



Defining Vulnerability in Port Austin

The effects of climate change have been felt by everyone. With planning and preparation, communities can weather the storms and recover, becoming even better places to live and thrive. Through community-wide planning, resilient communities actively cultivate their abilities to recover from adverse situations and events, working to strengthen and diversify their local economies and communication networks, increase social capital and civic engagement, enhance ecosystem services, improve human health and social systems, and build local adaptive capacity.

Building Community Resilience

As defined by the Urban Sustainability Directors Network, community resilience is the ability of a community to anticipate, accommodate and positively adapt to or thrive amidst changing climate conditions or hazard events and enhance quality of life, reliable systems, economic vitality and conservation of resources for present and future generations. The Rockefeller Foundation emphasizes equity as an important component of resilience, stating that community resilience is the capacity of people — particularly the poor and vulnerable — to survive and thrive no matter what stresses or shocks they encounter. Communities that are resilient are able to learn from adversity and adapt quickly to change. In general, the most important qualities of resilient communities are: (1) Reflective, (2) Flexible, (3) Integrated, (4) Robust, (5) Resourceful, (6) Redundant and (7) Inclusive. The Rockefeller Foundation has identified 12 indicators within these qualities that make for a resilient community. However, it is important to acknowledge that Port Austin is unique, and not all of these indicators or characteristics may be necessary for the community to be “resilient.”

The following is a community vulnerability assessment focused on Port Austin. This assessment begins with an overview of regional climate trends and predicts societal impacts, then transitions to detailed assessments of the community’s vulnerabilities to extreme heat and flooding events. Although the assessment is concentrated on these two specific types of events, many of the considerations and societal impacts identified would be present in other stresses and shocks within the community (e.g., a winter storm).

In completing the assessment, a variety of factors are considered, such as demographics, environmental conditions, locations of critical facilities and essential services and the built environment. This assessment informs recommendations for reducing identified

There are three key rationales to support regulation of flood prone areas: “(1) to protect the unwary from investing in or occupying flood prone property; (2) to protect other riparian landowners (upstream, downstream, or cross-stream) from higher flood levels due to ill-considered encroachment on floodplains by their neighbors; and (3) to protect the community from the costs of rescue and disaster assistance. The first two related to classical nuisance law while the third more closely related to public resource protection.”

-From Rutherford H. Platt’s Disasters and Democracy: The Politics of Extreme Natural Events. Three rationales originally proposed by University of Chicago Law Professor Allison Dunham in 1959.



community vulnerabilities through policies, programs and projects, which will inevitably lead to a more resilient community.

Climate Variability

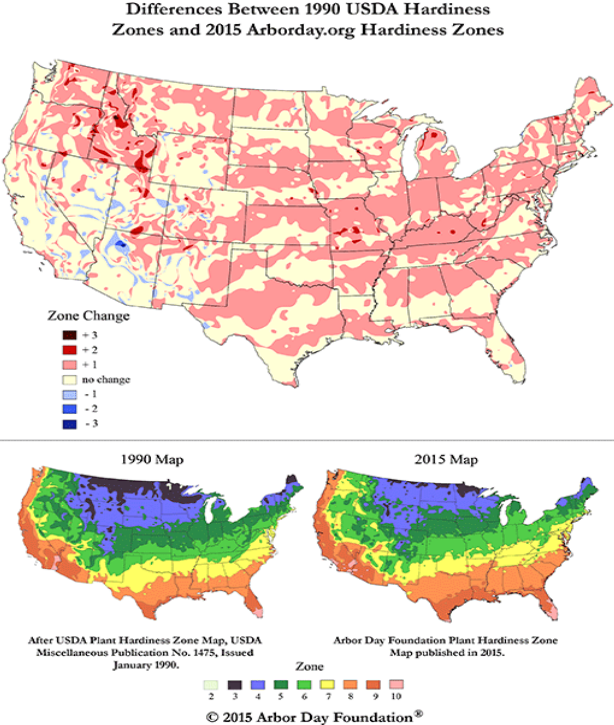
Based on the most recent models, the climate of Port Austin will continue to warm, with greater increases in average temperatures during the winter months and at night. There are a variety of weather impacts expected with this change in average temperatures. Some of the potential impacts of climate change in the township are listed below:

- Storms are expected to become more frequent and more severe
- Increases in winter and spring precipitation
- Less precipitation as snow and more as rain
- Less winter ice on lakes
- Extended growing season (earlier spring/later fall)
- More flooding events with risks of erosion
- Increases in frequency and length of severe heat events (heat waves)
- Increased risk of drought, particularly in summer

It is important to note that increased flooding and more intense drought are not mutually exclusive nor contradictory. In the Great Lakes region, scientists are predicting more intense rain events in the fall and winter along with more intense droughts in the summer months.

These changes in climate could have a number of both positive and negative effects in Port Austin. For example, an extended growing season could help support new crops and increase crop yields for area farmers. On the other hand, the highly variable weather conditions — such as severe storms and flooding mixed with summer droughts — present big challenges to farming. Much of the U.S. has been warmer in recent years, and that affects which plants grow best in various regions. The Arbor Day Foundation completed an extensive update of U.S. Hardiness Zones based

Figure 11.



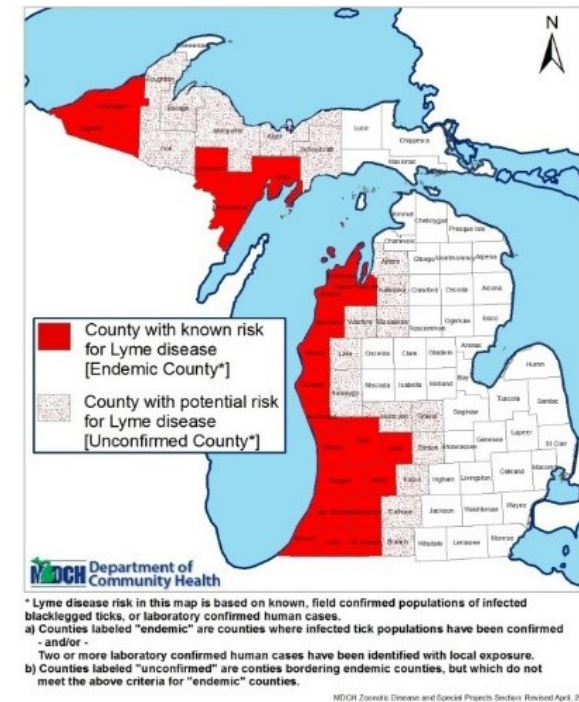
on data from 5,000 National Climatic Data Center cooperative stations across the continental United States. As illustrated in Figure 11, zones in the thumb of Lower Michigan are shifting northward. A few decades ago, Huron County was solidly in Zone 5; today, Zone 6 plants that once thrived in the southern reaches of the state can now successfully survive in Huron County. It is worth noting that the Port Austin area has remained in Zone 5 from 1990 to 2015, though this may change in the coming decades if climate change continues on its current trajectory.

Public Health and Climate

Major health effects of long-term climatic change are predicted for the U.S. Midwest. Already, people in Michigan are experiencing higher rates of skin and eye damage from increased exposure to ultraviolet radiation, increased incidence of respiratory and cardiovascular diseases, and increased incidence of vector-borne and water-borne diseases.³⁹ Weather conditions and high heat events exacerbate health conditions like allergies, asthma and obesity.

The Michigan Department of Health and Human Services (MDHHS) published the Michigan Climate and Health Adaptation Plan in 2011. The Plan indicates there is an increase in the number of illnesses and deaths as a result of extreme heat events; declining air quality as a result of increased production of ozone and particulate matter from heat and drought events; and adverse changes to water quality and availability following severe weather events. In the long term, health experts are most concerned with a rising incidence of infectious diseases and outbreaks of new diseases not currently endemic to Michigan; increasing numbers of disease vectors and the appearance of new vectors not currently established in Michigan; and a degradation of food safety, security and supply. For example, blacklegged ticks are one disease vector that has increased in recent years. According to the MDHHS, the first official reported human case of Lyme disease in Michigan was in 1985. Cases have now been reported in both the Upper and Lower Peninsula and are increasing. It is anticipated that the number of cases reported will continue to increase due to public and medical personnel education and expanding tick ranges.

Figure 12. Lyme Disease Risk by Michigan County



³⁹National Research Council. Reconciling observations of global temperature change. Washington, DC: National Academy Press, 2000:86.