



A Framework for Implementing
RESILIENCE HUBS
IN YPSILANTI, MICHIGAN

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ARTWORK

The cover of this report was designed by Detroit-based artist Bridget Quinn. The three works shown in the report were designed by Ypsilanti-based artist Jessica Tenbusch. The cover and the works titled *Cultivated* and *Foraged* were commissioned exclusively for this project.

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KEY TERMS

Block Leader – Individual(s) in charge of leading resilience efforts and resource distribution at the scale of their neighborhood block. Also may be referred to as “block champion” or “ambassador.”

Community – A group of people connected by shared attitudes, passions, place, or goals.

Geographic Information System (GIS) – A computer program with the purpose of mapping, modeling, and analyzing data based on geographic locations.

Material Needs – Tangible resources that can meet the daily and emergency needs of residents.

Mutual Aid – A form of community-wide social connection and participation, where all members are cared for by one another and new social bonds are forged.

Qualtrics – A platform to distribute web-based surveys.

Resilience – The adaptive ability to resist and recover from hardship.

Resilience Hub – Spaces that can support the daily needs of residents and aid in the distribution of resources to the community before, during, and after a significant stressor, including natural and artificial disasters, pandemics, or otherwise impactful events. Also may be referred to as “resiliency hub” or “resilience center.”

Resilience Network – An interconnected group of resilience-oriented partners in the community.

Social and Emotional Needs – Concepts that residents find important for supporting social health, mental health, and wellbeing.

Solar + Storage – An energy system that combines solar panels with battery storage technology, enabling the connected building to operate independently from the electrical grid.

EXECUTIVE SUMMARY

A Framework for Implementing Resilience Hubs in Ypsilanti, MI

Background

The imminent combination of increasing natural disasters due to climate change, degenerating national support systems, and declining natural resources suggests an ever-increasing need to focus on local resilience and adaptation rather than mitigation alone. Envisioning such a future, our team proposes resilience hubs as a solution to these issues. First termed by the Urban Sustainability Director's Network, these centers provide physical, social, and emotional resources to neighborhoods before, during, and after natural hazard events. This research aims to produce materials to help residents identify how their communities can become more resilient and independent, as well as adapt to a new climate normal.

This project focuses on the City of Ypsilanti, located in Washtenaw County and Southeast Michigan, just west of Detroit. The City has an enduring history within the automotive industry and the educational field, and it is well known for its arts and culture. The total population has increased since 2010, although it has plateaued in recent years.

Methods

Our team conducted analyses using geographic information systems (GIS) to identify optimal locations for hub placement with an emphasis on environmental justice and equity. We utilized screening tools and data provided by the U.S. Environmental Protection Agency to determine priority areas that are most susceptible to environmental risks and harm. Furthermore, we conducted analyses to identify existing structures that can be readily adapted to serve as hubs while still maintaining their original functionality.

Additionally, we created and piloted survey and interview tools to be used by future research teams when working with communities to implement resilience hubs. Ensuring enhanced user understanding and accessibility were paramount during the development of these tools. Additionally, our pilot interviews produced an initial set of deductive and inductive response "codes", or repeated themes across interviewees. Future groups should reference these codes when analyzing interview data and refine them as needed to create a more tailored approach to implementing a resilience hub, specific to the community they hope to serve.

With financial challenges often posing a barrier to climate resilience projects, we also identified a variety of potential funders and funding mechanisms to ensure the financial sustainability of resilience hubs. The report includes (a) an initial list of philanthropic organizations who support projects related to community resilience; (b) descriptions of traditional municipal funding resources, such as municipal operating funds and debt; and (c) descriptions of novel and creative approaches, such as resilience bonds and revolving energy funds. Cities can use these methods in conjunction with one another to fund hub implementation.

Results

Based on the findings of this report, our team recommends the City of Ypsilanti continue work on establishing Parkridge Community Center as the city's first official resilience hub. Many programs and services that can be included in a hub are already present in that space, such as opportunities for recreation and youth educational programs, making it a natural location for a hub. Parkridge also has the capacity to expand to include more resources, such as renewable energy and storage, by utilizing the funding opportunities outlined in this report.

This recommendation is related to our second, which is to utilize the surveys and interviews created as part of this project as a bottom-up approach to understanding resident needs and desires for what should be included in this hub, along with future hubs. This emphasizes a participatory research design that iteratively seeks feedback from the broader community before moving forward with any one set of recommendations for establishing community resilience, equitably placing community voices at the forefront of hub planning. With a continuing group of master's students already underway on continuing this work, this will allow neighborhoods to shape a hub precisely in their vision.

As a final recommendation, we suggest the community builds a resilience network, which is an interconnected group of resilience-oriented partners, places, and programs in the community. Establishing a formal network of resilience-based initiatives can provide residents with vital information on how to access services and resources during times of need, which can greatly complement and promote the use of any physical hub location. Alongside this idea, the City of Ypsilanti should consider creating a formal resilience ambassador program that provides residents who are interested in serving as block leaders with the support and resources to enhance neighborhood resilience on a street-by-street basis. With the implementation of a resilience hub, a resilience network, and an ambassador program, the City of Ypsilanti can be at the frontier of innovation for community-wide resilience and adaptation efforts.

INTRODUCTION AND PROJECT GOALS

Purpose and Project Summary

This project aims to address how communities in the United States with socioeconomic challenges can establish spaces of resilience in order to adapt to a future with fewer resources and greater climate instability. This will be done specifically in the context of Ypsilanti, Michigan to understand and address needs that communities of similar demographic makeups may have as we experience increasingly frequent climate impacts. Climate disasters and emergency declarations have been on the rise over the past two decades due to anthropogenic climate impacts. The significant amount of support needed to address and respond to such impacts can quickly deplete institutional resources, leaving citizens to act without assistance from outside of the community and instead turn to one another for support during such times.

The research resulting from this project serves as a procedural guide to enhance adaptive strategies to climate events through community-operated and designed gathering spaces, referred to as resilience hubs. While the focus of this study is on the community of Ypsilanti, a unique feature of a hub is that it often operates on the scale of a neighborhood, and networks of hubs can provide the anticipatory, adaptive strategies necessary to build resilience at the community level. This will be discussed here to guide Ypsilanti residents and decision-makers in gathering data and making progress toward implementing resilience hubs.

Climate Change in Southeast Michigan

Southeast Michigan has remained largely untouched from climate change impacts compared to other parts of the United States. However, present conditions cannot undercut the need to prepare for the undeniable effects to come. Fortunately, the region is highly motivated to combat climate change and has taken action in the forms of climate emergency declarations (City of Ann Arbor Environmental Commission, 2019; Washtenaw County Board of Commissioners, 2019) and aggressive climate action plans to eliminate local contributions to greenhouse gas emissions entirely (City of Ann Arbor Office of Sustainability and Innovations, 2020).

Even with planned mitigation efforts, temperatures in Southeast Michigan are still projected to rise between 3 to 6°F in the next few decades (Great Lakes Integrated Sciences + Assessments (GLISA), 2019). Days above 90°F will likely double in the same timeframe (Great Lakes Integrated Sciences + Assessments (GLISA), 2014). This level of warming can contribute to significant heat-related illnesses. A warmer climate also diminishes air quality, primarily in the form of ground-level ozone (Great Lakes Integrated Sciences + Assessments (GLISA), 2014; Melillo et al., 2014, 418-440; U.S. Environmental Protection Agency Climate Change Division, 2016). A substantial body of medical research has linked repeated ozone exposure to reduced lung functioning, increased respiratory illness, airway inflammation and hyperactivity, and cardiovascular morbidity (U.S. Environmental Protection Agency, 2006).

While a warmer climate allows for a longer growing season of crops, excessive heat causes an overall decline in yields (U.S. Environmental Protection Agency Climate Change Division, 2016). The subsequent unstable winter conditions also increase the variability of freezing springtime temperatures during vital stages of early crop growth (Melillo et al., 2014; Yu et al., 2014).

Furthermore, a growing body of research indicates that rising temperatures increase the opportunity for the spread of various pathogens (Harvell et al., 2002; Stewart & Elliott, 2015). With the current circumstances highlighted during COVID-19, an increased preparedness for such events is necessary.

While these consequences are concerning in their own right, there will be several other additional impacts from climate change than fluctuations in temperature alone. In addition to the aforementioned effects, Southeast Michigan will experience a drastic increase in precipitation, particularly in the form of extreme weather events (Great Lakes Integrated Sciences + Assessments (GLISA), 2019; Melillo et al., 2014). The subsequent impacts from flooding span across a variety of sectors and can quickly degrade aquatic systems, agriculture, and built infrastructure. An example is the failure of the Edenville and Sanford dams in May 2020 that was brought on by heavy rains and resulted in a catastrophic 500-year flood (State of Michigan Department of Environment, Great Lakes, and Energy, 2020). A flood of this scale often has cascading consequences, with serious effects on the built environment. The dam failures displaced nearly 10,000 residents amid the Covid-19 pandemic and inundated a chemical plant, potentially contaminating the watershed (CBS & Associated Press, 2020; Schafer, 2020).

This only begins to touch upon the many issues climate change presents. Cumulative natural hazards are likely to pose even greater risks. Research predicts that the global population will persistently face up to six co-occurring natural disasters by the end of the century (Mora et al., 2018). These events are expected to be on the scale of past catastrophes such as the megatsunami that struck Sri Lanka in 2004, Hurricane Katrina in 2005, the Australian bushfires in 2019 to 2020, or the present Covid-19 pandemic. All of these disasters collectively cost hundreds of billions of dollars in economic damages, produced untold environmental harm, and resulted in widespread human mortality. Resources for aid were stretched thin even though events of this size were not experienced concurrently. With emergency assistance likely to be strained globally, communities will have to increasingly rely on themselves as the world becomes less hospitable.

An Approach to Neighborhood Resilience

Considering the impaired state of federal funding sources allocated to address intensifying weather-related events, the capacity of individual communities to handle the impacts of natural disasters from our changing climate is currently insufficient. This fear has already become a reality in several places across the United States. In California, for example, during September of 2019, millions of residents had no electricity for up to a week due to concerns of electric lines starting wildfires under extremely dry, windy conditions (CNBC, 2019). Vulnerable populations relied on voluntary community assistance to meet their needs as assistance demands were exacerbated by large fire events and available resources from state and local communities quickly disappeared (Mays, 2019). In early 2021, unusually frigid temperatures led to the collapse of energy infrastructure in areas of Texas. In response to the crisis, there were cases of neighborhoods and broader communities aiding each other where state and federal governments did not (Villarreal, 2021). Preventative measures for disaster mitigation, such as reducing utility supplies, may also become increasingly common in a less hospitable climate.

Resilience hubs are one possible approach to establish neighborhood resilience in the face of climate change and its impacts. Resilience hubs aim to provide resources to assist community members in times of need, offer a communal space for discussion, knowledge sharing, and events, and would take coming energy descent into consideration by utilizing solar-plus-storage systems for operational energy needs. Communities can implement hubs to increase adaptive capacity to climate emergencies while easing the transition to a new normal, serving an additional purpose beyond emergency response centers. As cities are increasingly beginning to plan for climate emergencies, including the use of city-level “climate action plans” (VHB Engineering, Surveying, and Landscape Architecture, P.C., 2014), Ypsilanti and similar communities will need to draw on their community organizing power in order to plan for the distribution of resources required in these situations.

The conceptualization of hubs should be organized in such a way that makes them attractive environments to occupy even outside of an emergency scenario. These spaces should preferably be regarded as comforting and restorative so that people use and benefit from them more frequently, avoiding potential negative social connotations or mere use as disaster relief spaces. For example, in Ann Arbor, the Northside Community Center will be the city’s first resilience center, and already serves as the administrative building for the Community Action Network, providing a multitude of day-to-day services for residents in the area amidst a green, natural landscape. (Stanton, 2020). Similarly, an approach to this would be to implement biophilic design (visual greenery and auditory cues reminiscent of nature), both as part of the indoor and outdoor built environment of the hub. Such design is proven to improve mood and decrease stress levels and feelings of anxiety (Beukeboom et al., 2012; Chang & Chen, 2005; Gillis & Gatersleben, 2015). Each of these benefits would help create a multi-use space that people enjoy occupying, in addition to a center for people experiencing weather-related trauma.

When facing climate emergencies and transitions, the availability of social resources (e.g., community, meaning, and grounded values) are as important as physical resources (e.g., temperature, safety, and access to food) in achieving resilience. Creating resilience is, therefore, as much a psychological endeavor as a physical and environmental one. One possible feature of a hub is to foster situations for conversations to take place about things that matter in the lives of those undergoing climate emergencies, crises, and transitions. In other words, concepts that tend to be difficult to talk about, such as intangible values and practices relevant to resilience, are given space for productive discussion.

Planning for a Hub and Potential Alternatives

However, vulnerable populations may not necessarily self-identify the importance of social resources or physical design in establishing a hub and instead focus on the more imminent, physical needs that are not yet being addressed. As a result, our project aims to meet communities where they are by offering resources to conduct semi-structured interviews and surveys to help identify where, and if, hubs can improve quality of life while also establishing resilience at a neighborhood-level. This research aims to get residents to identify how their community can become more resilient, independent, and adapt to a new climate normal. By

gathering this data, teams trying to establish resilience hubs can convey bottom-up recommendations for enhancing local scale resilience.

While we lay out what is pertinent to constructing the ideal resilience hub, we also recognize that economic barriers will often prevent communities in need from establishing one. While discovering funding opportunities is part of the solution, it can only go so far. However, another possibility remains in what is already established. In this, our project looks to identify resilience opportunities—or structures, groups, and programs already in place—that can serve the function of a hub while not having a centralized physical location. Currently, there is no name given to the many non-building-centric resilience initiatives. In many of the materials presented in this report, such approaches are referred to as resilience “block leaders” (although, in fact, block leaders are only one example of this category of resilience initiatives). Communities can take advantage of the emerging network of block leaders as a low-cost way of transitioning in the coming period of climate variability. However, whether using a hub or one of the alternatives, the program developed must be based on the feedback generated by local participants identifying the needs that must be fulfilled in order for their neighborhood to become resilient.

PAST AND CURRENT RESILIENCE MOVEMENTS

Neighborhood-wide organizations that focus on building connections among residents predate much of the current work on resilience centers, which focus more so on coordinating an emergency response in the context of climate change impacts. While not explicitly named as “resilience” or “preparedness” groups, many of them successfully coordinate local efforts to become better stewards of the space they occupy and better caretakers for the people they share it with. Neighborhood associations, for example, are active in many areas of the country and continue to plan events at the community level, allowing residents to join this existing network for information, physical resources, and a general sense of connectedness to the place and people around them. In fact, neighborhood associations were raised a number of times during our preliminary interviews with Ypsilanti residents as a potential network to leverage when thinking about how to organize the distribution of resources outside of a physical center location. When conceptualizing what a “block leader” approach to resilience may look like, there are a number of past and current movements one might draw from.

When looking at the origins of neighborhood resilience building, several such movements were underway during the 1960s and '70s that laid the groundwork for much of the neighborhood organizing we see today. In nearby Ann Arbor, Mich. in 1970, the University of Michigan saw not only the first Teach-In for the Environment, leading to today’s “Earth Day”, but the creation of Ann Arbor’s Ecology Center, who in collaboration with and support from the surrounding community built one of the most successful curbside recycling programs in the country at that time (Harlow, 2020). This was only made possible with the amount of dedication from surrounding residents who created community-wide education programs and door-knocking campaigns, leading to a 70% participation rate in the program (Michigan in the World and the Environmental Justice HistoryLab, 2018). This example provided early evidence for the idea that communities can be successful in achieving what doesn’t yet exist if enough people are made aware of the issue and what can be done to remedy it for the betterment of their community. A

group with similar aims includes Berkeley's Ecology Center, built and organized by residents to coordinate recycling, composting, and home gardening. This center also demonstrated an early example of locally-organized environmental cleanup from a 1971 oil spill in the San Francisco Bay that, to this day, has led people to continue to call their environmental hotline for information on local emergencies (Ecology Center, n.d.). With an increasing awareness of the environmental catastrophes occurring during that time, residents in Boulder, Colo. were also preparing teach-in events in response to such events (Sutter, 2010). Once again, organizers of these events insisted that it be more than just a "campus thing" and were active in including the local business community to encourage individual action from those in the area.

The above examples point to a level of past activism at the local level that set the precedent for resilience centers today, allowing neighbors to develop a collective vision for the future of their community, and work toward making it a reality. As a result, resilience hubs and centers are currently underway in numerous U.S. cities, including the following:

- Berkeley, Calif. (City of Berkeley, n.d.)
- Baltimore, Md. (Curran & Pottiger, 2019)
- Seattle, Ore. (Seattle Government, n.d.)
- Minneapolis, Minn. (Rogerson & Majumdar Narayan, 2020)
- Ann Arbor, Mich. (City of Ann Arbor, 2020)
- Los Angeles, Calif. (100 Resilient Cities, 2018)
- Washington D.C. (100 Resilient Cities, 2019)
- Austin, Texas (Sandoval, 2019)

Mutual Aid

We can also look to the older idea of mutual aid, or the form of social connection and participation, where people in a community vow to care for each other and build new social bonds that are durable (Spade, 2020). As defined by the USDN, the resilience hub concept contains features that are consistent with mutual aid, particularly the focus on community coordination and resource distribution (Baja et al., 2019). This section will give a brief overview of mutual aid, followed by a few examples of when it has been used to enhance social connectedness and community health successfully.

One way to understand mutual aid is that it can act as a mechanism for people to have their material and nonmaterial desires and needs fulfilled through alternative, and usually local, means (Spade, 2020). As an example, consider the instance of catastrophic weather events in Texas in February of 2021, where a failure of standard assistance infrastructure, i.e., state institutions, led to people within communities helping each other (Villarreal, 2021). Sometimes governments and standard philanthropic programs fail to meet the needs of people, particularly people of traditionally marginalized groups, which necessitates the existence of other methods of care. Another component of mutual aid is the focus placed on work that is not traditionally recognized and acknowledged, such as care work (Spade, 2020). Resilience hubs reflect the importance of this work by attempting to establish pathways for care work (e.g., eldercare and childcare), along

with other forms of social bonds that might not be compensated for or recognized by more mainstream institutions. A final component of mutual aid that is relevant to the work of this report is its bottom-up nature, which exists in contrast to the standard, top-down approach that governments and philanthropy often undertake (Spade, 2020). This is another feature of mutual aid that fits well within a broader resilience framework; a necessary condition of this project is that the Ypsilanti community has essential input in what a resilience hub in their community will offer.

There are far too many examples of mutual aid in action to detail in a single report, however, there are a couple worth exploring. One notable example is that of the Black Panther Party's community programs. These included free food offerings, medical clinics, rides for senior citizens, and many more (Spade, 2020). Importantly, these endeavors were opposed in many respects by the federal government, indicating that mainstream channels are not always helpful to people of historically marginalized groups. This further reinforces the idea that mutual aid can be a source of empowerment, solidarity, and care among neighborhoods and communities (Spade, 2020). Another historical example of mutual aid in United States history was the Free African Society of the late 1700s. Unsurprisingly, white institutions—such as many churches—refused to offer social services to Black community members, which led to the need for Black Americans to form a mutual aid society of their own. This society offered services to the ill, the elderly, and orphaned children that the dominant social infrastructure refused to offer. Also notable about this instance of mutual aid was its focus not only on material needs but also its focus on spirituality, morality, and culture (Barga, n.d.). This acts as a reminder that enhancing resilience is both a material issue (e.g., food and shelter) as well as a psychological and social one (e.g., social connectedness and culture).

RESILIENCE HUBS

A search for existing models of resilience hubs led to the Urban Sustainability Directors Network (USDN), which lays much of the theoretical groundwork for what might constitute a resilience hub. The overarching aims of resilience hubs are to become spaces that can support residents and aid in the distribution of resources and services at all points of a climate-related stressor to the community before, during, and after the event (Baja, 2018). The USDN has also made mention, both in written materials and by way of conference presentations, of specific cities with whom they are working to establish hubs of varying types. These cities include Washington D.C., Baltimore, Miami, Minneapolis and St. Paul, as well as Ann Arbor (Lundgren, 2019; (Rothschild, 2019). The idea behind resilience hubs emerged from 40 community interviews conducted in Baltimore as part of an effort to develop an “individual preparedness initiative” by the USDN. The concerns of residents in that community that came forward in interviews include (Baja, 2018):

1. lack of access to resources to react and respond in a hazard event;
2. lack of financial means to purchase backup food and water supplies;
3. little or no access to a vehicle to evacuate and dependence on unreliable transit systems;
and
4. no out-of-area contacts of family members.

What goes into a Resilience Hub?



Figure 1. Visualization of features of resilience hubs

However, upon further research into the progress of resilience hubs in the cities mentioned above, it becomes apparent that their construction is still very much in the planning phase, if not altogether a theoretical proposal (Climate Ready DC, n.d.; Lundgren, 2019; Samra, 2019). In the case of St. Paul, factors such as discontinued funding opportunities have prevented the hub from moving beyond the ideation phase to the realization of the actual physical building (Bloomberg Philanthropies, 2019; City of Saint Paul, 2019). As a result, there is much information about what an ideal resilience hub might look like—predominantly from organizations like the USDN and large-scale convened meetings like the National Adaptation Forum (Lundgren, 2019)—but very few concrete examples of how resilience hubs have been implemented in the long-term or the impact that they have had on community resilience. This presents us with the unique opportunity to understand how to reshape our vision of resilience hubs to fit the needs of community members in towns that are socioeconomically and racially diverse, such as Ypsilanti.

Around the same time that the conceptualization of resilience hubs began, the United States, as well as communities across the world, were seeing the official declaration of climate emergencies spanning from the local to regional levels. While this can mean many different things for each community, “many see it as a drive for carbon neutrality and a mandate for further political

action” (Ellsmoor, 2019). Organizations such as Climate Emergency Declaration and Mobilisation in Action (CEDAMIA, n.d.) have been tracking where and when such declarations have been made at a global scale and have pooled this information to include local news reports and official city and county level documents from each location that give details about the circumstances under which each declaration was made along with what they propose to do (CEDAMIA, n.d.). At the end of 2019, this list included over 69 U.S. cities that covered roughly 25 million citizens.

In Washtenaw County, the declaration to become carbon neutral no later than 2035 was made in September of 2019 (Ross, 2019). This was soon followed by a declaration made in Ann Arbor in November 2019 to reach carbon neutrality by 2030 (Stanton, 2020). In the plans brought forth following the emergency declarations in Washtenaw County and Ann Arbor, resilience hubs were proposed. One hub has already been implemented at the Northside Community Center, and others will soon be implemented as a way to locally address climate preparedness for a significant number of residents. There will be consideration for the need for hubs to be building-efficient and carbon neutral in their design and construction/retrofit. This momentum for climate resilience is a reflection of county-wide efforts, with Ypsilanti residents already considering the establishment of a resilience hub.

The Promise of Peonies by Jessica Tenbusch



Peonies bloom annually for decades once firmly established in a location.

HISTORICAL CONTEXT OF YPSILANTI

Understanding an area's history is vital to inform community development efforts, as each location has a different context that informs what is possible and what is needed. The Urban Sustainability Directors Network Guide to Developing Resilience Hubs states that researching community history is particularly important for establishing resilience hubs (Urban Sustainability Directors Network, 2019). Teams looking to increase neighborhood resilience in any way must understand the risks faced by residents, their root causes, and the extent to which residents trust local governmental institutions. This kind of information ultimately shapes what a hub can and should do for a community.

The history of Ypsilanti is a long and progressive one. While the land on which the city sits was likely first inhabited by humans starting 12,000 years ago at the end of the last Ice Age, there is only conclusive evidence for human habitation along the Huron River starting 5,000 years ago (Maynard, 2014). These early inhabitants were primarily hunter-gatherers who lived in a self-sustaining fashion off of the land, although small-scale agriculture and plant domestication eventually enabled small settlements in the region (Smith & Yarnell, 2009). Some mounds and burial tumuli, which are both mounds of earth and stones, along the Huron River appear to be from the Late Woodland period lasting from 500 to 1000 CE (Maynard, 2014). By the 1700s, indigenous tribes in the area included Bodéwadmi, Wyandot, Miami, Delaware, Ojibwe, Shawnee (occupying a village near the mouth of the Huron), Sauk, Odawa, and a number of other bands in the Detroit area (Maynard, 2014). People in these tribes traversed trails next to the Huron River and used the land as a campground and as a burial site. Many of these tribes fought against encroaching French and British colonists and eventually made various treaties with them, many under coercive and violent circumstances. While there is evidence of looting of Ypsilanti's archaeological resources over time, the City still likely sits atop a substantial amount of archaeological evidence that could teach us further about its prehistory (Maynard, 2014).

While the above prehistory of the area may not seem relevant to the establishment of resilience hubs, we believe that thinking about how humans have inhabited the area for possibly up to 12,000 years helps us envision how another 12,000 years (and hopefully more) will be possible for the inhabitants of the space. We also believe acknowledging the Native Americans who were once the primary inhabitants of this area helps begin to address systematic oppression of this group, connect current residents to the past, and lead us to think about ways that we can make residents' current relationship with the land and the environment more sustainable.

The City of Ypsilanti provides a history of the city on their website. In 1809, three French explorers built a log structure near a Native trading post on the Huron River, near where Ypsilanti sits today. Judge Benjamin Woodruff Jr. followed a proprietor of the trading post to the area and established Woodruff's Grove in 1823, which merged with a nearby settlement in 1829 to form Ypsilanti. The name derives from Greek General Demetrios Ypsilantis given his successes in the Greek War of Independence against the Ottoman Empire. In the following years, officials constructed various roads and rail lines between Ypsilanti and Detroit and Chicago, which brought more travelers and commerce to the area. The Michigan Normal School, now known as Eastern Michigan University, started in 1849 as a teacher training school in the area. This school created many jobs for the

area and brought in fresh batches of young students, many of whom stay in the area and influence its culture to this day. Much of the development of the City's early industry, which included many mills and paved the way for the development of the automotive industry in the area, was enabled by water power from the Huron River.

Between 1850 and 1860, the City's Black population tripled because many escaped slaves and others looking to escape racial violence and discrimination stopped in the City while traveling on the Underground Railroad to Canada (Kelly, 2017). Ypsilanti historian Matt Siegfried notes that many escaped slaves and others fleeing persecution built houses for themselves in the southern part of Ypsilanti where they housed themselves and other escaped slaves (Kelly, 2017). Ypsi's Black population then also doubled from 1920 to 1930, again from 1930 to 1940, and then again during World War II due to the Great Migration and general exodus of Black folks from the South (Kelly, 2017). This history is partly why Ypsilanti today is roughly 27.3% Black and African American (United States Census, n.d.) while the state of Michigan as a whole is only 14.1% Black and African American (United States Census, n.d.). Due to structural racism and other systematic oppression of African Americans in the United States, the disproportionate African American population in Ypsilanti leads to various environmental injustices (Mohai et al., n.d.), educational injustices (Shaw, 2012), and instances of police brutality (Haddad, 2020) that must be fully considered when doing any sort of community development.

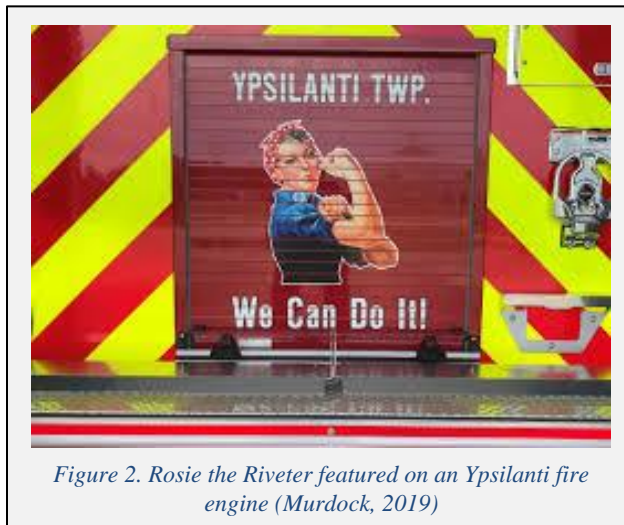


Figure 2. Rosie the Riveter featured on an Ypsilanti fire engine (Murdock, 2019)

Ypsilanti is also widely known for its contribution to the Allied victory in World War II given that it was the site of the Willow Run Bomber Plant. Construction of the plant was completed in 1942 by Ford Motor Company, and the plant was designed by famous Michigan architect Albert Kahn. After some initial startup difficulties, the plant was able to produce B-24 bombers at a rapid pace, and these were used by every branch of the US military and some of the Allied forces, helping win the war. The famous cultural icon Rosie the Riveter, shown in Figure 2, was based on a real woman who worked in Willow

Run plant named Rose Will Monroe (Pruitt, 2018). The establishment of this plant led to a mass migration of people to the area, which stimulated the economy but also caused housing shortages. After the war, various automakers owned the plant and used it to manufacture different models of cars. Ypsilanti was also known as a hub of automotive manufacturing, although with offshoring of such jobs and shifts in the global labor market, this is less and less the case with time.

Today, Ypsilanti struggles with poverty. As of 2010, roughly 32.3% of residents live in poverty compared to a poverty rate of just 11.8% in the US generally (U.S. Census Bureau, 2020). The following factors have been identified as contributing to this issue (Marsh, 2016):

- By 1960, construction of I-94 had been completed, allowing travelers to completely pass through Ypsilanti en route to Chicago rather than having to travel through downtown as they had previously.
- The North American Free Trade Agreement, passed by President Bill Clinton in the 1990s, along with other free trade agreements resulted in the offshoring of manufacturing jobs to places with cheaper labor, depriving the area of low-skilled jobs. Fewer jobs mean less tax revenue for the City to spend on local jobs and public works projects as well.
- Large volumes of subsidized, Section 8 housing in Ypsilanti were purchased and are owned by out-of-state corporations solely concerned with maximizing profits rather than the prosperity of the community.
- Eastern Michigan University owns 40% of the city's property and is tax-exempt, which also deprives Ypsi of tax revenue.

As noted above, issues of structural racism and systematic oppression combined with the large proportion of African Americans in the City likely also contribute to the heightened poverty rate. Fortunately, various initiatives ranging from Michigan State Housing Development Authority's Blueprints for Downtowns program (Michigan State Housing Development Authority, 2007) to the general support for local entrepreneurship (TV6 News Team, 2020) are helping Ypsi continue to flourish even in the post-industrial age.

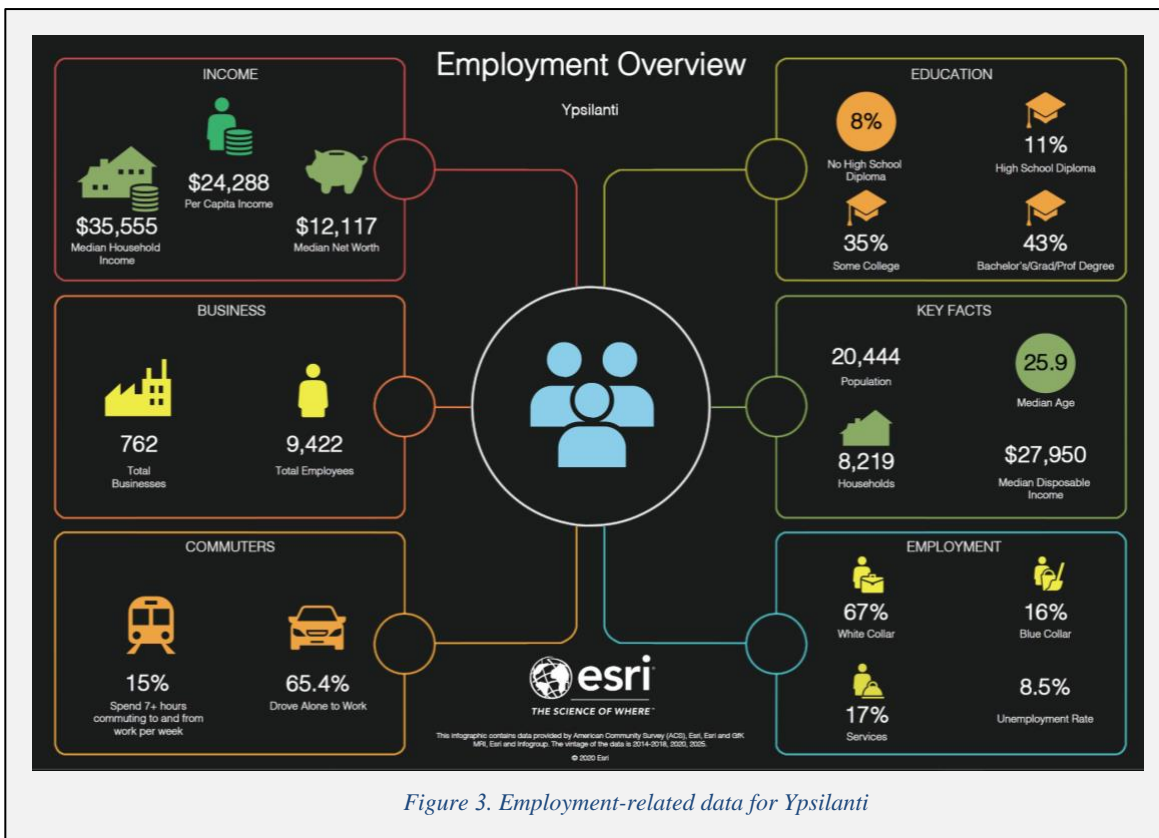


Figure 3. Employment-related data for Ypsilanti

Other recent, historical items that demonstrate Ypsilanti's progressive, diverse, and community-focused past include the following:

- Ypsilanti hosts many different annual festivals and events including DIYpsi, Ypsilanti Heritage Festival, Michigan Elvis Fest, Orphan Car Festival, the Michigan Brewers Guild Summer Beer Festival, various live music days, and so on (Ypsi Real, 2021).
- The City was one of the first in Michigan to dramatically reduce the penalty for use of cannabis.
- In the 1990s, Ypsi was the first city in Michigan to pass a living wage ordinance.
- In 1979, the City elected the state's first Muslim to win elected office to its city council.
- Demonstrating the town's sense of humor, the Ypsilanti Water Tower won the title of the World's Most Phallic Building from Cabinet magazine.
- Domino's Pizza, now a pizza chain present in over 90 countries, was founded in Ypsilanti.
- Part of Ypsilanti's diversity is due to a combination of the universities in the area bringing a variety of students, staff, and professors to the City as well as the automotive industry attracting many different groups to the area, ranging from children of former slaves to European immigrants.
- Many see Ypsilanti as the Brooklyn to Ann Arbor's Manhattan (Stanton, 2019), as rising land values and rents in Ann Arbor along with general gentrification have driven many musicians, poets, actors, and other artistic folks to Ypsilanti where they have established a vibrant arts scene.

Understanding the history of an area before engaging in planning-related work is vital to learn more about common issues faced by residents in the area, how current conditions arose along with potential solutions, and the best ways to frame information and engage with residents. Often, individuals from academic institutions have taken to approaching a given program or community intervention with a very specific idea of what should be implemented and start first by distributing pre-determined survey instruments to residents to measure the researcher's outcomes of interest. However, what this report proposes is an alternative to such an approach: working with community members to actively include their voices from the outset and continue to incorporate them throughout every stage of the research process to co-develop an effective intervention. An arguably more equitable research design, this is referred to as *community-based participatory research*, *participatory action research*, or *simply action research*. This would eliminate the need for future research groups to revisit a community and re-collect data on outcomes that could inform an intervention, because our work would instead implement a community-envisioned program with longevity. An example of this approach that was undertaken in Ypsilanti is that of Growing Hope, a non-profit organization dedicated to teaching and empowering the local community to, "grow, sell, buy, prepare, and eat nourishing food" (Growing Hope, 2019). This organization began through the work and research of a former graduate student and faculty team and was built into a lasting initiative to maintain a sustainable food system built by the community, for the community.

CONTEXTUAL ANALYSIS

Ypsilanti is comprised of several census block groups, which are demographically similar areas containing between 600 and 3,000 people each (United States Census, 1994). A block group can be considered similar to how a neighborhood would operate but allows for a more standardized boundary to enable research, and the replication of that research, along geographic lines. While each of these areas deserves the benefits resilience hubs can offer, prior analyses have determined that the cost of implementation can be prohibitive for municipalities (City of Ann Arbor Office of Sustainability & Innovations, 2020), implying that resource limitations will prevent citywide establishment of hubs at first. However, it is important to note that resilience hubs should work in conjunction with existing services and provisions, rather than look to replace them. For the purposes of this research, we determined the areas of Ypsilanti that are most vulnerable to the impacts of climate change and other environmental insecurities given their level of economic and social resources.

Please see Appendix A for a comprehensive breakdown of the analysis discussed in this section.

Methodology

This analysis was performed using data from the U.S. Environmental Protection Agency (EPA) Environmental Justice Screening and Mapping Tool, EJSCREEN (U.S. Environmental Protection Agency, 2016). The tool includes a variety of demographic variables and environmental indicators that are combined to assess a community's potential vulnerability. The output is recorded as a percentile relative to the national average. For example, if an area scores in the 87th percentile for exposure to a given environmental indicator, this signals that 87% of block groups in the United States have lower concentrations of that indicator. The tool then combines the prevalence of the indicator with the underlying demographics of the block group to create a measure of risk. Demographic factors may relate to the susceptibility of sickness from environmental pollutants in a number of ways. For example, children have higher breathing rates, which may cause them to inhale more of a pollutant than adults. A greater density of children in a block group, then, will be indicated by a higher score than in an area comprised of nearly all adults. A more in-depth analysis on this tool and how the analysis was performed is included in the full report version of this document.



Figure 4. Areas of priority by most vulnerable block group in Ypsilanti

Results

We performed a geographic information system (GIS)¹ analysis using data from the EJSscreen tool to better understand the exposure levels and subsequent risks to the Ypsilanti population. As resilience hubs are best operated at the neighborhood level, we opted to define boundaries by the census block groups. In total, eight environmental indicators, each factored in with six underlying demographic variables indicating risk, were used to perform the analysis. After interpreting the results, we found six different block groups that were consistently within the highest clustered percentiles of exposure for each indicator, meaning that these neighborhoods in Ypsilanti were the most vulnerable to local environmental hazards due to both socioeconomic and environmental indicators at the time of the analysis. It is our recommendation that these neighborhoods, highlighted in Figure 4, be prioritized for the development of resilience hubs.

Implications

Resilience programs ought to be defined by the community they hope to serve. One, tight-knit neighborhood may opt for a resilience block leader approach or a more dispersed model of resilience leadership as is the case with “ambassador programs,” while others may look to

¹ Maps throughout this report were created using ArcGIS® software by Esri. ArcGIS® and ArcMap™ are the intellectual property of Esri and are used herein under license. Copyright © Esri. All rights reserved. For more information about Esri® software, please visit www.esri.com.

collectively create a physical building from the ground up. A third option may be to convert existing structures that can already facilitate the needs of a neighborhood.

All are viable options worth considering when planning for neighborhood resilience. However, the notion of restructuring existing spaces for the purposes of a hub has two particularly important benefits in that it is less expensive than building a new hub and is more centralized than a block leader or ambassador program approach. While these are decisions that would need to be determined by the residents of each neighborhood, we expanded upon our prior analysis to include a contextual exploration of how restructuring existing buildings in Ypsilanti would take place. In each of the six previously identified block groups, we completed further GIS analysis to identify existing buildings that have the potential to be readily transformed into a resilience hub.



First, buildings were categorized by their functional purpose. This allows for a better understanding of the layout of a neighborhood and the resources that are already available to the residents. Furthermore, it offers the ability to quickly recognize structures that may be suitable for a hub. We determined potential sites based on the general criteria provided by the Urban Sustainability Directors Network guidance for evaluation (Urban Sustainability Directors Network, 2019). These primarily included locations that are generally highly trusted and frequently visited within the neighborhood, such as community centers, places of worship, local businesses, healthcare facilities, and government offices. We further narrowed these potential structures by determining whether the current use of the building offers a *community-serving*

purpose (i.e., whether community members would already visit this location for purposes that align with those of a resilience hub; in this case, spaces such as government offices might be considered to a lesser extent). In conjunction with participatory feedback gathered from surveys, this type of analysis could inform coalition-building strategies and identify specific partners who may be interested in neighborhood resilience efforts.

The buildings highlighted in Figure 5 represent some of the potential spaces identified in block group 4106002 that could be restructured to function as a resilience hub while still serving their original intended purpose for the community. It is important to note that we are not making any *specific* recommendation for a hub location in Ypsilanti. Rather, such recommendations require further information pertaining to whether a given location will meet identified needs and whether it will be a trusted and comfortable place for a hub, informed by considerable community input. Additionally, further research must consider and uphold existing community work that is presently being done. This analysis can serve as an important first step and provide some structure to such conversations moving forward.

Cultivated by Jessica Tenbusch



*Featured local species: cherry tomato, squash blossoms, red mulberry, apple, Homo sapiens.
Native species and maintaining biodiversity are key to ecosystem resilience in the face of climate change.*

SURVEY AND INTERVIEW INSTRUMENTS

Survey

In this section, we discuss the background and creation of our principal survey that will be used to collect data on three main areas: material needs, social and emotional needs, and information relevant to establishing a resilience hub. This survey, so we have imagined, would be sent out in two key ways: through the software Qualtrics and through mailers (the latter of which we have not created) that would be sent to residents of Ypsilanti. The Qualtrics surveys, or the online survey, would be simple to distribute. Future groups that collect data may use relevant social media groups (e.g., Ypsilanti community pages) to advertise the online survey. They may also reach out to Ypsilanti contacts (some of which are listed in Appendix F) to disperse the survey to citizens. In this section, we get into more detail on the content and format of the surveys that we have created for future use. Also, we discuss the limited data collection that we engaged in with the purpose of making our surveys more precise. The survey itself can be found in Appendix B. The online survey is an all-encompassing question set that ideally will be used by a future group (e.g., another School for Environment and Sustainability (SEAS) student research team) to collect data on the citizens of Ypsilanti to learn more about their desires, needs, and thoughts regarding a resilience hub. The following sections will go into more detail on the key components of the survey.

Survey Error

Before beginning data collection, it is important to consider the various forms of error that could arise when engaging the community. This section will briefly discuss a few important methodological points that future groups ought to consider before releasing the surveys officially. Online surveys, by their nature, are unable to perfectly capture the intended information from the desired population. Given that this report is intended for master's student groups at the School for Environment and Sustainability, who might be new to conducting research, we will very briefly discuss four forms of survey error that can occur with web-based surveys: coverage, nonresponse, sampling, and measurement. Each of these forms of error will have implications for how to think about the results of the survey data. It is thus important to acknowledge that the data collected from this survey will not and cannot make perfect conclusions about the Ypsilanti community at large.

Coverage error occurs when there is an asymmetry between the desired population and the people who are actually being surveyed via some list or frame (Couper, 2000). Consider the case where the city commission sends out the survey to a group of citizens whose email addresses were on a master list of citizens who had expressed an interest in sustainability. It is not difficult to see how this could result in an *under* coverage of the wider population and their attitudes, views, and interests. With Internet surveys, in particular, it is important to consider that because not everyone has reliable Internet access, there will necessarily be imperfect coverage of the community. Given that there is no master list of Ypsilanti email addresses, this error *will* occur and should be acknowledged.

Nonresponse error is defined as the possible difference in meaningful data between those who responded to a given survey and those who did not (Lavrakas, 2008). In other words, is there

reason to think that those who responded to the survey (i.e., the response rate) have different beliefs, attitudes, experiences, and so on, than those that did not respond? As an example, what if those who responded to the survey are people who are especially interested in sustainable initiatives? Or, what if those who responded have more time because they don't have children? Future groups will need to be just as thoughtful about whose answers are *not* being recorded as they are about the ones whose answers are being recorded.

Sampling error is present when there is a discrepancy between the target population and the sample taken (Couper, 2000). More specifically, that the *method* of obtaining the sample was inadequate to gauge the target population. Given that the sample cannot, by definition, fully capture the population, there will always be sampling error. However, there are still considerations that when taken seriously might mitigate sampling error. A common example is self-selection bias. Imagine that the online survey was posted on a webpage for environmental enthusiasts who reside in Ypsilanti and 50% of the people in this online community volunteered to take the survey. If these were the only people to take the survey, then we could only be able to, perhaps, make conclusions about Ypsilanti environmental enthusiasts who are inclined to be in web-based communities. Thus, we should not generalize the results to the city at large (Couper, 2000).

Measurement error can be understood as the degree of mismatch between your measure (also known as the process of operationalization) and the true value that you are interested in (Lavrakas, 2008). Imagine a researcher was interested in measuring the happiness of several participants. In order to measure happiness, the researcher looks only at the pitch of each participant's laugh. On the face of it, we can say that this is a bad operationalization of happiness, given that happiness is a complex phenomenon that could not be measured by something as arbitrary as the pitch of one's laugh. So, for this project, it is important to think hard about what construct you're interested in (e.g., sense of security in one's neighborhood) and if your measure is actually robust enough to capture the construct. It should also be noted that it is impossible to have a perfect measure of a true value. The best we can do is to test our measures and try and get as close as possible, given our constraints, to the construct. Future groups working on resilience hubs should consider formally studying research methods to gain a deeper understanding of these concepts.

Introduction and Other Features of a Hub

The survey begins by introducing the project and then giving a brief, digestible overview of what a resilience hub can be (see Appendix B). Alongside this text is a digital image created by a group member that gives an aesthetically pleasing sense of what a hub is and can provide.

Alongside offering resources that fit the material and socioemotional needs of the community, a hub can have other distinct features; not all hubs should look and function in the same way. Therefore, it would be useful to capture the community's preferences for a.) the preferred *type* of hub; and b.) the preferred *location* of the hub. We proposed two possible models for a hub in the survey: the classic building model, as established by the USDN (Baja, 2018), and a block leader model that reflects the history of mutual aid networks.

The block leader model was centered on trusted members of the neighborhood who might keep resources in their homes, teach neighbors resilience-focused skills, and check on community members in times of need. The point of this survey question is to gauge which model would be preferred by community members, again referring back to the contextual and participatory nature of a resilience hub. The preferred location of a hub, which assumes a building model, was also included in the survey. Included are eleven possibilities for where community members think a hub could make sense (e.g., a fire station or community center). It should be noted that neither of these question sets, hub model or location, are exhaustive. It is the case that there could be many more options that are not being taken into consideration by the survey.



Photo by Ted Eytan, licensed under CC BY-SA 2.0 (Minneapolis 2040, n.d.)

Material Needs

A key feature of our needs assessment is the material needs of residents in the relevant areas. These can be thought of as the physical *stuff* that people report the degree to which they might want in a resilience hub. Some examples include cleaning supplies, temperature control, and medicine. Broadly speaking, we separated these choice options into two conceptual categories: emergency tools and everyday resources. Future groups who use this survey should consider doing factor analysis to see if the results roughly line up with these categories. While it may be difficult for a resilience hub to guarantee access to all such supplies, it is important to determine any priorities that a given community or area of the community may have. Certain factors that researchers and students may not be aware of could influence if residents have or might want

more access to, say, tools, or pet food. We also added a question on the online survey for residents to put something that was not in the main list of possible material needs. This is to ensure that things that we may not have included could be captured. Particularly if the data reveals that such material things are often written-in as being important.

Social and Emotional Needs

As well as being a physical and material endeavor, a robust sense of resilience is also a fundamentally psychological endeavor. Therefore, we also thought it was important to create a similar survey to the above that seeks to capture the degree of social and emotional resources currently available in the community and the perceived need for more services for coping with extreme events. Some examples of these items include the community's sense of closeness and safety. Broadly speaking, we separate these choice options into three conceptual factors: social, emotional, and cultural. Data from this survey tool could be used to inform what kind of non-material functions and resources a hub may have. An example of this could be the implementation of a game night if residents identify community connections, entertainment, and friendship as being lacking for them. Another example would be space for spirituality or solitude if that is what community members desire. A secondary component of the assessment of psychological needs is a series of questions that were taken, directly or indirectly, from preexisting survey sets (Büssing et al., 2009; French et al., 2016; Zaleski, 1996).

Interview

Our preliminary interview guide consists of questions that mirror those appearing in our online survey of Ypsilanti residents, but that more effectively allow for a conversational format typical of semi-structured interviews. These questions are again separated into three distinct categories to gauge residents' 1) material needs, 2) social and emotional needs, and 3) a potential preference for Ypsilanti's hub approach to utilize a block leader model, a physical location, or a combination of the two. Most importantly, we ask respondents to envision what they would like their community to look like five to ten years from now, how they might foresee each of these approaches working, and what specifically their community would need to do in order to make this vision a reality. We conclude with questions about whether they feel they would be integral to future resilience planning in their neighborhood, and whether they know anyone who would be important to involve in the process. In this way, we are foreshadowing a snowball sampling approach being beneficial to target already active and interested community members in the planning phases of a resilience hub.

Interview Bias

Like surveys and all other forms of data collection, interviews are subject to methodological challenges as well. It cannot be assumed that the interview will necessarily capture the true needs, desires, or features of a given population. This section will lay out some considerations when conducting interviews and offer a few ways to address these problems. It should be noted that these recommendations are not strict rules, as interviewers should use contextual factors and their best judgment to decide if a tool to mitigate error makes sense for a given interview. As stated above, the motivation for this section is to aid the next group of students, who are not guaranteed to have a background in research methodology.

To start, the mere presence of an interviewer creates a methodological challenge. Their presence may create social pressure for the interviewee to acknowledge certain social norms and act accordingly (Groves et al., 2009). Sensitive behaviors, in particular, are subject to this form of bias. In the case of this project, there are many plausible instances where this bias might come into play. Sensitive topics such as spiritual needs and certain material adversities might be harder to report directly to an interviewer, as opposed to a self-administered survey. Thus, when talking about sensitive topics, the interviewer would do well to consider this bias. Similarly, specific traits of the interviewers themselves are liable to bias the interviewee's responses. The age, race, gender, and religion—if visible—of the interviewer have been shown to have an impact on interview responses (Groves et al., 2009).

Interviewers also play a role in motivating interviewees to give answers of differing quality (i.e., answers that more or less approximate what the interviewer is looking for). Some data has shown that interviewers who request exact answers as opposed to general ideas are more likely to receive answers the score higher on measures of reporting quality (Groves et al., 2009). Interviewers for this project, then, might want to consider the balance between precision and open-ended questions.

Another valuable tool was asking the interviewees to make commitments, such as having them sign an agreement to provide accurate information (Groves et al., 2009). Lastly, the mode of the interview, or the medium through which it is conducted, should be acknowledged as a potential source of bias, as it can have significant impacts on data quality (Couper, 2005). During the COVID-19 pandemic, it may be the case that much, if not all, data collection happens via online video platforms or over the phone. It cannot be assumed that interviews conducted with these methods will necessarily produce the same answers as a face-to-face interview. Face-to-face interviews allow interviewers to notice body language, for example, which is impossible over the phone and more difficult over an online video platform. There is some evidence that online video interviews are only slightly edged out by face-to-face interviews on measures of answer quality (Krouwel et al., 2019). However, it would be useful for the next student group to look into the literature on this topic, particularly research that was published in response to the COVID-19 pandemic.

INITIAL RESULTS FROM INTERVIEWS FOR HUB APPROACH

After piloting our interviews with five long-time Ypsilanti residents, we found that many of our interview questions elicited responses that would be helpful in the creation of neighborhood hubs and resilience strategies in the coming years. In being asked to reflect on the past, current, and potential future states of their neighborhood, residents provided information on what they find most meaningful about where they live, why they continue to work and live there, and periodic challenges they face either individually or collectively as a resident of their neighborhood. In doing so, they expressed their desires for what resilience planning would look like in their immediate community and identified current social and physical structures in place that could help with these efforts. Using a co-coding approach, we found initial evidence for

themes that were anticipated through our line of questioning and were theoretically informed by our earlier research on resilience hubs and planning. Such codes are labeled as *deductive* or *concept-driven* and were thought through prior to conducting interviews (See Appendix D for the full interview codebook and example quotes from interviews). Some notable deductive themes include the following:

- The identification of aid organizations present in the community
- The level of accessibility to resources, (i.e., community resources that already exist or are lacking, and whether they are “in reach” for residents)
- Existing and future communication channels
- A preference for a physical resilience hub location as opposed to a block leader approach (likely due to familiarity with the concept and current planning underway in Ypsilanti, in addition to ambiguities around how a resilience block leader or network of individuals would coordinate an emergency response)
- An emphasis on emergency preparedness, and hub uses during emergency events
- Identifying psychological needs of neighborhood residents
- An expressed social cohesion with surrounding neighbors
- Educational services and opportunities present in the community, and
- Community economic challenges, including past, present and anticipated future challenges

In addition to the themes listed above, the interview coding process drew on a combination of approaches in order to incorporate themes that were anticipated and accounted for, alongside those that had not been anticipated. Emergent themes, or those that arise from an *inductive coding* approach, were identified and agreed upon by both coders to ensure consistency. This process provided several notable, emergent themes that have the potential to appear in future interviews with residents (See Appendix D).

Of importance this study’s key research questions and the conceptualization of resilience hubs, interviewees identified numerous ***trusted spaces and locations*** throughout Ypsilanti that they expressed as being influential to the community in providing resources and meeting day-to-day needs. Such locations included the Hope Clinic & Center, the Parkridge Community Center, churches throughout the city, neighborhood association meetings, the Ozone House, the Farm at St. Joe’s Hospital, and many others. Several of these places were mentioned indirectly when responding to our interview questions and may potentially be the result of our research team having interviewed very active members in the community. Each of the individuals we spoke with was involved in community volunteer work to some degree, and so were quick to mention places that they were aware of in their volunteer network, or similar places that they were aware of which actively provided resources and services to community members in need.

Many interviewees also emphasized their ***commitment to the neighborhood*** and the whole of Ypsilanti through the continued use of certain phrases or keywords that they felt were emblematic of the city and its people. For example, reiterating Ypsilanti's motto of “pride,

diversity, and heritage”, describing people with the “tenacity and determination” to get things done, or being “big on participation” as a town when the time comes to make important and/or difficult decisions, were all found to represent community commitment. Beyond their own volunteer work or involvement in community organizations, when asked about challenges present in their neighborhoods, many interviewees provided ways in which these challenges could be addressed by leveraging social factors and this sense of commitment. For example, one resident spoke to the challenge of the shift away from industrial jobs toward a new information technology economy, leading to a community-wide loss of employment for a long period of time. In response, they spoke to their neighborhood’s efforts of trying to “skill up” the younger generations: “[we’re] trying to get our children really engaged and making the new economy attractive to them and showing them the various opportunities that are there. So the challenges that we have is really educating our children and getting caught up to the rest of the world.” Following this, they described their work in setting up an after-school program to get students the educational attention they needed during the pandemic. Ultimately, commitment was demonstrated with key words to affectively describe their care for their neighborhood, but this was also demonstrated through descriptions of their own behaviors.

Similarly, interviewees noted on several occasions that Ypsilanti’s **diversity** is its strength and that drawing on that strength in order to ensure that everyone’s voices are heard would be critical in visualizing and implementing a resilience plan moving forward. When asked to envision their community five to ten years in the future, and speak to some things they would hope for, a younger interviewee mentioned wanting to be a homeowner, as opposed to a renter, and offered the following reason: “I really love Ypsi, I love the vibe. There’s so much diversity. You don’t feel like you have to be a certain way or live a certain way to live here, there’s just a variety of people.” They built upon this in describing how they would like this diverse community to grow stronger in the future: “I hope to have a diverse community who feels comfortable and welcomed by everyone, that everyone just waves at strangers and everyone’s just outside having fun in the summertime. I really hope to have neighbors that I can share moments with, and just have a kind of good conversation with...” Diversity, in sum, will be a vital piece to building on Ypsilanti’s already resilient community as they move toward planning for climate adaptation.

Expanding upon the “heritage” component of the city’s motto, all interviewees pointed to the significance of **having a shared history/story** in building a caring neighborhood, and noted that having similar experiences, and in some cases mutual geographic origins, increased their social connectedness. Having a shared history, both in experiences while residents of the city, but also familial history prior to Ypsilanti, might be a strength to emphasize while communicating with residents about their shared future. Drawing on similarities to facilitate trusting relationships among residents can only improve the ability of the community to collaboratively establish a resilience plan.

The following themes appeared less frequently within each interview, however, they consistently appeared across several of the interview sessions with residents. Each individual highlighted that the **geographic location** of the city, in addition to the location of their own individual neighborhoods within the larger city, was a positive for their experience as a resident. They noted

that they were within walking distance to stores, restaurants, and areas for social gatherings as well as being close to outdoor parks or natural environments. Often indirectly, participants underscored the importance of ***proximity to the natural environment*** when asked, “What makes your neighborhood a great place to live?” It is possible that this theme was overreported by individuals at the time of interviews given that they took place during the winter months of the COVID-19 pandemic, during a period when many people were seeking out outdoor, natural spaces as a substitute for our indoor built environments. However, the frequency of such responses warrants further investigation in future surveys and interviews and may justify the inclusion of questions gauging a desire for *connectedness to nature* as hubs or resilience networks are designed. Finally, an important theme emerged that centered on Ypsilanti’s senior residents, with several explicit recommendations to ***prioritize elders and senior communities*** in the resilience planning process. With senior communities relying even more on in-person interaction, one interviewee highlighted how senior spaces were particularly affected during the pandemic and noted that senior facilities would greatly benefit from resilience planning in the future. Moving forward, Ypsilanti can ensure that these residents, specifically, are properly accounted for during emergency events.



Figure 6. The Hope Center & Clinic, a local organization providing members of the Ypsilanti, MI community with everyday resources and medical care (VolunteerMatch, n.d.)

Each of the emergent themes offer glimpses into what components of a resilience hub would need to be considered and included in the context of Ypsilanti. However, they also offer insight into what similar communities might raise as concerns, strengths, or desires as they begin their plans to build an even more resilient community. Future interviews should consider these themes, but with an understanding that they may very well not be applicable to the broader population due to the initial limited sample size. However, the coding framework and preliminary results described here provide early evidence that the questions utilized for interviews yielded relevant and useful information to guide the city in the next phases of planning, regardless of which approaches are taken.

FUNDING FOR ESTABLISHING RESILIENCE HUBS

Ongoing financial sustainability is a vital part of building and operating resilience hubs. The following sections offer details to help create plans for finding the funds necessary to cover capital and operating expenses. See Appendix E for a list of potential funders for an Ypsilanti hub.

Common Mechanisms

Financial limitations on municipal budgets often impede the progress of resilience-based initiatives. Securing adequate and sustainable funding sources is of utmost importance. While the argument can be made that climate mitigation and resilience efforts can ultimately reduce costs to municipalities, they can be difficult to fund through traditional management approaches because of an improper fit into the existing funding frameworks. Overcoming these financial barriers are necessary to the implementation of resilience hubs.

Municipal Operating Funds

As the name suggests, a municipality's general operating fund raises capital from a variety of sources. The budget is derived from revenue generated through taxes, fees, and intergovernmental transfers as well as expenditures on necessary services and infrastructure. A challenge, however, lay in remaining economically viable while providing a high level of services and simultaneously keeping taxes appropriately low. If services are inadequate or financial

burdens too high, residents and businesses will be driven out. A declining population results in reduced revenue, further exacerbating the problem.

Even so, local governments are often restricted in setting effective rates for existing taxes, limiting their ability to keep pace with expenditures. For example, the 1976 Headlee Amendment to the Michigan constitution limited local governments by requiring voter approval on any increase to or newly established local taxes, while also constraining the maximum proceeds established from property tax and millage. While this protects private property owners from increased costs, it also places barriers on local governments from generating adequate revenues. Presently, the City of Ypsilanti generates 61% of general fund revenue from property taxes (City of Ypsilanti, 2018).

While many communities finance green infrastructure and sustainability initiatives through the existing general fund, others have looked at establishing new fees, taxes and other directed charges as a supplement (Bird, 2003; U.S. Environmental Protection Agency, 2008). These fees and charges are often aimed at new development or land use modifications and may be grouped in with already existing plan review and permitting fees. Charges for services, licenses and permits accounted for 12% of the City of Ypsilanti's general fund revenue sources (City of Ypsilanti, 2018).

Municipalities can also take advantage of funding through intergovernmental revenue transfers. This includes financial resources accumulated from other governments, mainly state and federal, through means of grants, shared taxes, and contingent loans and advances (U.S. Government Accountability Office, 2010). Michigan's Act 51 established a revenue sharing program between the state and local governments from levied taxes on fuel sales and vehicle registrations to be used for road infrastructure projects. Additional federal and state grants can be used to fund emergency services, which may free up general fund resources to sustain projects such as resilience hubs. Intergovernmental transfers comprised 23% of the general fund's revenue (City of Ypsilanti, 2018).

Municipal Debt

As a city's population increases, so do obligations to maintain, improve, and expand infrastructure and services. Coincidentally, climate change presents a unique challenge as common funding resources have not increased in line with more frequent and intense storms. Combined, these situations require municipalities to incur debt obligations. Interest is accrued at great cost even with prime lending rates and bond issuance due to the high-cost nature of municipal expenditures.

While less exciting than implementing a new project, municipalities can focus on reducing the amount of debt owed and, subsequently, reduce accrued annualized interest. Lowered interest costs can provide a more sustainable approach to project funding as opposed to being sourced from a single influx of yearly revenue generation. A surplus from the general fund revenue can be used to pay down obligations. Less revenue bonds, the City of Ypsilanti has greatly reduced their debt obligations from approximately \$27.7 million in 2005 down to just over \$10.5 million

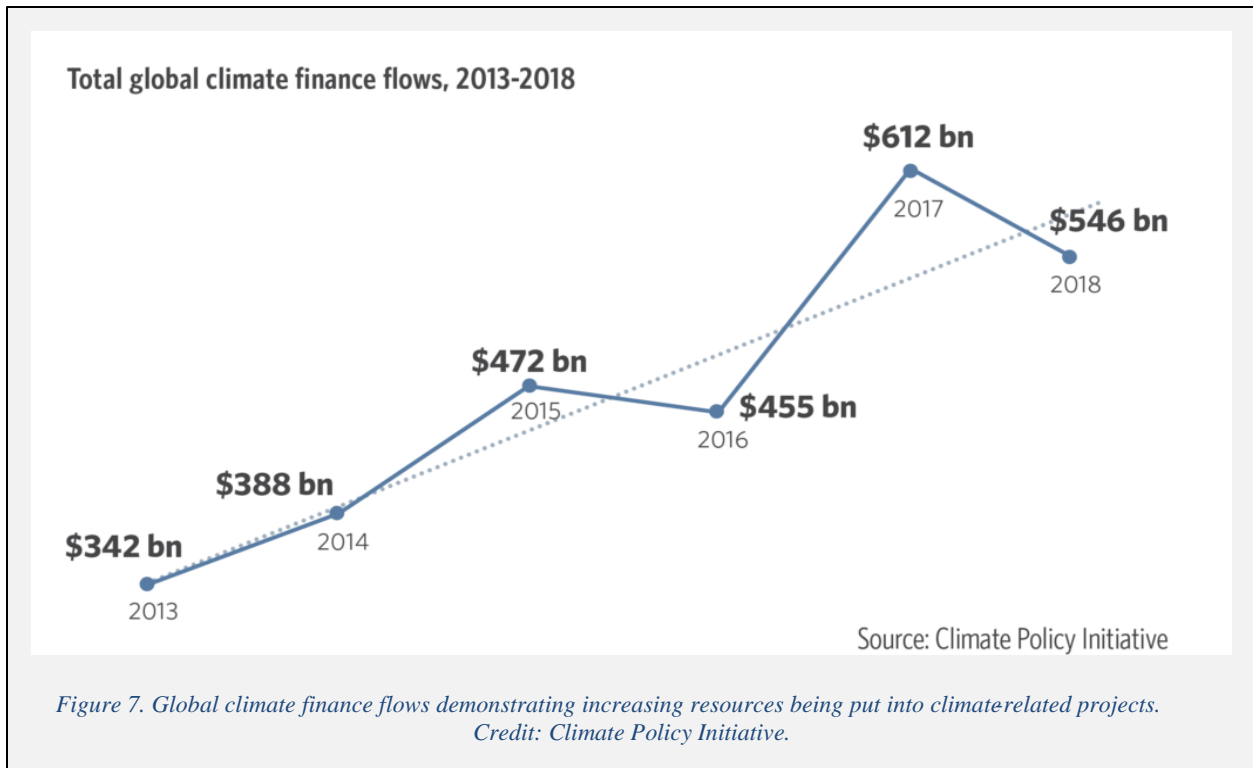
in the 2017 fiscal year. Debts combined from installments, revenue bonds, and general bonds are projected to decrease to nearly \$5 million by 2028 (City of Ypsilanti, 2018).

Grants

Grants for funding projects can come from a variety of sources, including federal and state governments, public and private partnerships, and philanthropic organizations such as non-governmental organizations (NGOs). Grants may either sustain the entirety of funding needs for a project or act as supplemental revenue in addition to methods outlined above. While grant funding will be earmarked for a specific purpose, the funds themselves are not expected to be returned to the provider organization. This benefits the municipality by not taking on additional debt while simultaneously maintaining lower tax burdens on residents and businesses.

Organizations will often send out requests for proposals (RFPs) with new funding opportunities. These will outline specific criteria for projects to inform a successful application. The criteria may include themes, categories, or structures that must be included for a proposal to be considered. Rather than applying to all opportunities, grant writers should focus efforts on RFPs with conditions that closely match project goals. For example, the Wildlife Conservation Society Climate Adaptation Fund provides annual grants to non-profit organizations focusing on conservation and preserving the functionality of ecosystems. While they do include climate adaptation as part of the RFP, a resilience hub project would likely not fit the criteria for this kind of grant, particularly if the proposal came from the local government.

The federal government also provides grant opportunities. The Federal Emergency Management Agency (FEMA) provides over \$660 million in annual funding to states, local communities, and territories as part of their Hazard Mitigation Assistance program. In the 2020 fiscal year, FEMA introduced the Building Resilient Infrastructure and Communities (BRIC) pre-disaster mitigation grant program. The priority criteria outlined for BRIC RFPs are to incentivize projects for public infrastructure, that mitigate risk to lifelines, that incorporate nature-based solutions, and to promote the adoption and enforcement of modern building codes (U.S. Federal Emergency Management Agency, 2020). This may serve as a potential opportunity for municipalities to finance neighborhood resilience hub projects.



Emerging Mechanisms

In addition to using operational or capital city funds or receiving direct grants, there are other emerging and creative funding mechanisms and products for resilience hubs—and other municipal resilience operations—that should be explored in the absence of or to supplement the former.

Resilience Bonds

The first of these is resilience bonds, which are a type of catastrophe bond meant to help cities with overstretched resources fund resilience-building initiatives. Re: focus partners, a design and finance firm, recently created this structure through their RE.bound initiative. The cited report is a full guide to how resilience bonds work (re:focus partners, LLC, 2017), but essentially they couple insurance and resilience projects through considering insurance payouts avoided by the presence of resilience infrastructure. Resilience bonds are distinct from conventional catastrophe bonds as they are more focused on proactive action to prevent terrible effects of natural disasters rather than paying to repair things after the disaster has occurred. This is a fairly new financial product with a rather complex structure, and implementation success depends on being able to model the reduction in risk that would arise from a given hub, which may not always be possible. Hubs may be too small to be covered by these products, too, although funding could potentially be bundled across multiple hubs within a city. These bonds are also more related to protecting physical assets than people necessarily. Regardless, teams seeking funding ought to investigate these, particularly as they become more common.

Tax Increment Financing

Tax increment financing (TIF) is another possibility for funding municipal projects expected to increase tax revenues within an area. TIFs work by issuing debt to offer a subsidy for some kind of improvement project that is expected to increase property values—and therefore property taxes—within the TIF district. The incremental future property taxes generated by this improvement are then earmarked to pay off the debt taken out to fund the initial subsidy. Net value is created for the area as, ideally, the improvement continues to create higher property values and meet resident needs even after the debt is paid off. California was the first state to allow TIFs in 1952, and they became increasingly popular in the 1980s and 1990s when federal funding for municipalities dried up (Dye & Merriman, 2006). Those looking to implement a TIF must proceed with caution, however, as they can contribute to gentrification through increasing real estate values and thus prices. Any model that depends on continued economic growth may also face issues during energy and resource descent. All of these factors and more must be taken into account when considering a TIF, as there are many other things that can go wrong as well (Jason, 2018).

Revolving Energy Funds

Revolving energy funds (REFs), also called green revolving funds (GRFs), are an increasingly common tool used by municipalities, universities, and other organizations to fund energy efficiency projects. These funds work by investing seed capital in energy efficiency projects, receiving payments back to the fund from savings generated by the projects, and reinvesting the money in other projects, ideally growing the fund slowly over time with modest interest rates on repayments and addition of seed capital. While resilience hubs are not primarily energy efficiency projects (although they can help reduce the need to consume as much energy during recovery from natural hazard events), it is possible to redirect excess savings generated by such funds to separate sustainability projects. While this is not a common use of REFs, it could be a way to procure hub funding while also enabling energy efficiency investments in the rest of the city.

Crowdfunding

While possibly not suitable for neighborhoods that face financial hardship, crowdfunding is another viable option for funding resilience hubs. Crowdfunding involves soliciting smaller donations from a large group of people—generally over the Internet through services such as GoFundMe—who are generally distributed over a large area. Hosts of crowdfunding causes may create different tiers tied to donation amounts that can be tied to physical or symbolic “rewards.” While this structure in particular is generally used for funding of new products, rewards for funding resilience hubs could include a plaque with donor names, a conversation with the hub team, or in cases of large donations, an invitation to the opening of the hub. There are various resources and past examples to look to for guidance on how to conduct a civic crowdfunding campaign, particularly for sustainability projects (Weinberger, n.d.; EMBARQ Network, n.d.; Gourlay, n.d.; Civic Tech Field Guide, n.d.; Spacehive, n.d.). However, there are also some concerns with civic crowdfunding regarding digital equity, fair representation, privatization of public services, and continuity of funding, all of which must be considered when using this funding option (Minton, 2017; Davies, 2014).

Third-Party Ownership of Renewable Energy

Third-party ownership of renewable energy systems at resilience hubs, such as through power purchase agreements, is a strategy recommended by the USDN guidance document (Urban Sustainability Directors Network, 2019). Third-party ownership essentially involves having a third party—generally a private company that is a third party of both the customer and the electric utility company—build, own, and operate a renewable energy system in exchange for continued payment per unit of energy generated over a predetermined period of time. This structure can be beneficial to customers who want a renewable power system as the private company handles the financing and other details of implementing the system. These private companies can take advantage of tax incentives that non-tax paying entities cannot, such as accelerated depreciation and other renewable power incentives, allowing them to pass on savings to the customer. It also shifts capital costs away from the customer and turns them into operating expenses; with a third-party ownership structure, customers simply pay a price per kilowatt-hour, similar to normal utility bills. However, the energy is generated on the spot and may be stored in a battery storage system that can be installed with the system. If electricity bills are high, this structure can provide projects that are cash-flow positive from day one and that do not add any debt to the city's balance sheet, which is also important for cities with regulatory debt ceilings. At the end of the contract, the customer can extend the contract, have the developer remove the system, or buy the system outright at a significantly discounted price. For all of these reasons, third-party ownership of renewable energy systems on resilience hubs can be a powerful tool.

Utility Incentives

In many states, there are also incentives from utility companies to install renewable energy systems or energy efficiency technologies. These differ by state and municipality and can be complicated, but the Database of State Incentives for Renewables & Efficiency, or DSIRE, can be very helpful for uncovering these (NC Clean Energy Technology Center, n.d.). Such incentives may also help bring down capital and/or operating costs for the hub.

Donations

Finally, in-kind donations such as volunteer labor and donated goods can also help bring down capital and operating costs, easing the funding process. Implementation teams could seek these kinds of free goods and services from residents, businesses, universities/colleges/other educational institutions, nonprofits, non-governmental organizations, folk schools, or philanthropic foundations. There are already examples of volunteer labor in Washtenaw County being used to reduce the costs of solar installations, such as through SolarYpsi (Engineers & Scientists Acting Locally, 2020) and at Fire Station 6 in Ann Arbor (Stanton, 2019). Labor may also be available separately from the federal government's Civilian Climate Corps, which was recently included in one of President Biden's executive orders.

Relevant Organizations

Engaging with an organization that specializes in climate adaptation or resilience funding may be beneficial for more complex or expensive resilience hub projects. The research team has identified multiple groups as potentially useful resources for further guidance on this and for

emerging mechanisms for resilience funding (Clean Energy Group, n.d.; Quantified Ventures, n.d.; Climate Resilience Consulting, n.d.; re:focus Partners, n.d.)

Combined Approach

The City of Ann Arbor estimated the staffing, hard, and soft costs of resilience hubs to exceed \$5 million over the course of ten years (City of Ann Arbor Office of Sustainability and Innovations, 2020). While this would cover the costs for multiple hubs, it is unlikely this sum could come from any individual funding mechanism listed above. This project has identified many grant programs and organizations that routinely fund projects similar to resilience hubs (see Appendix E). Diversifying methods generates a reliable source of funding, which ultimately increases the lifetime sustainability of the project.

COMMUNITY BUILDING FOR IMPLEMENTATION

In order to ensure that resilience hubs are built around the needs of those in the neighborhood and to maximize the likelihood of use, community building before and during hub planning and implementation is vital. While a participatory design process has instrumental value for maximizing hub usefulness, community building also has an inherent value associated with fostering human flourishing and general community resilience.

The ability to create connections and promote the emotional states associated with a tightly knit community will depend on the group working to establish the hub. For example, a student group will have different resources and competencies than a neighborhood association, which itself will have important differences compared to a city-sponsored commission. With this in mind, this section describes specific actions, principles, and considerations that could be applicable regardless of the affiliations of those on the hub's project team. The following sections capture different aspects of community building that are particularly important for resilience hub groups to consider during initial assessment and implementation.

Initial and Group Engagement

The "Contextual Analysis" section of this report describes various tools and methods that allow project teams to conduct initial vulnerability assessments of an area where the group hypothesizes that a hub might be useful. However, the analysis in that section is done remotely at first to find potential areas of priority that may be facing particular environmental and social challenges. This kind of analysis must be complemented with site visits to the neighborhood along with an introductory engagement with residents. A good example of this kind of engagement is attending sustainability or environmental commission meetings, if possible, as the authors of this report did with the Ypsilanti Sustainability Commission for a few months. If there is no environmentally focused commission or group, then attending city council meetings are also a way to understand current challenges in the city and how residents are responding to them.

This type of engagement can help validate and calibrate the initial results of the vulnerability assessment, and it serves as a first step in spreading awareness about the potential for resilience

hubs in the area. Intentionally taking the time to do this is important even if the group is composed of current residents, as not all residents experience cities in the same way (a phenomenon described by the Dual City model (Atributos Urbanos, n.d.)). Exploring the city and attending commission, council, committee, and association meetings will help project teams gather information that may be helpful in further iterating on the vulnerability assessment and in informing the next steps of the project.

The next phase in the establishment of a resilience hub involves very clear and purposeful community engagement to inform the goals and other details of the hub. Identifying the following groups in an area can help begin the process (sourced from (Urban Sustainability Directors Network, 2019) and personal communication with Raymond De Young, November 18, 2020):

- Neighborhood associations
- Educational systems
- Health systems
- Cultural institutions
- Environmental organizations
- Faith-based centers
- Community development corporations
- Local media and newspapers
- Housing agencies
- Local amateur radio groups (ARES/RACES)
- Emergency Operations Centers (EOCs)
- Food pantries
- Ready.gov and Community Emergency Response Team (CERT) groups
- Local Urban Sustainability Directors Network (USDN) contacts
- Local American Society of Adaptation Professionals (ASAP) contacts
- City/township/county sustainability commission/committee members

Municipal authorities and local utility companies are other important groups to identify in this step. The USDN also recommends identifying community organizers, local elected officials, faith leaders, business owners, and firefighters in addition to the above organizations as their involvement could be vital throughout the process.

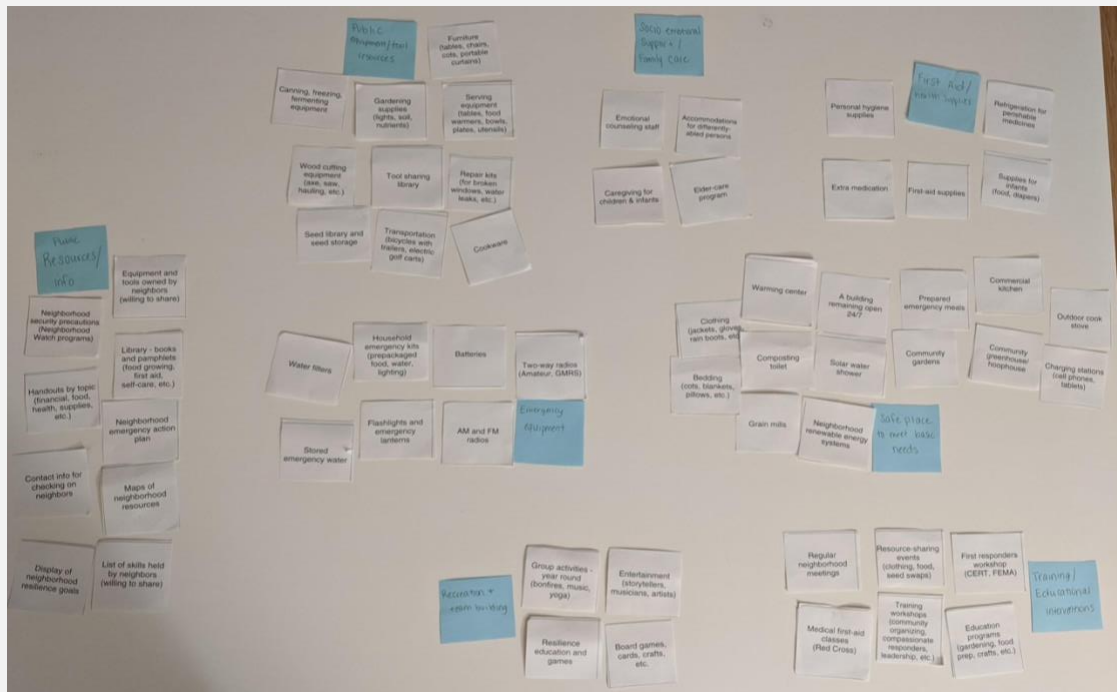


Figure 8. Conceptual Content Cognitive Map (3CM) is an approach created to better understand individual perceptions and representations of a concept (Kearney & Kaplan, 1997). In the above example, participants sorted cards of potential features, resources, and services a hub may offer into like self-identified groups. The arrangement, association, and omission of cards together form the creator's needs and desires for their ideal hub. This enables a unique level of engagement and ownership of the results that is not otherwise found in traditional data collection methods.

Once the core project team has identified as many potentially relevant groups and individuals as possible, they must then engage with those that will be necessary to the shaping and establishment of the hub. There are no hard-and-fast rules for who ought to be included at this point, as there are various issues that may preclude the involvement of any one organization or individual, ranging from not existing in a particular community to dissolution to lack of interest, and so on. The nature and content of this engagement will depend on the constraints of the project, potential personal connections, and the team's plan for goal setting based on the guidance from the USDN (Urban Sustainability Directors Network, 2019). Distributing the resilience hub surveys to associated organizations may be appropriate as well, and they may also be able to distribute the surveys to their wider networks to allow for more data collection.

Building Trust

Building trust with the various identified organizations and individuals during the project will help increase its chances of success, as defined by a hub that actually serves residents' needs. Three types of trust include contractual, communication, and competence, which involve maintaining clear expectations, frequently sharing information, and demonstrating competence in performing tasks respectively (Reina & Reina, 2007). Demonstrating genuine concern and compassion for others is another important way to build trust (Hoelting, 2017).

Contractual trust can be built within the project team by creating some kind of team charter, potentially with key performance indicators or other metrics that clearly indicate the goals of the group. Clear, fair delegation of tasks, taking into account each member or group's constraints and skills, will also help build this kind of trust. Contractual trust with community stakeholders can be maintained by following through on agreements and structuring incentives such that they serve both the community and the project team.

Frequent sharing of information for communication trust can be done through multiple means, including but not limited to city commission presentations, community presentations, meetings with city officials and community members, social media, informational tables at festivals or other community events, city newsletters, or even door-to-door canvassing. Those organizing these events must be sensitive to how stakeholders might best want to engage with information; community members may or may not have computers, Internet connections, time to attend presentations, etc.

Project teams can earn competence trust by putting a great deal of effort into the work and having it show, which will naturally help build the credibility of the team. Finally and most importantly, the project team must exhibit, to the largest extent possible, the utmost care, concern, and compassion for the stakeholders with whom they work, particularly given the hardships they may face. Putting effort into building trust in all of these ways will not only make the process of implementing a resilience hub more enjoyable, but it will also make buy-in, and thus use and benefits, more likely.

Supportive Environments for Effectiveness

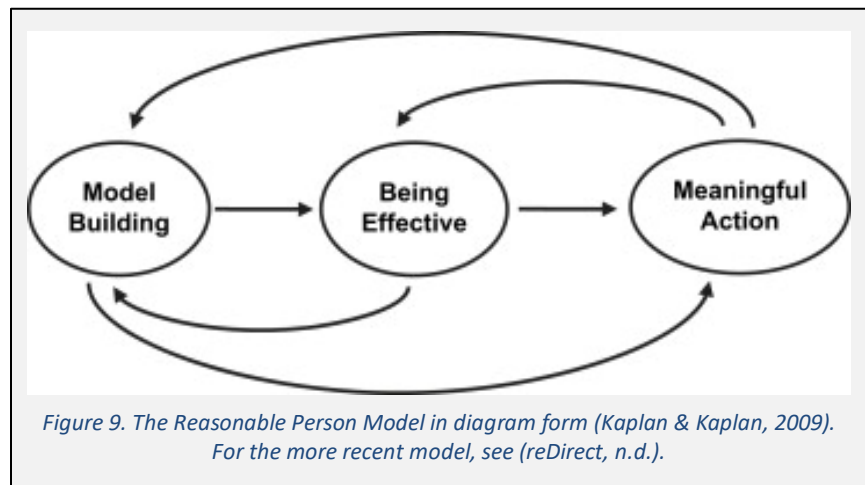
As a part of both the effort to build community as well as to integrate valuable coursework from the Behavior, Education, and Communication (BEC) track from the School for Environment and Sustainability, this section will briefly introduce a psychological framework that could be a useful tool for data collection, planning, and implementation: the Supportive Environment for Effectiveness (SEE) model (reDirect, n.d.), previously known as the Reasonable Person Model. This section is not intended to say, in absolute terms, how a future group *must* engage with the community, but rather show that there are many options, some of which can be found in the Behavior, Education, and Communication curriculum at the School for Environment and Sustainability. We recommend that a future group explore these models of community engagement and behavior change and recognize that this is an extremely cursory overview of a deeply complex model. Also worth mentioning is that while SEE might be a place to start, it may not be the correct approach for the community of interest and, therefore, some degree of exploration and thoughtfulness will be necessary to find the right approach.

The fundamental premise behind SEE is that humans are more than hyper-rational decision-makers and that the environments that we find ourselves in have an impact on our ability to be effective in certain endeavors. More specifically, these environments affect our capacity for information processing and, thus, our capacity to be reasonable, with reasonableness being understood as displaying cooperation, moderateness, civility, and the capacity to be constructive

(Kaplan & Kaplan, 2009). Fostering these qualities, like reasonableness, is likely to be a valuable effort when trying to engage a community in the implementation of a resilience hub.

The point of the SEE model is to create the kinds of environments that are most conducive to reasonableness by fulfilling people’s informational needs. Kaplan and Kaplan (2009) argue that this process contains three core components: model building, being effective, and meaningful action. This section will briefly address these three components.

A mental model is a “simplified version of reality that one stores in one’s head and uses to make sense of things, to plan, and to evaluate possibilities” (Kaplan & Kaplan, 2009). In other words, robust mental models of a given situation can aid in understanding, and, more generally, can fulfill the need for contexts to *make sense* to people. More specifically, environments that successfully engage mental models are ones that support the ability for people to explore (places and ideas) without becoming disoriented (Kaplan & Kaplan, 2009).



The meaningful action component of this model concerns itself with understanding the importance of helping people feel that they can make a difference and that they are needed in their communities. Further, it emphasizes the importance of making sure that community members feel heard and that their

perspectives are being acknowledged (Kaplan & Kaplan, 2009). Fostering meaningful action among a community can embolden individuals to be more engaged, agreeable, and cooperative.

People also care about being effective in their endeavors and projects. The third component of this model, effectiveness, can be thought of as the combination of “achieving clear-headedness and enhancing one’s feeling of competence and confidence” (Kaplan & Kaplan, 2009). A key part of understanding effectiveness lies in Attention Restoration Theory, which proposes, in part, that nature can foster reflectiveness, mental clarity, and can restore attention after it has been fatigued (Kaplan, 1995).

As has been laid out in this report, the project of building a resilience hub in Ypsilanti, Michigan is a fundamentally participatory process that requires input and knowledge from the community. Models like SEE can aid in this process. If a future group chose the SEE model, or components of it, as a starting point, they might consider how it could concretely fit into community engagement. How would the student group make the idea of a resilience hub compatible with people’s mental models and avoid frustration? How can meaningful, impactful participation be

made obvious? What kind of environments would foster effectiveness by allowing community members the space for reflection? While these questions, and others like them, are difficult to answer, they are arguably necessary to gain robust input and engagement from the community.

CONCLUSION, RECOMMENDATIONS, AND NEXT STEPS

Initially, this project intended to perform data collection to inform the specific plan and location for an initial resilience hub in Ypsilanti. However, the COVID-19 pandemic slowed progress on the project and led to various restrictions on human subjects research that precluded execution of the original research plan.

The project team altered the project to instead create a set of foundational materials that could greatly expedite the implementation of future resilience hubs in Ypsilanti and potentially in similar communities. By investigating, recording, and publishing the sections in this report, future project teams should be able to more quickly make progress on the implementation of resilience hubs in Ypsilanti than they would have otherwise been able to do. This structure may also allow for multiple teams to work on hub projects in different areas of the City simultaneously.

Recommendations

Based on the findings of this report, our team recommends the City of Ypsilanti should immediately begin work on establishing Parkridge Community Center as the city's first resilience hub. As outlined in the contextual analysis, the area in which that hub is located stands to benefit greatly from the services a hub may offer, and this recommendation is further corroborated by locations mentioned throughout initial interviews with residents. Additionally, many programs and services that can be included in a hub are already present in that space, such as opportunities for recreation and youth educational programs. The Parkridge Community Center can eventually expand to include more resources, such as plans for renewable energy and storage, by utilizing the resources and funding opportunities outlined in this report. In fact, some funding and community partnership opportunities have been recently presented to those who oversee the Parkridge Community Center. In response to the COVID-19 pandemic and the need for virtual learning, Parkridge has partnered with Ypsilanti Community Schools, Eastern Michigan University (EMU), and Washtenaw County to increase literacy, provide mentorship to students, and encourage graduating EMU students to remain in Ypsilanti and continue to build their community after completing their degree (Rigg, 2021). In addition, the Parkridge Community Center was recently awarded a \$60,000 grant to support these efforts and increase access to digital learning platforms to promote literacy (Rezler, 2021).

Furthermore, we recommend the surveys and interviews created as part of this project be used as a bottom-up approach to understanding resident needs and desires for what should be included in this proposed first hub along with future hubs. This emphasizes a participatory research design that iteratively seeks feedback from the broader community before moving forward with any one set of recommendations for establishing community resiliency, equitably placing community voices at the forefront of hub planning. After doing so, the city can promote Parkridge Community Center to the local community as a hub directly informed by resident

needs. Resources and information on the hub should be publicly available and widely distributed to ensure that citizens are aware of the programs, resources, and services offered to them.

Hubs should also extend beyond physical buildings. As a final recommendation, we suggest the community builds a resilience network, or an interconnected group of resilience-oriented partners in the community. Our project has already begun identifying potential partners and organizations that would be ideal to enhance community resilience in the Southside area of Ypsilanti, where Parkridge Community Center is located, and beyond. Ypsilanti's motto of Pride, Diversity, and Heritage is characteristic in its citizens and businesses that comprise the city. Throughout the COVID-19 pandemic, there has been no shortage of volunteers willing to aid those in need. Establishing a formal network of resilience-based initiatives can provide residents with vital information on how to access services and resources during times of need, which can greatly complement, and promote the use of any physical hub location, thus maximizing the number of approaches to holistically establish resilience.

Finally, the City of Ypsilanti should create a formal resilience ambassador program that provides block leaders with the support and resources to enhance neighborhood resilience on a block-by-block basis. As identified in the interviews with residents, revitalizing neighborhood associations for this purpose may provide a starting point for who in the community should serve as block leaders in the future. After the implementation of a resilience hub, a resilience network, and an ambassador program, the City of Ypsilanti can be at the frontier of innovation for community-wide resilience and adaptation efforts.

Next Steps

Future project teams could originate from local universities, community organizations, local nonprofits, inspired residents, or the local government of the City of Ypsilanti. Ideally, there will also be future teams emerging from Integrative Research Seminars (IRSs) offered through the School for Environment and Sustainability at the University of Michigan that will work on data collection and hub planning.

We hope that work on resilience hubs in Ypsilanti will continue into the future. Figure 10 shows a vision for future activities, although this should be seen as provisional and subject to change based on the desires of residents.

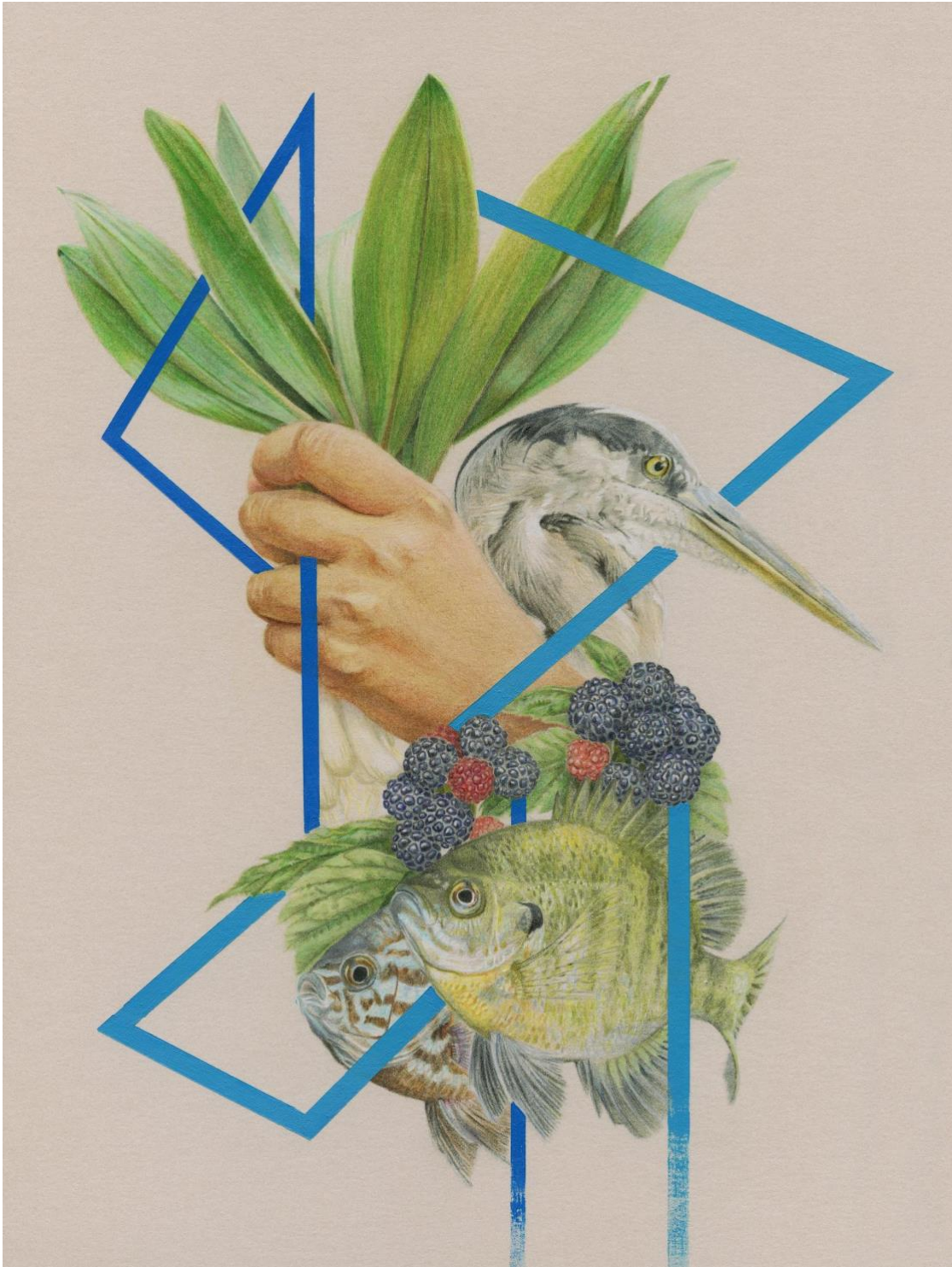


Figure 10. Potential timeline for resilience hub activities in Ypsilanti

It is possible to modify the framework presented in this report to adapt it to other cities, counties, or territories. The first step in this process would involve researching the expected impacts in the area of interest due to climate change. If the area is in the United States, the NOAA Regional Integrated Sciences and Assessments (RISA) program could be quite useful for this (NOAA Climate Program Office, n.d.). Any such analysis would need to consider not merely the expected climatic changes but also how these changes—and others related to increasing prices or decreasing availability of energy, food, or materials—would affect residents of the study area in particular. As with any planning-related work, understanding the history of the territory will be important (as this report has done with the history of Ypsilanti). Once a team explores the expected climatic effects and historical context, conducting a vulnerability assessment using a methodology like the one described in this report will be necessary to identify specific locations for hubs that would serve the most, or the most vulnerable, people. It might be possible at this point to slightly change the wording to adapt the survey and interview instruments offered here, although factors like the language proficiencies of residents will have to be considered. If there is a large number of people who are illiterate or only modestly literate, people who are deaf or blind, or people who speak a language other than English, the instruments, and the corresponding method of interpreting results, will need to be adapted significantly. The funding options and community building tips offered in this report should be widely applicable, however.

Finally, as resilience hubs are a fairly new concept at the time of writing, there are many further areas of research and practice to be explored. In particular, reports such as these could benefit from a more systematic investigation into how prehistory and history of an area inform modern resilience efforts. Guidance on the selection of particular buildings or individuals for resilience hubs could help streamline the implementation process. The creation of a centralized resilience funding database—similar to the list offered by the US Climate Resilience Toolkit (U.S. Climate Resilience Toolkit, 2020) but with more offerings and the ability to filter search results—would be tremendously useful to future teams when they begin looking for funding sources. Improvements to climate vulnerability assessments and survey and interview instruments are always useful as well, particularly if they involve making these tools applicable to different possible local circumstances (e.g., a Spanish-speaking population, a disproportionate number of older citizens). As time goes on and the impacts of climate change become increasingly visible and dangerous, activities and research surrounding resilience will be increasingly relevant to ensuring the well-being of people all around the world.

Foraged by Jessica Tenbusch



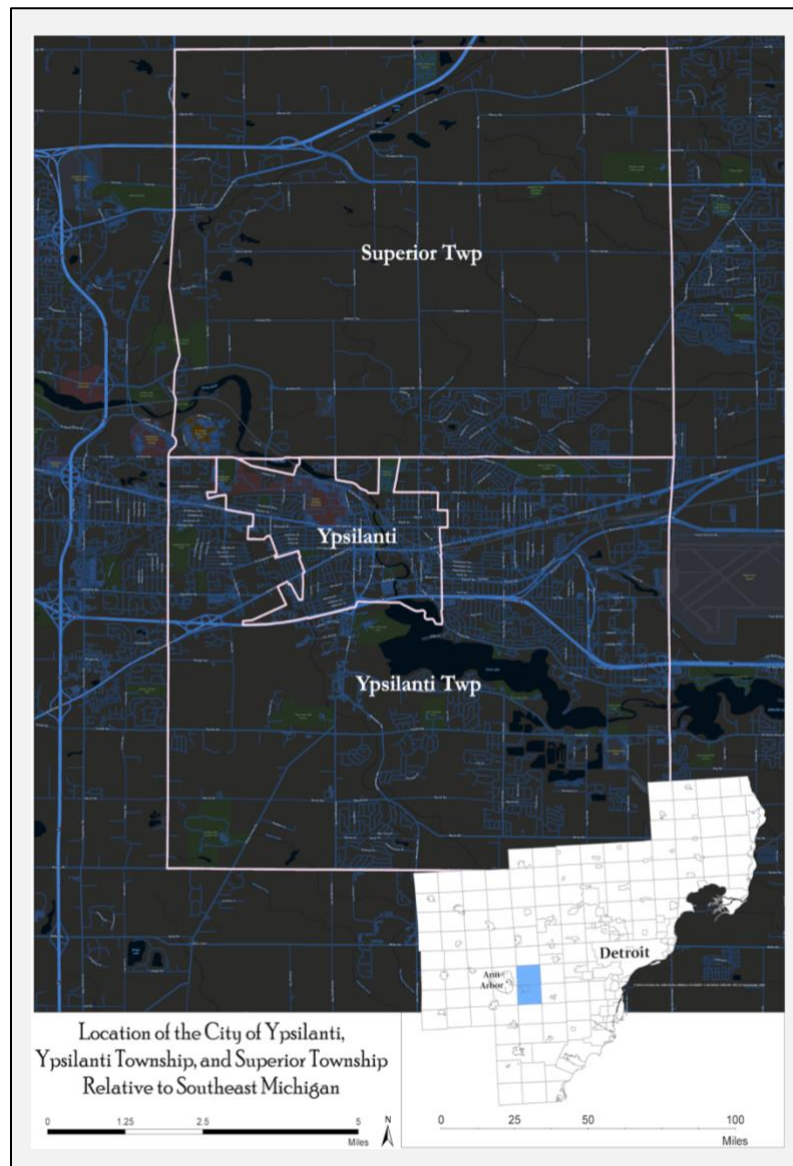
Featured local species: great blue heron, wild ramps, bluegill, pumpkinseed sunfish, wild black raspberry, Homo sapiens. Engaging with and protecting local ecosystems offers physical and psychological sustenance, both of which are vital for fostering resilience.

APPENDIX A - CONTEXTUAL ANALYSIS

Background

Ypsilanti is divided into 72 block groups and 38 tracts determined by US Census Bureau standards. Block groups are a combination of similarly featured blocks, forming relatively homogeneous subdivisions within tracts (U.S. Census Bureau, 1994). Data for this analysis was used at this scale. This analysis is one example of an approach to determine the areas of Ypsilanti that are most susceptible to the impacts of climate change and environmental degradation while being the least economically and socially equipped to combat them. All block groups within the City of Ypsilanti, Ypsilanti Township, and Superior Township were included in this analysis.

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Methodology

The EJSCREEN tool used for this analysis includes a combination of six categories of demographic data and eleven environmental indicators. While this list is not inclusive of all factors that affect vulnerability, it provides contextual analysis relative to the condition of the United States as a whole. Still, it is important to note there are limitations in both the extent and accuracy of the data at such a local level. The EJSCREEN tool provides public access to data as a means of transparency from the organization and is not meant to be used as a mandate for local governments to follow. Still, it is an important first step and component in the process of understanding the context of local communities. Additionally, not all relevant environmental factors are considered in this tool. While the included factors are important, they alone do not capture the full picture of environmental quality in any given area. Given this, it is

important to supplement the findings in this analysis with further qualitative explorations from local knowledge. Finally, working with a national database at such a fine scale can cause some uncertainties in the estimates for both the environmental and demographic indicators. Two environmental indicators included in this analysis, PM2.5 and ozone, only have data available at the census tract level. Block groups in the same census tracts were assigned the same value in this instance. Demographic estimates come from surveys, rather than a census of all households and averaged throughout the block group. This can cause some variation in the data compared to reality but is the best available data for the indicator.

Building beyond a traditional social vulnerability analysis, EJSCREEN combines demographic and environmental indicators to provide a viewpoint of socio-environmental susceptibility. Determining what factors to include in the tool, the EPA used the following guidance:

To help achieve EPA's goal for EJ (i.e., the fair treatment and meaningful involvement of all people), EPA places particular emphasis on the public health of and environmental conditions affecting minority, low-income, and indigenous populations. In recognizing that these populations frequently bear a disproportionate burden of environmental harms and risks ... EPA works to protect them from adverse public health and environmental effects of its programs. EPA should pay particular attention to the vulnerabilities of these populations because they have historically been exposed to a combination of physical, chemical, biological, social, and cultural factors that have imposed greater environmental burdens on them than those imposed on the general population. (U.S. Environmental Protection Agency, 2015)

The EJSCREEN tool uses outlined demographic factors as a general indication of the risk associated with the various environmental indicators. While the environmental indicators suggest possible exposure to toxicants or health impacts, demographics are used to indicate the susceptibility of harm to these risks (U.S. Environmental Protection Agency, 2016). The focus on the interaction of these factors is complex but intentional. As outlined in the EJSCREEN technical documentation, demographics may relate to the susceptibility of environmental pollutants through any of the following means:

- Greater personal exposure despite the same ambient level of pollutant. For example, children have higher breathing rates or ingest more lead dust than adults (U.S. EPA, 2011a), and certain groups may tend to encounter or be less able to avoid certain exposures due to limited resources, language barriers, education, cultural practices, or lack of information.
- Susceptibility because of a greater percentage increase in health risk for a given exposure, e.g., "effect modification" or "multiplicative interaction" may occur. An example would be where cumulative previous exposure means a group is more likely to be closer to a threshold for adverse effects, or where greater stress/allostatic load increases susceptibility through inflammatory or other pathways. Several examples of effect modification relevant to EJ and PM2.5 are referenced by Bell & Ebisu, 2012 and in a review of subgroups susceptible to ozone (Bell, Zanobetti, & Dominici, 2014). A growing body of

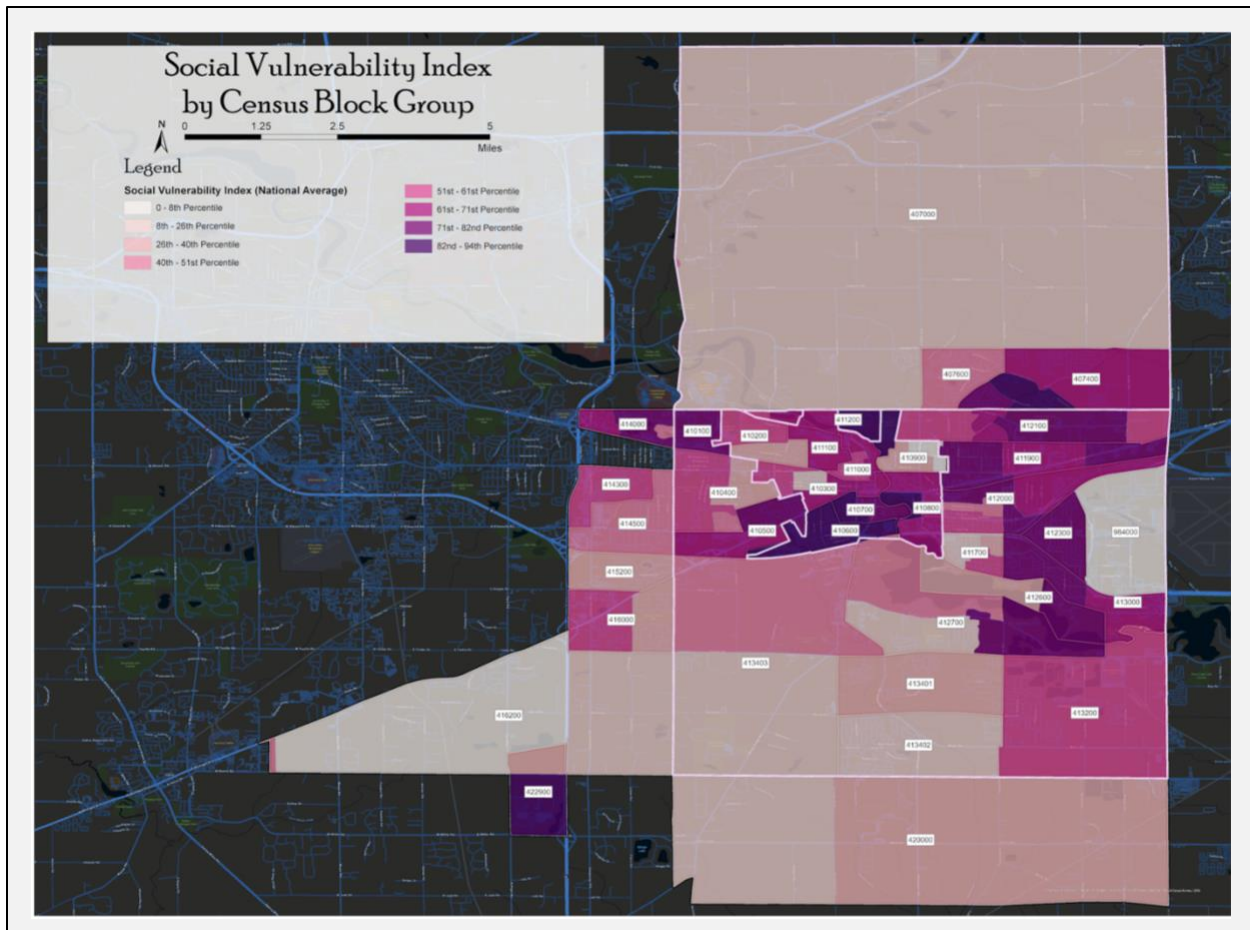
research has documented interactions of psychosocial stress and environmental exposures.

- Susceptibility because of higher baseline risk or rates of pre-existing diseases. The same percent increase in mortality risk has a larger impact on absolute risk if baseline risk is higher.
- Susceptibility because of increased overall burden resulting from an initial health risk (e.g., because of less ability to recover due to lack of health care or resources). For example, low-income or minority individuals, or those with less than a high school education, are far less likely to have health insurance (Cohen & Martinez, 2011). (U.S. Environmental Protection Agency, 2019)

In total, the following six demographic factors were considered in the EJSCREEN analysis:

- Low-Income: The number or percent of a block group's population in households where the household income is less than or equal to twice the federal "poverty level."
- Minority: The number or percent of individuals in a block group who list their racial status as a race other than white alone and/or list their ethnicity as Hispanic or Latino. That is, all people other than non-Hispanic white-alone individuals. The word "alone" in this case indicates that the person is of a single race, since multiracial individuals are tabulated in another category—a non-Hispanic individual who is half white and half American Indian would be counted as a minority by this definition.
- Less than high school education: The number or percent of people age 25 or older in a block group whose education is short of a high school diploma.
- Linguistic isolation: The number or percent of people in a block group living in linguistically isolated households. A household in which all members age 14 years and over speak a non-English language and also speak English less than "very well" (have difficulty with English) is linguistically isolated.
- Individuals under age 5: The number or percent of people in a block group under the age of 5.
- Individuals over age 64: The number or percent of people in a block group over the age of 64. (U.S. Environmental Protection Agency, 2019)

The aggregate combination of the above factors resulted in an output of overall social vulnerability of the area in percentile compared to the national average:



While there were eleven environmental factors included in the EJSscreen, only eight had data available at the block group level for the Ypsilanti area. For determining the areas of priority in Ypsilanti, the following environmental indicators were used:

- Percentage of houses built pre-1960's (potential for lead paint)
- Proximity of EPA National Priority List (NPL) sites
- Proximity of hazardous waste transfer, storage, and disposal facility (TSDF)
- Proximity of facilities with EPA mandated risk management plans (RMP) (potential chemical exposure and elevated risk in natural disasters)
- Levels of ozone in the air
- Levels of particulate matter (PM2.5) in the air
- Traffic proximity and volume
- Proximity to major direct water discharges

All GIS analyses were performed using the various environmental justice indicators in combination with the supplementary demographic index and were represented as a percentile of the national average. Each individual analysis can be represented with the following formula:

$$EJ \text{ Index with Supplementary Demographics} = (\text{Environmental Indicator}) \times (\text{Supplementary Demographic Index for Block Group} - \text{Supplementary Demographic Index for US}) \times (\text{Block Group Population})$$

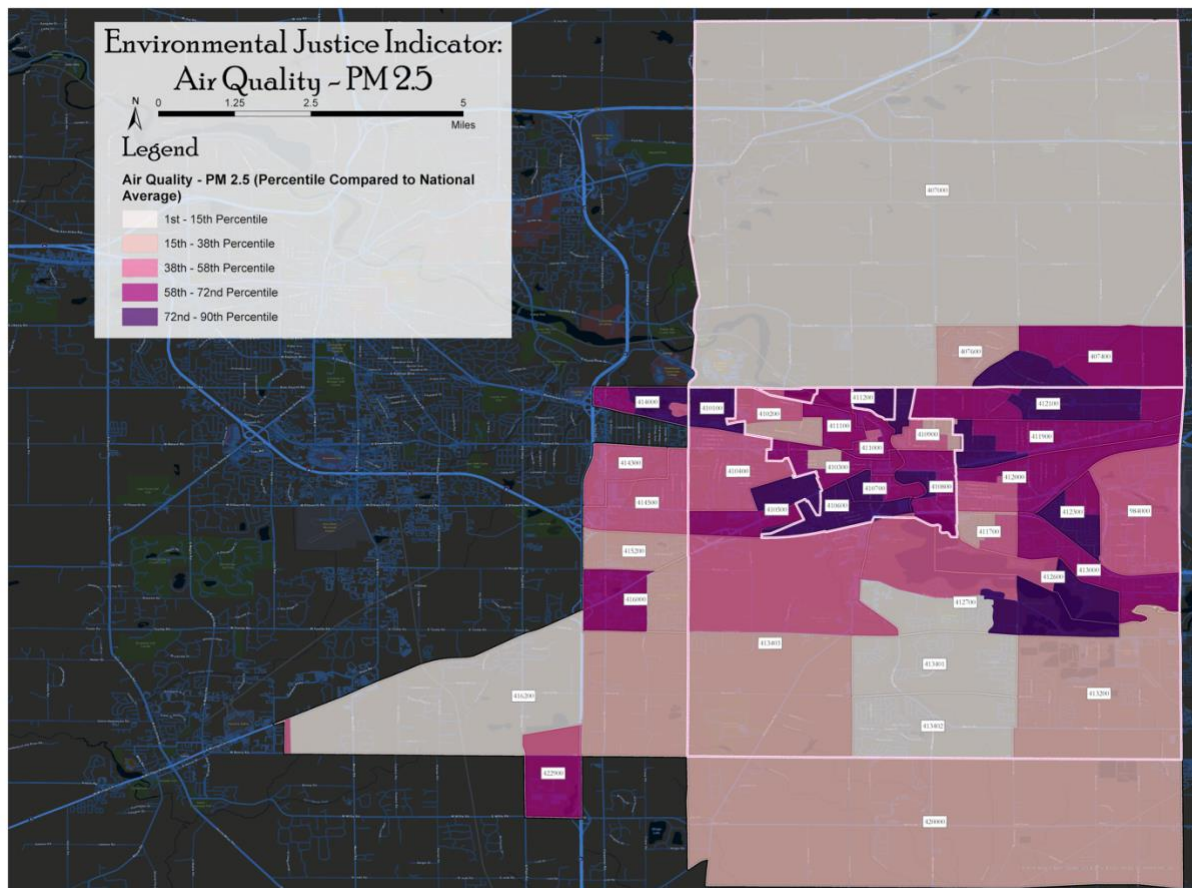
(U.S. Environmental Protection Agency, 2019 p. 22)

An aggregate output of all maps was then used to discover if there was any overlap in block groups being at the highest percentile from the combined environmental indicators. Percentiles for each environmental indicator were calculated using the Jenks Natural Breaks classification. This methodology arranges the data in the most optimal class ranges that mark logical breakpoints to minimize data differences in each group and maximize the difference between classes (Slocum et al., 2009). After separating out the highest percentile blocks for each indicator, or those with the highest exposure or risk in the area, the data was analyzed to find intersections from the combined indicators.

Results

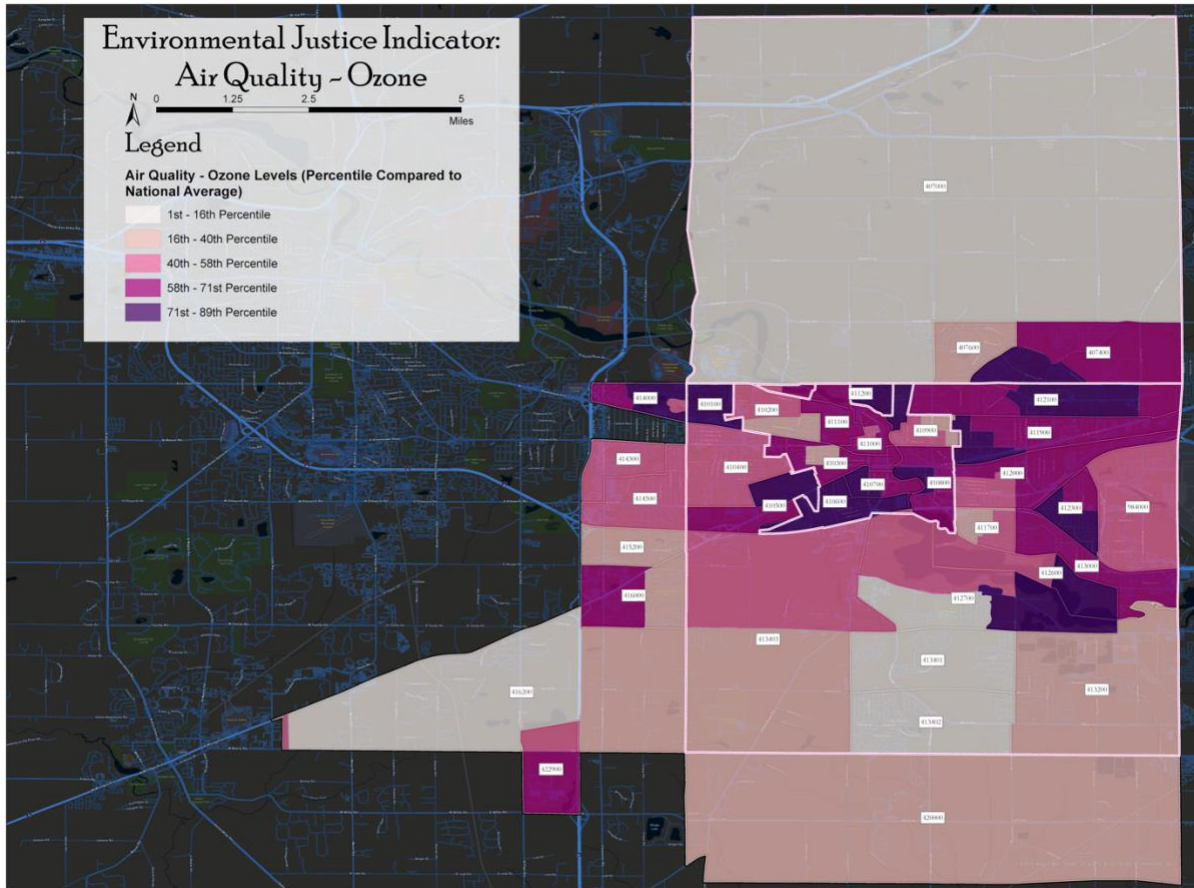
Overall, there were six block groups that were always in the highest percentile group for each indicator. These block groups represent neighborhoods in Ypsilanti that are vulnerable to local environmental hazards due to both socioeconomic and environmental indicators. It is our suggestion that these areas be prioritized from an equity standpoint for the development of a community envisioned resilience hub. Rationale for this assessment has been provided in the contextual analysis section earlier in the report. In the online version of this report, headers for each map can be opened for a larger viewing and downloading for each of the coinciding maps.

ENVIRONMENTAL INDICATOR MAP 1: AIR QUALITY – PM2.5



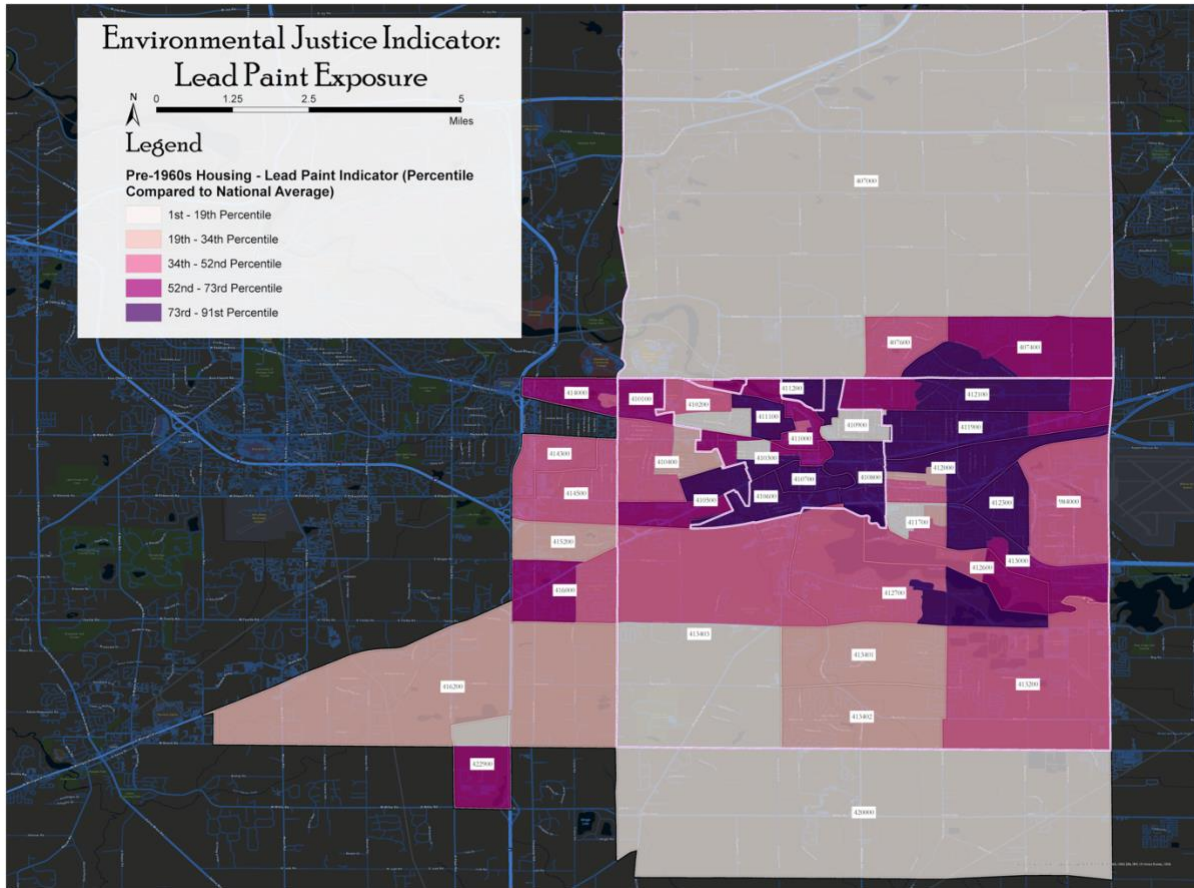
This indicator uses estimates of annual average PM_{2.5} concentrations in micrograms per cubic meter. Levels of PM_{2.5} are based on model estimates using a downscaling method to apply a predictive annual daily average (U.S. Environmental Protection Agency, 2019). Particulate matter is one of six principal pollutants that is included in the National Ambient Air Quality Standards (NAAQS). Exposure to PM_{2.5} over prolonged periods of time elevates the risk of “premature mortality from cardiovascular diseases or lung cancer, and increased health problems such as asthma attacks” (U.S. Environmental Protection Agency, 2010). Percentiles included in the map do not necessarily indicate levels that are consistently dangerous but are a reflective comparison of base levels throughout the United States.

ENVIRONMENTAL INDICATOR MAP 2: AIR QUALITY - OZONE



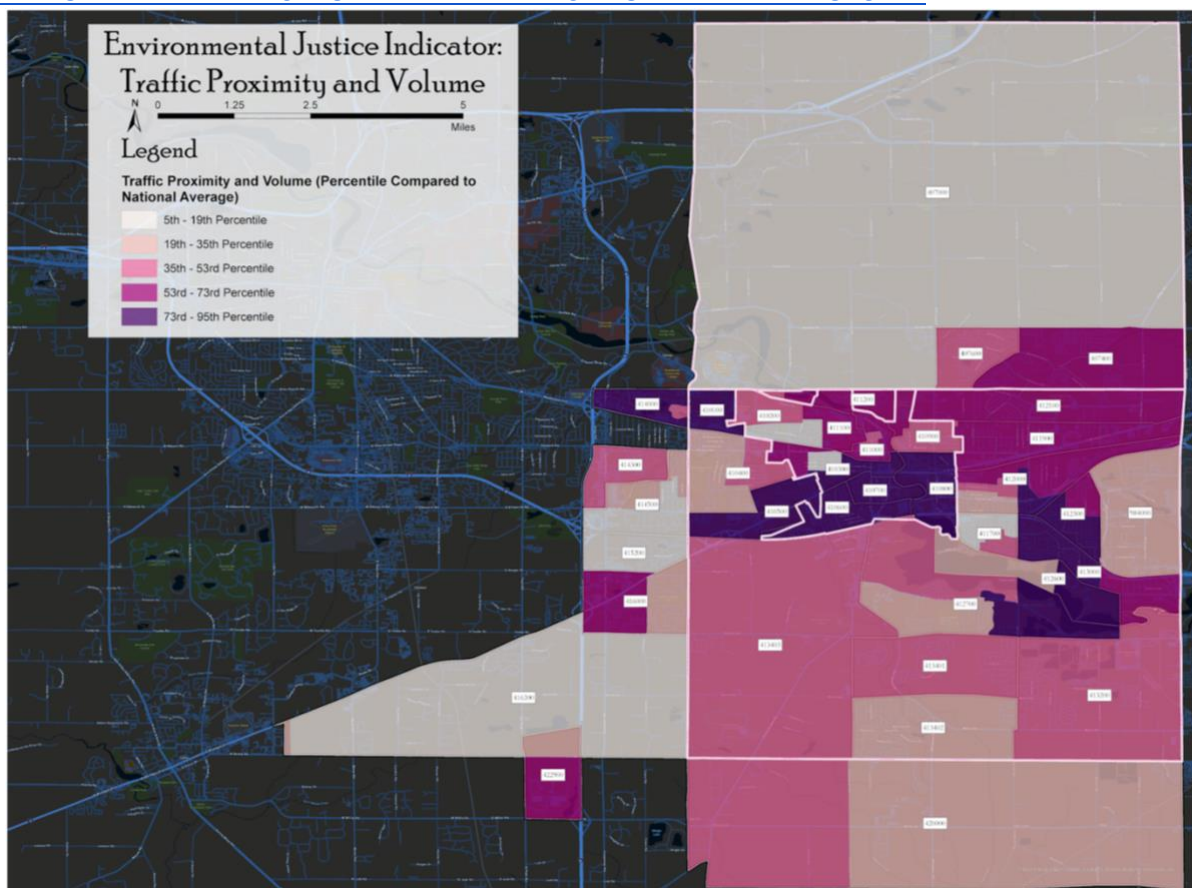
The ozone indicator uses May-September average of daily maximum 8-hour-average ozone concentrations. There has been an established connection between exposure to high levels of ozone and adverse health impacts through multiple epidemiological and toxicological studies (U.S. Environmental Protection Agency, 2006). Such impacts, including reduced lung functioning and increased inflammation, result in increased hospital admissions and mortality. Studies have also shown interactive effects on health with ozone and underlying health conditions or vulnerable populations, including older adults, children, people with preexisting pulmonary diseases, and outdoor workers (U.S. Environmental Protection Agency, 2006). Similar to PM_{2.5}, percentiles do not necessarily indicate dangerous levels, but do compare averages between percentiles of all block groups in the United States. Estimates are based off of the same downscaling method mentioned in the PM_{2.5} section.

ENVIRONMENTAL INDICATOR MAP 3: LEAD PAINT



This indicator uses the percentage of homes in each block group that were built pre-1960s as an estimate of the likelihood of significant lead-based paint hazards (U.S. Environmental Protection Agency, 2019). Lead has long been known to cause adverse health impacts. Certain demographic groups are at heightened risk from lead exposure. Studies have demonstrated a stronger association between high blood lead levels and poor cardiovascular outcomes in Mexican-American and non-Hispanic Black populations compared to non-Hispanic whites (U.S. Environmental Protection Agency, 2013). Lead exposure is particularly dangerous to children and neurological development, even at low levels. Direct contact from lead-based paint can occur through ingestion or inhalation as the paint chips, flakes, or becomes chalky. It is estimated that 54% of homes built pre-1960s have significant lead hazards (Jacobs et al., 2002).

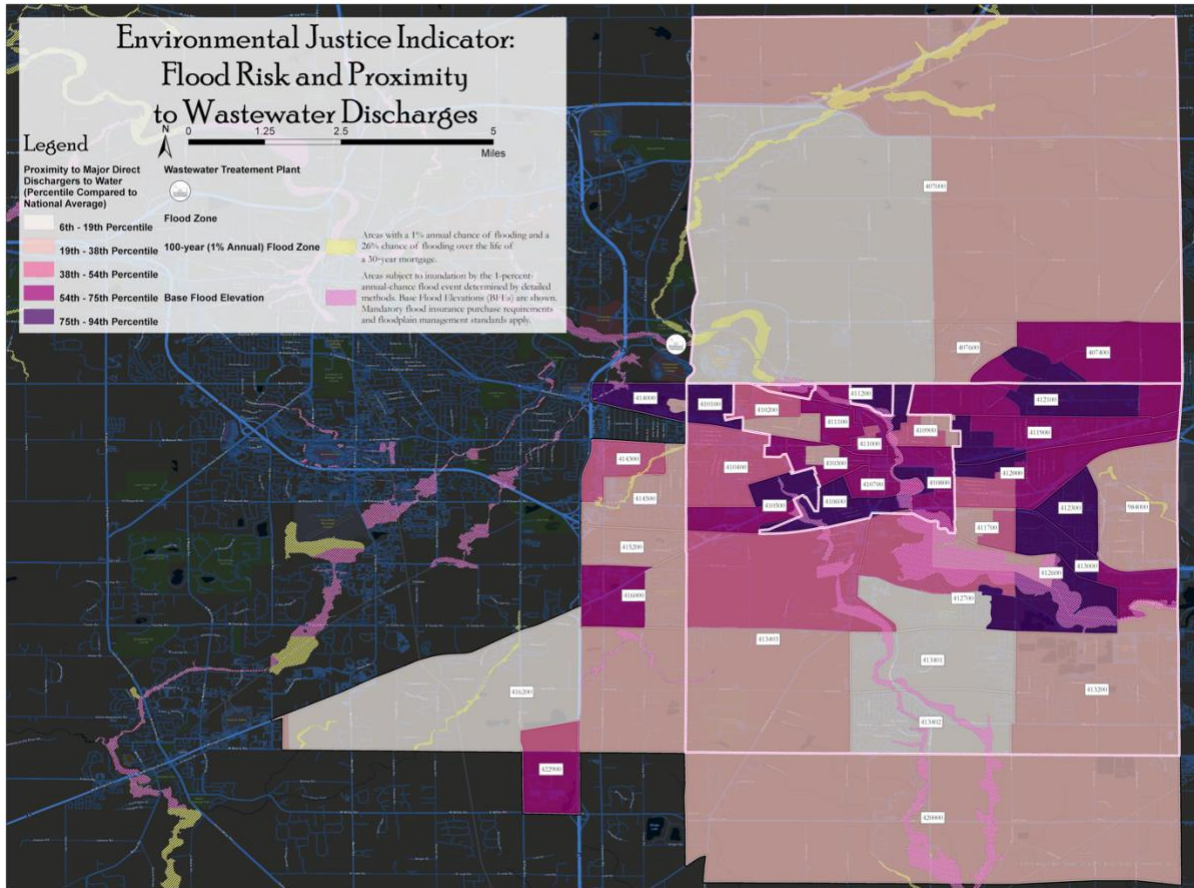
ENVIRONMENTAL INDICATOR MAP 4: TRAFFIC PROXIMITY AND VOLUME



The EPA Technical Document for the EJSCREEN tool describes traffic proximity and volume as the “count of vehicles per day within 500 meters of a block centroid, divided by distance in meters, presented as the population-weighted average of blocks in each block group. Adjustments are made so that the minimum distance used is reasonable when very small.” While a close proximity to major roads is likely beneficial for job availability, access to public transit, food, and other amenities, it does come at a cost for exceptionally high-density traffic zones. The EJSCREEN tool accounts for this by adjusting for close proximity to very high volumes of traffic.

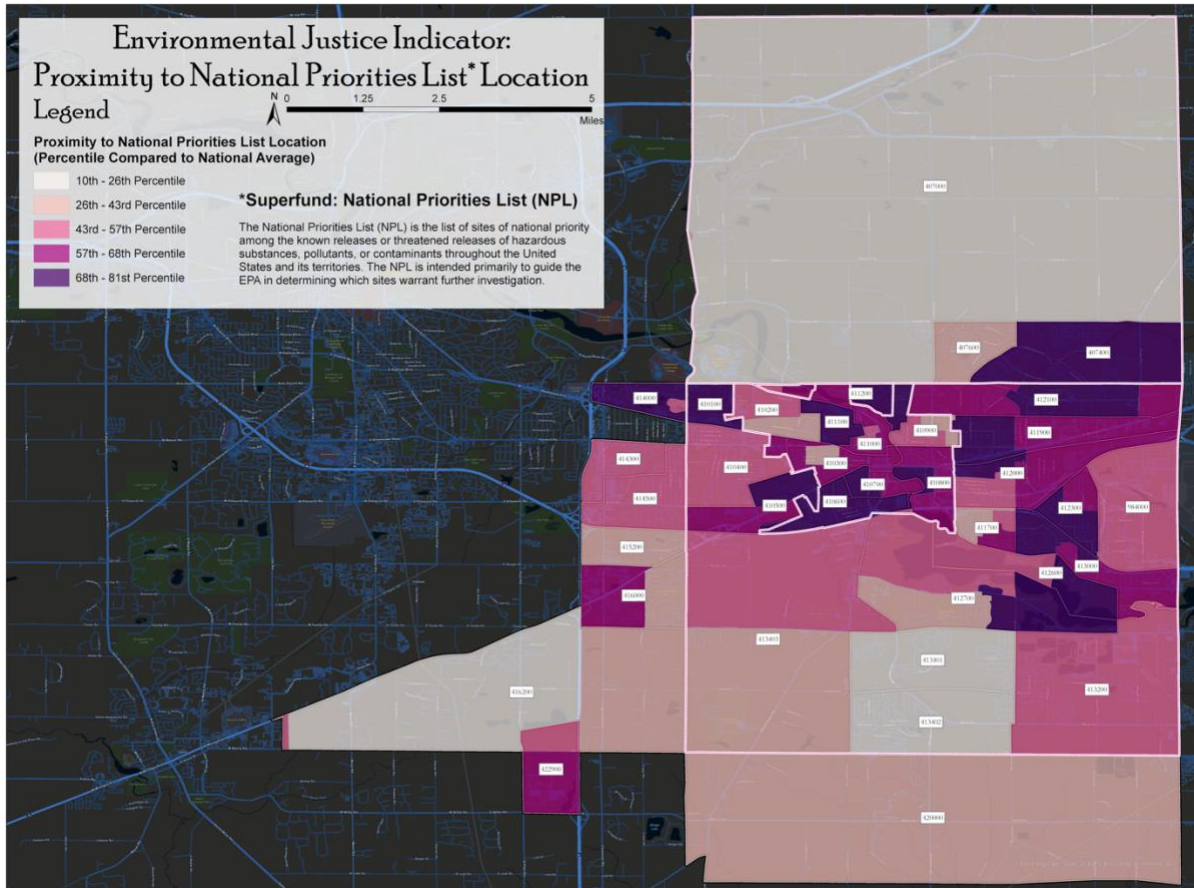
Proximity to high volume traffic increases risks of aggravating and potentially causing the development of asthma, incite underlying cardiovascular disease pathologies, and correlate with higher prevalence of cardiovascular diseases, coronary heart disease, myocardial infarction, and mortality from these conditions. This is due to the density of vehicle related emissions of PM_{2.5}, ozone, lead and other metals, air toxins such as benzene, nitrogen oxides, hydrocarbons and carbon monoxide (Baumann et al., 2011; Health Effects Institute, 2010; Hoffmann et al., 2009; U.S. Environmental Protection Agency, 2016). Beyond emissions, the role of sound plays a role in residential health. Noise related to transportation has been associated with the production of stress hormones, disturbances of sleep, hypertension, multiple heart conditions, and a risk of stroke among the elderly (Sørensen et al., 2011). Studies controlling for many factors found the presence of hazardous waste sites and high traffic volume to be the determinants for self-reported stress (Yang & Matthews, 2010).

ENVIRONMENTAL INDICATOR MAP 5: MAJOR DIRECT WATER DISCHARGES



This indicator measures the amount of major direct discharge facilities within 5 kilometers of each block group. Major direct discharge facilities may be authorized through a National Pollutant Discharge Elimination System (NPDES) permit. This is an important distinction, as the EJSCREEN tool does not account for actual discharge events or pollutant levels, but the potential for pollution through the concentration of facilities with NPDES permits (U.S. Environmental Protection Agency, 2019). There are three notable factors to consider, however. First, the Huron River runs downstream through Ypsilanti at a low-flow rate. This allows for pollutants to settle in the area after a discharge event, rather than be quickly distributed throughout the watershed. Secondly, the Ann Arbor Wastewater Treatment Plant is upstream of Ypsilanti. Since 2016, this facility has discharged over 1 million gallons of raw or partially treated sewage into the Huron River and its tributaries (Stanton, 2020). Pollution associated with sewage, such as the increased presence of phosphorus, nitrogen and cyanotoxins have been found in the river in the past (Detroit Free Press Staff, 2018). Finally, Southeast Michigan is projected to witness an increase of heavy precipitation events, flooding, and severe erosion (Graham Sustainability Institute, 2015; Pryor et al., 2014). While the EJSCREEN tool is only accounting for potential risk, the hazards in this area have been realized and will likely worsen alongside a changing climate.

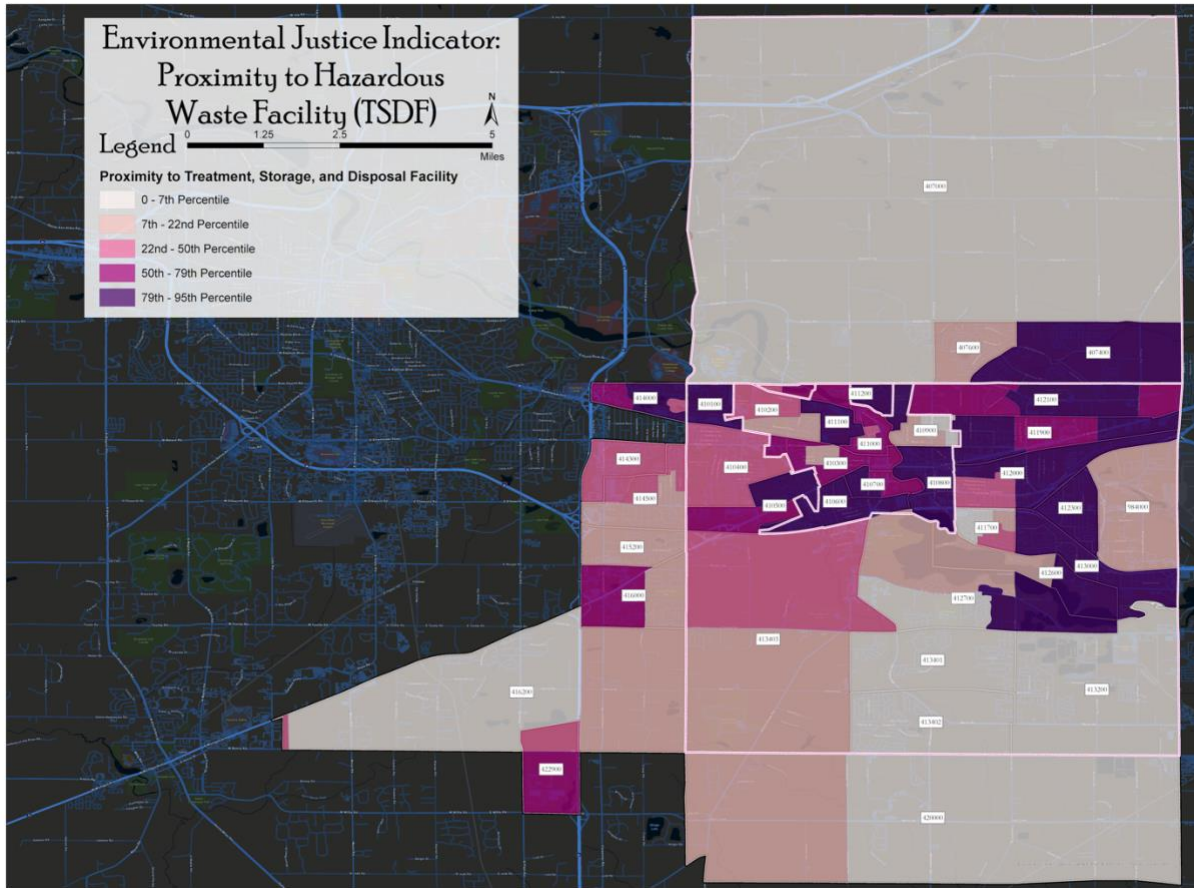
ENVIRONMENTAL INDICATOR MAP 6: PROXIMITY TO NATIONAL PRIORITY LIST (NPL) SITES



The NPL is a key subset of sites covered as part of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, more commonly referred to as Superfund. These sites are identified through meeting specified criteria and public comment to establish areas that warrant EPA cleanup actions. The EJSCREEN tool accounts for the amount of NPL sites within a 5km radius of the average resident in each block group. The aggregate percentile is calculated through the number of sites within that radius, the distance of the sites, and the population of the block group (U.S. Environmental Protection Agency, 2019).

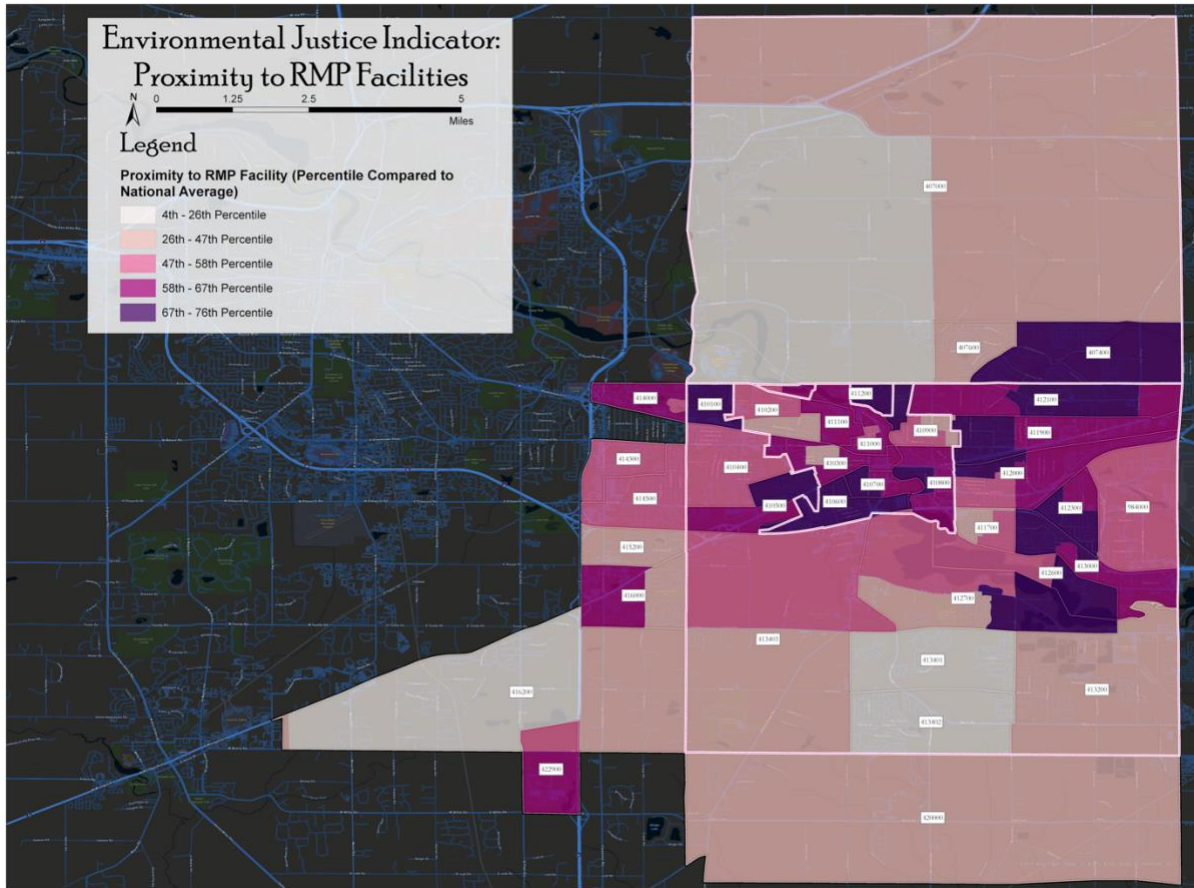
Contaminants vary between each NPL site and there are many ways in which they may reach individuals. Volatile compounds, particularly in dry climates, can become an airborne pollutant and be inhaled by community members. While Southeast Michigan is projected to increase in heavy precipitation events in the winter, summertime is seen to become warmer and drier (Graham Sustainability Institute, 2015; Pryor et al., 2014). This has implications for ground and surface water levels in the summer as well and subsequently may increase the concentration of pollutants as water levels decrease. Human health can also be impacted through the bioaccumulation of contaminants from NPL sites in the food chain (U.S. Environmental Protection Agency, 2000).

ENVIRONMENTAL INDICATOR MAP 7: PROXIMITY TO TREATMENT, STORAGE, AND DISPOSAL FACILITIES (TSDF)



Similar to NPL sites, this indicator measures the amount of TSDFs within a 5km radius, distance of the sites to each block group, and the weighted average population of each block group (U.S. Environmental Protection Agency, 2019). TSDFs are facilities that handle hazardous and solid wastes to fulfill RCRA Subtitle C mandating that waste must be managed strictly from “cradle to grave” (U.S. 94th Congress, 1976). The issues surrounding TSDFs are similar to that of NPL sites. Additionally, these facilities are disproportionately located in low-income and minority communities (Bullard, Mohai, Saha, & Wright, 2007).

ENVIRONMENTAL INDICATOR MAP 8: PROXIMITY TO A FACILITY WITH A RISK MANAGEMENT PLAN (RMP)



This indicator uses the same methodology as TSDFs and NPL sites. RMP facilities are mandated to have risk management plans due to the handling of regulated substances known for their high acute toxicity or because of their flammable or explosive potential (U.S. Environmental Protection Agency, 2019). Again, the EJSCREEN tool uses proximity as an indicator of potential harm, rather than actual risk or exposure. However, any accidental release, fire, or explosion at any regulated facility can be devastating, especially as the density of facilities in a locality increases.

APPENDIX B - SURVEY

Background Information and Questions

This survey was created by a group of graduate students at the University of Michigan School for Environment and Sustainability (SEAS). Our goal is to gather community input on the needs of residents of Ypsilanti as it relates to resilience hubs. This survey contains questions that relate to your experience as an Ypsilanti resident.

Your participation is completely voluntary, and you can skip any question you want. Your responses to this survey will be anonymous. We thank you in advance for your participation. This should take about 7 minutes.

Resilience Hub Explanation

Resilience hubs provide day-to-day resources to residents that are vital during emergencies. Climate change increases the likelihood of emergencies in Ypsilanti. Some day-to-day resources can be physical like food and wireless Internet. Other day-to-day resources can be psychological and social, like a feeling of closeness to one's neighbors.

Hubs also serve as spaces to teach how to increase community resilience, which is a community's ability to adapt to and recover from emergencies. Events and classes can be held year-round with the goal of teaching these skills and improving social connections.

Please take a moment to look at the graphic of a resilience hub that is below this text before moving on to the next page. If you are taking this survey on a smartphone or tablet, you may use your fingers to zoom in on the picture.

What goes into a Resilience Hub?



Local Building and Block Leader

There are different kinds of hubs. One type could involve a **local building** where people can meet, take classes, farm fresh food, and get other resources. This is the type discussed in the survey so far.

Another type could involve having **block leaders** whose neighbors identify them as trusted leaders in their community. They may keep resources in their home, teach their neighbors how to get their own food and energy, and give out supplies and support in times of need.

How well would each type work in your neighborhood? [Rate on the following scale: (1) Not at all, (2) A little, (3) Somewhat, (4) Very, and (5) Extremely]

- _____ 1. Local building
- _____ 2. Block leader

Hub Importance and Location

The following list contains places where a resilience hub could be located. How well do you think these places would work for a resilience hub? [Rate on the following scale: (1) Not at all, (2) A little, (3) Somewhat, (4) Very, and (5) Extremely]

- _____ 1. Religious building
- _____ 2. School
- _____ 3. Hospital
- _____ 4. Government building (e.g., city hall)
- _____ 5. Police station
- _____ 6. Fire station
- _____ 7. Local park
- _____ 8. Community center
- _____ 9. Library
- _____ 10. Local business
- _____ 11. Home in your community

12. What other spaces come to mind that would make sense for a resilience hub?

Social and Emotional Resources

A resilience hub can offer the following resources, services, and experiences. How important to you is it that a hub offers these things? [Rate on the following scale: (1) Not at all, (2) A little, (3) Somewhat, (4) Very, and (5) Extremely]

- _____ 1. Friendship
- _____ 2. Safety and security
- _____ 3. Cultural experiences
- _____ 4. Hope for the future
- _____ 5. General feeling of well-being
- _____ 6. Quietness and solitude
- _____ 7. Being close with nature
- _____ 8. Child care
- _____ 9. Elder care
- _____ 10. Classes on life skills, like gardening and home repair
- _____ 11. Feeling like you belong in your neighborhood
- _____ 12. Fun and play
- _____ 13. Opportunities to help others
- _____ 14. Religious/spiritual experiences
- _____ 15. Relationship with pets (e.g., dogs and cats)
- _____ 16. Other (Please list) _____

Please rate your agreement with the statements below. [Rate on the following scale: (1) Not at all, (2) A little, (3) Somewhat, (4) Very, and (5) Extremely]

- _____ 1. I am afraid that some disaster will occur soon
- _____ 2. I worry that I will not be able to provide for my family
- _____ 3. I believe that my neighbors would help me in an emergency
- _____ 4. I would be willing to work together with others on something to improve my neighborhood
- _____ 5. I would be comfortable eating something grown in a neighbor's yard

- _____ 6. I desire to relax more often in a quiet place
- _____ 7. I want to talk with others about my fears and worries
- _____ 8. I want to enjoy the beauty of nature more often

Material Resources

A resilience hub can offer the following supplies and services. How important is it to you that a hub offers these things? [Rate on the following scale: (1) Not at all, (2) A little, (3) Somewhat, (4) Very, and (5) Extremely]

- _____ 1. Clothing
- _____ 2. Electricity and lighting
- _____ 3. Temperature control (e.g., air conditioning)
- _____ 4. Toiletries (e.g., toothpaste and deodorant)
- _____ 5. Cleaning supplies
- _____ 6. Medicine
- _____ 7. Entertainment (e.g., games and movies)
- _____ 8. Electronics
- _____ 9. Internet access
- _____ 10. Tools
- _____ 11. Gardening supplies
- _____ 12. Prescription eyewear
- _____ 13. Personal accessories (e.g., watches and jewelry)
- _____ 14. Public transportation
- _____ 15. Repair services for things like appliances
- _____ 16. Pet food and other pet needs
- _____ 17. Other (Please list) _____

18. How important do you think a hub is for your neighborhood? [Rate on the following scale: (1) Not at all, (2) A little, (3) Somewhat, (4) Very, and (5) Extremely]

Conclusion

Thank you for taking our survey! The results will inform next steps for a possible resilience hub project in Ypsilanti.

If you have any questions or further comments, please email ypsireshub@umich.edu

Email feedback: If you would like to help us by providing more feedback on resilience hubs in your community, please provide your email below. Your email will not be linked to your responses.

Improvements: Do you have any feedback for the survey creators? How could this survey be improved?

APPENDIX C - INTERVIEW GUIDE

Introductory Script

Mention the following key points:

- Thank participants for joining the call today and for their previous participation in filling out our online survey.
- Purpose of the call: To discuss community resilience and how we may plan with our community to...
 - Prepare for climate impacts and other possible futures² and
 - Positively adapt to these impacts
- Introduction to resilience hubs and resilience block leaders > “The services found in resilience hubs can be provided to a community either through a physical location or in the form of a block leader.”
 - A physical hub = 1) a community building in a trusted location, 2) open year-round, 3) staffed by volunteers, and 4) includes important resources for the community.
 - A block leader approach = a trusted individual within a neighborhood, responsible for similar aspects of what a physical hub can provide.
 - i.e., they may host or share informative workshops, or distribute resources during an emergency.
 - More localized approach, typically on a block-by-block basis, while a physical hub extends to an entire neighborhood or beyond.³

(distribute hub infographic in person or display on-screen if in an online format)

- “We **hope to determine which may be the best approach** for your neighborhood to increase resilience, while also **understanding the day-to-day needs** you have in your community.”
- What our questions and the session will look like: This is in no way a formal interview. Our session shouldn’t last more than about an hour, and we plan to record it. Their participation throughout is completely voluntary.
 - Ask if anyone has questions before continuing (gain consent to record)
- Intro questions: Have them go around and introduce themselves to establish a sense of familiarity, asking who they are and what neighborhood they’re from, as well as how long they’ve been a resident.

Community Needs Questions

(“The following are questions about your needs as a resident in your neighborhood...”)

1. What makes your neighborhood a great place to live?
2. What challenges are present in your neighborhood?

² Mention when talking that “possible futures” might entail things like higher food prices, higher energy prices, less stable government support

³ If an interviewee asks about differences, discuss how block leaders can be a bit easier to implement in terms of time and money

3. Reflecting on past situations, what kinds of things are easily accessible in your neighborhood?
4. Reflecting on past situations, what kinds of things are difficult to access in your neighborhood?
5. Given the situation that arose from COVID-19, how prepared do you think your neighborhood is to meet the needs of residents in future emergencies?

Social and Emotional Needs Interview Questions

("The following are questions that ask about your experience with others in your neighborhood, and your experience as a resident more generally...")

6. Have you attended neighborhood-wide events in the past?
 - a. Which events?/What kind of events?
 - b. Can you describe what your experience was like at this event?
7. Are you part of any organizations designed to help residents in your neighborhood, and if so, which ones?
8. Have you felt that you could go to your neighbors with any needs you had in an emergency?
9. When you imagine your neighborhood in 5-10 years, what do you hope for?
 - a. What is needed to get there?
 - b. What challenges or barriers do you anticipate?

Approach Questions

("Based on the above information...")

10. In the resilience hub located in a physical community building as described above, what would you include?
 - a. What should the space look like?
 - b. What services or programs would be available to people in your neighborhood?
11. Similarly, what would you expect of a resilience block leader in your neighborhood?
 - a. What should they do to coordinate a neighborhood emergency response?
12. Do you feel either yourself or any of your neighbors could build resilience in your neighborhood? (If yes, ask who and what qualities they have that make the interviewee confident that they could serve as a block leader.)
13. Imagine an emergency event⁴ happening in your community 5-10 years down the road. What positive neighborhood responses do you expect in this situation?
 - a. What are the strengths of your neighborhood that would help create a positive neighborhood response in this situation?
 - b. What are the weaknesses of your neighborhood that would prevent creating a positive response in this situation?

⁴ If asked to describe an example of an emergency event, mention we don't want to be too specific or narrow in how we think about this, but examples could include floods, tornados, pandemics, etc. and that we are trying to get a general sense of neighborhood responses to collective issues.

APPENDIX D - INTERVIEW CODEBOOK

Deductive Codes

Below are the codes informed and anticipated by our main research questions.

Name	Definition	Example Quote
Block Leader	Attributes or description of block leader	“What I would expect, first of all, is a person to be completely dedicated and have a compassion for the people, and an understanding and working knowledge of what’s going on, and what’s happening, and be able to articulate that to the community. And also, be able to respond to the needs, if not being able to directly lend assistance, to give direction where they need to go. Also, more importantly, to be able to know the people on their block on a personal name basis. There’s a beautiful thing about when you’re asking for help, and the person you’re asking knows where you live. So, it’s not just somebody who is there because I raised my hand, this is what I want to do, but to be able to know the persons on their block. And also, I’d expect them to go check on them, you know from time to time. You know, hey, you okay? And just let them know that I am here. So that compassion, that genuine compassion for humanity is a definite requirement for me.”
Communication channels	Mentions of strengths or weaknesses of current and/or future community communication approaches	“And then one of the things that when the pandemic hit us here, that really stuck to me, is that we have like the communication [piece]. Like the way to communicate, and like reach people who don't have technology, you know, all these different things and each person’s living situation just amped up. Right? When we were in quarantine, like whatever is happening in that space. So how do we even support, you know, what does that look like with all these different needs? And so that really made me want to think about, “how do we work on having something that can better use for communication, but then all the different ways that that could build infrastructure?” The social infrastructure that we need to be able to co-govern and to be able to, you know, hopefully learn and like, <i>meet people</i> . You know? Because also the way that neighborhoods look is a lot different than how some were like created, right? And so how do we do that? Because we have to be ready for you know, influxes of people, all these things.”
Events	Mentions of community events	“But yeah I'll go to those things, to like block parties where people block off the street or something. Yeah, or we'll host like a May Day event and the park, you know. So we do a lot of stuff in the park too.”
Places	Mentions of significant places within the community (i.e., those that provide physical or social resources)	“So there's Prospect Park, I go there all the time, and Downtown Depot town, then there's Frog Park, which I really enjoy to go down to like walk the dog or just hang out and I follow the Ypsi Townies [group] on Facebook and people are really responsive on Facebook and I find cool little shops, cool little coffee shops nearby.”
Organizations	Organizations mentioned during interview	(NA; No quote needed)
People	Names of individuals, or their roles, that are influential in community processes	(NA; No quote needed)
Prospection	Interviewee generates and evaluates mental representations of possible futures (i.e., the imagination of future scenarios, and planning for their community)	“...like the neighborhood associations like the way they are now. They're like, these online presences... and again, I went to one group [and they had a map]. I remember it was like, old school, like it's been like through some ringers... That's like generations old or something, like a map like “here's all the houses” and it was like you know they had these little markings, like, “oh, this person, you know he's helped with snow or...whatever.” That's not really what they had on there. But we <i>could</i> have something like that, that could be supported by resources so that they actually could stay up to date and we could have something where people who are new to the neighborhood can kind of know what's coming up.”

Name	Definition	Example Quote
Response	Community response to crises or emergencies	"I would say that we are prepared, just not as prepared as we <i>could</i> be. I feel like there's a lot of different demographics in my neighborhood: there's low income, there are people who have high income, middle class. But lately I've been seeing a lot of advertisements or boards that say like, on these days there's free food in these areas, or some people have even put out little tables that say "free food, grab whatever you want", you know, during the COVID times."
Services	Services present or lacking in community	"You know, my last neighborhood, there's not much to hope for. So, it was a really nice neighborhood. I liked everything about it; their access to Prospect Park, they've put the skatepark in there, and they've got the rain garden, and people take care of it. I mean I was out there with one of those little claws and a thing picking up garbage. You know, over the big picture I wasn't the only one doing it. So people just cared about the community."
Social (Feelings toward others)	Social cohesion/disharmony in community or neighborhood, past, present or anticipated	"And a lot of their gathering spaces were believe it or not barber shops, where the guys would gather, and the ladies would gather at the little small restaurants, you know, where we had little small breakfast places. And some people would just go there and spend literally all their morning and mid-afternoon eating breakfast and sipping on a cup of coffee for the remainder of the day."
Economic	Mentions of economic challenges or growth opportunities (past, present or future)	"I haven't really faced any challenges other than that the taxes are so high, and it would be nice to get those down. It makes the whole community less sustainable when you have to pay almost double your mortgage for taxes."
Education	Educational opportunities or needs in community	"We have EMU, which is a hub, which is positive. Ypsilanti, Washtenaw county, has two major universities, we have wonderful health care systems. We have St. Joe's and you have U of M."
Services/Institutions	Educational service or institutions such as public schools or universities	NA
Skills	Skill development that should be focused on	NA
Emergency Prep	Mentions of present or future emergency preparations	<i>Example quotes in subcategories below</i>
Events	Mentions of past, present, or future emergency events	"Also there could be some catastrophic event that could happen within the city that would devastate it and that people would have to be displaced from their homes. If we would have a flood, tornado, something like that, you know, that could devastate the city and that would have consequences that it would be difficult to pull out of that, it would take a lot of extra resources and so that would be my concern."
Past Crises	Mentions of challenges faced in community	"And when urban renewal came through in the 1960s, and I do recall it, I lived through it, you know it divided our community and that killed the black businesses where we actually had a black business community, where we had those things – we had a grocery store, drug store, we even had a pool hall, we had restaurants we had all that and that killed that."
Past Crises	Mentions of challenges faced in community	"And when urban renewal came through in the 1960s, and I do recall it, I lived through it, you know it divided our community and that killed the black businesses where we actually had a black business community, where we had those things – we had a grocery store, drug store, we even had a pool hall, we had restaurants we had all that and that killed that."

Name	Definition	Example Quote
Resources	Mentions of resources that are/should be present in emergency responses	"I also hope to have a community where we're all at different points of our lives, where there might be people who don't resources but I want [them] to know that 'Oh, I can go to hope clinic or I can go to SOS if I don't have money for groceries this week,' you know."
Hub conceptualization	Descriptors of ideal hub	"I'd love for it to be a place where people can like do fees exchanges and where overflow of garden stuff can go...and I think in terms of some different emergencies... there's different kinds of tools and things I would think we would need...and to be able to kind of think through the kind of things we might need for different kinds of crises, but then also to try to think about the different populations we might have, too, and things geared toward that. You know, if we're thinking about families, things like diapers and baby formula and things like that. If we're thinking about people who might have a lot of different medications or different things like that. So, you know, try to think about what we might need in those instances. Like more variety, as opposed to more stuff, I guess."
Provisioning Resources	Mentions of various resources, either realized or lacking, in community	<i>Example quotes in subcategories below</i>
Daily Needs	Mentions of resources such as clothing, sanitary needs, etc.	"Food, access to basic needs, there's plenty of local stores around. The co-op's tremendous for getting everything else you need. And other than that, if you put your mind to it, you can pretty much cover most of your needs within the area. There's shops that will allow you to buy gifts for people, there's shops to buy groceries, and then there's just all kinds of different necessities. So I like access to the things we need, and I like the fact that most of them are not chain stores."
Food	Mentions of food resources, either lacking or available	"So Washtenaw County as a governing body – which controls or shares a lot of the resource involving health and food distribution if you will – distributes through those churches."
Water	Mentions of water resources, either lacking or available	"So, a water filtration system where we could-- if push came to shove where we just couldn't get out and get anymore drinking water-- we could you know, make our own, so it's drinkable."
Psychological	Mentions of psychological needs	"Something that I would like to have with like what we're going through right now and moving forward into the future, like after COVID, is like a coping system. So hopefully we got through this, and <i>this</i> is how we're going to, not necessarily get back to normal, but like this is how we're going to better the future and make it more of a positive, and <i>kind of</i> getting back to the normal of life, if that makes sense."

Inductive Codes

Common themes that emerged throughout the coding process and appeared across all interviews.

Name	Definition	Example Quote
Community commitment	These are recurring words or phrases within interviews that demonstrate a commitment to and intimate understanding of their community	"I think people are resilient and most of the people are kind. So they would help their neighbor. So, between the tenacity and resilience and the caring about your neighbors, I think that encompasses most of what would be done."
Diversity	Interviewee reflects on diversity as a characteristic that is unique/special about Ypsilanti	"So there's a lot of educational opportunities going on. A lot of educational opportunities where people come here from, like I said, all over to get an education. So it's a really great place to live, you meet a very diverse group of people. Like I said, we have the pride in our community."
Geographic location	Interviewee reflects on the geographic location and proximity to other places as a unique/special characteristic of Ypsilanti	"Walkability is great, you know, I'm just outside of Depot town and so that's nice, and right by the park, as I said, so that's cool. My neighborhood actually has a lot of folks who grew up here, you know, my house was only owned by one other family, who built it."
Importance of natural environment	Interviewee reflects expresses the importance of and an appreciation for natural spaces	"And right outside of that area is the Border-to-Border trail leading across from Ypsilanti to Ypsilanti Township –from the City of Ypsilanti Proper across I-94. So, we will be bridging that next year and it leads to a beautiful park which I was talking about before, Ford Lake, the man-made park, which has wildlife –I mean there's eagles out there, loons, red foxes, deer, all kinds of beautiful migratory birds that have come here as well as fish species that are non-invasive - that's making our community very beautiful."
Prioritizing senior care	Interviewee expresses a special consideration for seniors in the community. <i>This code appears in multiple ways i.e., senior facilities as potential hub locations, as being communities particularly hard hit by the pandemic, etc.)</i>	"One interruption of thought. We do have a couple of senior complexes in our neighborhood, and on-site resilience hubs in these would be probably one of the most beneficial hubs in the area, because they're on a budget, they are in big, large, buildings that likely have a space that they can use for that, whether it be one room, one apartment in the building or whatnot. It seems like a good place to get it moving when someone figures out how they're going to pay for it. I mean, I'm pragmatic. Everything needs to get paid for no matter how great it is."
Shared history and/or story	Interviewee demonstrates a connection to those in their neighborhood and community by reflecting on their shared past or present	"[In a future emergency in my neighborhood, I could see...] People helping each other. If it were to be a tornado or whatever I could foresee folks in our neighborhood jumping in there. "What can I do, how can we help? Do you need food? Do you need some shelter emergency-wise? Do you need some clothing? Blankets ,towels?" That kind of thing. I could see any of my neighbors in a close proximity jumping in and saying, what do I need to do?"
Trusted locations and spaces	Interviewee identifies a space or network of similar spaces within their community that they trust to coordinate resource distribution	"So I volunteered for Hope clinic, I volunteered for SOS. I know that they just opened an Ozone House over off of Clark road, I believe, I can't remember if that's Clark road... I have friends that work there, although I'm not a part of Ozone House. But I know people that work there, that if I know someone who's struggling, I can let them know and they'll provide assistance."

APPENDIX E - FUNDING RESOURCES

These philanthropic organizations were identified during the project as potential funding sources for implementing resilience programs and hubs in Ypsilanti. Related funding priorities for each organization are also listed. Michigan-based organizations have been listed first as it may be easier to procure funding for a project in Ypsilanti from them.

Michigan-Based Organizations

- [Americana Foundation](#) - Agriculture; Community and economic development; Community improvement; Environment; Food security
- [Charles Stewart Mott Foundation](#) - Community and economic development; Education; Employment; Natural resources; Sustainable development; Urban development; Urban renewal
- [Community Foundation for Southeast Michigan](#) - Academics; Children and youth; Economically disadvantaged people; Low-income people; Students
- [DTE Energy Foundation](#) - Community and economic development; Community improvement; Energy efficiency; Environment; Family services; Green building; Sustainable development; Urban development
- [Federal Emergency Management Agency Mitigation Assistance Resource Guide](#) - Community planning and capacity building; Economic recovery; Health and social services; Housing; Infrastructure systems; Natural and cultural resources
- [Ford Motor Company Fund](#) - Basic and emergency aid; Community and economic development; Environment; Family services; Food aid; Human services; Special populations support
- [Herbert H. and Grace A. Dow Foundation](#) - Community and economic development; Human services; Natural resources; Science
- [James A. & Faith Knight Foundation](#) - Family services; Human services; Women's services; Youth development
- [Kresge Foundation](#) - Children and youth; Economically disadvantaged people; Ethnic and racial groups; Low-income people; Students; Young adults
- [Masco Corporation Foundation](#) - Economic development; Environment; Housing development; Human services; Natural resources; Public affairs; Public policy
- [Michigan Health Endowment Fund](#) - Family services; Food security; Health; Human services; Public health; Special population support
- [Porter Family Foundation](#) - Climate change; Economic development; Education; Human services; Natural resources
- [Ralph C. Wilson, Jr. Foundation](#) - Economic development; Education; Human services; Youth development
- [W.K. Kellogg Foundation](#) - Community and economic development; Community improvement; Education; Health; Sustainable development; Youth organizing; Youth services
- [Wege Foundation](#) - Community and economic development; Environment; Environmental education; Human services; Natural resources

Relevant Organizations Located Outside of Michigan

- [Bank of America Charitable Foundation](#) - Community and economic development; Community improvement; Environment; Family services; Green building; Human services; Social enterprise
- [Ben and Jerry's Foundation](#) - Community and economic development; Community food systems; Environment; Human services; Social rights; Special population support
- [Comerica Charitable Foundation](#) - Community and economic development; Community improvement; Family services; Human services; Special population support
- [Compton Foundation](#) - Anti-discrimination; Climate change; Communication media; Social rights
- [Energy Foundation](#) - Climate change; Economic development; Energy efficiency; Energy resources; Environment; Natural resources; Renewable energy; Social rights
- [Jessie Smith Noyes Foundation](#) - Anti-discrimination; Community and economic development; Environmental justice; Toxic substance control; Youth development
- [Joyce Foundation](#) - Economic development; Education; Environment; Natural resources
- [McKnight Foundation](#) - Climate change; Energy; Science; Community development
- [Surdna Foundation](#) - Anti-discrimination; Community and economic development; Energy efficiency; Environment; Green building; Social rights; Sustainable development
- [We Energies Foundation](#) - Basic and emergency aid; Community and economic development; Disaster and emergency management; Environment; Environmental education; Job creation and workforce development; Sustainable development
- [Wells Fargo Foundation](#) - Community and economic development; Environment; Green building; Human services; Sustainable development

APPENDIX F - KEY CONTACTS

This section features some key contacts that helped the original team in the creation of this report or may be helpful to future teams working on next steps to implement a resilience hub in Ypsilanti. Each section includes the name and/or organization, a very brief description of their background/credentials, an email address if available, and a webpage if available. When reaching out to these contacts, it is best to do so with respect and gratitude as many of these people and groups are already quite busy with significant amounts of work to help their various communities.

Please note that this list was compiled in 2020 so parts of it will become outdated with time.

- Prof. Raymond De Young - professor who sponsored first U-M resilience hub projects
 - rdeyoung@umich.edu
 - <https://seas.umich.edu/research/faculty/raymond-de-young>
- Trevor McCarty, Desmond Kirwan, Grant Faber, Paige Porter - initial Ypsi resilience hub team
 - tmccarty@umich.edu, desmondk@umich.edu, gfaber@umich.edu, paigemp@umich.edu
- Ypsilanti Sustainability Commission - body in Ypsilanti that oversees sustainability work
 - Email Keith Michalowski, Chair, at kmichalowski@gmail.com
 - <https://www.cityofypsilanti.com/642/Sustainability-Commission> and <https://www.facebook.com/sustain.ypsi/>
- Beth Gibbons - Executive Director of American Society of Adaptation Professionals and Ypsi Sustainability Commission member
 - bgibbons@adaptpros.org
 - <https://adaptationprofessionals.org/about/>
- Takunia (T.C.) Collins - founder of the volunteer gardening education program Willow Run Acres
 - willowrunacres@gmail.com
 - <https://willowrunacres.com/>
- Ronald Akers - Ypsilanti Director of Public Services
 - rakers@cityofypsilanti.com
 - <https://cityofypsilanti.com/directory.aspx?EID=156>
- Kristin Baja - USDN Programs Director for Climate Resilience
 - kristinbaja@usdn.org
 - <https://www.usdn.org/usdn-staff.html>
- Growing Hope - Ypsi organization that teaches residents how to grow food, provides farming space, and staffs farmers' markets
 - Email Elizabeth Bee Ayer, Program Director, bee@growinghope.net
 - <https://growinghope.net/>
- Dr. Jose Alfaro - SEAS lecturer with knowledge of community outreach for sustainability projects
 - jfalfaro@umich.edu
 - <http://css.umich.edu/person/jose-alfaro>

- Barbara Lucas - local environmental reporter and interviewer who can help promote things
 - blgreensource@gmail.com
 - <https://www.wemu.org/people/barbara-lucas>
- Dr. Missy Stults - sustainability manager for Ann Arbor with specific resilience hub experience
 - mstults@a2gov.org
 - <https://www.a2gov.org/departments/systems-planning/planning-areas/climate-sustainability/Pages/Sustainability.aspx>
- Washtenaw County Extension Office - state-sponsored organization serving as bridge between agriculture, business, and university research in Washtenaw
 - msue.washtenaw@county.msu.edu
 - <https://www.canr.msu.edu/washtenaw/county-extension-office>
- Jae Gerhart - Local Foods Coordinator at Washtenaw County Extension Office
 - gerhart1@msu.edu
 - https://www.canr.msu.edu/people/jae_gerhart
- Deidre Hope - Master Gardener Coordinator at Washtenaw County Extension Office
 - hopedeir@msu.edu
 - <https://www.canr.msu.edu/people/deirdre-hope>
- Cultivate - community-centered coffee and taphouse with potential for holding community events
 - <https://www.cultivateypsi.com/>
- beezy's - coffee shop that might be suitable for interviews, focus groups, and outreach
 - jesse@beezyscafe.com
 - <http://beezyscafe.com/>
- Elizabeth Santiago - resilience hub fellow for city of Ann Arbor and source for this report
 - esanti@umich.edu
 - <https://www.linkedin.com/in/ensantiago>
- Theo Eggermont - U-M alumnus who works as Director of Public Works for Washtenaw County
 - eggermontt@washtenaw.org
 - <https://www.washtenaw.org/directory.aspx?EID=511>
- Prof. Joe Trumpey - U-M professor in art and environment who specializes in off-the-grid living and natural design
 - jtrumpey@umich.edu
 - https://stamps.umich.edu/people/detail/joseph_trumpey
- Bridget Quinn - U-M MFA who specializes in art representing the nexus of citizen activism and nature
 - quinn.frances@gmail.com
 - <http://www.bridgetfrancesquinn.com/>
- Jessica Tenbusch - Ypsilanti-based artist focusing on the complex relationships between plants, animals, and humans
 - jessica.tenbusch@gmail.com
 - <https://www.jessicatenbusch.com/>

APPENDIX G - OTHER RESOURCES

- Communities Responding to Extreme Weather (CREW) Resilience Planning Resources: <https://www.climatecrew.org/resources>
- Communities Responding to Extreme Weather (CREW) Resilience Hub Map and Information: https://www.climatecrew.org/resilience_hubs
- Climate Resilience Hub Boston Planning: https://www.clf.org/wp-content/uploads/2020/09/ResilienceHubReport_final3.pdf
- Resilience Hubs in Austin, Texas: https://commons.pratt.edu/sesresearch/wp-content/uploads/sites/157/2019/06/2019_Spring_Sandoval_Summer_Report-1.pdf
- U.S. Climate Resilience Toolkit Funding Opportunities: <https://toolkit.climate.gov/content/funding-opportunities>
- NorCal Resilience Network Resilience Hubs Initiative: <https://norcalresilience.org/resilient-hub-initiative/>
- Resilient Cities Catalyst: <https://www.rcc.city/>
- Adaptation Fund: <https://www.adaptation-fund.org/>
- Racial Equity Tools Resource Guide: <https://www.racialequitytools.org/>
- Common Ground Relief: <https://www.commongroundrelief.org/>
- University of Minnesota Extension Public Engagement Strategies: <https://extension.umn.edu/leadership-development/public-engagement-strategies>
- Community Organizing: People Power from the Grassroots: <https://comm-org.wisc.edu/papers97/beckwith.htm>

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