

Local Zoning in Michigan for Great Lakes Coastal Shoreland Management Initial Findings and Guidance

July 24, 2019

Richard K. Norton, Ph.D., J.D., Urban and Regional Planning Program, University of Michigan
Oday Salim, J.D., Environmental Law and Sustainability Clinic, School of Law, UM
Michael Friese, J.D., M.U.R.P. Candidate, Urban and Regional Planning Program, UM
Everett Secor, J.D. Candidate, School of Law, UM

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.

The statements, findings, conclusions and recommendation in this report are those of the researchers and do not necessarily reflect the views of the Michigan Department of Environment, Great Lakes, and Energy and the National Oceanic and Atmospheric Administration.



Local Zoning in Michigan for Great Lakes Coastal Shoreland Management Initial Findings and Guidance

Richard K. Norton, Ph.D., J.D., Urban and Regional Planning Program, University of Michigan
Oday Salim, J.D., Environmental Law and Sustainability Clinic, School of Law, UM
Michael Friese, J.D., M.U.R.P. Candidate, Urban and Regional Planning Program, UM
Everett Secor, J.D. Candidate, School of Law, UM

July 24, 2019

Introduction and Background

With funding from the Michigan Coastal Zone Management Program,¹ researchers at the University of Michigan have conducted a preliminary review of zoning ordinance provisions that Great Lakes coastal localities might adopt to improve their management of Great Lakes shoreland areas, focusing on hazard mitigation. We conducted this review primarily in the Networks Northwest Region of the Lower Peninsula. This document presents some initial findings and guidance drawn from that preliminary work.²

Michigan's 'inland seas'—the Great Lakes—are not large enough to be discernably tidal, but their standing water levels fluctuate substantially over the course of decades.³ Especially during periods of high water, the lakes aggressively erode their shorelines, especially those comprised primarily of sands and gravels (i.e., much of them). Michigan experienced high lake levels on all of its Great Lakes from roughly the late 1940s through the late 1950s, from the late 1960s through the late 1980s (including the next-to-last recorded 'all-time high' for all of the lakes, in 1986), and again for a shorter period during the mid 1990s. The lakes were then relatively low for an unusually long period of time—from the late 1990s through the early 2010s. They are now, as of this writing, at or above all-time high levels again.

Those same periods of high water corresponded roughly with governmental efforts both to address harms caused by shoreline processes and to better conserve coastal resources, along with the emergence of a heightened environmental protection sensibility more broadly.

¹ 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

² The statements, findings, conclusions and recommendation in this report are those of the authors and do not necessarily reflect the views of the Michigan Department of Environment, Great Lakes, and Energy and the National Oceanic and Atmospheric Administration.

³ For a more detailed discussion of Great Lakes water level and shoreline processes, see Richard K. Norton, Guy A. Meadows, and Lorelle A. Meadows. 2013. "The deceptively complicated 'elevation ordinary high water mark' and the problem with using it on a Great Lakes shore." *Journal of Great Lakes Research* 39(2013):527-535.

Michigan passed the Great Lakes Submerged Lands Act in 1955⁴, for example, followed by the Shorelands Protection and Management Act in 1970.⁵ Similarly, during the 1970s and 1980s—in the middle of an extended period of high water levels—the state of Michigan commissioned a number of reports and produced a number of guidance brochures, including legal analyses focusing on local zoning authorities and model zoning provisions.⁶ Aside from additional information booklets and studies published in the late 1990s and early 2000s (i.e., at the end of the last extended period of high lake levels),⁷ relatively little has been published on the state of shoreland management efforts, or providing guidance for improving local shoreland management, since.

Today, it makes little sense to present a single recommended model zoning ordinance, or even specific recommended model zoning provisions, because of the unique conditions that any given stretch of Great Lakes coastline enjoys, and given the wide array of approaches to zoning that Michigan communities already employ. Rather, we present some background information on enabling authorities; a summary of key shoreland management issues a coastal locality typically faces, along with corresponding regulatory goals it might adopt; a set of zoning options a locality might employ to advance one or more of those regulatory goals; and a set of questions and other considerations to account for in deciding how to proceed. Altogether, these materials provide a protocol a locality can use to tailor its development management program, including especially its local zoning regulations, to best manage its Great Lakes coastal shorelands so as to conserve Michigan’s coastal resources while respecting coastal shoreland owners’ private property rights.

For purposes here, we refer to the submerged land and dry beach immediately at the water’s edge of a Great Lake as the ‘coastline’ or ‘shoreline.’ We refer to the land area relatively close to a Great Lake that might be affected by coastal storms, bluff failures, erosional processes, or other related events within the foreseeable future as ‘coastal shorelands.’ Coastal shorelands include, for example, beaches, foredunes, dunes, bluffs, and near-lake riverine floodplains.⁸

⁴ Public Act 247 of 1955, MCL 322.701 et seq. This act was subsequently amended several times (1958 PA 94, 1982 PA 68, 1982 PA 68, 1985 PA 180), and it has since been consolidated as part of the Natural Resources and Environmental Protection Act (NREPA) (1994 PA 451), Part 325, MCL 324.32501 et seq..

⁵ Public Act 245 of 1970, MCL 281.631. This act has since been consolidated as part of NREPA, Part 323, MCL 324.32301 et seq.

⁶ See for example: Michigan Department of Natural Resources. No Date (but apparently produced in the early 1970s). *Erosion*. Lansing, MI: Water Development Services Division; Earnest F. Brater. No Date (but apparently produced in the late 1970s). *Beach Erosion in Michigan: An Historical Review*. Lansing, MI: Water Development Services Division, Michigan Department of Natural Resources; Jerry Mitchell. 1978. *Legal Analysis of Local Shoreland Ordinances* (Final Draft). Escanaba, MI: CUPPAD Regional Commission (prepared under contract from the Michigan Coastal Management Program, Department of Natural Resources).

⁷ See for example Philip Keilor. 2003. *Living on the Coast: Protecting Investments in Shore Property on the Great Lakes*. Madison, WI: University of Wisconsin Sea Grant Aquatic Sciences Center (prepared under contract from the U.S. Army Corp of Engineers, Detroit Division).

⁸ These definitions are consistent with, but more illustrative than, those provided by Part 323 (Shorelands Protection and Management) of NREPA: “(f) ‘Shoreline’ means that area of the shorelands where land and water meet”, and “(e) ‘Shoreland’ means the land, water, and land beneath the water that is in close proximity to the shoreline of a Great Lake or a connecting waterway” (MCL 324.32301).

Authorities

The primary purpose of this analysis is to address the management of Great Lakes coastal shorelands in terms of the public regulation of the use and development of privately owned shoreland areas, as well as public investment in infrastructure like roads, water, and sewer systems within those shoreland areas, for a variety of reasons noted below. Historically in Michigan, as with the rest of the U.S., most of the responsibility for managing coastal shorelands—especially those beyond the coastline itself—falls to the state and especially to local government.⁹

The federal government plays a role in Great Lakes coastal management primarily through programs administered by the Federal Emergency Management Agency (FEMA, including most prominently the National Flood Insurance Program—NFIP), and through permits issued by the U.S. Army Corp of Engineers for the placement of structures within waters of the U.S.¹⁰ The latter is sometimes referred to as the federal navigational servitude, and it is applicable lakeward of an elevation-based ‘ordinary high-water mark’. In any case, while these programs are important where they apply, they are also limited in terms of the shorelands to which they apply—primarily at the shoreline or lakeward of it, or along riverine areas that are not necessarily coastal.¹¹

The state of Michigan plays a more substantial role with regard to the management of development within Great Lakes coastal shoreland areas. It enjoys the authority to provide public services and to manage private land use through a combination of constitutional and common law doctrines.¹² Upon admission to the Union, the electors of the state recognized the

⁹ For more information on Great Lakes coastal management issues generally, as well as findings from a study of current shoreland management efforts by Michigan’s Great Lakes coastal localities specifically, see: Richard K. Norton, Nina P. David, Stephen Buckman, and Patricia D. Koman. 2018. “Overlooking the coast: Limited local planning for coastal area management along Michigan’s Great Lakes.” *Land Use Policy* 71(2018): 183-203.

¹⁰ The Great Lakes are also an international water body, implicating international authorities that have some implications—albeit limited—regarding shoreland management. For a thorough discussion of legal doctrines as they relate to governance of the Great Lakes generally, see Noah D. Hall and Benjamin C. Houston. 2014. “Law and governance of the Great Lakes.” *DePaul Law Review* 63(723): 723-770). For an overview of governance of Great Lakes shorelands in particular, see Richard K. Norton and Guy A. Meadows. 2014. “Land and water governance on the shores of the Laurentian Great Lakes.” *Water International* 39(6): 901-920.

¹¹ Through the NFIP, FEMA produces Flood Insurance Rate Maps (FIRMs) and it requires that localities participating in the NFIP adopt floodplain regulations to control development within designated flood areas. Great Lakes coastal localities participating in the NFIP, therefore, should have already adopted some minimal protections against hazardous flooding either through their zoning codes or stand-alone floodplain management ordinances. These protections apply to near-lake coastal shorelands along riverine systems as they drain into a drowned river mouth lake or delta (e.g., Pere Marquette Lake), or directly into a Great Lake. Unlike in ocean coastal settings, FEMA has not adopted maps showing coastal zones at risk from high-velocity or high-energy waves (often referred to as VE zones), although it is currently conducting a study and may adopt formal maps showing Great Lakes coastal VE zones in the future (see <http://www.greatlakescoast.org/great-lakes-coastal-analysis-and-mapping/>).

¹² Article IV, Section 52 of the Michigan Constitution, for example, provides:

The conservation and development of the natural resources of the state are hereby declared to be of paramount public concern in the interest of the health, safety and general welfare of the people. The

inherent powers enjoyed by the state, along with limitations on those powers, in ratifying the Michigan Constitution.¹³ Most notably for purposes here, those inherent powers include powers and duties emanating from the police power and the public trust doctrines.¹⁴

Through its inherent police power authorities, the state has the broad prerogative to adopt regulations and establish programs designed to protect public health, safety, morals, and the general welfare.¹⁵ Through the public trust doctrine, the state owns the submerged lands of the Great Lakes. It also holds in trust for the people of the state an interest—for the purposes of navigation, fishing, commerce, and recreation—in the navigable waters, submerged lands, and shorelands of the lakes up to the ‘ordinary high-water mark.’¹⁶

Drawing on those authorities, the state of Michigan has adopted several acts that speak directly to the regulation of Great Lakes shorelands, all of which are now codified in the Natural Resources and Environmental Protection Act (NREPA).¹⁷ These include: floodplain protection (Part 31);¹⁸ wetlands protection (Part 303);¹⁹ shorelands protection and management (Part 323,²⁰ speaking specifically to state-designated “high risk erosion areas” (HREAs), “environmental areas” (EAs), and “flood risk areas” (FRAs)); submerged lands of the Great Lakes (Part 325);²¹ and sand dune protection (Part 353,²² speaking specifically to state-designated “critical dune areas” (CRAs)).²³

legislature shall provide for the protection of the air, water and other natural resources of the state from pollution, impairment and destruction.

¹³ See John J. Rae, ed. 1999. *Local Government Law and Practice in Michigan*. Michigan Municipal League. § 1.2.

¹⁴ For a detailed analysis of the sources of the police power and public trust doctrines, and their applicability along Michigan’s Great Lakes shorelands, see: Richard K. Norton and Nancy H. Welsh. 2019. “Reconciling police power prerogatives, public trust interests, and private property rights along Laurentian Great Lakes shores.” *Michigan Journal of Environmental & Administrative Law* 8(2): 409-476. In addition to these sovereign powers, the state of Michigan may enjoy the ‘property power’—the power to take actions to protect both public and private property. We are currently researching the contours and potential scope of that power for future presentation.

¹⁵ See, e.g., *Clements v. McCabe*, 210 Mich. 207 (1920). See also generally Gerald A. Fisher, *et al.* 2019. *Michigan Zoning, Planning, and Land Use* (January 2019 Update). Ann Arbor, MI: Institute of Continuing Legal Education (discussing planning and zoning authorities specifically in Michigan); Julian C. Juergensmeyer, *et al.* 2018 *Land Use Planning and Development Regulation Law* (4th Ed.). St. Paul, MN: Thompson West (discussing planning and zoning authorities broadly in the U.S.).

¹⁶ See, e.g., *State v. Venice of America Land Co.*, 160 Mich. 680 (1910); *Nedtweg v. Wallace*, 237 Mich. 14 (1926); *Glass v. Goeckel*, 473 Mich. 667 (2005).

¹⁷ Public Act 451 of 1994, MCL 324.101 *et seq.*

¹⁸ MCL 324.3108.

¹⁹ MCL 324.30301 *et seq.*

²⁰ MCL 324.32301 *et seq.*

²¹ MCL 324.32501 *et seq.*

²² MCL 324.35301 *et seq.*

²³ For a general overview of these and other state and local programs addressing land-use related environmental protection issues in Michigan, see Katherine A. Ardizzone and Mark A. Wyckoff. 2010. *Filling the Gaps: Environmental Protection Options for Local Government* (2nd Ed.). Lansing, MI: Michigan Department of Environmental Quality, Coastal Zone Management Program.

In turn, through these acts, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) regulates directly the development and use of these specific state-designated Great Lakes shoreland areas, following administrative procedures that are detailed and extensive.²⁴ As with federal law, however, while those regulatory programs are important where they apply, they are also limited in terms of the Great Lakes shorelands to which they apply. The HREA and EA regulations, for example, each apply to only about 10 percent of the state's some 3,200 miles of linear shoreland area.²⁵

Because the state's current shoreland management program is so limited spatially, and given the historical devolution of land management authorities from the state to local government, coastal localities play the primary role in managing the development and use of the state's coastal shorelands. This is true especially for shorelands not currently at risk from coastal storms but that could be at risk within a long-term planning horizon given Great Lakes shoreline dynamics, discussed more below.

The primary authorities that localities enjoy for managing land use are the authority to adopt zoning, guided by the authority to engage in community master planning. These authorities generally, and the authority to regulate through zoning in particular, is a specialized exercise of the police power.²⁶ The Michigan Supreme Court ruled early in the 20th Century that localities do not enjoy the power to zone through their broad, delegated police power authorities, but that it must be delegated specifically to them by the state.²⁷ The Michigan legislature subsequently enabled all of Michigan's localities—villages, cities, townships, and counties—to undertake both community master planning and zoning through several separate enabling laws, which today have been consolidated in the Michigan Planning Enabling Act (MPEA)²⁸ and the Michigan Zoning Enabling Act (MZEA), respectively.²⁹

It is important to note that the MZEA requires that a “zoning ordinance shall be based upon a plan designed to promote the public health, safety, and general welfare....”³⁰ Local planning engaged pursuant to the MPEA thus plays an important role both in satisfying this requirement and in ensuring that zoning provisions such as those discussed here are coherent,

²⁴ See, for example, Administrative Rule sections R.281.21, *et seq.*, which address permitting requirements for development within HREAs, EAs, and FRAs.

²⁵ For overviews of these programs and information regarding the spatial extents of them, see: https://www.michigan.gov/egle/0,9429,7-135-3313_3684_3725---,00.html (Floodplain Management, including the National Flood Insurance Program); https://www.michigan.gov/egle/0,9429,7-135-3313_3687---,00.html (wetlands protection); https://www.michigan.gov/egle/0,9429,7-135-3313_3677_3700---,00.html (Shorelands Management Program); https://www.michigan.gov/egle/0,9429,7-135-3313_3677_3702---,00.html (Submerged Lands Program); and https://www.michigan.gov/egle/0,9429,7-135-3311_4114-9832--,00.html (Critical Dunes Area Program).

²⁶ See Gerald A. Fisher. 2019. “Chapter 1: Overview of zoning and planning.” In, Gerald A. Fisher, *et al.*, *Michigan Zoning, Planning, and Land Use* (January 2019 Update). Ann Arbor, MI: Institute of Continuing Legal Education.

²⁷ *Clements v. McCabe*, 210 Mich. 207 (1920).

²⁸ Public Act 33 of 2008, MCL 125.3801, *et seq.*

²⁹ Public Act 110 of 2006, MCL 125.3101, *et seq.*

³⁰ MCL 125.3203.

comprehensible, appropriately designed, and well-justified—all for the purposes of informing landowners looking to understand what they are allowed to do with their shoreland properties, zoning administrators as they administer the local zoning code, and courts as they adjudicate disputes that may arise.³¹ Nonetheless, the focus of the material presented here is on the process and provisions that localities might adopt for coastal shoreland management through their zoning ordinances, assuming that the need for and contours of those provisions have been called for and contemplated by the locality through its planning efforts.

Finally, note that the state provisions for the regulation of shorelands pursuant to floodplain risk areas, high risk erosion areas, environmental areas, and critical dune areas described above all allow localities to administer regulations adopted pursuant to those provisions, or specifically enable localities to adopt zoning regulations for those purposes with reference to the MZEA. In any of these cases, a locality zoning to manage its shorelands for any of those purposes must submit their ordinances to EGLE for review and approval. Even so, all of these provisions allow localities to adopt regulations more stringent than the minimum provisions established by state law, save for those addressing critical dune areas under Part 353, which has pre-empted local regulation more stringent than the provisions established by that part.³² Accordingly, the zoning provisions presented here pertain to provisions that a locality might adopt to regulate its shorelands for the purposes of hazard mitigation and environmental conservation broadly, either in conjunction with the relevant state-established program or separate from it (or in addition to it), excluding the regulation of state-designated critical dune areas *per se*.

Shoreland Management Study Overview

The need for improved local management of coastal shorelines given the dynamic nature of those shorelines—dynamics that are increasingly exacerbated by the effects of climate change—has been well established in the academic and practitioner literatures. This includes the need for improved local management of Great Lakes coastal shorelands.³³ In fact, the Great Lakes pose a unique challenge because of the effects of lake water level fluctuations over time, as noted above.³⁴

Most importantly, while the lakes are not large enough to be discernably tidal, they fluctuate in vertical elevation substantially over the course of decades. As a result, when the lakes are low for extended periods, Great Lakes beaches may appear to accrete. As lake levels rise again,

³¹ See Richard K. Norton. 2011. “Who decides, how and why? Planning for the judicial review of local legislative zoning decisions.” *The Urban Lawyer* 43(4):1085-1105.

³² MCL 324.35312(2).

³³ See, e.g., Richard K. Norton et al. 2018. “Overlooking the coast: Limited local planning for coastal area management along Michigan’s Great Lakes.” *Land Use Policy* 71(2018): 183-203.

³⁴ See Richard K. Norton et al. 2013. “The deceptively complicated ‘elevation ordinary high water mark’ and the problem with using it on a Great Lakes shore.” *Journal of Great Lakes Research* 39(2013):527-535.

however, sandy beaches quickly erode away. Moreover, when lake levels are high for extended periods, the lakes erode their shorelines aggressively, especially along beaches characterized primarily by sands and gravels. Thus much of Michigan’s Great Lakes shorelines are experiencing long-term erosion rates of about one foot per year landward on average, but they experience that erosion in a ‘two-step-forward-one-step-back’ progression as lake levels fluctuate. That phenomenon obscures the long-term erosion dynamic, and it makes the process of fixing relevant setback lines challenging, as discussed more below.

Given the authorities localities enjoy to manage Great Lakes shorelands, and given the unique challenges posed by Great Lakes dynamics, we conducted a web-based review of analyses and model zoning provisions that might inform local zoning efforts by Michigan’s Great Lakes coastal localities. A selection of those materials is provided in Appendix A. In addition, drawing from those provisions and the academic literature, we developed an evaluation protocol to assess local zoning ordinances with regard to their coastal shoreland management provisions, we collected local zoning ordinances within the Networks Northwest Region available on the web, and we evaluated a selection of them using that protocol (totaling 20 codes evaluated, including 12 townships, five cities, and three villages). Table 1 presents selected findings from that evaluation exercise. Finally, using that background literature review and code evaluation exercise, we developed the preliminary guidance materials presented here.

Table 1. Results from evaluation of selected local zoning ordinances in the Networks Northwest Region. (20 codes evaluated: 12 townships, 5 cities, and 3 villages)

Provision	Number (percent)
<i>Special Great Lakes Shoreline Protection / High Hazard District</i>	5 (25%)
Construction-related provisions (in general or within a GL District)	7 (35%)
Development limitations on or with regard to:	
Steep slopes	11 (55%)
Impervious surfaces / non-point source pollution	10 (50%)
Vegetation removal	10 (50%)
Septic systems	8 (40%)
Placement of armoring structures (e.g., seawalls)	5 (25%)
Structural protections for buildings (e.g., elevation)	3 (15%)
<i>Setbacks from Great Lakes Coastline Specifically</i>	14 (70%)
Setbacks tied to:	
Property line	2 (10%, 14% of those using setbacks)
Ordinary high-water mark	10 (50%, 70% using setbacks)
Process for siting OHWM provided	4 (20%, 29% using setbacks)
Natural feature other than OHWM	5 (25%, 36% using setbacks)
<i>Post-Storm Recovery / Response Performance Guarantee</i>	0 (0%)

Zoning Processes and Provisions for Great Lakes Coastal Shoreland Management

General Purposes for Shoreland Management Zoning

Drawing from the sources noted, we identify five larger purposes for which a Great Lakes coastal community might adopt shoreland management provisions, including the following.

1. **Hazard mitigation.** Provisions designed to protect the following from storm-related flooding and high-energy wave damage:
 - Private shoreland and beaches, including
 - Uplands beyond the coastline but subject to inundation and high-energy waves
 - Private/public trust beach (i.e., publicly owned beach and privately owned beach subject to the public trust interest lakeward of the OHWM)
 - Private and public structures within the shoreland area subject to inundation and waves
 - State lake bed and beach shoreland as boundaries naturally shift over time, including
 - State submerged lands
 - Public trust/private beach
2. **Post-storm response and recovery.** Provisions designed to ensure that funds for post-storm response and recovery:
 - Minimize the cost of response and recovery efforts
 - Fairly allocate those costs incurred vis-à-vis the benefits of the developed land uses affected
3. **Resource conservation and pollution control.** Provisions designed to ensure the following:
 - Safeguard the natural movement of the Great Lakes shoreline and beach over time
 - Conserve coastal wetlands and other natural habitats
 - Minimize water flows perpendicular to the shore or flowing from upland areas to the shore that might accelerate and/or otherwise alter natural erosion processes
 - Minimize non-point source pollution, including
 - Runoff from impervious surfaces
 - Septic discharges
4. **Aesthetics / cultural preservation.** Provisions designed to ensure the following:
 - Protect the visual setting along the shore, including sight lines perpendicular to the shore and the massing of structures along the shoreline
 - Conservation of historic structures and other culturally important features
5. **Public access.** Provisions designed to ensure adequate access of the public to public trust beaches for the purposes of beach walking and other appropriate recreational activities.

Options for Zoning / Local Regulation (Overview)

To advance those general purposes or goals, Michigan’s coastal communities face several fundamental options for adopting zoning codes, or amending their current codes, including the following, most of which are not exclusive.

1. **Do nothing.** Under this option, a community would:
 - Rely on beach nourishment (i.e., deposition of sediments onto beaches to maintain them), if source sediments are readily available (e.g., from nearby channel dredging projects);
 - Allow lake-bed armoring (i.e., lakeward of the OHWM) by private shoreland owners seeking to protect their properties (if permitted by the state and federal governments);
 - Allow shoreland armoring (i.e., landward of the OHWM) for the same; and/or
 - Allow (or experience) natural shoreline dynamics, and rely on private structural retreat where property owners make the decision to retreat individually.

2. **Address shoreland management through general provisions only** (i.e., not a Great Lake shoreland district specifically). Under this approach, a community might use or continue a variety of provisions applicable throughout the most or all of the jurisdiction zoned, such as:
 - Protections for wetlands;
 - Controls on impervious surfaces to control water flow and nonpoint source pollution;
 - Controls on the development of steep slopes (or tops of bluffs) to diminish the risk of bluff failures; and/or
 - Generic setbacks from property lines (e.g., a standard but arbitrary 30 ft. setback from the ‘rear’ or lakefront lot line, not necessarily adjusted for shoreline movement).

3. **Adopt a coastal shoreland district or overlay zone with development management provisions.** Under this approach, the default would be to allow for development within the shorelands district, with standards imposed to address potential harms or protect coastal resources (such as those just described; see more discussion below). This approach might include the adoption of shoreline setbacks tied to natural features and/or dynamic shoreline movement.

4. **Adopt dynamic setbacks from Great Lakes shorelines.** Under this approach, the default would be to prohibit development of most structures (and/or permanent structures) lakeward of the setback, possibly with provisions for variances (see more discussion below). Setbacks might be adopted as free-standing provisions, or included as part of a coastal shoreland district or overlay zone.

5. **Impose post-storm response and recover bond (performance guarantee) requirements.** While not clearly enabled by the MZEA,³⁵ a growing number of communities in Michigan are

³⁵ Section 505(1) of the MZEA (MCL 125.3505(1)) authorizes the imposition of a performance guarantee to “ensure compliance with a zoning ordinance and any conditions imposed under a zoning ordinance,” which is a broad

requiring that developers of cell tower facilities and wind turbines post bonds or performance guarantees to ensure that those facilities are removed and the sites restored (or adequately and appropriately replaced) at the end of the service life of the facility. It may be possible for coastal communities to similarly require the posting of a response and recovery bond to be used if and when a structure becomes irreparably damaged by a coastal storm. That requirement might be imposed, for example, at the time the structure becomes a nonconforming use by virtue of a new or shifted setback. The purpose of the bond would be to ensure that the structure is adequately and safely removed once damaged, or if and when placed at unacceptable risk by a coastal storm or by long-term erosion, and that the cost of doing so is born by the property owner who benefited from the structure rather than the general public.

Coastal District / Overlay District Provisions

If a coastal community decides to adopt a special Great Lakes shoreland district, or an overlay district, the community should consider the following issues and provisions:

- The establishment of the **spatial boundaries** of the district. Approaches to doing so might include or be based on, for example:
 - A standard (but arbitrary) distance from the shoreline (e.g., 1000 feet)
 - A point based on an anticipated erosion distance (e.g., the 30 year, 60 year, or some longer erosion rate)
 - A point based on some other existing natural feature (e.g., dune field, some distance beyond the top of a bluff line)
 - A boundary based on potential inundation areas during extreme coastal storms (i.e., including storm surge and flooding)
 - Some combination of these approaches
- The establishment of **dynamic shoreline setbacks** (see below).
- The establishment of other restrictions and/or requirements related to the **development and use** of shorelands, such as:
 - Limits on lot splits, limits on the creation of sub-standard lots, and/or provisions for lot consolidation of substandard lots
 - The requirement that lakefront lots be 'deep' (i.e., extending for some substantial distance away from the shoreline) to allow for the eventual movement of structures landward
 - Provisions addressing the placement of structures so as to limit potential for damage from structural projectiles during storms or ensure adequate access for post-storm recovery (e.g., limits on density or the proximity of structures to one another)

provision, but the details of that section appear to contemplate primarily (perhaps only?) a bond intended to ensure the completion of improvements required during some construction or development-related project, with a date-certain timeframe, rather than an more open 'end of serviceable life' timeframe.

- The establishment of structural requirements so as to minimize **risks to structures** caused by storms or ongoing erosion, such as:
 - Requirements to anchor buildings and/or elevate them above the base flood elevation or a storm-surge elevation
 - Limitations on overall size, story, and/or building footprints
 - Requirements that all structures be (realistically) moveable should erosion or other natural features threaten those structures, including requirements such as:
 - Use of a crawl space for access, but no basement
 - Stud wall construction (not log, brick, stone)
 - Single story construction
 - Regular rectangular or square building footprints
 - Limits on footprint size
- The establishment of provisions to ensure the conservation of **environmental conditions** like coastal habitats and water quality, such as:
 - Requirements for the maintenance of, or prohibitions on the removal of, native vegetation (and/or vegetation generally)
 - Requirements that small wetlands (i.e., those not addressed by state regulation, or augmenting those regulations) be protected and/or restored
 - Provisions requiring and/or incentivizing the use of landscaping (especially “living shoreline” landscaping) in lieu of hard armoring structures
 - Limits on the use and/or placement of septic systems
 - Requirements for the use of “green infrastructure” (e.g., swales, rain gardens) to control the infiltration of surface water runoff (promoting the natural filtration of surface waters, but attending to the potential deleterious effects of infiltration on bluff stability)

Dynamic Shoreline Setbacks

In addition to a special Great Lakes shoreland zoning district, or in conjunction with the establishment of such a district, a coastal community might consider the adoption of setbacks from the shoreline that are based upon the natural features and dynamics of that shoreline, and that are tied to the natural movement of that shoreline over time. In adopting such setbacks, the community should consider the following issues and provisions:

- The **specific and unique shoreland features** to be considered in establishing the setback, such as:
 - The height and slope of banks and/or bluffs, along with shoreline stability
 - The natural background erosion rate for the area or subareas
 - The presence of other existing natural features of concern (e.g., wetlands, dunes)
 - The lot sizes and dimensions of existing lots, especially those that have been developed
 - The amount and types of existing structural development, including shoreline armoring

- The appropriate shoreline feature(s) from which to **benchmark the setback**, such as:
 - Shoreland property lakeside boundary lines³⁶
 - The water's edge³⁷
 - A designated high-hazard boundary (e.g., a high-hazard line that could be estimated should a 'perfect' coastal storm hit, accounting for high lake levels and storm surge)
 - The 'ordinary high water mark' (OHWM), which might be, for example,
 - Defined via the federal or state regulatory OHWM boundary and fixed by the state, or
 - Defined in the local ordinance itself and fixed by local officials or the petitioner following a prescribed analytical process
 - An erosion hazard or shoreline recession line (e.g., the 30-year or 60-year erosion hazard or recession line, etc.)

Ordinance Mechanics to Address

In drafting these various provisions, the coastal locality should address a variety of considerations related to the mechanics of both developing the provisions and implementing them, such as the following:

- Providing a **statement of findings and intent** that both justifies and contextualizes the requirements;
- Clearly specifying **allowable uses**, accessory uses, prohibited uses, and so on, within the shoreline district and/or setback area;
- Clearly specifying **permitting requirements** (e.g., standards for site plan review, standards and procedures for special uses);
- Establishing special provisions for coastal districts and/or setbacks through the use of **planned unit development (PUD)**, **special exception use (SEU)**, or **conditional use** provisions;
- Clearly establishing appropriate conditions, types, and standards for the issuance of **variances** within coastal shoreland districts and/or setbacks;
- Addressing the creation, continuance, and removal of **nonconforming uses and structures** within coastal shoreland districts and setback areas, such as:
 - Allowing the rebuilding of structures damaged to whatever extent and however damaged, without altering use or structure dimensions, if site conditions allow; or

³⁶ Note that even though shorefront properties are 'moveable freeholds,' where the shoreline boundaries of those properties naturally move as the shoreline accretes and erodes over time (see *Glass v. Goeckel*, 473 Mich. 667 (2005)), the property line is not a good feature, and we do not recommend its use, for the purpose of benchmarking a naturally shifting setback because of potential confusion regarding the legal status of that boundary and because of the regular movement of it over shorter periods of time.

³⁷ We similarly do not recommend the use of the water's edge as a setback benchmark for the same reasons noted, regardless of whether the water's edge serves as a property boundary or is lakeward of a platted property boundary.

- Allowing the rebuilding of structures damaged for non-coastal-dynamics reasons only (e.g., fire) if conditions allow, while requiring removal of a structure if damaged X% by coastal dynamics; or
- Requiring removal of structures damaged X% by whatever cause
- Stating the intent to (and effectively providing notice of) **periodic review of setback lines** and/or coastal district boundaries, which may result in non-conforming status based on changes in natural conditions; and
- Linking the proposed zoning provisions to other state program requirements and local ordinances.

Questions to Ask in Drafting the Ordinance

Finally, in anticipation of drafting coastal shoreland management provisions, and during the process of doing so, local officials and citizens should continually reflect on a number of pivotal issues and decision-points that will shape the overall approach taken, such as the following.

1. What are the primary goals of the ordinance, especially where goals may conflict? Most pointedly, when natural processes are highly dynamic and both objectives cannot be served simultaneously, has the community decided to save the naturally functioning beach even at the expense of a beach structure, or has it decided to allow a shoreland property owner to save the beach house even at the expense of the naturally functioning beach?
2. What is the appropriate method to be used in drawing the boundaries of districts and/or benchmarking the boundaries for setbacks given the larger goals for which those provisions are being adopted? The code might employ, for example:
 - Textual definitions and references only (especially if relying on a state-established boundary);
 - Textual descriptions and fixed/mapped locations made within the ordinance itself (i.e., established and fixed by the community in adopted the ordinance); or
 - A textual description of the boundary conceptually and an analytical siting process for siting the boundary provided by the ordinance, with the analysis and actual siting conducted by local officials or by the petitioner on an as-needed basis.³⁸
3. Similarly, given the characteristics of the shorelands at issue and the approach taken by the community through its existing code, does it make most sense for the community to adopt shoreland management provisions that are specific and fixed, providing increased certainty regarding potential uses and requiring little discretion on the part of the zoning administrator, but correspondingly providing less flexibility for shoreland property owners? Or, alternatively, does it make most sense to use an approach based on performance

³⁸ If the latter, the code should also specify whether the analysis must be conducted by some type of certified professional, subject to site plan review, etc.

standards (e.g., via PUD provisions), providing more flexibility for the shoreland property owner but correspondingly raising the potential for inappropriate or unwieldy discretionary decision-making by local officials?

4. Does the code adequately and appropriately specify monitoring and administration responsibilities, and given that question along with review of the provisions themselves, is it credibly possible to adequately monitor and administer the new code provisions?
5. Is the code adequately and appropriately linked to, or at least not in conflict with, other local zoning, subdivision, and related regulatory provisions that apply to the development and use of coastal shorelands (e.g., building standards, requirements regarding the use, siting, maintenance, and/or removal of septic systems)? Is it similarly linked to and in compliance with applicable state regulatory programs (e.g., the HREA program)?
6. Finally, does the code clearly specify an appropriate and fixed period for reviewing the boundaries of a shoreland district and/or setback, and does it clearly state the implications of adjusting those boundaries (specifically, potentially converting a permitted structure to a nonconforming use/structure status)?

Appendix – Links to Selected Model Ordinances

Wetlands Buffer:

- http://www.aswm.org/pdf_lib/model_ordinance_1209.pdf
- <http://dnr.wi.gov/topic/ShorelandZoning/documents/NR117model.pdf>
- <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.319.6568&rep=rep1&type=pdf>
- https://www.scdhec.gov/HomeAndEnvironment/Docs/CLBO_Manual.pdf

Riparian Buffer:

- http://www.hrwc.org/wp-content/uploads/2009/11/HRWC_riparianbuffer_model_ordinance.pdf
- http://www.epa.gov/sites/production/files/2015-12/documents/2002_09_19_nps_ordinanceuments_buffer_model_ordinance1.pdf
- <http://superiorwatersheds.org/images/riparianbufferreportnew.pdf>

Maximum % lot coverage (limiting impervious surfaces):

- <http://www.oregon.gov/lcd/docs/publications/wqgbchapter4zon.pdf>
- http://www.ncwrpc.org/county_ftp/NR115/Chapter2.pdf
- <http://www.dem.ri.gov/programs/bpoladm/suswshed/pdfs/imperv.pdf>
- http://www.fws.gov/southwest/es/Documents/R2ES/LitCited/4TX_Sal/Arnold_and_Gibbons_1996_Impervious_cover.pdf

Fencing Regulations for Waterfront properties (viewshed protection):

- <http://www.preservationnation.org/information-center/law-and-policy/legal-resources/preservation-law-101/resources/Viewshed-Protection.pdf>

General Model Ordinance Information:

- <http://dnr.wi.gov/topic/ShorelandZoning/documents/NR115ModelOrdinance.pdf>
- http://seagrant.noaa.gov/Portals/0/Documents/what_we_do/social_science/ss_tools_reports/resilient-planning_web.pdf
- <http://coastalsmartgrowth.noaa.gov/elements/design.html>
- <http://dnr.wi.gov/topic/ShorelandZoning/LocalGovResources/local.html>
- <http://www.miseagrant.umich.edu/wp-content/blogs.dir/1/files/2013/08/13-720-Best-Practices-Working-Waterfronts-Case-Study.pdf>
- <http://dnr.wi.gov/topic/ShorelandZoning/documents/annotatedordinance.pdf>
- <https://coast.noaa.gov/czm/enhancement/media/mi3092011.pdf>
- <http://coastal.ohiodnr.gov/ocmp>
- <http://www.semcog.org/reports/lid/index.html#>
- http://landpolicy.msu.edu/resources/rural_water_quality_protection_a_planning_zoning_guide_book_for_local_offici