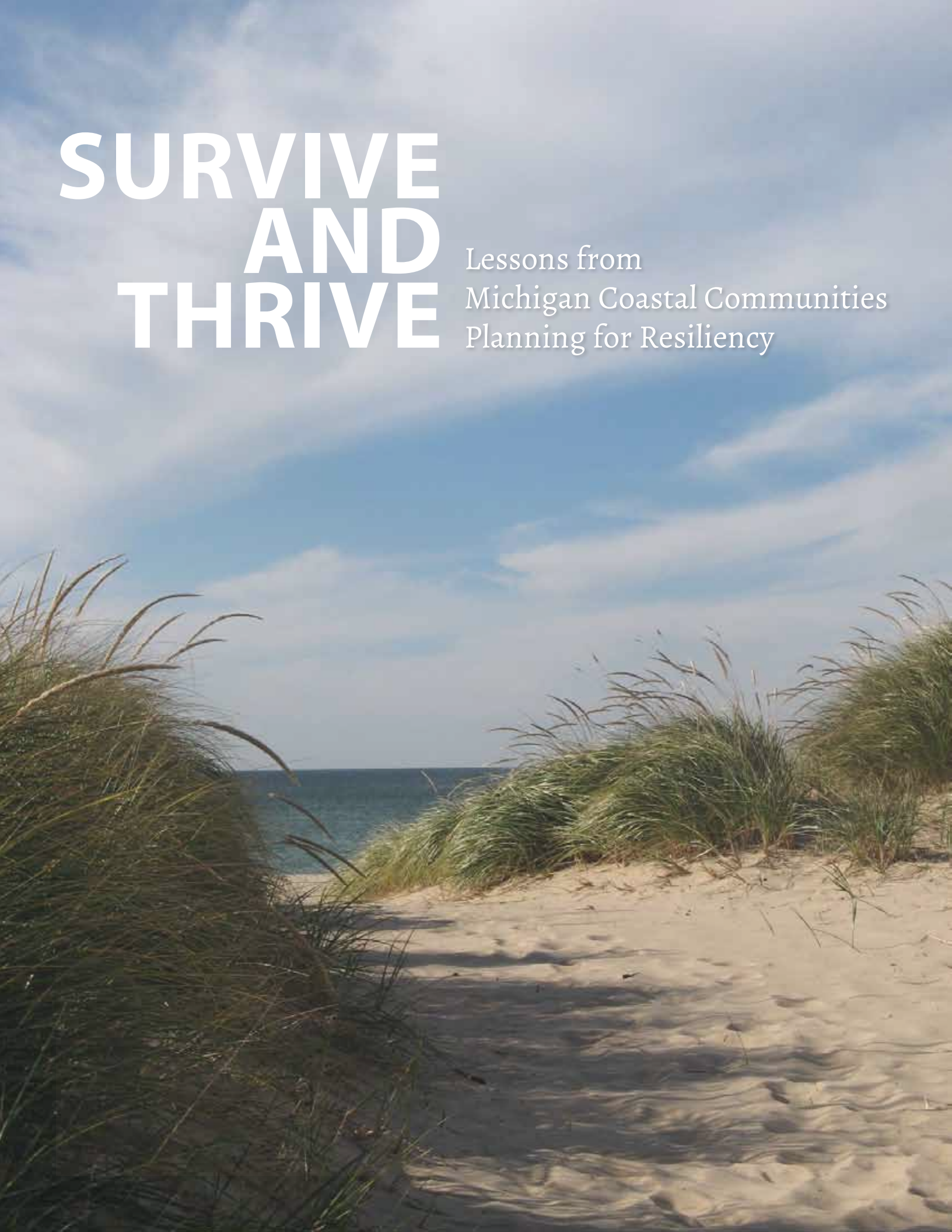
SURVIVE AND THRIVE

Lessons from
Michigan Coastal Communities
Planning for Resiliency



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Why Planning for Resiliency is Important

We create master plans because we want our communities to thrive, both now and in the future. More and more, there is a sense that these plans should focus on making our community as "resilient" as possible in the face of a complex, changing world. Resilience can be defined as the ability of a community to recover or "bounce back" from adversity – whether an economic downturn, extreme weather, environmental disaster or demographic shift.

Resiliency can be incorporated into a community's planning in many ways. It can take the form of the required county "All Hazards Plan," which is incident- or response-based, or incorporated into a master plan to make a community's land and infrastructure better able to withstand shocks to the system, whether they increased precipitation and flooding, shoreline erosion and inundation associated with lake level fluctuation, disruptive technology or environmental contamination.

As communities plan for their future, it is important to anticipate trends and changes that could negatively impact the resilience of the community. Incorporating data and best practices into the master plan process can help a community, literally and figuratively, weather the storms on the horizon.

Over the course of three coastal resiliency projects funded by the Michigan Coastal Zone Management Program, the Michigan Association of Planning (MAP) has started learning what works and what does not. This report is intended to be a resource for communities that wish to learn from these projects and the communities that participated in them.

Learning What Works

A strong partnership between MAP and the Coastal Zone Management (CZM) program in Michigan's Office of the Great Lakes (OGL) emerged in 2014, starting with a strategic approach to increase the knowledge of municipal planners and officials about community resilience to climate impacts. At that time, there were few community planners integrating climate change, resilience or coastal management into master plans or policies. While MAP had previously devoted issues of the *Michigan Planner* magazine and two Resilience Summits to the topic, the understanding of resilience science and practice was practically non-existent among the professional planning community in Michigan. The partnership developed a program of four distinct phases that was introduced into 11 pilot communities.

In Phase 1 of the partnership, MAP developed a curriculum on coastal sustainability and resilience and launched the Master Planning for Sustainability and Resilience workshop in five locations across the state. Over 200 individuals participated in the training. This would be the start of a strategic knowledge-building effort that would span the next 5 years.

Building on the resiliency training project, MAP's Phase 2 grant commenced in 2015 – 2016. The Master Planning for Sustainability and Resilience Pilot enabled MAP to provide funding to six coastal communities to assist in hiring consultants for their local master planning efforts: the cities of Bay City, Trenton, and Hancock, the village of Sebewaing, the township of Baraga and the West Michigan Shoreline Regional Development Commission (WMSRDC). The goal of the Phase 2 work was to provide concrete examples that demonstrate the myriad ways resilience best practices can be integrated into a master plan, showing a way forward to other coastal communities in Michigan.

MAP Resilience Objectives

- Elevate the understanding of local government leaders that climate change is real, and that it will have serious impacts on our communities
- Help local leaders understand that local planning and zoning policy changes can help communities adapt to external shocks such as climate change
- Provide support for master plans that set policy direction for community resiliency
- Increase awareness of zoning best practices so that decision makers do not exacerbate and perpetuate harmful planning practices
- Provide direct technical assistance to communities to encourage implementation of resiliency plans
- Build a robust knowledge base and integrate lessons learned and input received during planning processes

MASTER PLAN PILOT COMMUNITIES

Baraga Township
City of Bay City
City of Hancock
City of Trenton
Village of Sebewaing
Muskegon Lake: City of Muskegon
Laketon Township
City of North Muskegon

IMPLEMENTATION PILOT COMMUNITIES

City of Grand Haven
City of Marquette
City of Trenton
Village of Mackinaw City
Village of Sebewaing

A key element of the six pilot master plan projects was the inclusion of data on local climate trends and lake level variation. Much of this information was provided by Land Information Access Association (LIAA) and the University of Michigan (UM). LIAA and UM have been advocates and leaders in Michigan's resilience planning movement. They developed methodologies and best practices based on science, national research, and deep exploration, and worked to engage and deliver resilience plans to frequently resistant audiences.

While master plan policy is an effective way to set the course for local government action, it is within the regulatory realm where real change can happen. Phase 3 of the project, Coastal Resiliency Regulatory Solutions, provided direct financial assistance to communities seeking to implement resiliency elements in their master plans. The funding allowed these communities to hire a planning or environmental consultant to develop and adopt regulatory and policy solutions that would improve resilience to extreme coastal dynamics, long-term climate changes and weather events, and associated environmental, economic, and social impacts.

The project successfully contracted with five municipalities, including returning Phase 2 pilot master plan communities Trenton and Sebewaing, in addition to the cities of Marquette and Grand Haven, and the village of Mackinaw City.

The fourth and final phase of MAP's resiliency project, Planners as Community Resilience Leaders, centered on bringing the lessons of the first three phases to Michigan planning professionals and land use officials. This document is the final product of the Phase 4 work and highlights what was learned by MAP, its Climate Network Partners and participating communities.

The Challenges of Planning for a Resilient Community

As the professional association for community planners and appointed land use officials, MAP understands that community policy directly affects long term community resiliency.

Educating local officials is an important first step, but so often - even when equipped with tools and best planning practices for resiliency planning - there are barriers to moving from planning to implementation. Some of these barriers include:

- Limited "next step" expertise: training is typically enough to introduce awareness of the need to plan for resiliency, but not enough to make technical, science-based changes to local policy;
- Not all local officials have been exposed to sustainability and resiliency concepts, or if they have, they do not understand their elevated role as community leaders to drive policy change;
- Connection with ideological and partisan messaging, which prevents some communities from exploring science-based policy solutions;
- Difficulty rallying leaders and residents around policy change that has longer-term benefits rather than short-term success;
- Lack of funding or staff resources to make necessary changes to the master plan or local zoning codes that will institutionalize or codify resiliency approaches.

MAP interviewed participants from pilot project communities to learn how they addressed these challenges. The following summarizes the lessons learned from these efforts, in the hopes they will help other communities build resiliency into their plans and policies.

Aerial view of the Grand River in Grand Haven after a flood event.

Building Awareness and Capacity

The majority of Michigan's communities do not have a professional planner on staff, and often lack the capacity to advance the policies and plans necessary to incorporate resilience practices into the local work plan. *The Master Planning for Community Resilience* workshops in Phase I were targeted to elected and appointed officials, with the goal of building the capacity of these officials to become the local resilience leaders. However, it soon became clear that as supportive as these officials are, they would need technical assistance and community support to move forward.

Lesson: Training consultants and planning professionals about resiliency approaches can help build community capacity

Municipalities often depend on planning consultants or professional staff to prepare master plans, zoning ordinances and other regulatory amendments. Most of these professionals have the skill set necessary to create zoning and land development ordinance proposals, but only a select few have knowledge to codify resiliency efforts, particularly on coastal-specific issues. Education of planning consultants and professional planners about the tools and techniques available to address resiliency issues continues to be a challenge for moving forward with planning and implementation efforts.

To address this gap, targeted training of planning consultants and professional staff planners, possibly with a 'Train the Trainer' approach, to equip them with the prowess to deliver these resilient planning techniques, would efficiently equip the planners that do much of the work across the state to deliver consistent coastal resilience products.

All of the communities participating in the pilot program used consultants with resiliency planning experience to guide their projects. Participants reinforced the importance of having the technical expertise

Endangered building along Lake Superior shoreline.

of these consultants available to navigate the planning or implementation process. However, recognizing that the area of climate and resiliency planning is relatively new in Michigan, more consultants will require in-depth training to provide the type of technical expertise needed for a growing number of communities interested in tackling resiliency issues. For communities seeking a resiliency planning consultant, one approach to getting the appropriate technical expertise is to start the process with a Request for Qualifications (RFQ). This process allows the community to identify the in-depth knowledge and training desired and determine what firms should proceed to a Request for Proposals (RFP) process. Qualifications to request include completion of MAP's Master *Planning for Sustainability and Resilience* training and experience in creating and mapping vulnerability assessments.

Lesson: The most successful resiliency efforts come from "ready" communities with a sense of urgency

Experience from the pilot master plan communities indicates that communities with concerns about specific local climate or environmental impacts are more motivated to incorporate resiliency components in their master plans and codes. This is especially true for communities concerned about climate and severe weather impact on their economic livelihood. Many pilot master plan communities cited specific concerns that led to their project participation, including ice jams, flooding, shoreline erosion, rising lake levels and intense rain storms. In the case of Muskegon Lake, a winter storm in 2015 that damaged several shoreline assets due to sustained winds during a high water period instilled a sense of urgency for community

involvement. Sebewaing experienced early spring snowmelt and ice jams combined with rising lake levels that caused extensive flooding of the Sebewaing River in the downtown, threatening utility assets essential to the local agricultural processing plant.

Other communities are motivated by an interest in protecting a special environment or preventing property or economic loss. The City of Trenton was motivated by the total loss of its riverfront property: it was too contaminated to re-use and far too contaminated for the city to remediate, and EPA assistance was inaccessible without an updated master plan. The City of Grand Haven and its residents were concerned about improving water quality in a largely developed environment, protecting an area of sensitive features along the shoreline and addressing development and redevelopment pressures that might result in the encroachment of coastal homes too close to Lake Michigan's rising water levels. The City partnered with Grand Haven Township in 2016 to update their master plan through the Resilient Michigan program (www.resilientmichigan.org). The community's commitment to resiliency solutions has been sustained through the city's master planning effort and subsequent code amendments and educational efforts.

If the community sees their resiliency concerns as important, but not urgent, it may be difficult to move forward with meaningful resiliency planning or implementation. One pilot community initially identified extreme cold, heavy storms, flash floods, drought and wildfire as the extreme weather events it wanted to address, but after starting the project, decided it did not have the capacity or political will to address potential responses to these issues. In a situation where the community has identified a valid climate-related issue but does not have the will or wherewithal to address it, an alternative would be to actively participate in the county hazard mitigation planning update process to ensure that issue is included and prioritized.

Even if a community is initially invested in addressing a resiliency concern, it can be challenging to implement the plan later on. In one pilot community, the resiliency recommendations in the newly adopted master plan seemed non-controversial until they were applied to a specific site. In the face of zoning changes to implement the plan, the community opted to adjust its long-term resiliency goals to accept the more immediate economic and environmental benefits of continuing intensive waterfront industrial zoning in the hopes that continued redevelopment may eventually address long-standing contamination issues.

One way to start off the planning effort in the right direction is to begin the process with an education effort. This would involve training for the entire planning team, including planning commissioners, staff, citizen members and elected officials, followed by information sessions for the general public. The benefit of taking the time to educate those involved includes developing a common language to use throughout the planning process and establishing trust by reinforcing that everyone involved is learning.

Finally, it is important to recognize that lukewarm support from community leadership, lack of resources for policy implementation, and competing and more urgent local priorities are potential reasons for putting off or scaling back incorporating resiliency principles until a later plan update, when the community is more ready. However, it also important to note that even a half-successful effort

Muskegon Lake resilience assessment process diagram.

can start a community conversation and provide a foundation for the next time there is an opportunity to update the master plan or revise the zoning ordinance.

Incorporating Resiliency into the Master Plan

One of the most effective ways to address resiliency issues in a community is to plan for them. Most communities already have hazard mitigation plans prepared by county or municipal emergency management professionals. The county plans are rich sources of information on historical weather events and their impacts within the county. This is important for at least two reasons. First, the plans document that weather hazards are real and warrant attention, regardless of personal opinions about the reality of climate change. Second, they provide an excellent starting point for understanding the types of hazards that the community will face at some time in the future – this is valuable where the community has a short institutional memory of past weather-related problems in the region that it might decide to address in its land use plan.

As important as hazard mitigation plans can be, they tend to be operational in nature and typically do not address the potential for changes to land use or investments in infrastructure. Most plans also are limited to addressing extreme weather and climate issues by looking at past weather events, rather than emerging climate science. All six pilot master plan communities went beyond the traditional hazard mitigation approach, with varying degrees of success.

Four of the pilot communities chose to incorporate resiliency into their master plan updates. The advantage of this approach is that it allows for resiliency concepts to be incorporated comprehensively throughout typical master plan topics such as land use, housing, transportation and infrastructure. It also lends a legitimacy that comes from being part of a community's official statement of its future. However, several pilot communities required additional time to create their master plans because other important issues not directly related to the resiliency goals came up during the planning process. In one community, a discussion about incorporating a form-based code prompted a controversy that required additional public meetings and pulled attention away from the resiliency focus.

Another approach taken by one community was to create a standalone resiliency plan,

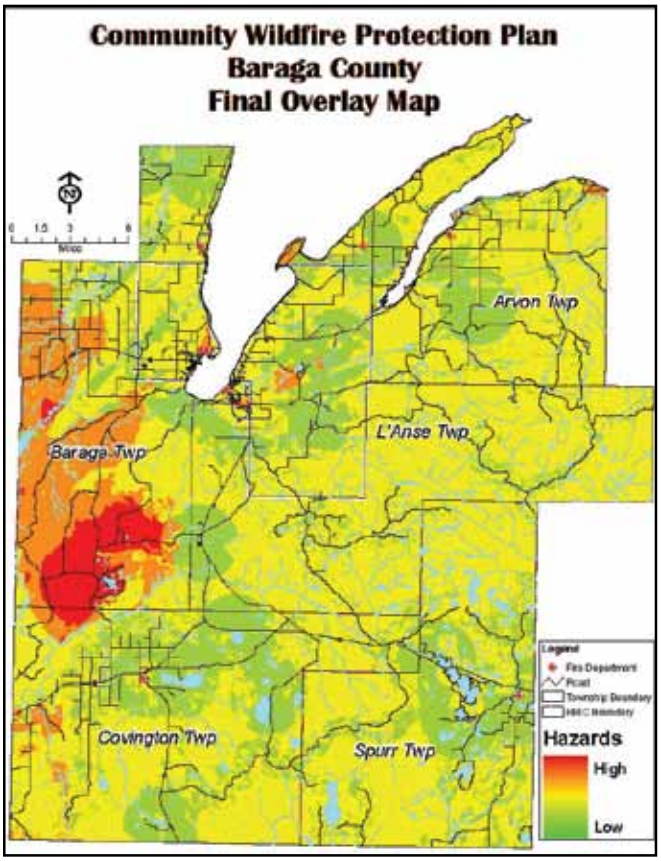
focused on the urgent flood-related issues the community was facing. This allowed for the plan to be more focused and timely. It also has acted as a catalyst for the community to take on a long overdue master plan update, in which it is incorporating the resiliency goals developed in the earlier plan.

The last community opted to create a regional sub-area plan, since the lake that was the focus of the planning effort encompasses three jurisdictions. The sub-area plan was developed to provide strategies that each of the three communities can include in their master plan updates.

Lesson: Successful resiliency initiatives often start with a catalyst

The most successful of the pilot master plans started out with a resiliency champion (or champions) that convinced their community to participate in the project. In one of the pilot communities, it was the head of the local public utility who was knowledgeable about the impact of past flooding on the community's power infrastructure and the effect it had on the local seasonal industry. In another community, the planning commission recognized that resiliency planning was important for protecting their community's long-standing investment in lakefront tourism. These champions communicate a sense of urgency and highlight the connections between the community's goals and the need for planning and action.

While visionary leaders can serve as catalysts to spearhead the planning effort, leadership at many levels is required for a successful project. In one pilot community, the resiliency planning effort lost momentum



Created by Ken Marshall; KBIC;
Source: Baraga County and Townships, SFS, BIA, MIDNR

when the champion was unable to get participation from important decision makers and potential partners in adjoining jurisdictions. One way to determine buy-in before embarking on resiliency planning is to provide an overview of the planning process to the governing body and seek a resolution of support to demonstrate a commitment to accomplish the effort.

Another important role for the catalyst or advocate is to provide continuity and momentum to help carry the planning process through to completion and advocate for implementation. However, unless the base of support is expanded to include others in the community, the good ideas may end up sitting on a shelf after adoption of the plan. One way to address this is to include elected officials and staff in the planning effort. This

Middle school student participants in Trenton Master Plan process.

has a dual benefit of encouraging continuity, while also making sure recommended actions are practical and implementable, given the capacity of the municipality.

Lesson: Data is an important foundation to resiliency planning

As already noted, pilot communities with concerns about specific local climate impacts were more motivated to incorporate resiliency components in their master plans. All of the six pilot master plan projects included presentations of local climate trends and a "vulnerability assessment". These were often paired with interviews of local stakeholders – businesses, tribal leaders, regional government – to identify concerns related to extreme weather impacts. Most of the pilot communities felt that having this data up front to help with decision making throughout the planning process was very important to the success of the project.

While the data used by the pilot communities was gathered by consultants covered by the CZM grant, climate data is also available to the public through other sources, such as county hazard mitigation plans, as noted above; the Michigan State University State Climatologist's Office, which provides historical data; Michigan Sea Grant; the Federal Emergency Management Agency; and the Great Lakes Integrated Sciences + Assessments Center (GLISA), which provides information on future climate trends in the Great Lakes region (www.glisa.umich.edu).

Several of the pilot communities employed scenario planning for presenting data, recognizing that climate predictions, especially at a local level, are a work in progress. This approach, developed by UM and LIAA, provided communities with three scientifically reasonable "climate futures": lucky, expected and the "perfect storm." The impacts to the community were presented for all three scenarios, which gave participants the opportunity to

think about potential future impacts and test and prioritize policies and actions.

A few of the pilot communities noted the accuracy of their vulnerability assessments was hampered by the lack of data on infrastructure conditions or models for resiliency infrastructure systems. In one community, they were hampered by a lack of studies on the nature and extent of deterioration under the water at the shoreline. Another community did not have accurate water and sewer condition information. This observation points to the importance of communities undertaking an asset management assessment to anticipate and address risks of infrastructure failure in the future.

Asset management assessments are typically conducted by consultants with engineering expertise and involve 1) conducting an inventory of publicly-owned infrastructure assets, such as utilities, public buildings, roads and recreational facilities; 2) evaluating the condition of these assets; 3) forecasting future infrastructure needs; and 4) prioritizing infrastructure improvements, based on an analysis of the data collected. The latter step involves identifying potential risks of the asset failing, which is valuable information for a vulnerability assessment. For instance, knowing that an earthen dam is failing can prompt a community discussion about whether to replace the dam to avoid catastrophic downstream damage from a failure, or address downstream impacts to allow for restoration of the river's natural function.

Trenton zoning proposal response boards outside City Council meeting.

Lesson: It's important to address skepticism head on

While the phenomenon of climate change is well-accepted in the science world, the term itself often stirs ideological and political connotations. At the start of one pilot community's resiliency planning effort, they received skepticism from some residents about the validity of predictions for a changing climate and the potential effect on their economy. In response, the consultant and planning commission invited the state climatologist to make a presentation at a public meeting, which was very well-received by the community and helped overcome the initial skepticism.

To address this issue in another pilot community, the planning team adjusted their terminology to talk about "extreme weather" rather than climate change. This approach also involved hearing from local residents and businesses up front about what weather-related impacts they were experiencing, which served to raise the topic of resiliency in a less threatening way, rather than starting with data that may have seemed out of context. Using information about past weather hazards from the county hazard mitigation plan could provide for helpful prompts for these conversations.

Many communities have addressed skepticism about predicting future trends – be it climate, economic or demographic – by characterizing the master planning efforts as "No Regrets Planning." This approach highlights policies and actions that will be beneficial to the community, even if the potential threat or hazard never materializes. For example, employing green infrastructure approaches such as pervious pavement may help with flooding issues, but even if there are no large floods, these approaches can serve to reduce polluted run-off into local waterways, positively affecting water quality. Larger setbacks from lake frontages can prevent property damage, but also support beach aesthetics in a community reliant on tourism.

It's important to acknowledge that these approaches provide "training wheels" for a community, which can work in the short term. In the the longer term, however, communities will need to accept the scientific consensus around climate change to fully address their resiliency concerns.

Lesson: Public engagement and consistent communication is key to community buy-in

In one of the pilot communities, the entire planning commission participated on the master plan project team. For the public open house on potential recommendations, each of the planning commissioners was there to answer questions. Full commission involvement built trust and accountability in the master planning process.

Another community tasked each member of the project steering committee with seeking out and attending the regular meetings of every group active in the community to explain the planning process and provide regular updates.

Keeping the public engaged throughout the process, a difficult task, ensures there is support for implementing the recommendations as soon as possible after plan approval. If the public interaction has been at a conceptual level, rather than addressing specific sticky issues, then this lack of engagement can hamper implementation and result in a sense of surprise about what the plan recommended, as noted earlier. One approach to address this is to provide a "refresher" meeting or activity before beginning an implementation effort. If there will be a significant gap in time between the adoption of the plan and any implementation effort, it is important to continue to keep the resiliency goals in the public eye by holding events such as a lecture series or community read.

It should be noted some communities need to get over the initial hurdle of being motivated to plan in the first place. If the planning process seems to be driven by external interests, there likely will be push back, rather than buy in.

Moving to Implementation

As anyone involved in master planning knows, it is much harder to implement good ideas than to come up with them. Of the five pilot communities involved in the regulatory implementation project, three chose to incorporate their resiliency recommendations into a comprehensive zoning ordinance update; one chose to pursue two specific zoning amendment recommendations and an educational guide; and one opted to explore a decision-making guideline to be adopted as village policy.

Lesson: Move quickly to implementation but bite off small pieces

The most successful pilot implementation projects used very specific recommendations from their master plan/resiliency plan as a springboard for their implementation efforts. An implementation 'best practice' is to develop targeted zoning amendments as part of the master plan's policy development process.

Those communities that chose to include their resiliency objectives in a comprehensive zoning ordinance update found that resiliency priorities could get buried in the debate over higher profile issues, such as density changes or sign regulations. The time required for these comprehensive code updates took a minimum of 20 months, and one is still ongoing after 2 years.

In contrast, the City of Grand Haven focused their implementation on very specific zoning ordinance amendments to update an existing sensitive area overlay district and a create shoreline setback requirement, which made staff effort and public engagement more focused. It took 9 months to complete these ordinance amendments.

The Village of Sebewaing considered developing floodplain regulations for their zoning ordinance, but instead opted to create a policy for siting of future utility assets as a first step as they worked to update their master plan as a basis for future zoning changes. This effort took 4 months to complete.

One pilot community noted that decision makers experienced "planning fatigue" from the intensive work involved in creating a plan and were eager to turn their attention to other items when the plan was done. Fortunately, the earlier work in this community created advocates to keep the issues in the public eye, including one of the village board members.

Lesson: Communities have short memories

Education about resilience best planning and implementation practices must be delivered again and again. While a planner may serve a community for many years, elected leadership turns over every two to four years, and planning commissioners and zoning board members change even more often in many municipalities. So even though a community may have participated in a coastal resilience workshop, or adopted resiliency recommendations in its master plan, others coming after will still need the training. A way to institutionalize the training is imperative.

Some of the pilot communities noted that although resiliency recommendations were vetted in the master plan process, their implementation initiative required a review and exploration of the earlier planning effort before it could move forward. A best practice used by some of the pilot communities is to include in the master plan a matrix of plan recommendations cross listed with implementation 'assignments' and timeframes that is used in developing a municipality's annual work program. Another approach is to assign the planning team to do an annual review of progress and report back to the planning commission.

Looking Ahead

As Michigan communities seek to become more resilient, they must be prepared to address several obstacles.

Limited availability of adequately trained planning consultants and municipal staff

Educating professional consulting and municipal planners is foundational to the development and execution of local resilience policy. MAP recognizes 32 private practice planning firms as members of the Planners in Private Practice Division and estimate there are more than 75 professional planners serving as planning consultants in Michigan. MAP's resiliency training events and those of partner organizations are a start, but more should be done to reach Michigan's planning consulting community and provide them with a scalable template for developing resilience master plans and codes.

Lack of funding for resiliency plans

Implementation of community plans is perpetually hampered by the limits of municipal finance. The good news is that as community leaders see the work their contemporaries are conducting around resilience solutions, the interest in advancing local policy will grow. Forward looking decision makers will recognize that smaller investments in the short term may save the community from making substantial investments in the future.

Some resiliency implementation efforts may be eligible for grant funding through the Hazard Mitigation Grant Program or the Floodplain Mitigation Assistance Program, both of which are administered by the Emergency Management and Homeland Security Division (EMHSD) of the Michigan Department of State Police. An important step forward would be the identification of other funding sources.

Ability to implement resiliency zoning

Policy implementation in the pilot communities (and other communities) doesn't end with adoption of the zoning ordinance. This is particularly important along Lake Michigan, where complex dune ecosystems, old land divisions, and deregulation initiatives make zoning reform and administration difficult.

It's not yet clear whether zoning administrators or others who enforce a "resilient zoning ordinance" need technical training, a procedures manual, or other guidance that explains how to administer the regulations in a way that aligns with the underlying resiliency principles. MAP has recently created a Zoning Administration training module that can be used as one tool for supporting the implementation of resiliency zoning.

Highlighted Community: Grand Haven

The City of Grand Haven is located on the shores of Lake Michigan and characterized by sand dunes, wetlands and desirable beaches. The Grand River runs along the northern boundary of the city as it empties into the lake. Tourism is important for the city and regional economy, and the area's natural features are an essential component to the community's quality of life.

In 2015, the City and Grand Haven Township formed a joint planning committee to participate in a CZM grant-funded study to determine the potential physical and environmental impacts of dynamic coastline processes on their communities. The resulting report, Building Coastal Resiliency in the City of Grand Haven, provided the basis for the resiliency recommendations that were subsequently incorporated in the master plan update, which was adopted in 2016. The master plan emphasizes encouraging development patterns that are viable economically, socially and environmentally.

The City followed up on the plan by participating in MAP's Coastal Resilience Regulatory Solutions project. Using the goal of protecting sensitive natural landscapes, the City retained LIAA to map "at risk" landscapes; update the city's Sensitive Areas Overlay District; develop a shoreline setback requirement; and create a management guide for homeowners living in sensitive landscapes. The City was able to complete all four initiatives in less than a year.

Highlighted Community: Sebewaing

The Sebewaing area is primarily agricultural, and crop land comprises one of the most vulnerable assets in the community, particularly as extreme weather events increase and average temperatures rise. The Village-owned utility provides the power to the Michigan Sugar Company's operations and processing station, which processes 925,000 tons of sugar annually, as well as production of dried beets, pressed pulp and molasses. The Village's utility infrastructure is primarily located within the floodplain of the Sebewaing River. Beet processing is seasonal in nature, adding unique energy requirements to the utility. Sebewaing Light and Water took on the resiliency planning effort as a way to safeguard the utility as changes in the climate impact the community at large.

The Village completed a resiliency plan that emphasized redundancy and formatted it to be included in a future master plan. While self-sufficiency is not a solution for all communities, it has become clear to Sebewaing that due to their distance from the generation source and unique energy needs, generating and distributing their own energy, as well as modifications in site planning, will provide the most reliable and cost effective approach to resiliency planning.

As a first effort to implement the recommendations of the plan, the Village developed a policy for siting of future utility assets that was subsequently approved by the Village Council. The policy calls for discouraging new, at-risk development in the mapped 100-year flood zone and seeks to site new critical public infrastructure outside of the 100-year flood zone. In addition, the policy requires public review for any infrastructure that is proposed to be located in the 100-year flood zone.

Master Plan Project Pilot Communities

Community	Baraga Township
Consultants	OHM Advisors, Land Information Access Association (LIAA)
Resiliency Concerns	Extreme cold, heavy storms, winter storms, flooding, lightning, hail, thunderstorms, high winds, flash floods, drought, wildfire.
Project	Baraga Township Master Plan (2017)

Community	City of Hancock
Consultants	OHM Advisors, Land Information Access Association (LIAA)
Resiliency Concerns	Extreme lake effect snow (208" annual average), extreme cold, winter storms, flooding, lightning, hail, thunderstorms, high winds, flash floods, wildfire.
Project	City of Hancock Master Plan (2018)

Community	City of Bay City
Consultant	Carlisle|Wortman Associates, Inc.
Resiliency Concerns	Shoreline erosion, flooding, ice jams, fluctuating water levels, deteriorating surface water quality. A major flood in 1986 caused significant property damage and loss.
Project	City of Bay City Master Plan (2017)

Community	Village of Sebewaing
Consultant	Delta Institute
Resiliency Concerns	Increasing intensity and duration of rainfall, rising lake levels combined with early spring snowmelt and ice jams in the Sebewaing River causing flooding.
Project	Village of Sebewaing Resiliency Plan (2017)

Community	City of Trenton
Consultants	Beckett & Raeder, Inc.
Resiliency Concerns	Generally increasing temperatures and more frequent heat wave episodes, increasing precipitation, flooding.
Project	Trenton Coast Resiliency Master Plan (2017)

Communities	Muskegon Lake Multi-Jurisdictional Sub Area (City of Muskegon, Laketon Township, City of North Muskegon)
Consultant	Delta Institute
Resiliency Concerns	Severe summer and winter storms, coastal flooding, ice scour, storm surges, shoaling exacerbated by low water levels. A winter storm in 2015 caused significant damage to docks and shoreline landscaping/habitat on Muskegon Lake.
Project	Muskegon Lake Resiliency Plan (2017)

Implementation Project Pilot Communities

Community	City of Grand Haven
Consultant	Land Information Access Association (LIAA)
Resiliency Concerns	Shoreline and lake level changes, erosion, critical dune areas, flooding
Project	Living in Sensitive Areas Homeowner's Guide; Beach Overlay District Ordinance, Sensitive Area Overlay District Ordinance (2018)

Community	Village of Mackinaw City
Consultant	Northeast Michigan Council of Governments (NEMCOG)
Resiliency Concerns	Ice build-up on the Straits of Mackinac, beach wash-outs from wave action, high winds, tourism impacts to shoreline natural resources and infrastructure.
Project	Comprehensive Zoning Ordinance Update (2018)

Community	City of Marquette
Consultant	McKenna
Resiliency Concerns	Development impacts on water quality such as beach closures due to high bacteria levels and flooding, tourism impacts on natural features, climate change.
Project	Land Development Code (2019)

Community	Village of Sebewaing
Consultant	Delta Institute
Resiliency Concerns	Location of critical utility infrastructure in flood zones.
Project	Floodplain Policy (2017)

Community	City of Trenton
Consultant	Beckett & Raeder, Inc.
Resiliency Concerns	Water quality degradation, riverfront industrial contamination.
Project	Comprehensive Zoning Ordinance Update

American Planning Association
Michigan Chapter

Making Great Communities Happen

About MAP

The Michigan Association of Planning (MAP) is a 501(c)(3) nonprofit membership organization. Established in 1945, for nearly 75 years we have provided professional planners and elected and appointed officials (city councils and township boards, planning commissions and zoning board members) with the tools and resources they need to make better land planning decisions to create quality communities.

Over several decades, MAP has collaborated with conservation, water resource, and environmental groups, partnering to integrate resilience themes into the educational training we deliver. Our intention is to help our members, and the communities they serve, increase understanding of natural resource and coastal lands preservation and provide the policy and regulatory framework they need to take action to adapt to the local impacts of climate change.