City of Frankfort
Coastal Sustainability Assessment

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Prepared by: LIAA
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Acknowledgements

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This Self-Assessment Tool references recommendations and best practices developed by LIAA, as well as from the following entities:

- Michigan State University School of Planning, Design and Construction—A Self-Assessment of Sustainability in Your Community
- Environmental Protection Agency (EPA)—Flood Resilience Checklist
- Sustainability Tools for Assessing and Rating Communities (STAR)
- Seagrant Wisconsin—Green Infrastructure Audit Tool
- Maryland's CoastSmart Communities Tool

LIAA

NOAA

EGLE

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

How to use this assessment tool

Each sustainability principle features various benchmarks that are often used as an indicator of local resilience. To complete the community self-assessment, read the benchmark question and its description and choose from the following response options:

Example of how a community may score themselves

Yes (Y) - The community has included this sustainability principle in its planning efforts and/or local policies and initiatives.

Yes, but should improve (I) - The community either practices this sustainability principle but does not explicitly include it in its planning documents, or the principle can be found in planning documents but could be implemented to a greater degree.

No (N) - The community has not considered this sustainability principle in its plans or local initiatives.

Don't know (?) - It is unclear if the community is practicing this sustainability principle or if this sustainability principle is applicable given local conditions.

Not applicable (NA) - This sustainability principle is not applicable given local conditions (for example, dune protection in a community without dunes).

	Benchmark	Self-Assessment	Description
2.4	Does the master plan, zoning ordinance or other municipal plan, regulation or program call for incentivizes or regulations for developments to include affordable housing options?		For a community to effectively address housing issues, it should have adopted plans that describe the local goals, objectives and action steps to achieve greater sustainability as it pertains to housing. Support for these plans acts as support for the "sticks and carrots" that the municipality can use to implement

The purpose of this self-assessment tool is to evaluate each of the benchmarks and look for gaps in your community's overall sustainability by identifying what is working well (Y), what is present but needs improvement (I), what is missing (N) and what is unclear (?). Once each benchmark has been categorized, the community can begin to plan for a more resilient future by addressing the best practices that would benefit the local economy, social opportunities, environment and coastlines.

Note: This assessment was completed by LIAA with the help of city staff and officials.

Category 1. Data gathering and mapping

Coastal communities can work towards implementing sustainable policies and best practices once they understand the risks that certain areas and structures are under. Data and mapping that is well-organized and easily presented can help to educate community residents on the importance of planning ahead for potential risks. This is a first step in planning for flood damages to residences, businesses, natural ecosystems and critical public facilities. Planning ahead can help to prevent damages or reduce the negative effects that these damages can cause.

	Benchmark	Self-Assessment	Description
24.1	Does the community use historical mapping of lake levels and lake level projections to inform land use decisions?	I—Study conducted for Bluffs Condos includes a rate of erosion assessment using various historical surveys that date back to 1950s.	The Great Lakes fluctuate in a decadal pattern with an average reduction in shoreline at around 1 foot per year. This fluctuation wherein buildable beach is present for some time and then gone later contributes to development in high-risk areas. Historical data, projections and responsive zoning can help reduce risky development.
24.2	If adjacent to a Great Lake, has the community mapped shoreline erosion using data provided through the Great Lakes Research Center, NOAA and the State of Michigan?	Y—The Hazard Mitigation Plan provides shoreline recession maps, using data from Northwest Lower Michigan Coastal Resilience Atlas bluffline recession mapping since 1938.	Use the following link to view shoreline data for Michigan's coasts: https://portal1-geo.sabu.mtu.edu/mtuarcgis/apps/webappviewer/index.html?id=d758800bb18e460ab39aa66631051156
24.3	Are flood risk maps and related data updated every five years?	I—LIAA developed a future flooding scenario map and FEMA Floodway maps are linked to online parcel data maps.	It is important that data on flood risks remain updated so that community planning mitigation efforts are based on accurate information.
24.4	Has the community benchmarked its climate risks and vulnerability to natural disasters so that it can measure improvements over time?	I— The City is staying aware of the high water cycle, groundwater, and ponding water. The City is also monitoring wind, snow, ice and tree cover— have tree board and tree inventory (MSU about 10 years ago).	Measurable benchmarks may include: property damages, the number of people and/or structures at risk and public spending on disaster recovery.
24.5	Are maps (or other spatial tools like GIS) used to spatially define the vulnerability of roads, public buildings (schools, hospitals, fire stations, etc.) and public services (wastewater treatment, water distribution, power transmissions, etc.) to coastal hazards?	Y—The Hazard Mitigation Plan for Benzie County has a table and map of critical facilities and infrastructure.	Using Digital Elevation Models, shoreline erosion data, lake level data and other key sources, communities can assess the risk to their most important assets. Decision makers can use these analyses to reduce hazard risks and improve sustainability.
24.6	Has the extent of past coastal hazards been identified and mapped based on historical records, existing plans and reports or scientific and local knowledge?	I—Study conducted for Bluffs Condos includes a rate of erosion assessment using various historical surveys that date back to 1950s.	Understanding past events can help inform future plans. The community should try to gather information from as many sources as possible in order to create a clearer picture of what risks the community may be facing.

Category 1. Data gathering and mapping (cont.)

	Benchmark	Self-Assessment	Description
24.7	Do any plans, and especially the Hazard Mitigation Plan, describe the damage and cost of previous storms, floods or erosion?	Y—The Hazard Mitigation Plan provides data on property damage cost estimates in an Economic Impact Analysis.	Dollar amounts for past damages can help community members decide how risk averse they want to be going forward.
24.8	Does the community track repetitive loss properties within the National Flood Insurance Program? (if there have been any)	Y—With updating FEMA map, the City knows what properties are impacted. Recently, City-owned property has been impacted (about $30K damage). Bluff area is of ultimate concern. No known issues of floodplain properties.	A repetitive loss property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978.
24.9	Are maps or spatial data used to predict the probable extent of future coastal hazards?	I— LIAA has developed heat and future flood scenario mapping for the City.	Similar to benchmark 24.7, measuring the probability of different coastal scenarios (100-year storm versus 500-year storm, for example) can help community members and decision makers decide to what extent they want to avert coastal risks.
24.10	Do community plans estimate the potential financial losses that may result from lake-level rise?	Y—Did an estimate on damage from lake level rise along harbor. Could estimate along shoreline using SEV and clean-up.	Along with understanding the sites most at risk of taking on damages, the community also benefits from knowing the potential costs of future damages so they can plan accordingly.
24.11	Does the municipality share the findings from risk and vulnerability assessments with planning staff, public works officials, transportation planners, emergency management, elected officials and the general public?	Y—The City has coastal resiliency group that is examining and exchanging information.	It is important for each municipal department to be on the same page, especially regarding hazard mitigation efforts. This can help increase consensus and buy-in around decision-making.
24.12	Has the community conducted a buildout analysis using current zoning to better understand the potential for development in at-risk areas?	Y— The City is engaged in RRC and is in the process of collaborating with DDA on a buildout of shoreline area, with the potential of creating a high-risk erosion overlay.	While a full buildout is rare, communities should be aware of the potential for increased development to occur in risk prone areas. This may help inform zoning changes to improve resilience.

Category 2. Zoning regulations

Municipal governments are responsible for protecting public health, safety and natural resources now and for generations to come. Zoning regulations are a useful tool for preserving natural assets and siting developments in low-risk areas. The local government should engage the community to explain the potential risks that natural hazards pose to community assets when development is not regulated. The master planning process is an ideal time for this engagement to occur.

	Benchmark	Self-Assessment	Description
25.1	Does the municipality use zoning regulations to reduce damages to the built environment?	Y—The ordinance addresses steep slopes and best management practices for stormwater.	Zoning regulations can work to prevent development in areas at serious risk of flooding, which can help reduce the fiscal damage that a natural disaster may cause.
25.2	Is the zoning ordinance reviewed periodically to ensure that it is effectively reducing the risk of flood damages?	Y—City is in a review process right now and will be looking at a high risk erosion overlay zone. Will also consider areas that are not already built and how to proactively address – working to proactively address known property changes.	If the same developed areas are repeatedly experiencing flooding, it may be time to seek regulatory options to reduce the financial burden that rebuilding these structures is having.
25.3	Does the master plan or zoning ordinance mention vegetation requirements for properties and developments near or within coastal areas?	Y—The zoning ordinance calls for steep slope standards where vegetation removal must be replaced and minimum of a 50-foot buffer on slopes in excess of 15%. Watercourses shall also not be cleared without approval.	Vegetation plays an important role in reducing runoff, preventing flooding and maintaining natural landscapes.
25.4	Does the master plan or local ordinances prevent the removal of native vegetation around houses near dunes and beaches?	Y—There are stormwater credits for native revegetation.	Dunes and beaches are at a greater risk of deterioration when vegetation is removed during development. Planning documents and municipal ordinances can help protect these natural features.
25.5	Does the zoning ordinance work to minimize the amount of impervious surfaces in the entire community?	Y—Under standards for approval there are provisions to achieve stormwater best management practices. Thinking about incorporating language. Some properties, such as art center and some parks have permeable pavement. Encouraging rain garden development and oil separation. Looking to get rid of parking requirement.	Impervious surfaces contribute to runoff, dune and beach loss and can be harmful to the natural and built environments. Pervious surfaces and natural landscaping should be utilized as much as possible.
25.6	Has the municipality established a buffer area around flood zones to restrict or guide development in these areas?	I—There are requirements for a 50-foot buffer of vegetation on slopes in excess of 15%.	This is an alternative to benchmark 25.1. When it is unfeasible to restrict development in a flood-prone area (i.e. there is already development there) the municipality may look to guide redevelopments and new developments to improve that area's ability to withstand natural hazards.

Category 2. Zoning regulations (cont.)

	Benchmark	Self-Assessment	Description
25.7	Does the community have local ordinances to protect dunes, bluffs, eroding cliffs, wetlands and/ or beaches from development disturbance?	I—Been working with EGLE regarding wetlands and erosion.	These natural features are lost forever if not protected. They play an important role in economic, social and environmental sustainability.
25.8	Are frequently flooded areas zoned or planned for open space protection and/or recreation use to prevent risky developments?	Y—Areas along the Lake Michigan shoreline are zoned recreational/park.	Areas that are repeatedly flooded are best kept in their natural state. Maintained as open space or recreation areas, they still contribute to the overall quality of the community.
25.9	Does the community regulate the elevation of residential, non-residential and public buildings or infrastructure to be above the base flood elevation within the 100-year floodplain?	N/A?—Never come into play. Have height limitation which helps address issues.	While elevating structures above the base flood elevation does not remove all risk to the property, it does reduce the chance that the structure will be damaged by a coastal hazard.
25.10	Does the community require the flood-proofing of structures within the 100-year floodplain?	Y—Rely on building department to address this.	Flood proofing refers to structural and non-structural changes, or adjustments made in the building that reduces or prevents flood damage to the structure and/or its contents. The two widely recognized types of flood-proofing are wet flood-proofing and dry flood-proofing.
25.11	Does the community prevent the rebuilding of structures destroyed by coastal hazards? (Where rebuilding is allowed, are additional design elements required to reduce the risk of future damages?)	I—Hope to do this, but not currently.	By preventing or regulating the rebuilding of damaged structures from coastal hazards, the municipality is reducing the health and financial risks posed to the property owner, as well as the potential costs incurred by the public.

Category 3: Structural design near dunes and bluffs

Traditionally, coastal homes are highly sought after (for their location and views) and for municipalities (high demand locations provide higher property tax returns). However, in recent decades some communities are finding that the social and economic costs that high-risk developments pose can often outweigh the benefits. Certain areas may need to be regulated to prevent development altogether. However, when this is impossible or undesirable, the local government can guide development to increase the sustainability of both the natural and built environments. These are best practices for all water-adjacent structures, and especially for those on dunes.

	Benchmark	Self-Assessment	Description
26.1	Are coastal homes regulated to have a smaller footprint?	N	Home designs with additional floors are able to provide the same amount of square footage to the homeowner but with less of a footprint on the natural environment. This also helps to reduce the amount of impervious surfaces.
26.2	Are homes built on dunes designed with innovation that promotes multiple uses for rooms in order to take up less space?	I—Steep slopes are regulated in the zoning ordinance, but nothing specific to dunes.	This would likely require incentives or an educational component rather than a regulatory power. Good design can work to reduce a building's footprint.
26.3	Are homes sited on dunes designed to avoid a concentrated dispersion of rainwater?	N	Homes in critical areas should be regulated to prevent water from dispersing concentratedly, which causes damage to the natural
26.4	Are homes on dunes encouraged to share driveways in order to avoid the amount of impervious surfaces?	N	Driveways typically use impervious materials so a reduction in their presence in critical areas can be an important step in sustaining dune and beach quality.
26.5	Are homes on dunes allowed to use pervious materials for driveways?	Y	The municipality can help reduce runoff and dune destruction by allowing pervious materials to be used for driveways.

Category 4. House siting

While structural design benchmarks are important factors in sustaining natural ecosystems, house siting can also contribute to the well-being of the natural environment, especially for dunes. Municipalities can work prudently to protect their dunes, which are important aspects of the environmental and economic sustainability of a place, by using regulatory controls to prevent unduly harmful development patterns.

	Benchmark	Self-Assessment	Description
27.1	Are homes on beaches regulated or incentivized to be placed at the point of arrival in order to reduce the damage created by driveways and parking?	I—Will be looking at this.	Previously mentioned, driveways and other impervious surfaces should be avoided to the extent possible, especially near dunes and beaches. Zoning regulations and incentives can promote house siting that reduces the need for more impervious driveway material.
27.2	Are coastal homes designed to work with natural features and conditions of the site?	Y—This is generally addressed.	Developments in critical ecosystems should not place an undue burden on said ecosystem's sustainability. Developments should alter the site as little as possible.
27.3	Are homes on dunes prevented from building close to the crest of the dune?	I— The City hopes to prevent this in the future with the intention of meeting or exceeding EGLE regulations with overlay district.	Development on the crest of the dune can cause damage to the dune itself while also placing the structure at risk of damage or loss.
27.4	Are homes on dunes encouraged to be oriented on the long axis of the house across the slope to minimize the variation in elevation within the footprint of the structure?	I—Have only had 2 new homes in last 30 years. One home has been moved twice. Other is 54-unit apartment complex (Michigan Shores). Will be considering this as the City moves toward stronger coastal resiliency.	Zoning regulations, incentives or education can be used by the municipality to encourage more sustainable site plans.

Category 5. Critical facilities and infrastructure

Sustainable communities can experience a natural disaster and continue to provide public services to residents before, during and immediately after the emergency. They are able to accomplish this by siting critical facilities such as police stations, fire stations, hospitals and important records in locations protected from damages in the event of a natural disaster.

	Benchmark	Self-Assessment	Description
28.1	When new critical facilities are developed, are they sited in locations that are protected from possible flooding?	Y—The City considers this and looks at areas that will be less impactful, such as with groundwater. For example, when replacing sidewalks, will include infrastructure (e.g., crushed stone) that allows for better water storage to prevent erosion and will develop rain garden around park that is now having issues.	Critical facilities should be located outside of flood zones whenever possible. This is where data gathering and mapping play an important role.
28.2	If critical facilities are located in areas at risk of flooding, are they outfitted with additional structural protective features?	I—Regional watershed plans recommend development standards.	Critical facilities must be able to function in the event of a natural disaster. This means ensuring that power, water, waste disposal, communications, and occasionally natural gas and steam are protected from potential damages.
28.3	Does the community have an emergency plan in place to continue providing services during an emergency?	Y—The County has an Office of Emergency Management with a Local Emergency Planning Committee and Local Planning Team. The Office also provides an emergency notification system.	In the event that a critical facility(ies) cannot function during or after a natural disaster, the community should have a plan in place to continue providing public services by other means.
28.4	Does the community have a plan for upgrading/ repairing critical transportation infrastructure?	Y—The City does asset management planning and is constantly planning for infrastructure upgrades.	Transportation infrastructure is vitally important to the community's economic and social sustainability. Proper maintenance and hazard planning can help ensure that this infrastructure remains intact.
28.5	When critical transportation infrastructure is repaired are best practices considered to reduce the risk of future flood damages?	I—The Hazard Mitigation Plan for Benzie County calls for communities to assess transportation infrastructure vulnerability.	This may include elevating roads above predicted flood levels, moving roads landward as erosion occurs and/or incorporating future flooding and lake-level rise into culvert size and placement.

Category 5. Critical facilities and infrastructure (cont.)

	Benchmark	Self-Assessment	Description
28.6	When upgrading **existing** community infrastructure, does the community consider the impact of coastal hazards?	Y—Maintains and enhances stormwater and is doing more raingarden development.	When the community updates its infrastructure it is important to consider environmental factors such as coastal erosion and/or shoreline change, lake-level rise, coastal flooding and storm surge.
28.7	When planning **new** community infrastructure, does the community consider the impact of coastal hazards?	Y	See Benchmark 28.6

Category 6. Disaster preparedness

Historical coastline data and projections can help municipalities implement scenario-based plans. For instance, flood risks can be predicted based on lucky, expected or worst-case scenarios. Each of these scenarios can be used to see how many structures or community assets may be damaged in the event of a natural disaster. This can help the community prioritize its hazard mitigation efforts.

	Benchmark	Self-Assessment	Description
29.1	Are there public facilities available for residents to receive supplies or shelter in the event of a disaster?	I—Not necessarily a formal plan, but community pulls together. The Government Center and hospital provide places but the City would like to have a generator system to use high school gym space. The City provides resources to people and works with Benzie Bus.	In the event that a natural disaster affects the ability of residents to remain in their homes, access supplies or seek health assistance, the community should have designated facilities to support the affected public.
29.2	Do residents know where emergency relief facilities are located within the community?	I— Generally.	Relief facilities are only as helpful as people's ability to access them. Educating the public before the occurrence of a natural disaster can help mitigate health risks.
29.3	Are there emergency relief facilities sited close to the community's vulnerable populations?	Y— People can access the available spots.	People who are low-income, elderly, disabled, living alone or spatially isolated are the most susceptible to the negative effects of a disaster. Their vulnerability to natural hazards can be reduced by siting resources close to these residences.
29.4	Has the community used scenario planning strategies to identify areas most at risk during a natural disaster?	Y— This is done at county level and involves public works, law, and fire. This is tied with incident command.	Scenario planning helps the community to decide the extent to which it will make plans and changes to mitigate its risk of flood damages. Scenario planning is when the lucky, expected or worst-case scenario guides mitigation efforts.
29.5	Has the community adopted a Hazard Mitigation Plan, an Emergency Preparedness Plan or a plan similar in nature?	Y—Benzie County provides a Hazard Mitigation Plan.	Plans can help to outline goals, objectives, action steps and responsibility for implementation. They can also give an idea of when and where budget expenditures should be allocated before, during and after flood damages have occurred.

Category 6. Disaster preparedness (cont.)

	Benchmark	Self-Assessment	Description
29.6	Are first responders prepared to address a natural disaster within the community?	Y	The municipality should work closely with the police, fire department and ambulatory services to identify gaps and opportunities to response efforts in the event of a community emergency.
29.7	Are professional planners, engineers and/or certified floodplain managers involved in the formation of the capital improvements plan?	Y—Work with City Engineer.	Experts in their given field can provide plan insights that may otherwise be overlooked.
29.8	Does your community have a communication system to reach the public before, during and after a disaster event?	Y—The County Office of Emergency Management offers the CodeRED notification system.	Being able to communicate safety procedures and updates to community members is an important factor when recovering from a major storm event.
29.9	Are community members engaged through education programs about mitigation options?	Y—There are opportunities.	Community members should understand why certain zoning regulations, local programs and public works projects exist. This can help promote public support and may encourage community members to implement mitigation features on their property.

Category 7. Bluff and ravine protection

Bluffs and ravines both play important roles in the environmental, economic and social sustainability of a place. Bluffs are a tourism draw for their aesthetic qualities and provide a natural barrier for coastal homes from flooding. Ravines are important to sustain in order to reduce the risk of flooding to nearby properties. There are certain tools and best practices that municipalities can implement to make sure that these natural features are not damaged, or damaged to a lesser extent, by development.

	Benchmark	Self-Assessment	Description
30.1	Does the master plan mention bluff and ravine protection?	I—The Master Plan describes the fragile nature of dunes.	Zoning regulations and other policy initiatives need to be backed up by an adopted community plan. The master planning process also helps to educate the public on the importance of protecting these natural features and how this can be accomplished by the private landowner.
30.2	Does the zoning ordinance require setbacks from bluffs and ravines for new structures, redeveloped structures or new impervious structures?	I—The City will likely address this with proposed shoreline overlay.	Setbacks from bluffs can help to protect the bluff itself from eroding faster than its natural tendencies and can also prevent homes from being sited in a risky location. Setbacks from ravines can help reduce erosion and the potential for flood damage near bodies of water.
30.3	Has the community identified properties near bluffs and ravines at risk of damage or loss?	I—The City will likely address this with proposed shoreline overlay.	Bluffs and ravines naturally erode, though developments and climate change can make these processes proceed at a faster rate. The community should work preemptively to reduce the likelihood of property damage or injuries to residents.
30.4	Does the community map bluffs and ravines in relation to fluctuating water levels?	Y—The City is staying aware of the high water cycle, groundwater, and ponding water and the study conducted for Bluffs Condos includes a rate of erosion assessment using various historical surveys that date back to 1950s. The Hazard Mitigation Plan also references the Northwest Lower Michigan Coastal Resilience Atlas bluffline recession mapping since 1938.	Mapping bluffs and ravines in relation to Great Lakes changing water levels can help to identify structures at risk of damage. Not all bluffs and ravines are susceptible to changes in lake levels and some are projected to change at greater rates.

Category 7. Bluff and ravine protection (cont.)

	Benchmark	Self-Assessment	Description
30.5	Does the community prevent the use of all-terrain vehicles (ATVs) on beaches, sand ridges or dunes in order to protect native vegetation from destruction?	Y—There are no motorized vehicles allowed on the beach.	ATVs can damage the native vegetation that is vital to the sustainability of coastal ecosystems.
30.6	Does the municipality have a program that works to help stabilize dunes? This can include replanting native beach grass and utilizing slot-type snow fences.	Y—The City of Frankfort DPW will place snow fencing on the beach at various locations in October of every year. The snow fencing is removed in May. The City also transplants dune grass each year from location to another depending on need. The City also will contract out to a private firm to plant dune grass in certain years. The City will also have volunteers to plant dune grass.	The municipality on its own, or in collaboration with local organizations and volunteers, can actively place natural and built features that act to reduce dune erosion.
30.7	Are steps, bridges and ramps mounted on posts to traverse steep or unstable slopes?	Y—The City has stairs connecting Nipissing Street with the beach. The primary beach area has a concrete walkway to connect the parking areas to the pier.	These infrastructure components can help to prevent erosive damages to dunes.

Category 8. Professional training

Communities hoping to implement the best practices described in this assessment tool are better positioned to do so when they have a staff that is highly trained in their respective profession. While this may include a formal education in planning, civil engineering or GIS, it is also important that current staff engage in ongoing education as new problems and best practices emerge. Municipal employees may take part in professional organizations, trainings offered by universities and should have certifications that demonstrate a thorough knowledge of topic matter.

	Benchmark	Self-Assessment	Description
31.1	Does the community have staff trained in mapping or monitoring potential hazards such as coastal erosion and/or shoreline change, lake-level rise, coastal flooding and/or storm surge?	I— The City is interested in having drone data, survey data and collecting data regularly. Also interested in getting wave buoy.	See the Benchmarks for sustainability topic 24 on the importance of accumulating data related to coastal hazards and monitoring these trends over time.
31.2	Does the community have a certified floodplain manager (CFM) on staff?	I—County might.	The Association of State Floodplain Managers has established a national program for professional certification of floodplain managers. By taking part in the program, local, state, federal and private-sector floodplain managers are encouraged to take part in continuing education and professional development.
31.3	Does the community have a floodplain manager or planner who participate in professional organizations or ongoing education?	Y—Coastal resiliency group is serving as people learning best practices.	In addition to the Association of State Floodplain Managers (ASFPM), other relevant professional organizations include the American Planning Association (APA), American Society of Civil Engineers (ASCE) and the American Public Works Association.
31.4	Does the community have technical or computer mapping capabilities?	Y—County, Civil Engineer, and Networks Northwest provide these services.	There are various GIS software programs. Communities should invest in mapping capabilities to measure coastal data, in addition to other important information such as demographics and land use.
31.5	Are municipal staff encouraged to attend professional conferences and/or trainings from universities and associations?	Y	Conferences and trainings can help introduce staff to emerging concepts related to coastal sustainability. These events also foster information exchanges between professionals.

Category 8. Professional training (cont.)

	Benchmark	Self-Assessment	Description
31.6	Does the municipality hire certified building inspectors?	Y—Partner with County who has department.	For developments that require flood-proofing measures or are subject to other zoning regulations related to coastal resilience, the municipality must have staff to enforce the code if it is to be successfully implemented.
31.7	Does the municipality staff an adequate number of people to enforce building codes?	I—Has staff, but could use more.	See Benchmark 31.6
31.8	Does the community have planning commissioners with formal training in planning?	Y—Planning Commission has gone through Citizen Planner, some are Master Citizen Planner.	Many planning commissioners across the U.S. are civically engaged members of the community, but often lack formal training in planning. New planning commissioners without a planning background should be encouraged to take part in trainings or certification courses. The American Citizen Planner program is one example of these.

Category 9. Hazard planning

One of the most important factors in implementing sustainable practices is to ensure that the community identifies goals, objectives and action steps in its plans. This is important for multiple reasons. First, planning processes are intended to engage the public to gather input and build consensus. Bother of these planning ingredients help make implementation more likely to occur. Second, the community needs to have a clear direction for how risk averse it wants to be. Plans help to clearly delineate what the community is willing to implement and less willing to implement as it becomes more sustainable. Plans should consider short and long-term risks and, in doing so, should identify short and long-term projects towards increased sustainability.

	Benchmark	Self-Assessment	Description
32.1	Does the community participate in the FEMA Community Rating System?	Y—Has floodplain management plan by ordinance.	According to FEMA, "The National Flood Insurance Program (NFIP) Community Rating System (CRS) was implemented in 1990 as a voluntary program for recognizing and encouraging community floodplain management activities exceeding the minimum NFIP standards. Any community in full compliance with the minimum NFIP floodplain management requirements may apply to join the CRS. "
32.2	Does the community have a current FEMA-approved Hazard Mitigation Plan?	Y—Benzie County has a Hazard Mitigation Plan.	According to FEMA, "FEMA requires state, tribal, territorial and local governments to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for mitigation projects. Jurisdictions must update their hazard mitigation plans and re-submit them for FEMA approval every five years to maintain eligibility."
32.3	Does the community's master plan have a coastal planning element or does the land use plan make recommendations to reduce coastal hazard vulnerability through planning?	Y—Districts on Lake Michigan shoreline as park. Language could be added to emphasize the importance of coastal health.	A comprehensive snapshot of the community's past, present and future, the master plan guides the overall direction of areas such as transportation, infrastructure, housing and the environment. It is critical that coastal resilience appear in the plan.
32.4	Does the community have an adopted floodplain management plan?	Y—Have floodplain management plan by ordinance.	Building off of the master plan, the floodplain management plan allows for greater detail and action step planning for managing hazardous areas.

Category 9. Hazard planning (cont.)

	Benchmark	Self-Assessment	Description
32.5	Do planning horizons consider potential long-term coastal hazards such as lake-level rise, coastal erosion and increased storm activity and severity?	Y—That's what the community is currently focusing on.	While the master plan and other local plans often consider a 20-30 year perspective for the future, many coastal-related trends require a wider timeframe. It is important to remember that Great Lakes coastal dynamics and changes in the climate are long-term trends and should be planned for with this understanding.
32.6	Does the water and sewer plan include recommendations for relocation, abandonment or protection of infrastructure at risk to coastal flooding or other coastal hazards?	I—Has stormwater and sanitary sewer asset management plan. Existing water has not been an issue.	Soil erosion, coastal flooding and lake level fluctuations can expose or cause damage to infrastructure. This poses a risk to public health and can subject the municipality to expenses to repair damaged systems.
32.7	Does the community have a timeline or strategic plan for the relocation, abandonment or protection of buildings in areas at risk of flooding?	Y—SAW grant provides estimated timeline. Have already taken care of a couple of severe issues.	The community can get ahead of costly damages when it plans for or anticipates the risks associated with flood-prone sites.
32.8	Have Memorandums of Understanding (MOUs) or Memorandums of Agreement (MOAs) been signed with neighboring communities to help one another before, during and/or after a disaster event?	Y—Mutual aid with fire departments, Emergency Management has agreements. Works with Elberta.	It is important to remember that disaster events do not stop at municipal boundaries. Local units of government must recognize the importance of working with neighboring jurisdictions to support regional sustainability.

Inventory of Existing Master Plan and Zoning Ordinance

Relevant Language

Found in 2021 Master Plan

Rural District, pg. 29

Within the Rural District sensitive natural features exist, including steep slopes, wetlands, and woodlands. The identification of all-natural features in a catalogue, with special attention for significant areas preserved from development. To accomplish this objective, the City will prepare a Rural District development fact sheet, including a map of sensitive natural resources, steep slopes, and details about soil conditions, allowable building sites, and site fingerprinting techniques. In particular, the development methodology must include a steep slope ordinance that identifies these sloped areas, and establishes use limitations based on slope and soil erosion characteristics.

Parks District, pg. 35

Parks are essential public spaces. They are essential because they are the "green infrastructure" of a community, the network of undeveloped and natural spaces that bring nature into the built environment. They serve to mitigate the impact of human development by filtering stormwater runoff and providing pervious surface for groundwater recharge and natural drainage. The trees and shrubs in these spaces help to absorb carbon dioxide and help to limit the community's carbon footprint. Parks provide a natural oasis within the confines of the urban community. They add cultural value as informal and formal gathering spaces and provide local recreational opportunities. They work to form a non-motorized system of transportation that extends from the Lake Michigan shoreline in Elberta to the beach in Frankfort (the Beach-to-Beach Trail). Traditionally, parks are identified but not given a unique district designation. These public spaces are so critical for Frankfort that these spaces must be preserved by creating a separate district solely for parks, natural areas and recreation. Further-more, creating a unique designation will help the City develop a long-term preservation and maintenance strategy for parks, wetlands and other open spaces and natural areas.

The Natural Environment, pg. 61

Frankfort's natural environment is an essential part to the community's special "sense of place". Frankfort was established because it is at the confluence of the Betsie River and Lake Michigan. The Betsie Bay is one of a few naturally protected harbors on Lake Michigan and this naturally encouraged the development of Frankfort. Lake Michigan and the Betsie Bay are the two most visible reminders of the importance of the City's natural environment. In addition to the water, Frankfort boasts sand dunes, bluffs, wet-lands and woodlands that all work to help define the character of the region. The preservation of these natural resources has long been a community value. Historically, society viewed natural resources as resources that can (and should) be exploited by mankind. Woodlands were logged for the timber that built our cities, wetlands were drained for farming, the Great Lakes were used as a place for effluent and sewage. We used these resources to build our communities and to create wealth in a relatively young nation. Over the

Relevant Language

Found in 2021 Master Plan

past 100 years, our collective understanding of the environment and how natural systems work has profoundly influenced how we treat these resources. We now understand that wetlands filter stormwater runoff and recharge the aquifers that provide our drinking water. We now understand how forests regenerate themselves and this has led to more sustainable forestry operations. We have mapped and studied endangered, threatened and rare species of flora and fauna and now understand their habitat requirements and their value and roles within ecosystems. We also have a better understanding of the value of our natural resources. This value is realized at a community scale and an individual scale. Just as street trees help create a unique neighborhood and district, mature trees also have a measurable impact on individual property values. Green infrastructure is the network of woodlands, wetlands, streams, lakes, rivers, and green spaces within a community. The industrial revolution proved that few communities can be considered "livable" communities without green infrastructure. These spaces and connections help to filter and clean stormwater runoff; they provide habitat for flora and fauna; they create recreational opportunities as parks; nature areas and trails; they maintain woodlands which help to cool communities and provide protection from winter winds. A complete network of green infrastructure reduces physical infrastructure costs, increases property values, generates economic development and improves the overall quality of life for the community. Therefore, the City needs a detailed environmental and energy policy, with a complementary development of a detailed maintenance and preservation strategy for the natural environment. This section consists of three sections - Natural Resources, Green Infrastructure and Energy.

Natural Resources

The City's natural resources are an essential part of what defines the community's overall character. The steep slopes and dunes, wetlands, the Lake Michigan and Betsie Bay shorelines and the significant woodlands throughout the City are all of critical long term importance to both the ecological and economic health of the City. During the past planning and visioning workshops, participants repeatedly cited the importance of the City's natural resources and features. Specifically, the City's dunes, steep slopes, waterfront areas and water quality in the Betsie Bay generated significant discussion and tentative consensus was reached on measures to protect and preserve these natural features. This input supported the findings of the Master Plan assessment which showed significant support for preservation of these resources.

Action Plan

Some previously stated goals such as developing a steep slope ordinance have been accomplished. Future actions should include: •Generate, by drone, a topographical map of the city at a minimum of two foot contour lines and use this map to identify steep slope areas. •Identify and inventory wetlands and significant tree cover. •Develop Best Management Practices (BMPs) to protect the long-term water quality of the Betsie River, Betsie Bay and Lake Michigan. •Implement Stormwater Assessment Management (SWAM) Practices and create incentives to reduce stormwater runoff through the use of

Relevant Language

Found in 2021 Master Plan

devices like pervious pavers, rain gardens, rain barrels. •Work with Betsie Lake Utilities Authority (BLUA) to ensure funding is available to maintain and enhance critical infrastructure. •Develop maintenance standards and policies for street trees, parks and natural areas.

Green Infrastructure.

As discussed, a City needs a network of parks, trails, natural and open spaces to ensure the community is a livable place. The spine of Frankfort's green infrastructure is its parks. Frankfort has a range of park facilities that cover a range of activities. The City has passive parks (Open Space Park), active parks (Market Square Park, Mineral Springs Park, the Beach-to-Beach Trail) and pocket parks (such as Father Marquette Memorial Park). Each of these facilities provides green space, habitat, and recreation. The most livable communities, which include huge metropolitan areas, small towns, neighborhoods and districts, all have a connected network of green spaces. In some places, these larger undeveloped spaces (typically parks or natural areas) are connected by greenways, streets lined with mature trees and yards with diverse and native landscaping, drainage swales or channels, utility corridors and other undeveloped land. Frankfort has high quality parks and natural areas. However, the City lacks significant connections between these spaces. There are opportunities like the proposed 7th Street boulevard that may provide enhanced linkage. Additional connections can be created through a robust street tree planting and maintenance program as well as via a larger network of rain gardens, over-land drainage systems and so called "backyard habitats".

Action Plan

The following actions will help to enhance the City's green infrastructure: •Work with MDOT to improve the 7th Street and M22 intersection •Utilize and maintain the list of appropriate street trees for planting on all public streets •Develop and implement maintenance standards and forestry procedures to ensure the long-term health of the City's street trees and provide these standards as information for residents to provide guidance for proper tree maintenance and optimal tree health •Work with residents, foundations, and other non-profit or funding agencies to create an endowed street tree fund, the sole purpose of which is to plant and maintain a full network of street trees throughout the City •Continue maintenance of a municipal tree nursery and maintain it in conjunction with local community partners to periodically provide nursery stock for the City. •Perform ongoing maintenance of the Beach-to-Beach Trail •Map and inventory the City's woodlands and wetlands •Periodically work with the Michigan Natural Features Inventory to identify sensitive habitat and local populations of rare, threatened and endangered species. •Work with Michigan State University Extension to encourage native landscaping, rain gardens and creation of "backyard habitats" which will help enhance connections between larger natural areas •In parks and civic properties use rain gardens, rain barrels and overland drainage in lieu of underground stormwater drains where possible •Use public buildings and properties as demonstration sites for more environmentally-friendly stormwater and landscaping treatments: One example would be to work with the post office to create a drive-through and drop off area and to create a rain garden on site to accommodate stormwater generated by the

Relevant Language

Found in 2022-2026 Recreation Plan

additional impervious surface.

Environmental Stewardship Assessment

In 2012, the Northwest Michigan Council of Governments completed a grant-funded Environmental Stewardship Assessment for the City of Frankfort and ten other communities in Northern Michigan. This assessment benchmarked the current level of environmental stewardship in Frankfort and created strategies for economic development based on protecting the natural resources in the community. Results of the assessment are summarized on the Environmental Stewardship Dashboard in the Appendix. Frankfort scored favorably in most are-as of the assessment, but received less than favorable scores in the areas of EnergyStar Portfolio Manager, Renewable Energy Use, DMR Pollutant Releases, and having-ng no Certified Clean Marinas.

The Michigan Clean Marina Program is a voluntary stewardship program that encourages marinas to reduce waste and prevent pollution in environmentally sound and economically feasible ways. The program results in a Clean Marina Certification through a ten-step process. The overall goals of the program are to improve the water quality in the Great Lakes and Michigan's inland waterways. The program can help marinas reduce pollution, enhance the public image of boating and marinas, and save money by reducing disposal fees and insurance costs. None of the four marinas in Frankfort are currently certified.

Municipal Ordinances Related to Coastal Sustainability

Found in the City of Frankfort Zoning Ordinance

Title	Location in Code		Ordinance Language
Provisions			
Stormwater Management	Section 8204	Pgs. 84-90	This sections details stormwater best management practices, processes, and requirements for stormwater management.
Rural District	Section 8302	Pgs. 139-40	This section addresses some natural features, including dunes.
Parks District	Section 8312	Pg. 159	This sections provides regulations for Park District. The Michigan Shoreline is primarily in the Parks District.
Parks District	Section 8313	Pgs. 159-166	This sections provides regulations for the permanent preservation of open space, preservation of natural features, and views of the water in relation to a development.

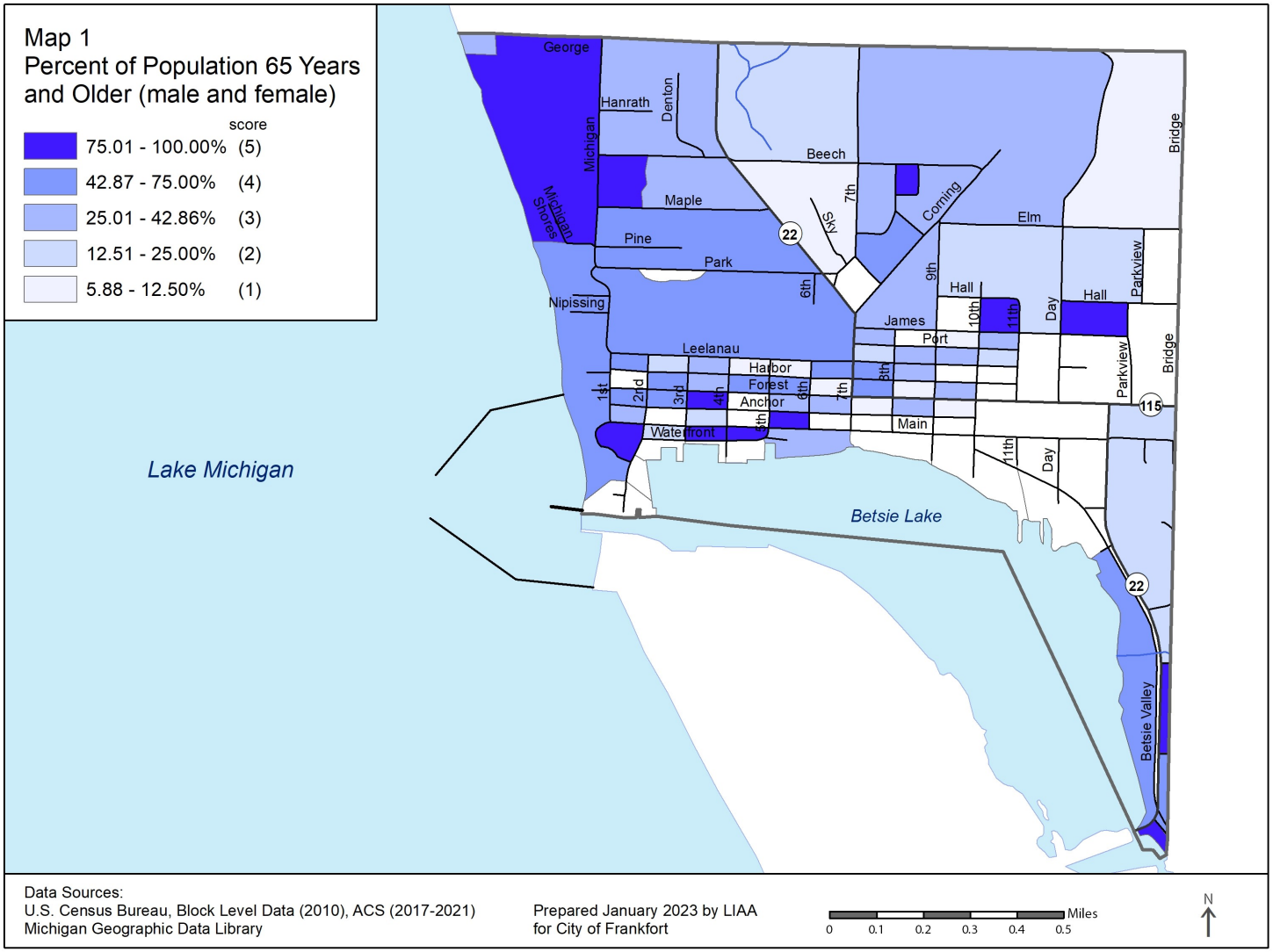
Municipal Ordinances Related to Coastal Sustainability

Found in the City of Frankfort Zoning Ordinance

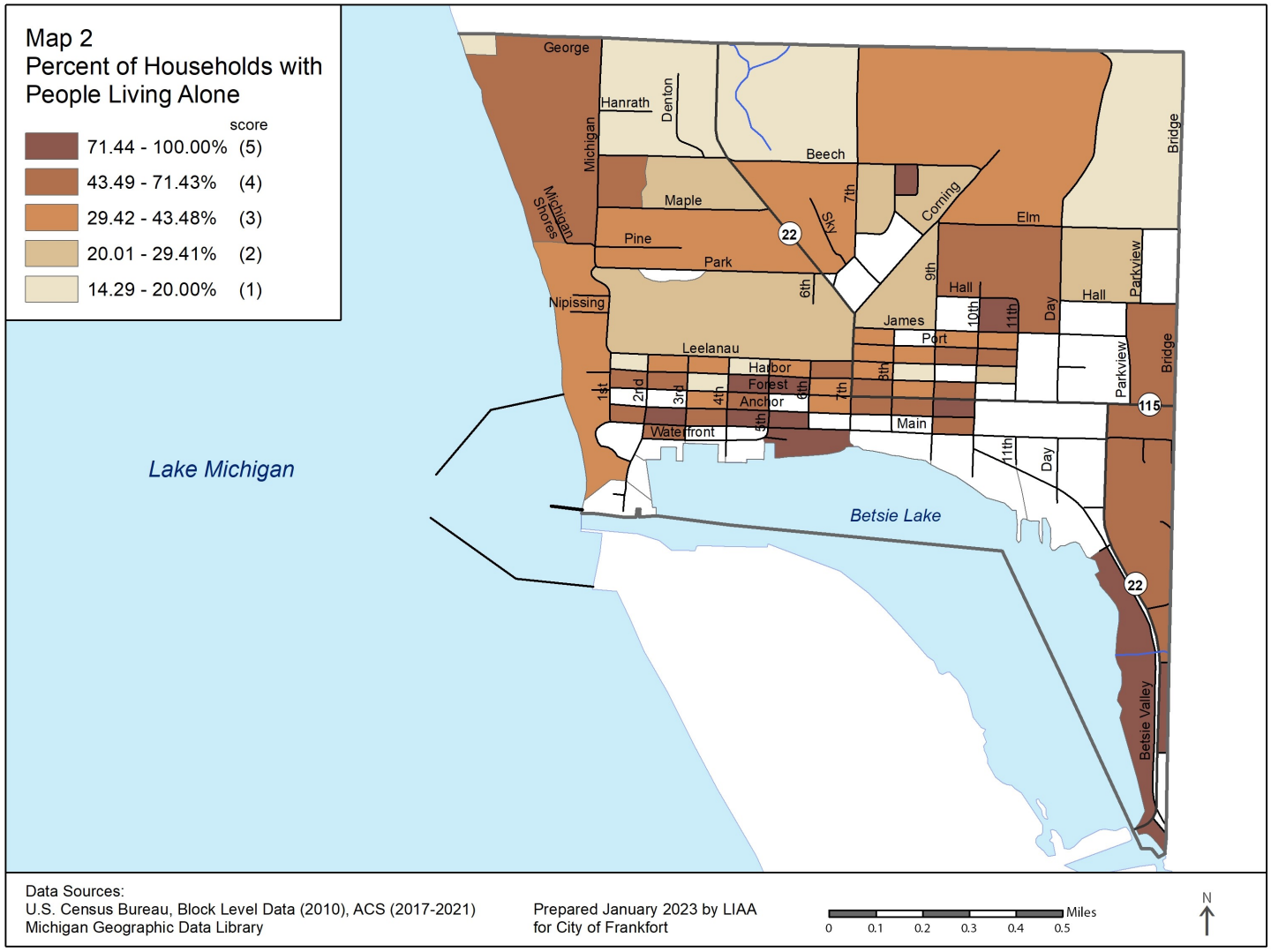
Title	Location in Code		Ordinance Language
Provisions			
Steep Slopes	8203.20	Pgs. 71-72	The section provides regulations to protect environmentally sensitive areas to prevent soil erosion and flooding.

Vulnerability Maps

Coastal Vulnerability Data and Maps



Coastal Vulnerability Data and Maps



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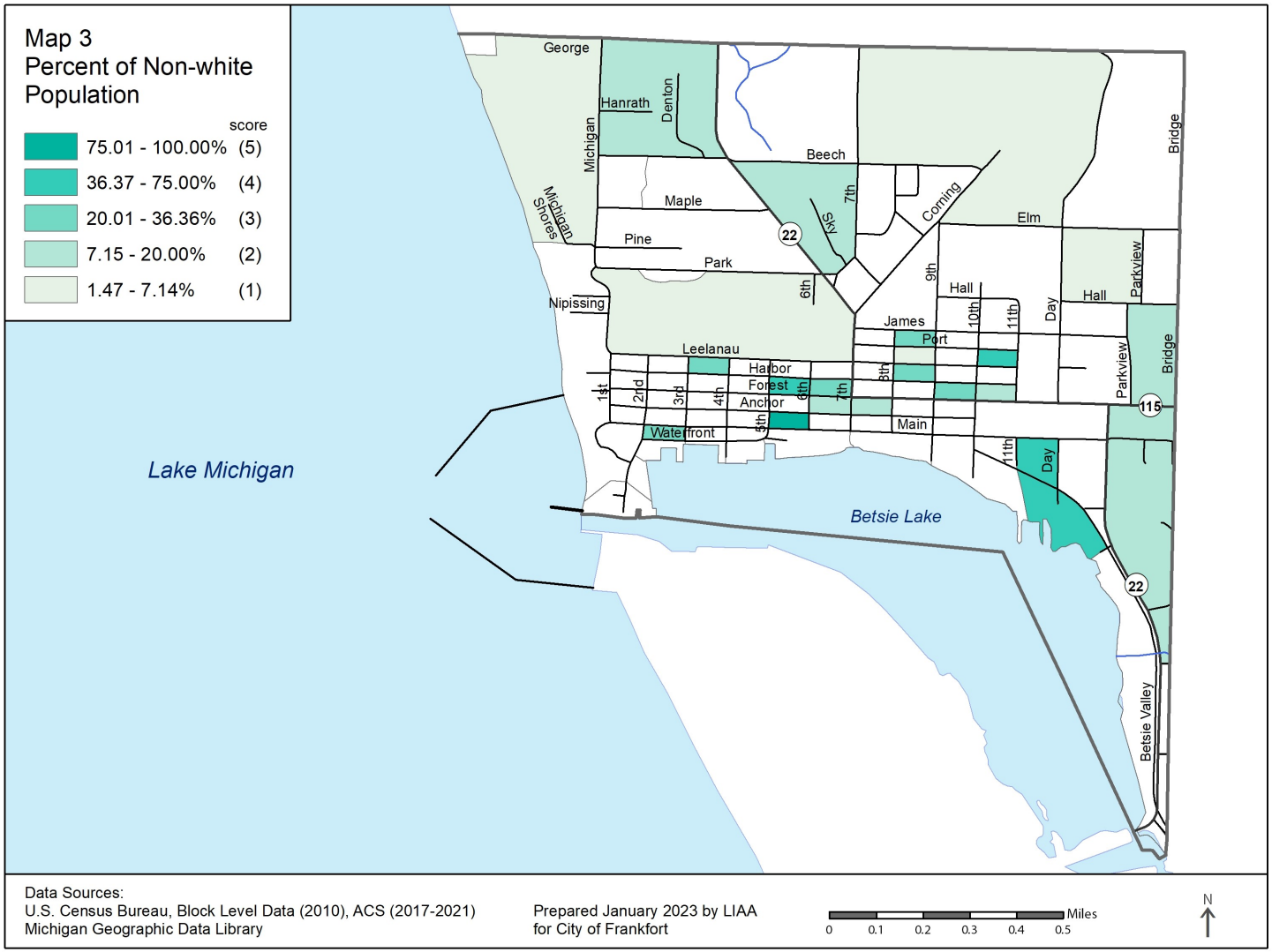

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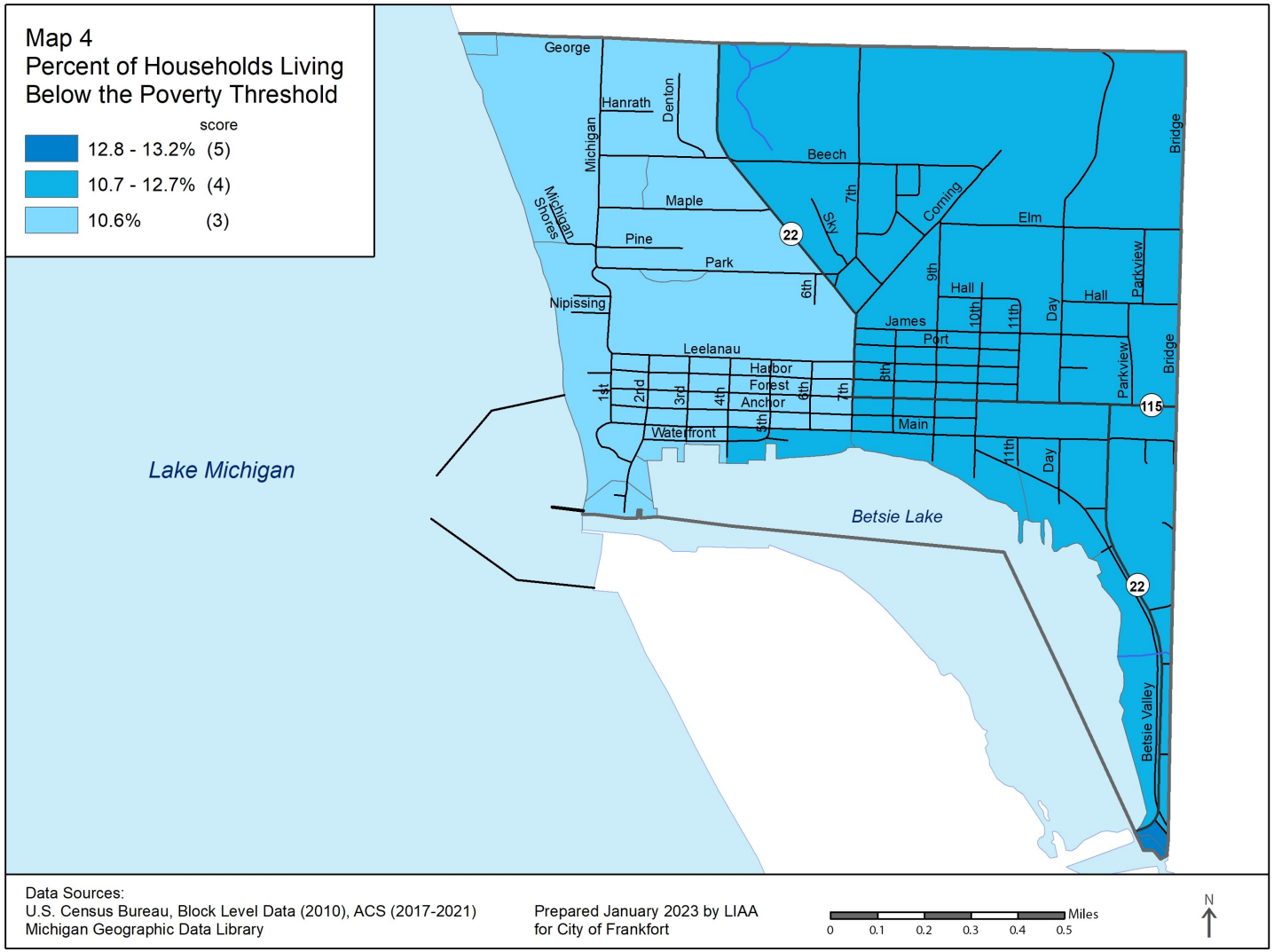

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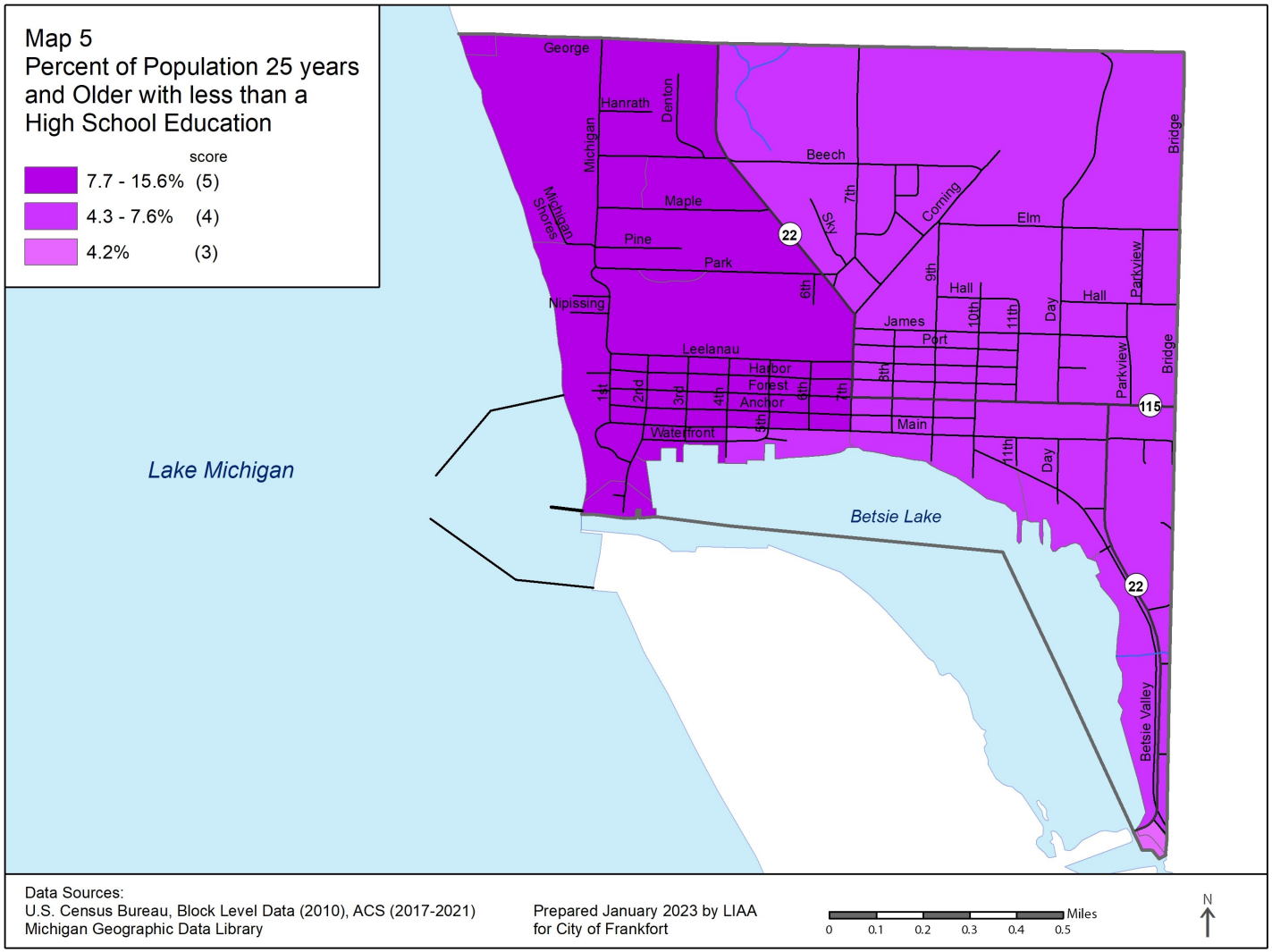

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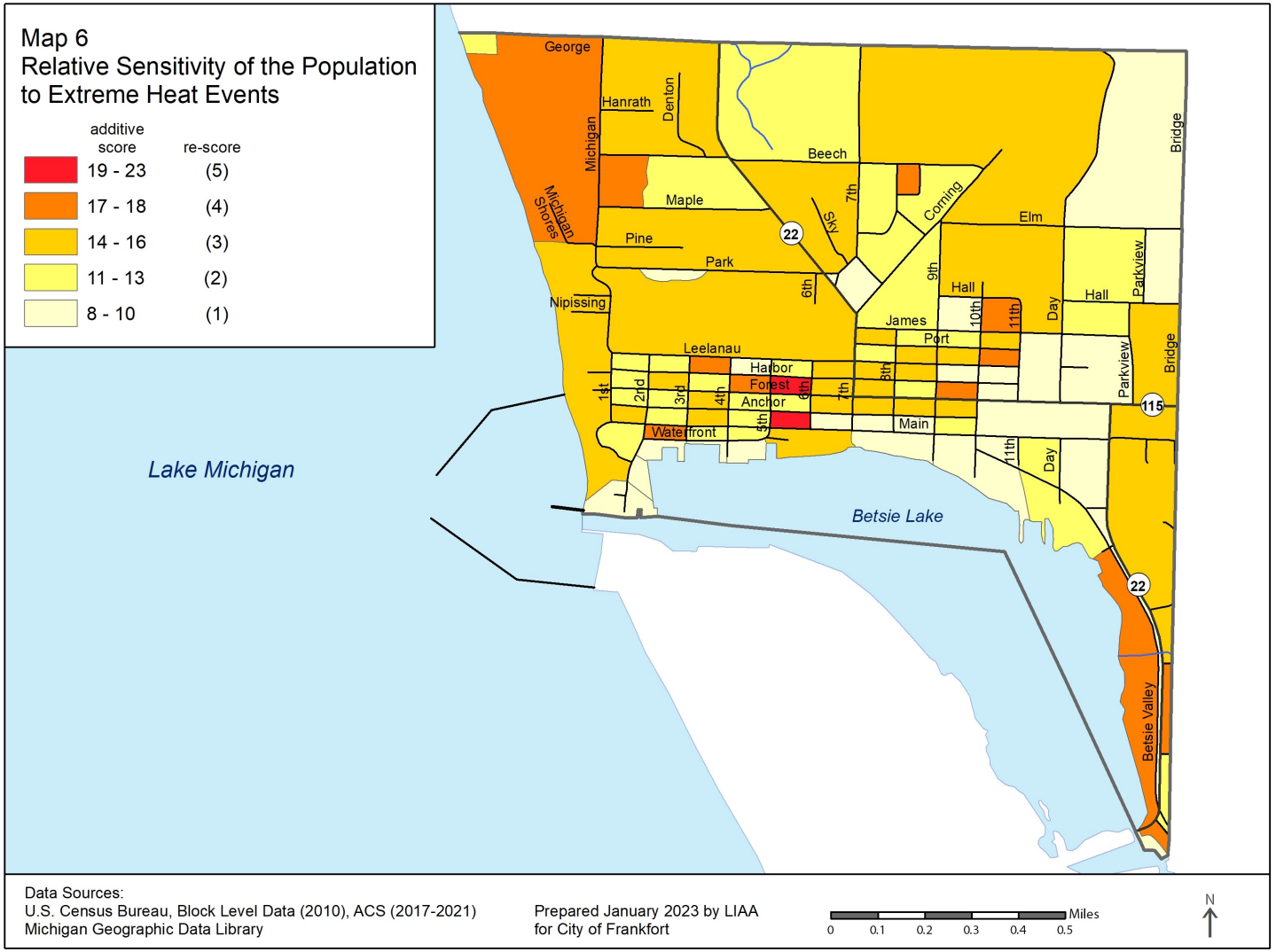

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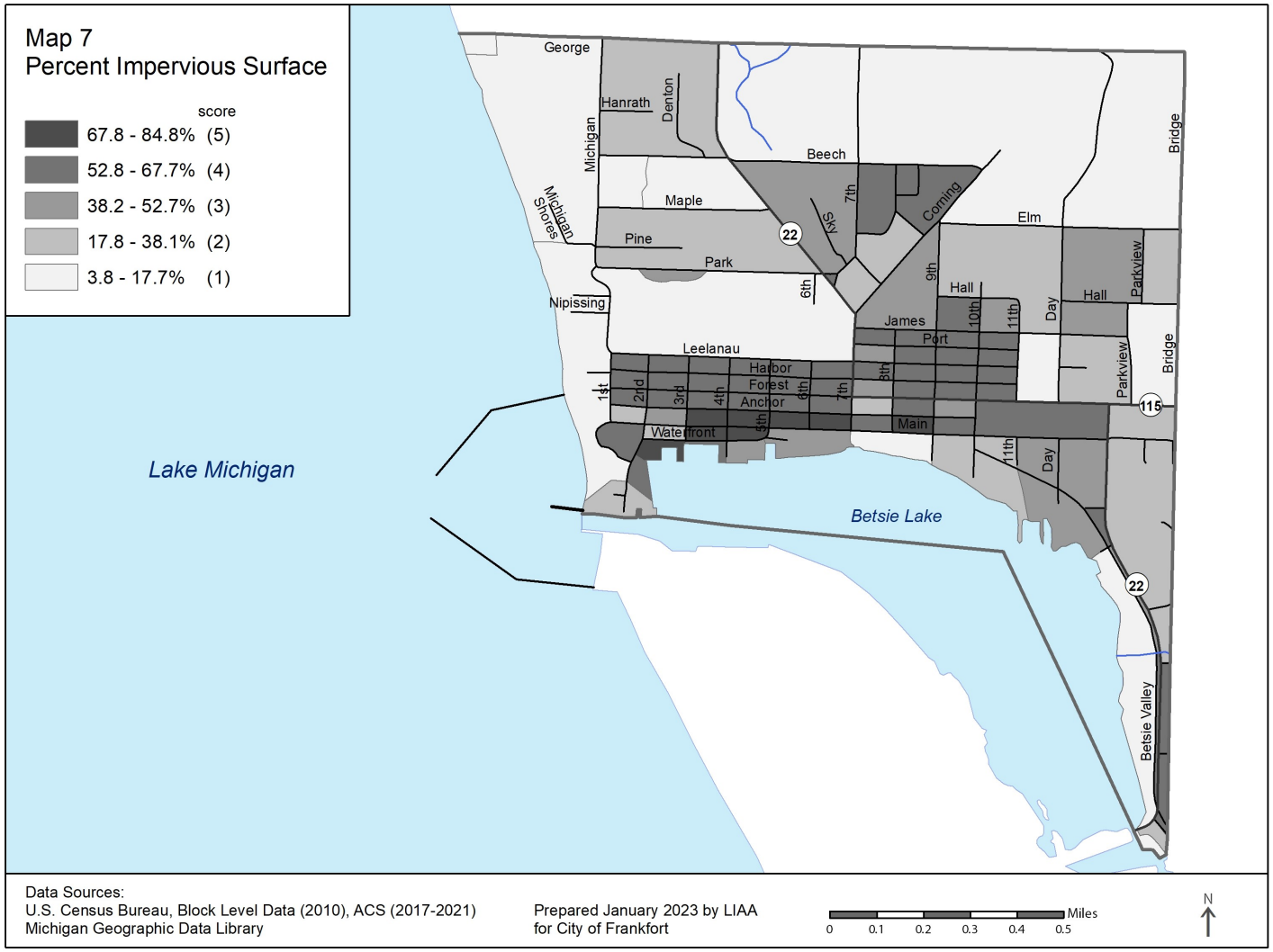

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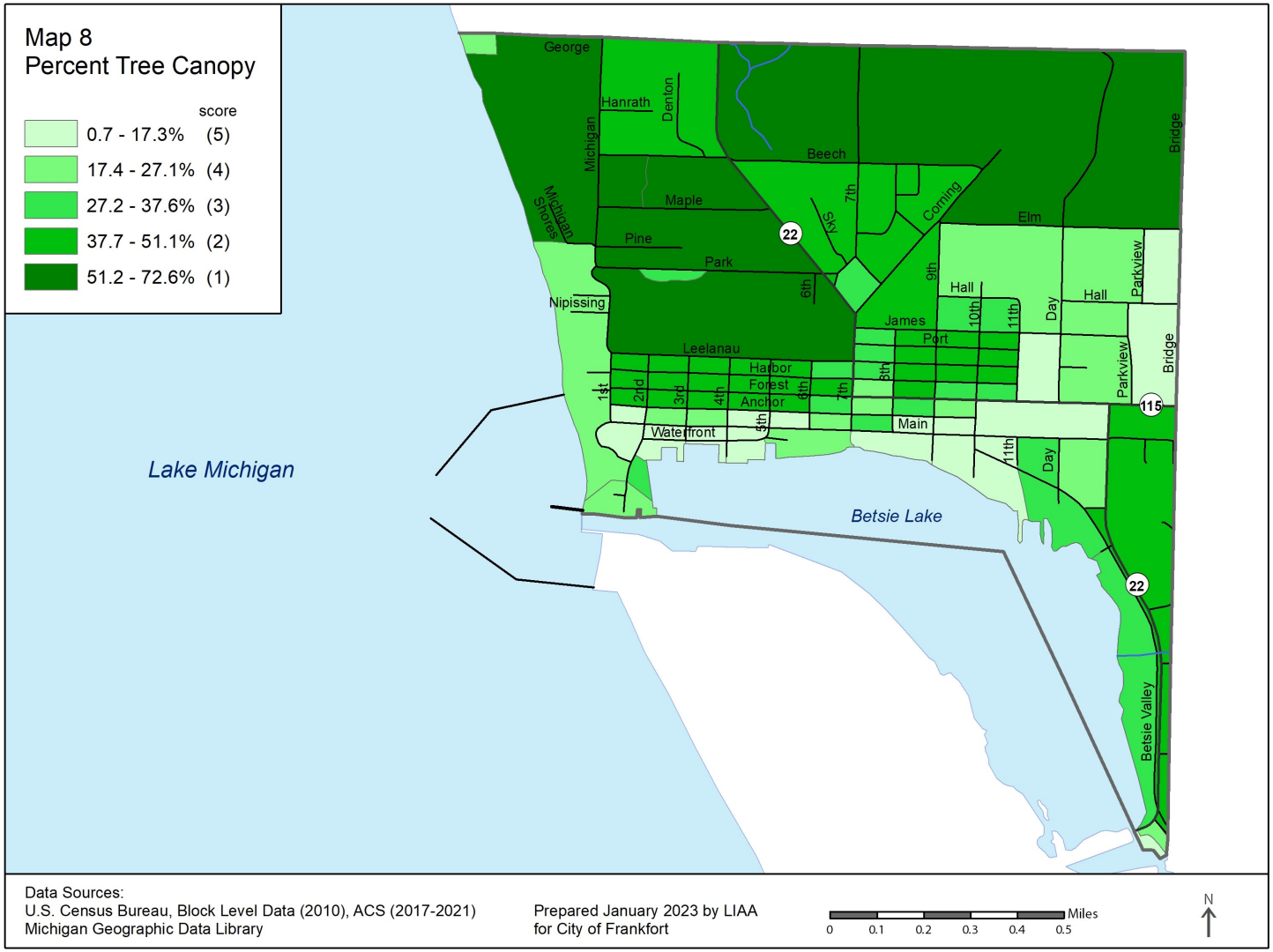

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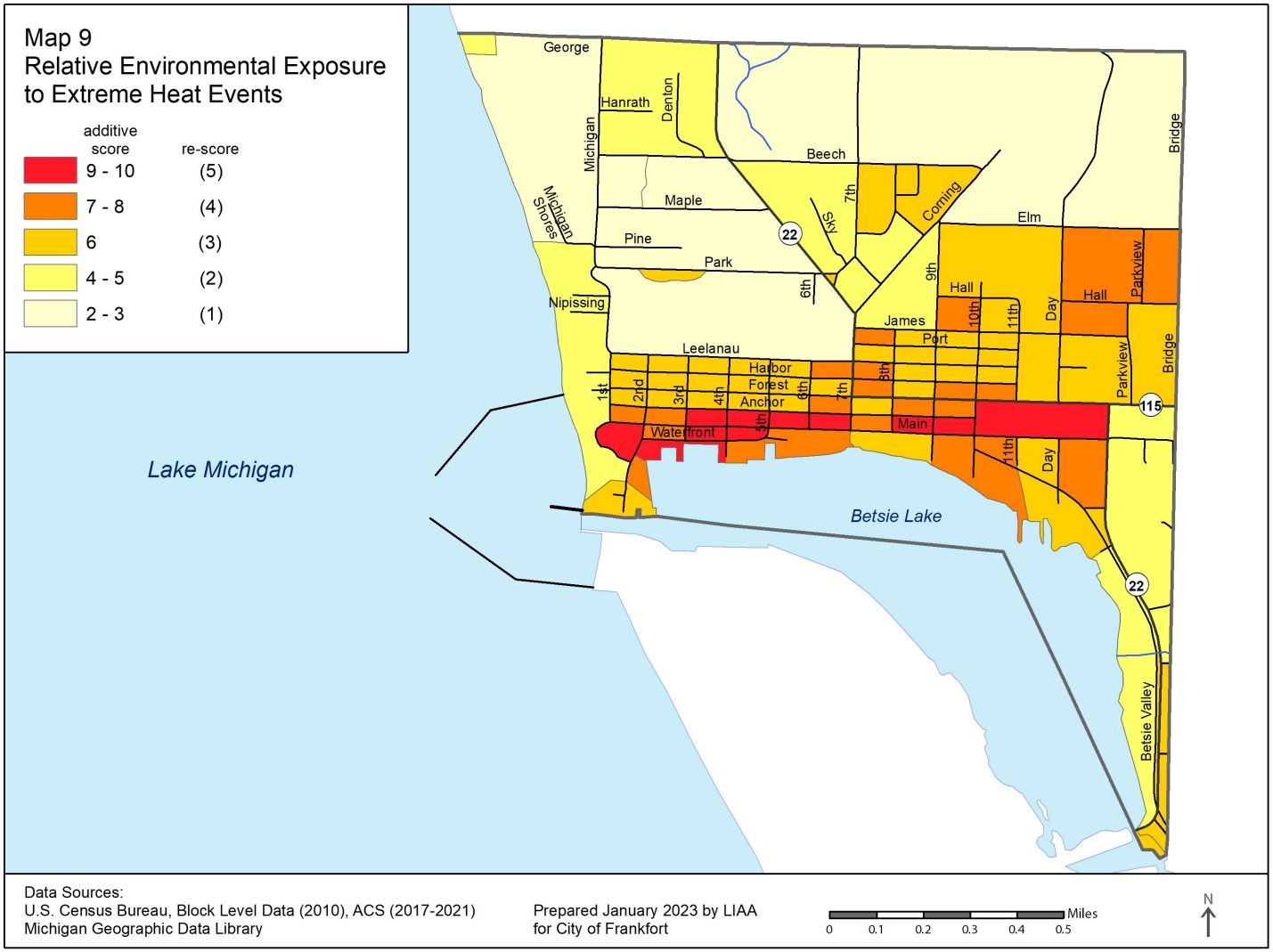

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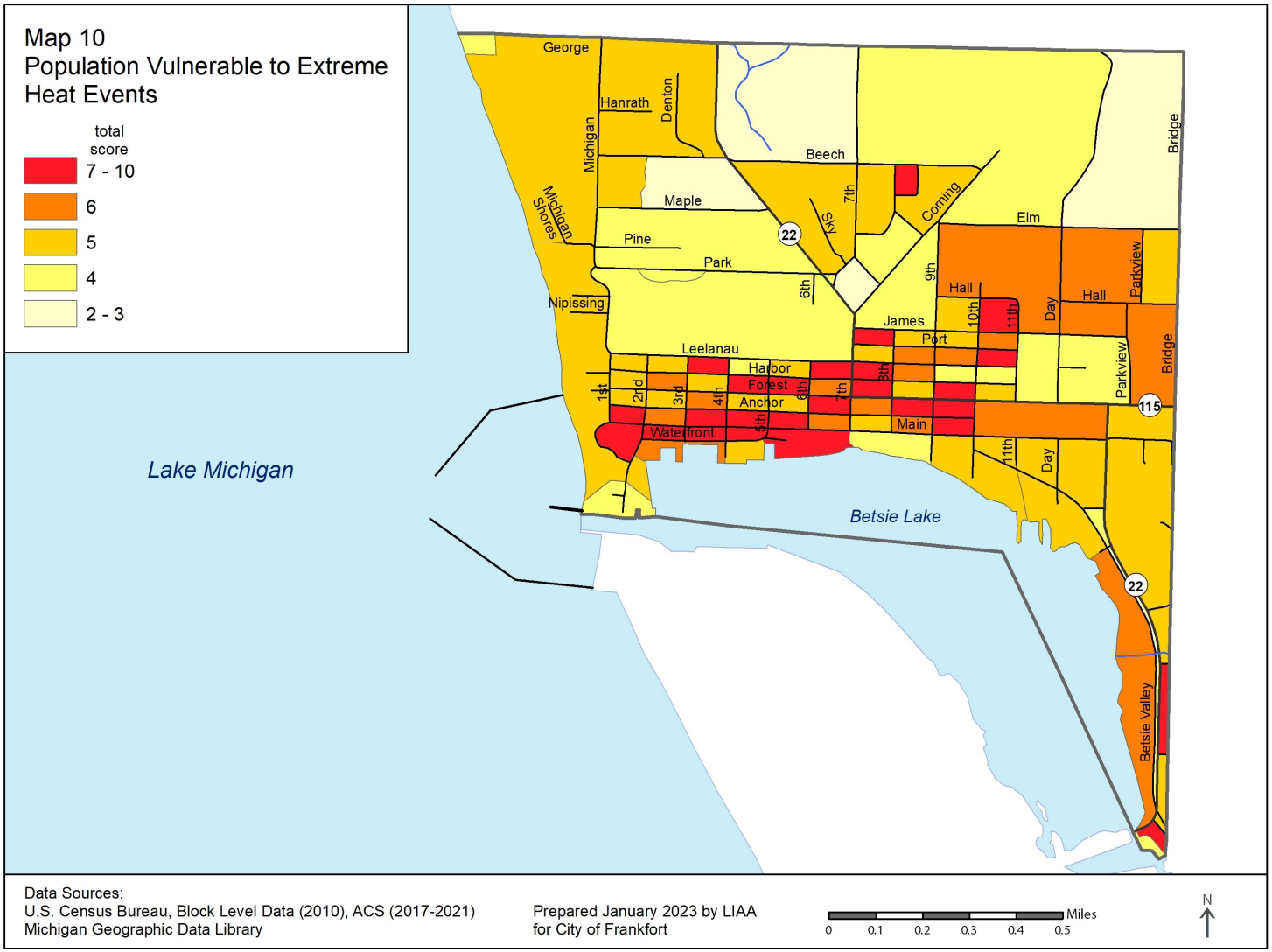

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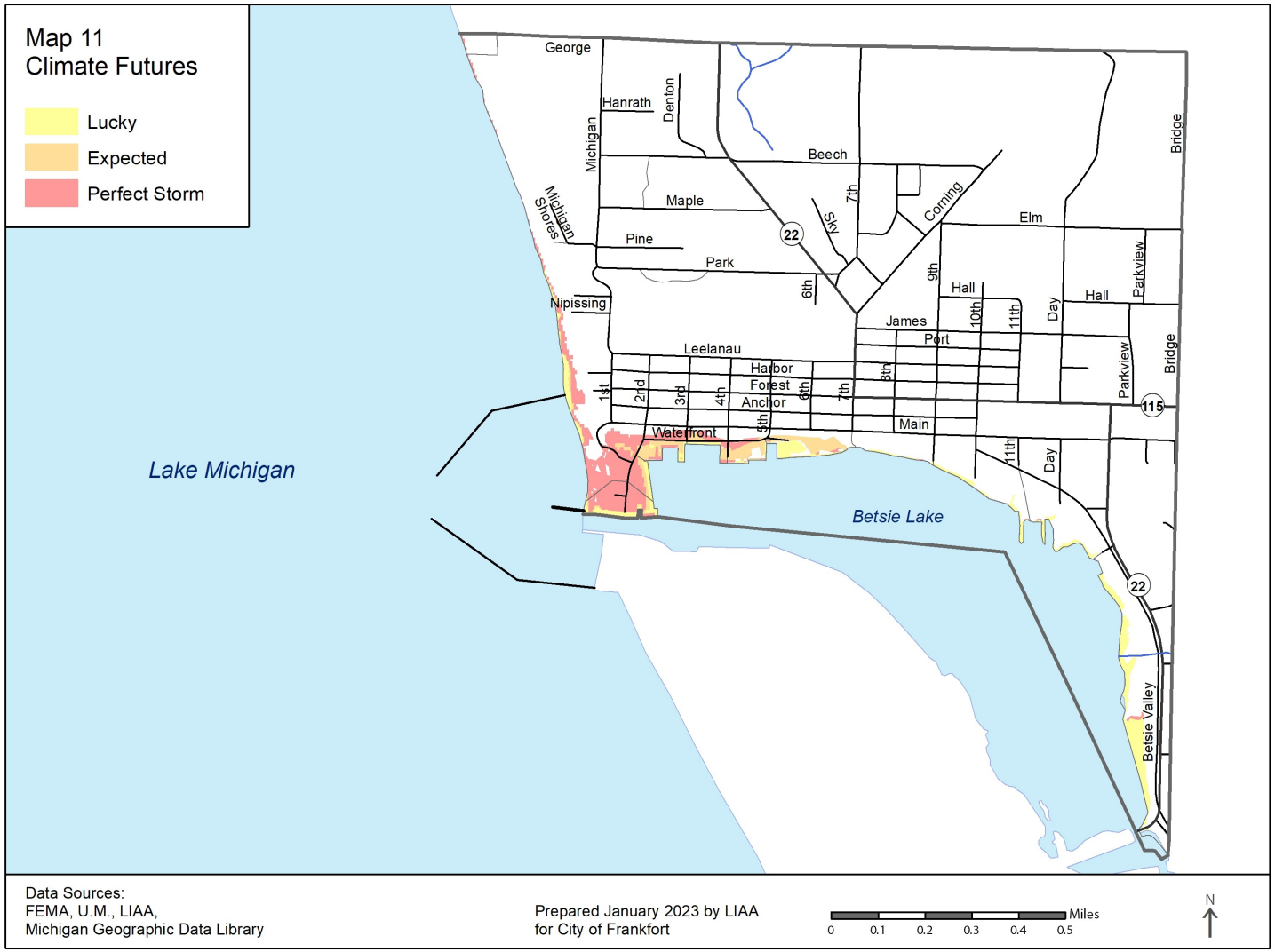

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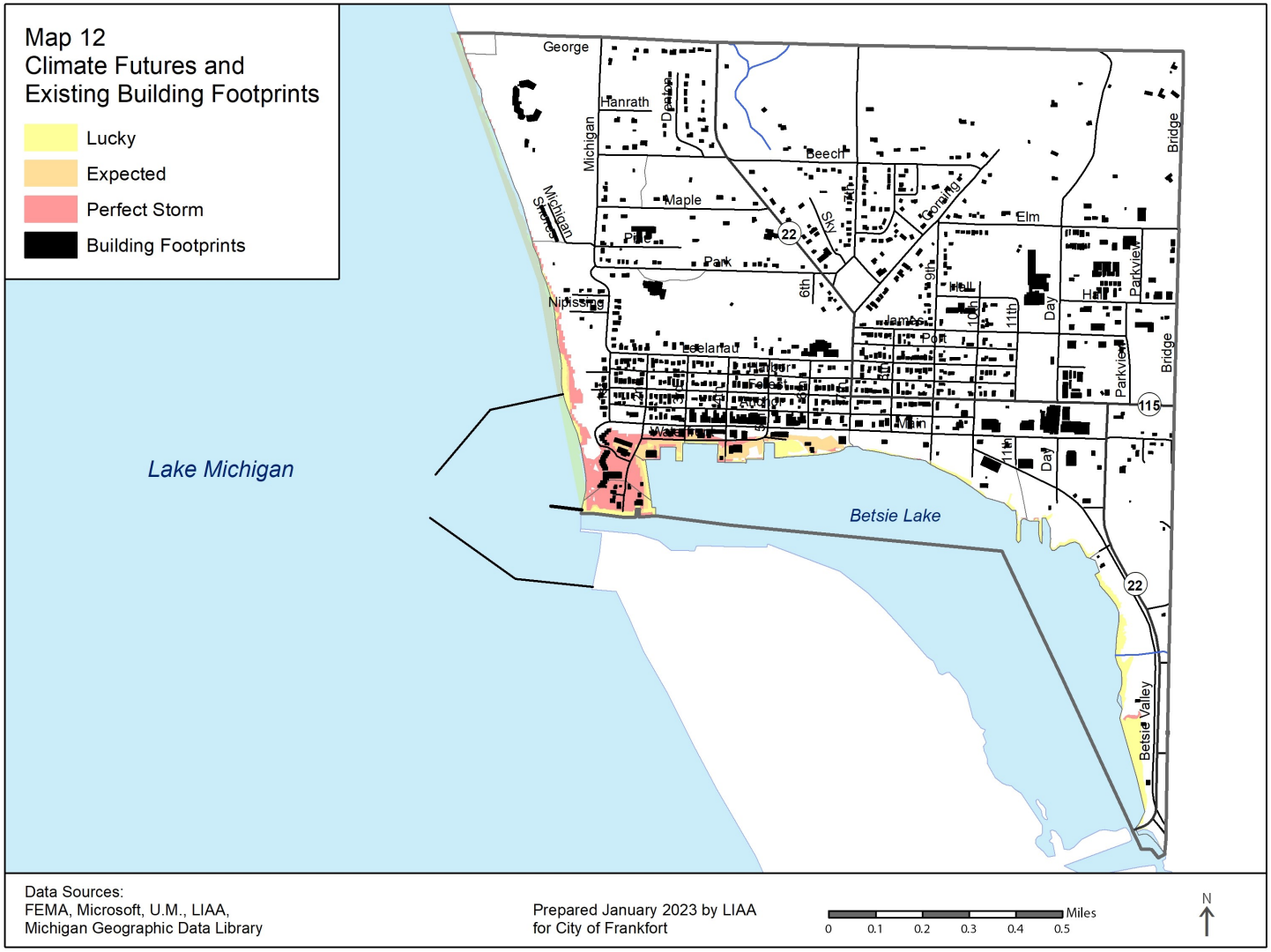

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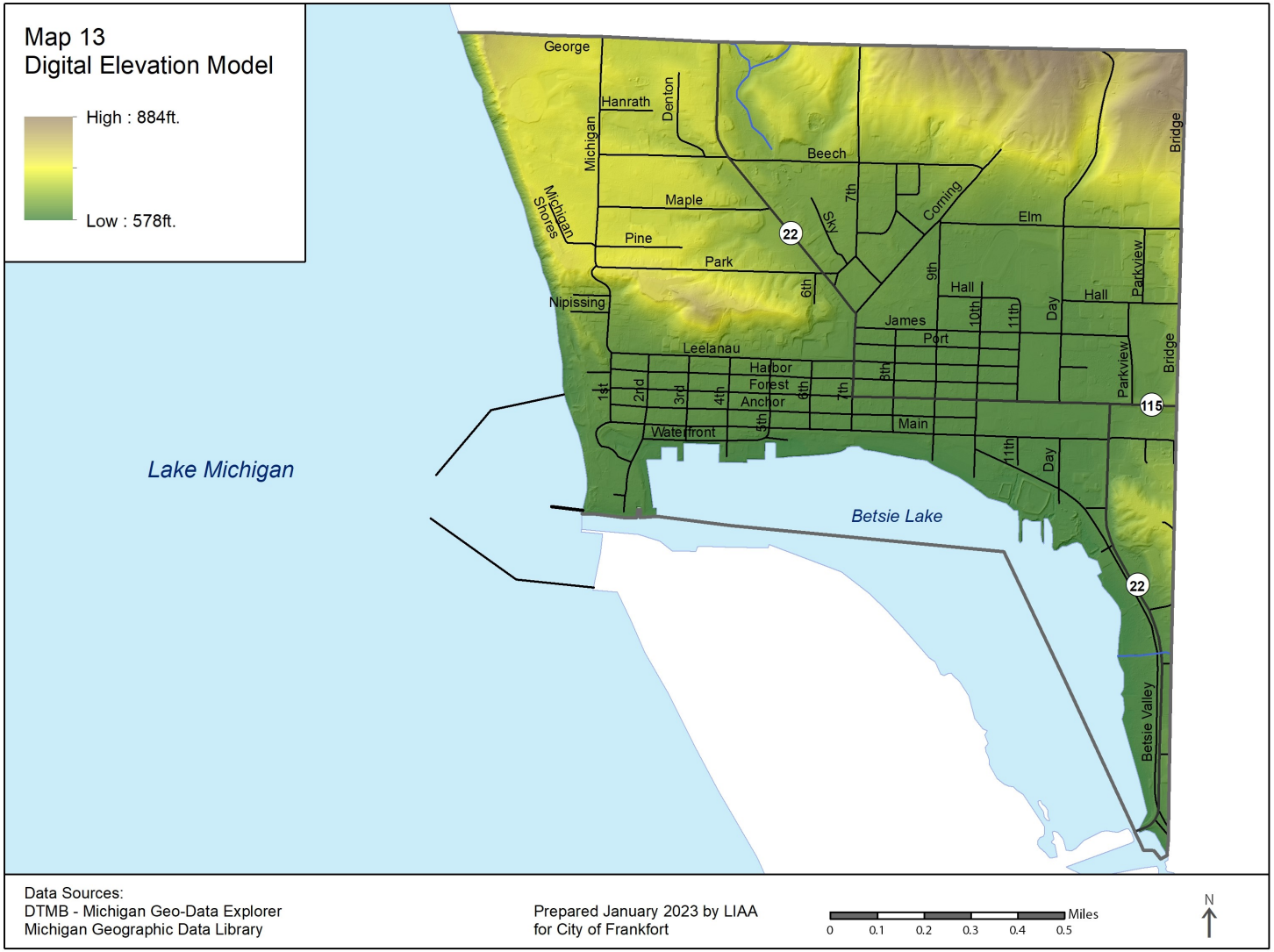

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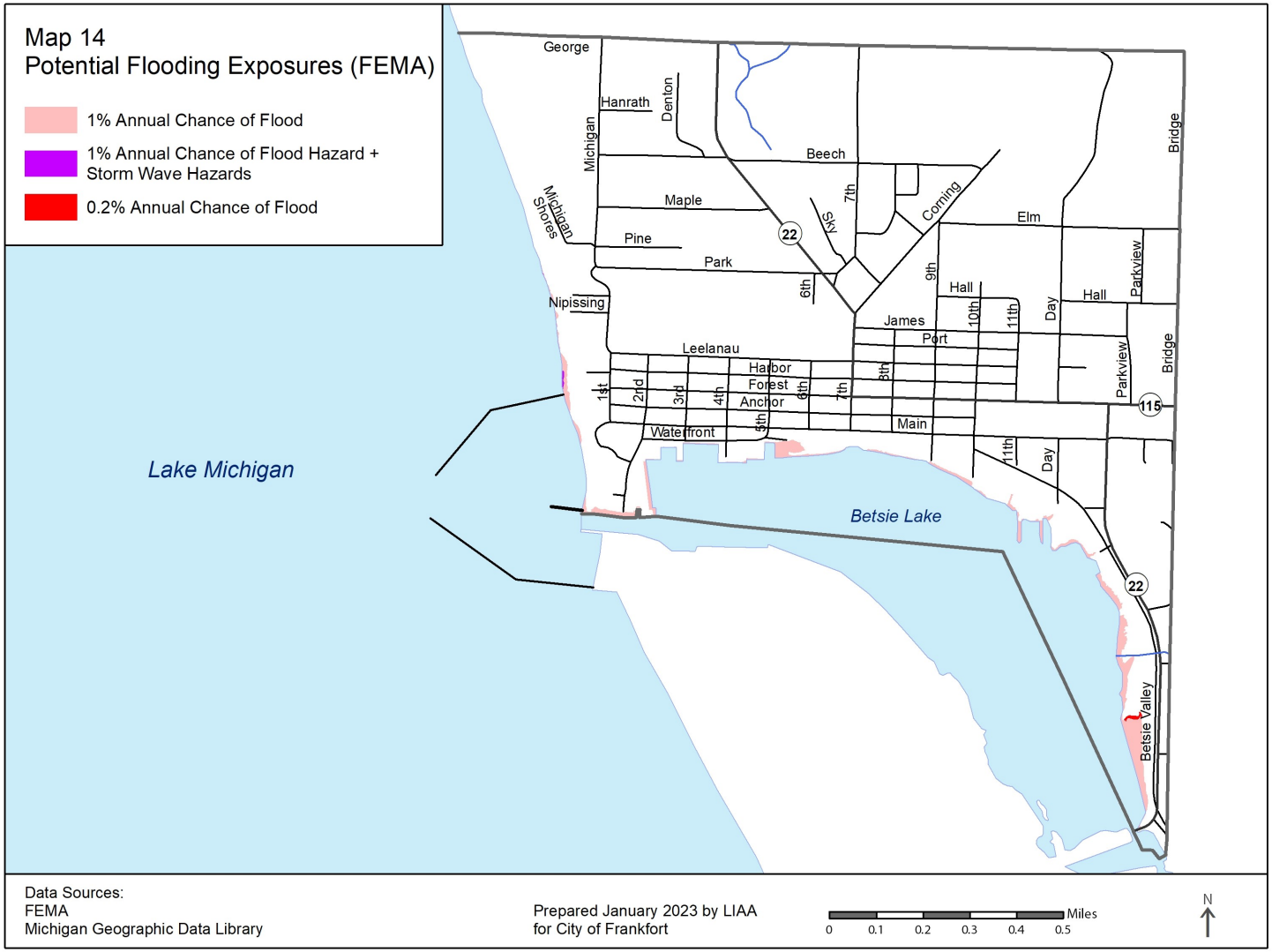

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