Peninsula Township
Coastal Sustainability Assessment

11/23/2022

Prepared by: LIAA

Innovative ideas for sustainable communities since 1993

this page has been left blank intentionally

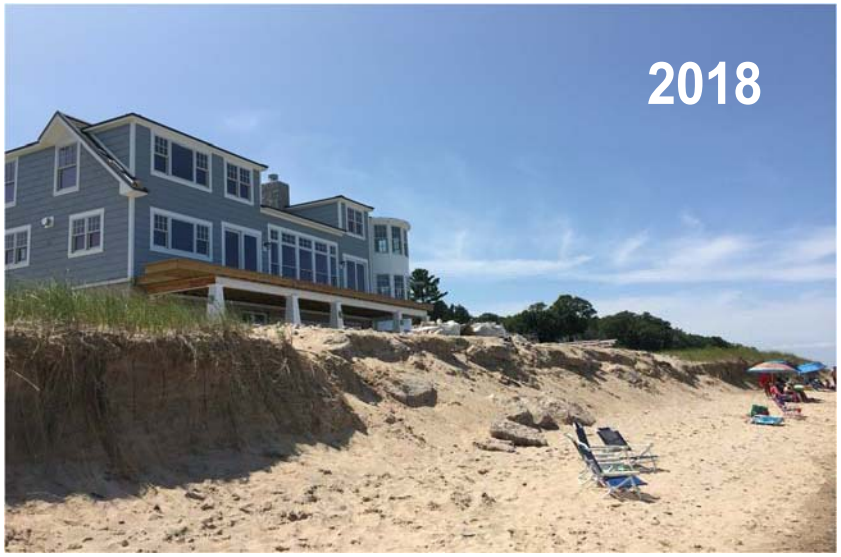
Acknowledgements

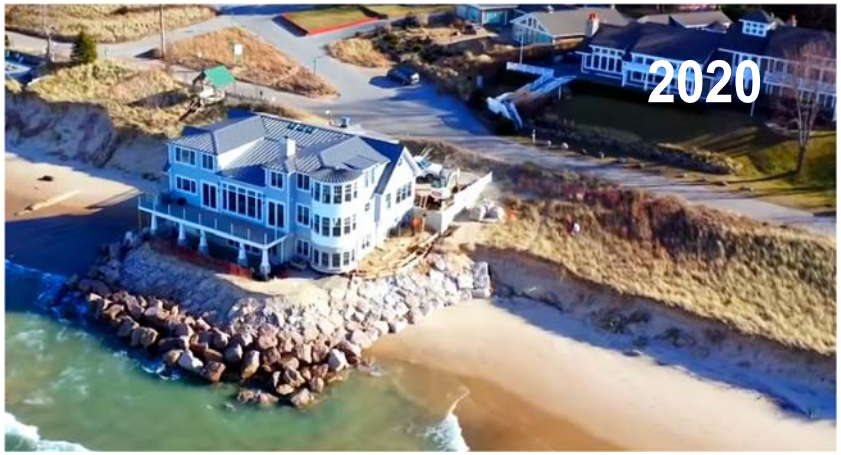
This *Community Sustainability Self-Assessment Tool* was developed by the Land Information Access Association (LIAA), Traverse City, Michigan. Financial assistance for this project was provided, in part, by the Michigan Coastal Zone Management Program, Department of Environment, Great Lakes, and Energy and is supported through a grant under the National Coastal Zone Management Act of 1972, as amended, administered by the Office for Coastal Management, National Oceanic and Atmospheric Administration.

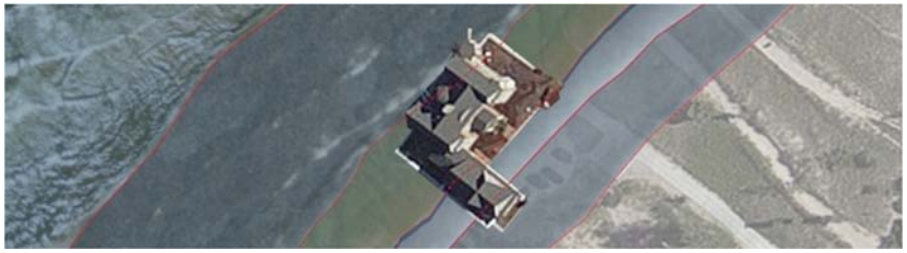
This Self-Assessment Tool references recommendations and best practices developed by LIAA, as well as from the following entities:

- 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

Table of Contents







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 community's vision for its housing.

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.

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?	N – not locally, though zoning regulations do implement a shoreline protection zone, it is unclear that this is based on historical mapping	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 provide through the Great Lakes Research Center, NOAA and the State of Michigan?	I – County GIS maintains some shoreline regression data	Use the following link to view shoreline data for Michigan's coasts: https://portal1-geo.sabu.mtu.edu/mtuarcgis/apps/webappviewer/?id=d758800bb18e460ab39aa66631051156
24.3	Are flood risk maps and related data updated every five years?	Y – County maintains 5-year Hazard Mitigation Plan; County has mapped flood-prone areas	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?	Y – County Hazard Mitigation Plan provides natural disaster benchmarks	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?	I – Hazard County Mitigation Plan provides map of most public infrastructure; spatial relationship could be defined with map overlays	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 – County Hazard Mitigation Plan provides cumulative impact of hazards since 1950's; does not include maps broken out over time	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.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

Data gathering and mapping (continued)

	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 County Hazard Mitigation Plan provides information on the damage and estimated cost of previous floods	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?	Y – there is only one property in the county according to the County Hazard Mitigation Plan	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?	N – special data is available; LIAA providing flood scenario maps	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?	I – there is historic data available through the county; the township has not estimated the potential financial loses	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?	? –	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?	N – LIAA is providing maps to assist with this effort	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.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

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 – generally, clear-cutting of native vegetation along the coastline is prohibited in several zoning districts	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?	? –	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 develop-ments near or within coastal areas?	I – ordinance requires vegetation be replaced that is removed and clear-cutting is prohibited for new development	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?	I –ordinance prevents the removal of approximately 70% of vegetation within 35 ft of coastlines; not clearly defined outside of the buffer zone	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?	I – generally, impervious surfaces are regulated for new development within 500 ft of OHWM or structures larger than 3,500 sq ft; paved surfaces (drives/parking) not included	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?	Y – site plans requires that flood zones are identified and restrictions apply within flood areas	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.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

Zoning regulations (continued)

	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?	Y – development in sensitive areas are regulated	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 – site plans requires that flood zones are identified and restrictions may apply within flood areas	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?	Y – "Floodplain" is described as areas falling below the North American Vertical Datum of 1988 (NAVD 88) and the flood insurance study for Grand Traverse County, Michigan, and the FEMA flood insurance rate maps (FIRM)	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 – if a structure is approved/permitted, it must comply with Michigan building codes which require floodproofing measures for all structures located within the 100-year floodplain	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?)	N – not necessarily as the destruction of a non-conforming structure within a flood-prone area may be approved if an application to the zoning board of appeals is approved	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.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

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/A – There are no "Critical Dune Areas" in the township as defined by Act 451 (part 353)	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?	N/A	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/A	Homes in critical areas should be regulated to prevent water from dispersing concentratedly, which causes damage to the natural environment, especially on dunes.
26.4	Are homes on dunes encouraged to share driveways in order to avoid the amount of impervious surfaces?	N/A	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?	N/A	The municipality can help reduce runoff and dune destruction by allowing pervious materials to be used for driveways.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

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 dunes and beaches regulated or incentivized to be placed at the point of arrival in order to reduce the damage created by driveways and parking?	N/A	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?	N/A	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?	N/A	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?	N/A	Zoning regulations, incentives or education can be used by the municipality to encourage more sustainable site plans.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

House siting

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?	N/A – no plans to develop new critical facility	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?	N/A – no critical facility are located within flood areas	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 – County has an Emergency Management Plan	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?	I – Township follows several County or region-wide plans for upgrading and repairing transportation infrastructure; identification of specific transportation infrastructure repairs is not specified	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?	Y – County Road Commission and MDOT maintain critical road infrastructure	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.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

Critical facilities and infrastructure (continued)

	Benchmark	Self-Assessment	Description
28.6	When upgrading **existing** community infrastructure, does the community consider the impact of coastal hazards?	I – County Road Commission and MDOT maintain critical road infrastructure; Local sewers and water are supplied along East Shore and Peninsula Drive (unknown if coastal hazards are taken into consideration when maintaining)	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?	N/A – no plans to develop new critical facility	See Benchmark 28.6

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

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 – information is not easily accessible	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 – information is not easily accessible	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?	I – information is not easily accessible	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?	I – LIAA prepared some mapping for the entire county; the township does not have local scenario plans or strategies; some maps will be provided by LIAA through the Coastal Assessment	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 – Hazard Mitigation Plan adopted by the County	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.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

Disaster preparedness (continued)

	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 – Licensed Planners and engineers are on staff or retained as contractors	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 – through the County Code Red and IPAWS alerts communication systems and local media	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?	N –	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.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

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?	N/A	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?	N/A	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?	N/A	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?	N/A	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.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

Bluff and ravine protection (continued)

	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?	N/A	ATV's 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.	N/A	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?	N/A	These infrastructure components can help to prevent erosive damages to dunes.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

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?	Y – County has staff capable of mapping and monitoring potential hazards	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?	Y – Not locally; available through Grand Traverse County Emergency Management	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?	N –	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 has technical staff with mapping capabilities	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 – Staff attends trainings through professional associations	Conferences and trainings can help introduce staff to emerging concepts related to coastal sustainability. These events also foster information exchanges between professionals.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

Professional training (continued)

	Benchmark	Self-Assessment	Description
31.6	Does the municipality hire certified building inspectors?	Y – Grand Traverse County provides all building permit services	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?	N/A	See Benchmark 31.6
31.8	Does the community have planning commissioners with formal training in planning?	N –	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.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

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 – Flood Insurance Rate Map initiated on 08/28/2018	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 All-Hazard Mitigation Plan?	Y – the County Hazard Mitigation Plan is approved by FEMA	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 – Residential distrccit R-1B is the zoning classification for Coastal Residential Zones	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?	I – There is not a floodplain management plan, however, floodplains are addressed in the Master Plan, Hazard Mitigation Plan, and Zoning Ordinance	Building off of the master plan, the floodplain management plan allows for greater detail and action step planning for managing hazardous areas.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

Hazard planning (continued)

	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?	I – The County Hazard Mitigation Plan acknowledges and addresses coastal dynamic issues; specific benchmarks should be set	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?	Y – There are public water/sewer facilities in the southern-end of the township and coastal hazards/flooding is considered; consideration of septic locations should be considered	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?	N – The township does not set a timeline for relocation or abandonment of buildings at-risk of flooding; can be addressed through existing non-conforming use ordinances	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 during before, during and/or after a disaster event?	? –	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.

Y—Yes **I** — Yes, but should improve **N** — No **?** — Don't know **NA** — Not applicable

Inventory of Existing Master Plan, Municipal Ordinances, and Hazard Mitigation Plan

Master Plan: Relevant Language

Found in the Draft 2022 Peninsula Township Master Plan

New Challenges

Record-high water levels in 2020 damaged vast segments of shoreline, causing severe erosion, millions in property damage, and the closure of a section of Bluff Road. (Page 48)

Vision

Peninsula Township has identified 12 "Vision Elements" in the revised Draft Master Plan document. Vision Element #2 directly correlates to Coastal Resilience (Page 51):

No.	VISION	SUBJECT AREA	SUMMARY
5	**Protect the shoreline and wetlands to the maximum extent possible through both regulation and education centered on vegetation protection and enhancement. Areas like Pyatt Lake Natural Area and other beach and coastal wetlands are an important buffer against pollution and flooding.**	**Land Use**	The last several years of high water levels on the Great Lakes have had a profound impact on coastal communities throughout Michigan. Coastal erosion and flooding have impacted residents with substantial costs and damages. Predicting lake levels in the future is all but impossible, but it is prudent to improve regulations and education efforts regarding vegetation removal so that future high water levels are less damaging and water quality is protected from erosion. Similarly, it is important to continue to educate residents on the value of all wetlands and shoreline vegetation cover as a means of reducing both flooding and pollution.

Existing Zoning

(Page 56)

Existing Zoning Structure		
Zoning District Name	**Minimum Lot Size**	**Description / Purpose**
R-1B District: Coastal Zone Residential District	25,000 sq. ft.	The R-1B coastal zone residential district sets standards for the development of residential properties of a semi-rural character along lakeshore drives and in areas of high scenic value where more intensive development would deteriorate the peninsula's environment and less intensive development is essential to maintain the established environment.

Municipal Ordinances

Found in the Peninsula Township Code of Ordinances; Zoning Code adopted 06/14/2022 with amendments

Shoreline Protection

Record lake levels combined with storm events produced well-documented and severe erosion problems where the magnitude of erosion led to road closures. The relationship between roadway maintenance and shoreline management has been challenging. In most areas, pavement and shoulder drainage improvements have not included sufficient measures to prevent erosion, and, in some areas, conditions have been made worse by tree and vegetation removal. The classic example of this occurs along Bluff Road, where a variety of factors contributed to the recent road closure. (page 59)

In response to high water problems, a common approach is to "armor" the shoreline with seawalls, boulders, or structures. While these efforts can provide short-term relief, experts warn that such structures can actually worsen erosion elsewhere, and the issue of what seawalls will look like when water levels recede also becomes relevant. Fewer than 10 years ago, Lake Michigan water levels were at very low levels. More "natural" solutions are often promoted by professionals to help prevent erosion. These include establishing and/or protecting existing natural deeprooted vegetation, which can hold soil in place, and requiring buildings and structures to be set back further from the shoreline so that the natural shoreline can be more "elastic" and adjust to changing lake levels over time.

The Peninsula Township Zoning Ordinance has related requirements in place to help ensure vegetated cover along the shoreline. Most significantly, tree cutting along a strip paralleling the shoreline and extending 35 feet inland from all points along the normal high-water mark of the shoreline is limited to 30 percent. In other words, at least 70 percent of this strip must remain vegetated. In large part, these requirements need attention and updates to clarify and better articulate requirements that benefit both landowners and zoning enforcement. Additional measures to consider include potential limitations on construction of specific types of shoreline armoring. (page 60)

Land Use

(Page 85)

VISON AND ORGANIZING PRINCIPLES (FROM CHAPTER 5)	ACTION STEPS	REFERENCE
#5 Protect the shoreline and wetlands to the maximum extent possible through both regulation and education centered on vegetation protection and enhancement. Areas like Pyatt Lake and other beach and coastal wetlands are an important buffer against pollution and flooding.	Update shoreline regulations (potentially including an overlay zoning district) and encourage shoreline protection education.	Page 59-61

Municipal Ordinances: General

Found in the Peninsula Township Code of Ordinances

Title	Location in Code	Ordinance No.	Ordinance Language
Code of Ordinances			
R-1B, Costal Zone Residential District	Article 3	Sec. 3.09(A)	The R-1B coastal zone residential district sets standards for the development of residential properties of a semi-rural character along lakeshore drives and in areas of high scenic value where more intensive development would deteriorate the environment and less intensive development is not essential to maintain the established environment.
R-1B, Costal Zone Residential District	Article 3	Sec. 3.09(D); Sec. 3.13	**Dimension Regulations** (setbacks) – Ordinary High Water Mark: 60 ft (in accordance with Section 3.13)
Supplemental Great Lakes Shoreline Regulations	Article 3	Sec. 3.13 (C)	**Filling and Grading Within 200 feet of Normal High Water Mark –** The following rules shall apply to any filling, grading or other earth movement within 200 feet of the normal high water mark to prevent harmful erosion and related sedimentation: (5) The Zoning Administrator may issue a land use permit for a sea wall without regard to the Minimum yard setback from the ordinary high water mark otherwise required in Section 6.8.1 when a sea wall is necessary to protect or prevent structures on the premises from erosion damage caused by high water.
Supplemental Great Lakes Shoreline Regulations	Article 3	Sec. 3.13 (D)	**Removal of Shore Cover –** Regulation of tree cutting along the Great Lakes shoreline is necessary to protect scenic beauty, control erosion and reduce effluent and nutrient flow from the shoreland. These provisions shall not apply to the removal of dead, diseased or dying trees at the discretion of the landowner, or to silvicultural thinning upon recommendation of a forester. Tree cutting in a strip paralleling the shoreline and extending thirty-five (35) feet inland from all points along the normal high water mark of the shoreline shall be limited in accordance with the following provisions: (1) No more than 30% of the length of this strip shall be clear cut to the depth of the strip. (2) Provided, further that cutting of this 30% shall not create a clear cut opening in this strip greater than thirty (30) feet wide for every one hundred (100) feet of shoreline. (6) Cutting Plan - as an alternative to the above requirements a special cutting plan allowing greater cutting may be permitted by the Board of Appeals. In applying for such a permit the Board may require the lot owner to submit a sketch of his lot including the following information: location of all structures, location of parking, gradient of the land, existing vegetation, proposed cutting and proposed replanting. The Board may grant such a permit only if it finds That such special cutting plans: a) Will not cause undue erosion or destruction of scenic beauty, and b) Will provide substantial shielding from the water of dwellings, accessory structures and parking areas. The Board may condition such a permit upon a guarantee of tree planting by the lot owner. Such an agreement shall be enforceable in court.

			(7) Commercial Forestry - from the inland edge of the thirty-five (35) foot strip to the outer limits of the shoreland the commercial harvesting of trees shall be allowed when accomplished under accepted forest management practices. The maintenance and improvement of water quality shall be emphasized in all timber harvesting operations. The purpose of this provision will favor long-lived species.
Supplemental Great Lakes Shoreline Regulations	Article 3	Sec. 3.13 (E)	**Review by Michigan Water Resources Committee –** If it is determined by the Zoning Administrator that any proposed structure may adversely effect, deteriorate or alter the shoreland resource, preliminary plans and specifications shall be transmitted to the staff of the Michigan Water Resource Commission for review and approval. If it is determined by the Water Resources Commission staff that such development would adversely affect public and private rights, impair the public trust or otherwise deteriorate the unique shoreland resource, such determination shall be considered sufficient justification for denying a building permit.
Environmental Performance Standards	Article 8	Sec. 8.01; Sec 8.01(A)	**Wetland Restrictions –** There shall be no development or modification of any kind within a wetland area without the Michigan Department of Environment, Great Lakes, and Energy (EGLE) first issuing a wetlands permit and/or an earth change and stormwater permit issued by Peninsula Township. Any such approved development shall be subject to the following: (A) Minimum Setback – A setback of 25 feet shall be maintained between any structure or impervious surface (including but not limited to parking lot, driveway, paths, etc.) and a wetland.
Environmental Performance Standards	Article 8	Sec. 8.02 (A-C, G)	**Floodplain Controls and Restrictions –** (A) Intent and Purposes – The purpose of these regulations is to protect those areas of the township that are subject to predictable flooding in the floodplain of the Great Lakes. All land included in the floodplain shall be subject to the requirements and prohibitions specified herein in addition to the normal zoning district requirements in which the land is located. (B) Applicability and Land Use Review – Notwithstanding anything to the contrary in this ordinance, any request to fill in a floodplain must be evaluated together with a permitted use set forth in Section 8.02(D). A request to fill in the floodplain or a portion thereof will not be considered alone and is not permitted. (C) Floodplain Area Identification – Floodplain areas are those established by current FEMA flood insurance rate maps (FIRM), the most recent and adopted version effective August 28, 2018. Base flood elevations (BFE) are shown on the FIRM and are described in the associated flood insurance study (FIS). (D) Vegetated Buffer Protection – Pursuant to Section 3.13, all shoreline properties including floodplain areas shall have a vegetated strip inland of the beach area to filter nutrients and stormwater and give protection from lake waves.
Stormwater Management	Article 8	Sec. 8.05 (B-C)	(B) Commercial and Development Parcels, Roads, and Other Non-Residential Use Stormwater Review – A stormwater review and permit from the zoning administrator and the township engineer is required in any of the following circumstances for non-residential parcels: (1) Whenever one or more acres of land are disturbed; (2) Within 500 feet of the ordinary high water mark (OHWM); (3) Whenever the impervious surface coverage of any structure is more than 3,500 square feet; (4) For any of the following type of developments: commercial use, mobile home park, multiple family dwelling, PUD, site condominium or condominium, or platted subdivision;

			(5) For a new or extended private road; or (6) For any other circumstances the zoning administrator deems necessary. (C) Residential Structures and Parcels Subject to Stormwater Review. (1) Minor Stormwater Review – The zoning administrator, if certified, shall review and approve the stormwater management plan prior to issuing a land use permit. Any parcel or structure that in the opinion of the zoning administrator requires review by the township engineer based on complexity of the disturbance of natural features or site development shall require a major stormwater review. Residential structures or parcels subject to minor stormwater review shall include the following situations: a) The impervious surface coverage (structures and in-ground surfaces) is fewer than 3,500 square feet; b) Less than one acre of ground will be disturbed; or c) All parcels within 500 feet of the OHWM. In the event that the zoning administrator in not certified in storm water management then a major storm water review is required. (2) Major Stormwater Review. The township engineer shall review and approve the stormwater management plan prior to issuing any land use permit. The cost of this review and inspections shall be paid by the applicant. Residential structures or parcels subject to major stormwater review shall include the following situations regardless of proximity to the OHWM: a) The impervious surface coverage (structures and in-ground surfaces) is 3,500 or more square feet; b) One acre or more of ground will be disturbed; or c) Any parcel or structure that the zoning administrator determines requires a major stormwater review.

Hazard Mitigation Plan

Found in the 2022 Grand Traverse County Hazard Mitigation Plan, adopted 09/07/2022

Hazard Identification and Assessment

Between 02/01/1950 and 05/31/2022 there were three (3) shoreline Hazard/Flood events in Acme, East Bay, Peninsula Townships and City of Traverse City which costs the communities a cumulative fiscal impact of approximately $218,792,198.29 over the same period. (pages 26-27)

Extreme Temperature

Peninsula Township has the highest median age (55.2) of all Grand Traverse County communities. Their relative sensitivity to extreme heat events. (Page 44)

Shoreline Hazards (Coastal Flooding and Coastal Recession)

The potential for substantially larger rain events and severe storms raises concerns of harm to human health and damage to buildings and infrastructure, especially for areas along the Lake Michigan coastline." Jurisdictions located on the Lake Michigan coast (Grand Traverse Bay) are impacted by shoreline hazards: Acme, East Bay, Peninsula Townships and City of Traverse City. (page 48)

Three (high-water) incidents have been reported. The first occurred on February 21, 1986 during the last major high water event prior to 2019. A Governors Disaster Declaration for shoreline problems in the State was enacted in 1985-1986 and included Grand Traverse County.

The second event occurred on October 16, 2019. Northwest to north winds produced high waves and elevated water levels along the northwest lower Michigan coastline. With Great Lakes water levels at near-record levels, significant coastal flooding and beach erosion resulted. Peninsula Drive was closed between McKinley and Wilson Roads due to coastal flooding and beach erosion. The east end of Marina Drive in Traverse City was also closed.

The third event occurred on October 21, 2019. Strong northerly to easterly winds resulted in another round of substantial coastal flooding and beach erosion, this time on both Lake Michigan and Lake Huron, for the 21st into the 22nd. On Old Mission Peninsula, docks were washed out. Waves reached the parking lot at Haserot Beach. (page 49)

There is a 4% chance of shoreline flooding and an equally small chance erosion will cause shoreline damages. Shoreline or soil erosion hazards involve the loss of property or necessitate the relocation of homes as sand or soil is removed by flowing water (lake, river, etc.) and carried away over time. The foundation of a structure, or underground utility pipes in the area, may become fully exposed and vulnerable to weather, extreme temperatures, water damage, or other sources of risk. Shoreline banks that support roadways may erode and cause the road surface to crack, become unstable, or more prone to deposits of sand, snow, water, and ice. This hazard is especially relevant to those municipalities that contain residential and commercial development along Grand Traverse Bay (Peninsula, East Bay and Acme Townships; Traverse City) that experience seasonal shifts in water levels and possible ice erosion hazards.

As lake water levels fluctuate and increased storminess occurs, shoreline recession and flooding will continue. In 2021 the levels of Lake Michigan-Huron began to decline, however, as historic data shows us, the water will begin to rise again. Those communities that have already faced shoreline hazards are likely to experience issues in the future. Changes in land use practices and improvements to the shoreline such as natural vegetation plantings or shoreline armoring may reinforce the shoreline for a period of time, but is likely not a permanent solution. (page 51)

Hazard Mitigation Plan

Found in the 2022 Grand Traverse County Hazard Mitigation Plan, adopted 09/07/2022

Goals and Objectives

(pages 58-59)

Priority Area 5: Shoreline Erosion Mitigation Strategies **Participating Jurisdictions:** Acme Township, East Bay Township, Peninsula Township, and City of Traverse City			
a. Drainage control projects	Building Construction Code Dept. Drain Commissioner (Lead) County Conservation District Emergency Management Department Townships and City	2-4 years from adoption of the plan	High
b. Enforcement of soil erosion statutes/permits	Building Construction Code Dept. Drain Commissioner (Lead) County Conservation District County Planning Department Emergency Management Coordinator MI Department of Environmental Quality U.S. Army Corps of Engineers	Ongoing	High
c. Enforcement of the building codes	County Building Inspector (Lead)	Ongoing	High
d. Enforcement of the grading levels no more than 10%	Building Construction Code Dept. Drain Commissioner County Conservation District (Lead)	Ongoing	Medium
e. Restoration of native shoreline vegetation	County Building Inspector Building Construction Code Dept. (Lead) Drain Commissioner County Conservation District Townships and City	Ongoing	High