity across the Western four counties in Connecticut and examine the efficacy of current emergency information messaging to inform historically marginalized individuals of protective actions and resources that may lower their disaster risk and increase resilience. Prior research by UConn's DISASTER research team revealed significant preparedness disparity along racial, ethnic and socioeconomic lines in eastern Connecticut. This project was designed to build off this earlier work by collecting matching data in western CT in order to: a. compare and contrast the state of disaster preparedness from resident and municipal perspectives and identify gaps between local level efforts and community needs, b. identify pressing municipal preparedness needs from the state, and c. increase resident preparedness through improved municipal risk communication and climate education among disadvantaged and minoritized communities.

This work is also motivated by the need to examine the effectiveness of emergency information messaging to inform historically marginalized individuals of protective actions and resources that may lower their disaster risk and increase resilience. Existing research suggests that members of marginalized communities may engage in different patterns of information seeking and rely on different trusted sources for information concerning high-consequence events. These disparities are attributed to structural inequalities in information distribution and resource allocation, placing historically underserved communities at a disadvantage, thereby increasing their vulnerability to extreme climate-related hazard events. Relatedly, research indicates that at-risk individuals will persistently monitor information sources until they feel able to make informed decisions (Griffin, Dunwoody, & Neuwirth,1999; Yang et al., 2011). Motivated information seekers are more likely to gravitate towards sources they already perceive as trustworthy (Griffin et al., 2002; Yang & Liu, 2020). While the bulk of this body of research has concentrated on general information-seeking trends (Griffin et al., 2002; Yang & Liu, 2021; Yang,

Dong, & Liu, 2022), a smaller subset of studies has explored whether these channel beliefs and sufficiency thresholds influence differential source preferences (Hwang & Jeong, 2020; Jin & Lane, 2022). These investigations imply that information seeking can be influenced by both motivational factors and specific source-related beliefs; combined with the arguments above, the information sources relied upon by members of underserved communities are a critical consideration in the management of disaster vulnerability, as both the dissemination of risk information and trust in the messenger will impact resilience outcomes.

III. Advancing CIRCA's mission and priority research areas

This project sought to inform three of CIRCA's research priorities, including:

1. Novel analysis approaches to characterize climate change impacts on humans, the economy, or Connecticut ecosystems.
2. The development of methods to characterize socioeconomic impacts of climate change on Connecticut communities.
3. The development and demonstration of approaches to assess the effectiveness of engagement strategies used in adaptation planning in the diverse array of Connecticut communities

It is well documented that climate change is a "threat multiplier" (Schwerdtle, Bowen & McMichael, 2017) that inordinately affects underserved, impoverished, and otherwise marginalized individuals. However, there is still much work to be done to understand how best to mitigate the impacts of climate change and ensure that communities are equitably equipped to withstand the impacts of future climate events. The most immediate relevance of this research to CIRCA is in the ongoing efforts towards the development and implementation of community Resilience Hubs. The research discussed here was presented and well-received at the CIRCA Resilience Hubs workshop on April 30th at the Swift Mill. The results point to a need for a revision of state level policies regarding the dependence upon and financial support for volunteer municipal-level emergency personnel, including increased financial assistance for communication technology, salaried positions, recruitment and diversity initiatives, and resident education programming. This work also highlights the need for increased municipal-level attention to community members with heightened risk factors including senior citizens, non-English speakers, pedestrians without access to transportation during evacuations, physically disabled residents, as well as those in poverty and requiring daily assistance for mobility, meals, medications, etc. In addition, we see that minoritized residents also recognize that they are lacking important emergency information including emergency instructions, weather warnings, evacuation information, and shelter locations. Improving state support for municipal level communications, engagement, outreach, and communication is key to ensuring that all residents are adequately prepared to be informed and equipped in the event of a weather-related hazard event.

One of the most significant products of this research was the development of a novel survey to assess the myriad impacts of climate change on CT residents, specifically marginalized residents, and the identification of the sources of climate preparedness-disparity along socioeconomic,

racial, and ethnic lines. The results of this survey and the interviews with EMDs informed the recommendations for increasing the efficacy of communication practices to inform, educate, and better assist residents. The survey, itself, can also be used moving forward to assist in CIRCA's efforts to qualitatively and quantitatively assess strategies for resilience and adaptation planning and assessing municipalities' ability to assist at-risk residents.

IV. Project Description, Methods and Goals

This research critically examined the state of Connecticut's dependence upon volunteers in emergency services in the wider context of the volunteer-based emergency services worldwide and the waning efficacy and ethics of placing such tremendous physical and time-intensive burden of disaster preparedness on an ever-dwindling population of volunteers. Well-cited issues with volunteer-based emergency response around the world reinforce problematic aspects of CT's system, namely the homogeneity of those serving in volunteer emergency services positions; the outdated communication systems upon which these emergency services depend; and the cumulative impact that these institutional practices may have on the contextual vulnerability and resilience of communities to the impacts of climate change. The data collected further illustrates the significance of ethnographic data and semi-structured interviews in the identification of sources of context- and spatially specific climate vulnerability that would otherwise elude census-tract social vulnerability analyses and the role that these data can play in the design of equitable, community-based preparedness programs and practices.

The project was comprised of three stages of research:

The first component of the project sought to identify areas of greatest need by incorporating risk burdens associated with climate-related hazards and demographic indicators into a multivariate analysis intended to highlight areas of highest climate-related risk coupled with highly vulnerable populations. Such preliminary analyses were designed to incorporate preexisting datasets such as those provided within the U.S. Climate & Economic Justice Screening Tool (CJEST) which provides indicators of climate risk burdens (e.g., potential flood risk, fire risk, agriculture loss, and building losses from all relevant hazards) and relevant portions of CIRCA's Connecticut Environmental Justice Screening Tool which incorporates important factors aimed at measuring the sensitivity of populations to the respective climate risk burdens.

Figure 1 depicts the social vulnerability of Connecticut's communities at the U.S. Census tract level of geography. To measure the social vulnerability of Connecticut's communities, we adopted the Social Vulnerability Index (SVI) variables and methodology applied by CIRCA for the Resilient Connecticut – Regional Climate Planning initiative for New Haven and Fairfield Counties. The SVI was adopted to identify populations and communities that may be differentially vulnerable to the impacts of climate change, and the SVI method was favored over other mainstream algorithms for measuring social vulnerability due to a robust variable set and calculation methodology that was adopted from two widely used and tested social vulnerability

indices (i.e., the University of South Carolina's Social Vulnerability Index (SoVI) and the CDC's Social Vulnerability Index). We extended the SVI methodology from New Haven and Fairfield counties to the entirety of the state in order to prioritize areas for our ethnographic interviews discussed in more detail below.

In addition to mapping social vulnerability, we examined the intersection of social vulnerability and climate-induced hazard and disaster risk. Here, climate risk burdens provided within the CJEST tool were coupled with the SVI. Figure 2 is a standardized bivariate map depicting the spatial distribution of properties per census tract that are at risk from floods within the next 30-years coupled with the SVI. Census tracts with high social vulnerability and a high potential flood risk (designated by the darkest shades of gray), high risk with low social vulnerability (shades of darker blue), and moderate risk with high social vulnerability (darker red) were identified throughout the state.

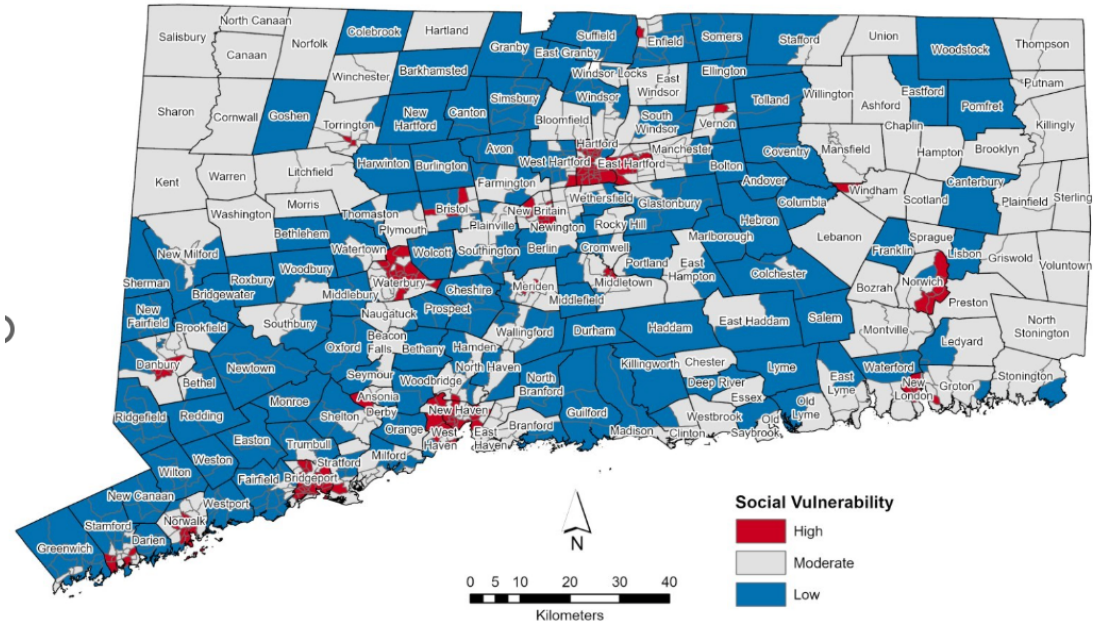

Fig. 1 *Spatial distribution of social vulnerability at the census tract level*

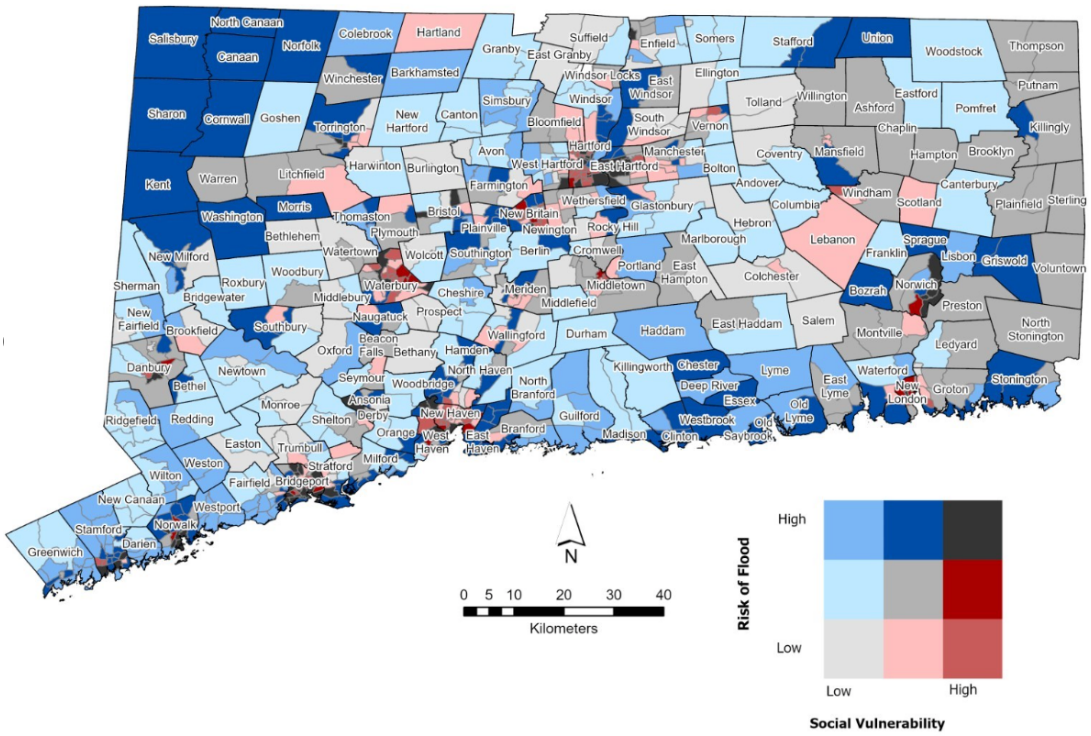

Fig. 2 *Spatial distribution of flood risk and social vulnerability at the census tract level*

The second component of the project included ethnographic interviews with CT Regional Coordinators and municipal Emergency Management Directors (EMD) in areas highlighted by our first component. To date, we have completed 29 interviews with EMDs and Regional Coordinators across 28 towns. Interviews focused on garnering information on RC and EMD responsibilities, concerns regarding the risks to communities posed by climate related hazards and events, as well as their greatest challenges to effectively meeting municipal and resident needs. Coding has identified several recurrent and overarching themes (Fig. 3):

a. Volunteerism issues: Decreasing numbers of volunteers, aging, underfunded
b. Collision of socioeconomic vulnerability and weather events (climate)
c. Juxtaposition of dependence upon mutual aid and the inadequacy of mutual aid during weather events
d. Lack of state funding to support towns' EMDs
e. Isolationist tendencies and 'Yankee mindsets': "Better on our own"
f. Gender and gendered notions of preparedness: 'alarmist' vs. reactive; professional vs. Tapped for positions; climate concerned vs. climate skeptics
g. Tensions between volunteers and professionals (small/rural vs. larger/wealthy)
h. Knickpoint events: when was EM established in a community? What events shaped approach? How long does preparedness last after knickpoint events.

Fig.3 EMD Interview Theme word cloud

The third component consisted of a web-based survey sent out to residents across the state to gather information on residents' perceptions of self-preparedness, climate risk awareness, trust in municipal and state emergency response officials, and preferred forms of emergency communication. This data was triangulated with interview data in order to identify understanding gaps between EMDs and community members. The findings largely indicate that members of at-risk communities exhibit less trust of emergency responders and planners, and that community resources such as food banks, churches, and libraries are essential information sources for members of these communities. The results also reveal racial and socioeconomic disparities in information sufficiency, self-identified preparedness, and risk awareness across geographic tracts with varying degrees of diversity and infrastructure vulnerability.

Recommendations for CIRCA, policy-makers, state and municipal leaders

- Disaster management policies and planning should focus on recognizing the influence of extended families and social networks.
- Crisis communication, policies, and risk awareness and preparedness education should initiate at the community level and be dispersed through trusted community institutions (libraries, schools, community centers, senior centers, churches), be provided in multimedia forms (radio, mailings, emails, bulletins) and available for ESL and non-English speaking residents.
- Crisis responders would be wise to build relationships with community leaders at trusted community institutions to more effectively inform those who may be in harm's way.
- The diversity of EMD and emergency response personnel should be increased through inclusion of women and racially minoritized groups, increasing the scope of position advertising to schools, community colleges, public health facilities, churches.
- Solicitation of state funding for part-time positions, updated emergency communications systems, emergency plan development, and resident risk and preparedness education programming.

V. Outcomes and products, including a description of the planned external grant application

Abstracts and Presentations:

- Abstract. EDEN: Extension Disaster Education Network Conference. "Hope is not a plan": Preparedness-disparity and emergency management in Connecticut, U.S. Portland, ME. 10/21-10/24
- Abstract. EDEN: Extension Disaster Education Network Conference. "Filling the Void: Increasing Emergency Preparedness Capacity Through an Undergraduate Ecorps Course Model," Portland, ME. 10/21-10/24.
- Talk. UConn CIRCA Planning for a Network of Resilience Hubs for Community Preparedness in Connecticut Workshop, On the Brink: Examining Preemptive Indicators of Disaster Vulnerability in Connecticut, April 2025.
- Talk. UConn TERRA Environmental Justice Panel, Methods in Environmental Justice and Disasters research, April 2025
- Talk, SfAA (Society for Applied Anthropology) 2025. Beckham, A and Shoreman-Ouimet. "Hope Is Not a Plan": Preparedness-Disparity and Emergency Management in Connecticut, U.S. Society for Applied Anthropology, March 2025.
- Talk, ECREA (European Communication Education and Research Association), 2023, Lachlan, K., Ouimet, E., DiCairano, J., Burton, C. and Walters, A. "Geographic variability in vulnerability and resilience: Implications of triangulating geospatial and social crisis communication data." October 2023
- Talk, NCA (National Communication Association), 2025 (under review). Lachlan, K.A., DiCairano, J., and Shoreman-Ouimet, E. "Weather risk information dependencies and preparation across geographic space and social vulnerability." November 2025

Papers based upon this research and related themes:

Published

- **Shoreman-Ouimet, E;** Harden, A. and Walters, A. (2024). Any Volunteers? The collision of Climate Change, Conventions of Practice, and Emergency Preparedness in Connecticut. *Human Organization,* 101(104276).
- **Shoreman-Ouimet, E.; DiCairano, J.; Lachlan, K; Burton, C**.; Walters, A.; Ouimet, W.; Barrett, J. (2024). On the Brink: Examining Preemptive Indicators of Disaster Vulnerability, Connecticut USA. *International Journal of Disaster Risk Reduction* (IJDRR) 101 (104276).
- Rouhana, F; Zhu, J; Bagtzoglou, A; **Burton, C**. 2025. Analyzing structural inequalities in natural hazard-induced power outages: A spatial-statistical approach. *International Journal of Disaster Risk Reduction* 117(105184).

Submitted

- Not Just Who, But Where: Examining Weather Risk Information Dependencies and Preparation across Geographic Space and Social Vulnerability. *Communication Quarterly*, submitted May 2025.
- Rouhana, F., Zhu, J. and **Burton, C.G.** (Accepted, In Press). Examining rural-urban vulnerability inequality in extreme weather-related power outages: case of Tropical Storm Isaias, Natural Hazards Review.

Related Grants

- Sloan Foundation: Pre-proposal: Equitable Energy Solutions: A Sociotechnical Approach to Enhancing Community Resilience and Decarbonization. (Submitted March 2025). $985,378. (Not Funded)
- NSF R2I2: Collaborative Science for Community Flood Resilience in the Northeast. Lead Institution, University of Albany,(PI: Jorge Gonzalez Cruz), $500,000 (Pending)
- NSF CHIRRP. CASCADE: Community-Academic Collaborations for Actionable Solutions in Disaster Adaptation, Engagement, and Empowerment. (PI Jorge Gonzalez Cruz, University of Albany), $100,000. Pending
- Co-PI. NOAA. Title: Filling the Emergency Preparedness Gap for Older and Underserved Populations in Select Coastal Connecticut Communities. SeaGrant PI Nancy Balcom. Status: Active (May 2024-), $207,814.(Funded)

Future grant plans

- NSF SAI (Strengthening American Infrastructure). *Shoreman-Ouimet plans to collaborate with the team on a proposal to examine energy infrastructure equity and resilience in the face of extreme events.*
- NSF IUSE. *Shoreman-Ouimet will be working with Extension faculty to submit a second round of funding for E-Corps which will incorporate an outreach-oriented course on disaster-preparedness in CT.*
- NSF DRMS (Decision, Risk, and Management Sciences). *Lachlan plans to collaborate with the team on a proposal examining infrastructure inequities, information processing, and disaster mitigation across at-risk communities in the northeast.
- NSF ISP (Infrastructure Systems and People). *Burton plans to collaborate with the team on a proposal that aims to develop a framework for improving the measurement and communication of disaster resilience by accounting for hazard and community context.