

APPENDIX C
Mackinac County, Michigan
Discovery Report

Discovery Report

Great Lakes Coastal Flood Study

Lake Michigan

Mackinac County, Michigan

Individual Discovery Report

Report Number 01

February 2013



U.S. Department of Homeland Security
Federal Emergency Management Agency Region V
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SUBMITTED BY:



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Project Area Community List

This list includes all communities within the Project Area covered by this report for the Great Lakes Coastal Study under consideration for new Federal Emergency Management Agency (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) products and datasets, which may include Flood Insurance Studies (FISs) and Flood Insurance Rate Maps (FIRMs). Not all communities will receive new/updated FEMA Risk MAP products and datasets or FISs and FIRMs.

Mackinac County
Bois Blanc, Township of
Clark, Township of*
Garfield, Township of
Hendricks, Township of
Hudson, Township of
Mackinac Island, City of
Marquette, Township of*
Moran, Township of
Newton, Township of
St. Ignace, City of
St. Ignace, Township of*

*During this Discovery process, stakeholders noted that Clark, Marquette, and St. Ignace Townships should be removed from the Lake Michigan Project Area as those communities are affected by Lake Huron.

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- Attachment B. Mackinac County Pre-Meeting Correspondence
- Attachment C. Draft Discovery Maps
- Attachment D. Proposed Draft Transect Figures
- Attachment E. Stakeholder Comments from Discovery Meeting
- Attachment F. Mackinac County Discovery Meeting Documents
- Attachment G. Coastal Data Request Form Compilation

Acronyms and Abbreviations

AAL	Average Annualized Loss
CAV	Community Assistance Visit
CBRS	Coastal Barrier Resources System
CID	Community Identification Number
CIS	Community Information System
CMAG	Coastal Management Assistance Grant
C-MAN	Coastal Marine Automated Network
CNMS	Coordinated Needs Management Strategy
CO-OPS	Center for Operational Oceanographic Products and Services
CRS	Community Rating System
DFO	Department of Fisheries and Oceans
FEMA	Federal Emergency Management Agency
FIPS	Federal Information Processing Standards
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
GLCRG	Great Lakes Coastal Restoration Grant
Hazus-MH	Multi-Hazard Risk Assessment and Loss Estimation Software Program
HWM	High Water Mark
HUC8	Hydrologic Unit Code 8
LOMA	Letter of Map Amendment
LOMC	Letter of Map Change
LOMR	Letter of Map Revision
LOMR-F	Letter of Map Revision based on Fill
MLI	Midterm Levee Inventory
NDBC	National Data Buoy Center
NFIP	National Flood Insurance Program
NGDC	National Geophysical Data Center
NID	National Inventory of Dams
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
Risk MAP	Risk Mapping, Assessment, and Planning
SFHA	Special Flood Hazard Area
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

I. Discovery Overview

The Federal Emergency Management Agency (FEMA) Risk Mapping, Assessment, and Planning, or Risk MAP, program, helps communities identify, assess, and reduce their flood risk. Through Risk MAP, FEMA provides information to enhance local mitigation plans, improve community outreach, and increase local resilience to floods.

During the Discovery phase of Risk MAP project development, FEMA:

- Gathers information about local flood risk and flood hazards
- Reviews mitigation plans to understand local mitigation capabilities, hazard risk assessments, and current or future mitigation activities
- Supports communities within the coastal area to develop a vision for the future
- Collects information from communities about their flooding history, development plans, daily operations, and stormwater and floodplain management activities
- Uses all information gathered to determine which areas require mapping, risk assessment, or mitigation planning assistance through a Risk MAP project
- Develops Discovery Map and Report that summarize and display the Discovery findings



The Discovery process involves coordination with Great Lakes stakeholders, data collection and analysis, community interviews, a Discovery Meeting with stakeholders affected by the study, and development of recommendations based on an analysis of data and information gathered throughout the process.

i. Great Lakes Coastal Flood Study

FEMA has initiated a coastal analysis and mapping study that may result in updated Flood Insurance Rate Maps (FIRMs) for coastal counties along the Great Lakes. The new coastal flood hazard analyses will utilize updated 1-percent-annual-chance (100-year) flood elevations obtained from a comprehensive storm surge study being developed by the U.S. Army Corps of Engineers (USACE).

The Great Lakes Coastal Flood Study (GLCFS) will incorporate modern analysis of historic storm and high water events and provide for updated flood risk information serving United States communities having shoreline along the Great Lakes. The storm surge study is one of the most extensive coastal storm surge analyses to date, encompassing coastal floodplains in the eight States with coastlines on the Great Lakes.



An updated coastal flood study is needed to obtain a better estimate of coastal flood hazards on the Great Lakes. The current, effective FIRMs are outdated primarily due to the age of data and the coastal methodologies used in producing them. Major changes in National Flood Insurance Program (NFIP) policies and methodologies have been implemented since the effective date of many flood insurance studies in the area, creating the need for an update that will reflect a more detailed and complete hazard determination.

The GLCFS includes a system-wide solution that provides a comprehensive analysis of storm and high water events within the Great Lakes Basin. This program is funded through the FEMA Risk MAP program. FEMA, USACE, Association of State Floodplain Managers (ASFPM), State partners, and FEMA contractors will collaborate in updating the coastal methodology and flood maps, and create new flood risk products. FEMA manages the NFIP, which is the cornerstone of the national strategy for preparing communities for flood-related disasters.

ii. Purpose of Great Lakes Discovery

The Great Lakes Discovery process included data collection, information exchange between all governmental levels of stakeholders, spatial data presentation, cooperative discussion with stakeholders to better understand the Great Lakes area, and a collaborative approach on the project planning. The process allowed FEMA to continue to vet the Great Lakes coastal study methodologies with a large stakeholder group, to discuss local priorities and data, to discuss mitigation strategies and coastal issues, and to move towards a project that will successfully identify the risks associated with Great Lakes flooding.

This Discovery Report discusses the communities potentially affected by coastal flooding in Mackinac County, Michigan. This Discovery process helped FEMA to better identify the types of datasets or products that will be useful at the local level, especially as it relates to identifying new mitigation strategies and actions, and for use in local planning efforts. Products that may be available to communities as a result of the Great Lakes flood study include updated FIRMs and FISs, coastal flood risk products, calibrated models for storm

surge and wave analysis on each of the lakes, and accurate depictions of water level and wave response on each lake occurring during hundreds of actual events. The type of product a community receives is dependent not only on the coastal flood study analysis results and funding, but also on the type of datasets, local and national, that are available.

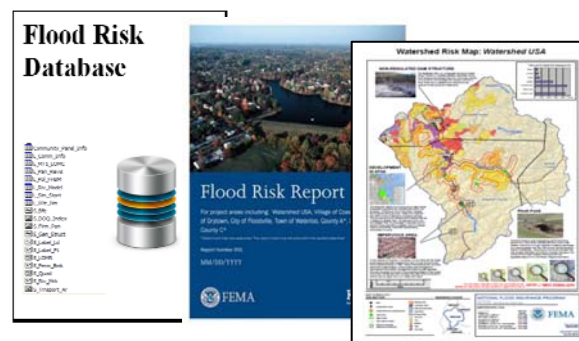
The following section describes the coastal flood risk products that a community may receive, as well as some products that are under development for the Great Lakes study areas.

iii. Coastal Flood Risk Products

As part of a Risk MAP project, FEMA will seek to provide State and community officials with three flood risk products to help them gain a better understanding of flood risk and its potential impact on communities and individuals. These products will also enable communities to move forward with informed mitigation actions to reduce identified risk. Delivery of the products discussed below will depend on available data, results of coastal analysis, local partnerships, and fiscal year funding.

The three products are:

- Flood Risk Database
- Flood Risk Report
- Flood Risk Map

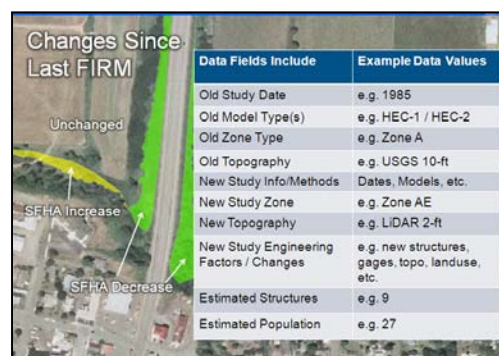


These products will summarize information captured in flood risk datasets that may be generated during a Risk MAP, or flood risk, study. The flood risk datasets could include regular and enhanced products. Standard flood risk datasets, also termed products, are described below.

- **Changes Since Last FIRM (CSLF)**

The CSLFs serve the following purposes:

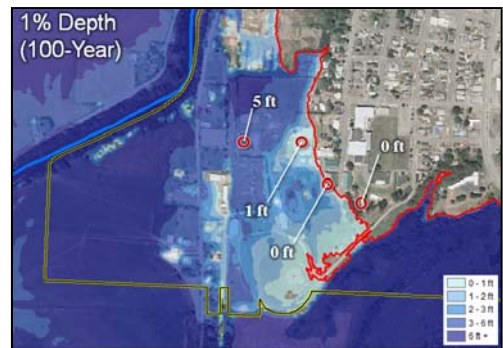
- Identify Areas and Types of Flood Zone Change:
 - Compares current effective (previous) with proposed (new) flood hazard mapping; and
 - Flood zone changes are categorized and quantified.
- Provide Study/Reach Level Rationale for Changes Including:
 - Methodology and assumptions; and



- Changes of model inputs or parameters (also known as Contributing Engineering Factors).

- **Flood Depth and Analysis Grids (1-percent-annual-chance event only)**

- Reflect total depth (i.e. stillwater and waves). Will be created for the 1-percent frequency event of the engineering studies performed and as appropriate for the data. Wave runup areas may not be applicable.
- Created using the regulatory mapping and associated zone breaks as input



- **Flood Risk Assessment (Hazardus-MH)**

- Hazardus-MH combines science, engineering and mathematical modeling with GIS technology to estimate losses of life and property, and shows those losses on a map.
- HAZUS-MH estimates impacts to the physical, social, and economic vitality of a community from earthquakes, hurricane, winds, and floods.
- Coastal flood risk assessments will be similar to riverine, but will use coastal depth grids as input for refined analysis.
- Hazardus-MH analysis and data can support adoption of high regulatory standards for structures in high loss areas.
- Hazardus-MH results can help to provide justification to find mitigation projects to protect citizens and properties from losses during future coastal flood events.



For more information about Hazardus and data inputs, visit <http://www.fema.gov/hazus> or enter keywords "fema hazus" into an internet search engine.



In addition, FEMA is looking into the possibility of developing some unique Great Lakes coastal flood risk products that utilize datasets that have recently been collected or will be collected as part of the GLCFS:

- Storm Response Erosion Data: Dataset is expected to contain the results from erosion analysis in response to the 1-percent-annual chance flood event
- Shoreline Feature Data: Dataset was developed by the USACE in 2012 and contains primary and secondary land use tables, as well as coastline type, materials, and vegetation. The current dataset contains data at one-mile spacing. The dataset does not include field-based reconnaissance or sediment/subsurface soil collection.

The delivery of these standard flood risk products and the Great Lakes coastal flood risk datasets will be dependent on the location of the Risk MAP study and coastal analysis, data

availability, fiscal year funding, and partnerships with local communities. Therefore, all communities may not receive flood risk products.

II. Stakeholder Communication and Coordination

Communication and coordination with Federal, State and local stakeholders is key to the success of the GLCFS. A large emphasis has been placed on identifying stakeholders early and often and working with those stakeholders continually throughout the study process, from Discovery all the way through flood map and flood risk product development. Through outreach, the goal is to increase understanding of the new coastal study methodologies and the tools and processes that will be available for risk-based community planning, and to increase flood hazard awareness within the Great Lakes coastal region.

i. Lake Michigan Discovery Stakeholder Coordination

Meetings, emails, telephone calls, and letters are essential to communicate effectively throughout the life of this Lake Michigan Coastal Flood Study project, which has begun with this Discovery process.

To kick-off this Discovery process, FEMA formed a group of core stakeholders, which included representatives from FEMA Region V, STARR (mapping partner to FEMA), USACE, NOAA, ASFPM, the State NFIP Coordinators, the State Hazard Mitigation Officers (SHMOs), and State Engineers. The core stakeholders reviewed the Discovery plan, objectives, and key outcomes for Lake Michigan Discovery with FEMA, provided suggestions for outreach and communication, and raised any concerns as it related to Lake Michigan and the coastal flood study process. Following this kick-off process, outreach, communication, and coordination with local stakeholders was initiated.

Discovery Meeting letter invitations were sent to local community and county stakeholders within the Mackinac County portions of the Lake Michigan Coastal Flood Study project. In addition, an email invitation was sent to a larger list of stakeholders including, but not limited to, the core stakeholders, other federal agencies, universities, watershed groups, Great Lakes associations, technical stakeholders, and emergency management agencies. Representatives from the local governments, including cities, townships, and villages, were considered fundamental stakeholders in this process because they have been elected or appointed to represent the interests of the residents of this project area.

The Discovery Meeting invitations also included a Coastal Data Request Form (Attachment A). Communities were asked to provide information on data that they had available at the local level that may be of use during the flood study update and during the development of the coastal flood risk products discussed earlier in this report. The Coastal Data Request Form included data requests for:

- Base Map Data
- Coastal Data

- Historic Flood Data
- Risk Assessment
- Flood Mitigation Information
- Community Plans and Projects
- Other comments/concerns based on local knowledge

Hudson Township returned information through the Coastal Data Request Form. A summary of the responses provided in the Coastal Data Request Form can be found in Section IV, Summary of Data Analysis, of this report.

In addition to the hard copy letter invitations, and in order to improve the communication and data sharing leading up to the Discovery Meeting, FEMA offered local communities an opportunity to attend pre-Discovery Meeting conference call, referred to as an “Information Exchange Session”. The conference call information was included in the Discovery Invitation letters mailed to local community officials, and an email reminder was sent out as well. The session’s intent was to begin the process of learning about local data availability and what the critical issues are for the Great Lakes communities. It should be noted that no local officials were able to attend the offered information exchange session conference call for Mackinac County, so data collection efforts prior to the Discovery Meeting were based on information received through emails, phone calls, the Coastal Data Request Form, and data research.

The core stakeholder documents, “Information Exchange Session” documents, and Discovery Meeting invitations can be found in Attachment B, Mackinac County Pre-Meeting Correspondence.

III. Discovery Meeting

The Discovery Meeting for Mackinac County was held on August 13, 2012 in St. Ignace, Michigan. Communities and stakeholders affected by coastal flooding in Mackinac County were invited to the Discovery Meeting. The purpose of this meeting was to facilitate discussion about study needs, mitigation project needs, desired compliance support, and local flood risk awareness efforts.



The objectives of the Discovery Meeting included:

- Continuation and expansion upon stakeholder engagement
- Discussion of data inputs from Federal, state and local stakeholders
- Identification of local coastal flood hazard needs and areas of concern
- Identification of flood risk products and datasets that best advance coastal mitigation action

- NFIP regulatory updates
- Discovery schedule and deliverables

The Discovery Meeting presentation included the following information:

- An overview of the GLCFS and schedule
- Review of the Discovery process and outcomes
- Discussion of coastal mapping and flood risk topics to be aware of
- Discussion of how the study may affect the communities, including compliance requirements
- Review of hazard mitigation opportunities and grant funding
- Encouragement and facilitated discussion regarding coastal study needs, mitigation project needs, desired compliance support, and local flood risk awareness efforts

Draft Discovery Maps for Mackinac County (Attachment C) were displayed and utilized during the meeting to encourage the discussion regarding areas of coastal flood risk concern and areas of hazard mitigation interest. The draft Discovery Maps shown at the meeting included geospatial and tabular data that had been collected prior to the meeting.

Geospatial Data:

- Average Annualized Loss (AAL) data
- Coastal Barrier Resources System (CBRS)¹
- Coordinated Needs Management Strategy (CNMS)² Data- riverine only
- Proposed Transects
- Effective Special Flood Hazard Areas (SFHAs)
- Jurisdictional Boundaries
- Letters of Map Change (LOMCs)
- Levees
- Shoreline
- Streams
- USGS Gages
- Watershed Boundaries

Tabular Data:

- Declared Disasters
- Flood Insurance Data
- Potential Mitigation Actions (from local Hazard Mitigation Plans)
- Summary of Shoreline Data (Type and Coverage)

¹ CBRS consists of the undeveloped coastal barriers and other areas located on the coasts of the United States that are identified and generally depicted on a series of maps. CBRS areas are ineligible for most new Federal expenditures and financial assistance.

² CNMS is FEMA's strategy for coordinating the management of mapping needs using modern geospatial technologies and current policies, requirements, and procedures. CNMS makes information related to mapping needs readily accessible and more usable. CNMS is only for riverine studies at this time. It is expected coastal needs will be captured in this system in the future..

Participants at the Discovery Meeting were asked to cooperatively identify Areas of Concern and Areas of Mitigation Interest (AoMIs) within the Mackinac County Lake Michigan study area using the draft Discovery Maps and through general discussion during the meeting.

In addition to the draft Discovery Maps, figures showing the location of initially proposed draft transects around Mackinac County were available for review and comment. Stakeholders were encouraged to review the proposed draft transects and provide comments related to the location of the transects. The proposed draft transect maps that were available at the Discovery Meeting for Mackinac County can be found in Attachment D. A sample map is shown below as Figure 1:

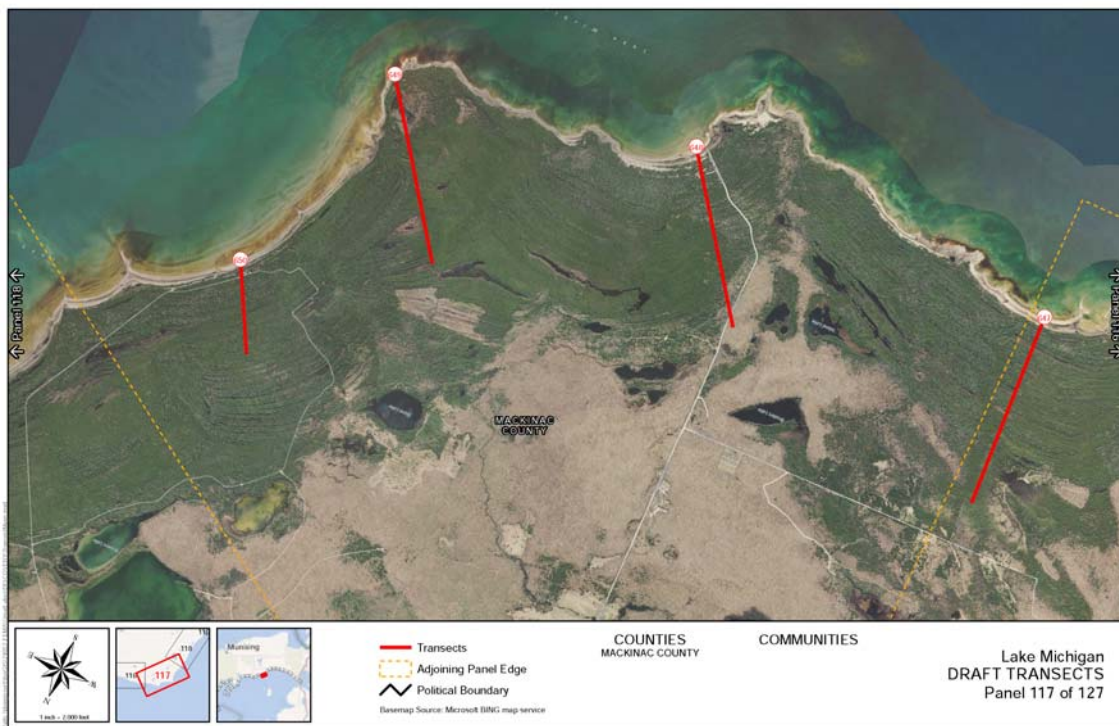


Figure 1: Sample Proposed Draft Transect Figure

All comments related to coastal flood risk and draft transects that were provided during the Mackinac County Discovery Meeting on the draft Discovery Maps and draft transect figures, as well as comments provided following the meeting, have been compiled into geospatial layers and associated tables. The GIS layers, titled “Stakeholder General Comments” and “Stakeholder Transect Comments”, are shown on the Final Discovery Map in Appendix R of the basin-wide Lake Michigan Discovery Report (Federal Emergency Management Agency, 2013). A description of each comment collected for Mackinac County can be found in Attachment E, Stakeholder Comments from Discovery Meeting, of this report. Each comment has a unique map identification number (if one exists) that correlates to its location on the Final Discovery Map. The identification of a comment (ID) categorized as a “Stakeholder General Comment” is represented by using the first three letters of the county name followed by a unique number (i.e. MAC – 1, MAC - 2). The identification of a comment (ID) categorized as a “Stakeholder Transect Comment” is represented by using the first three letters of the county name, followed by “TR”, followed by a unique number (i.e. MAC-TR-1, MAC-TR-2).

A summary of the transect comments collected and the resulting revisions to the draft transect layout can be found in this report in Section IV, Summary of Data Analysis, under the “Proposed Draft Transects” subsection.

Discovery Meeting minutes, sign in sheets, PowerPoint presentation, marked up draft Discovery Maps, and correspondence documentation have been included in Attachment F, Mackinac County Discovery Meeting Documents.

IV. Summary of Data Analysis

During this Discovery portion of the Lake Michigan Coastal Flood Study project, a massive collection of tabular and spatial data was conducted for all the coastal communities from Federal and State sources, as well as information collected through phone conversation, information exchange session conference call, the Discovery Meeting, and the Discovery Coastal Data Request Forms sent to each coastal community. This section lists the types of data and their sources that were collected for the Mackinac County study area, including information collected during and after the Discovery Meeting. The data analysis that follows Table 1 is divided into two sections: one section listing the data that can be used for Risk MAP product development and the other section listing the information that helped the study team to form a better understanding of the Mackinac County Lake Michigan Project Area prior to moving forward with the coastal flood study.

Table 1. Data Collected for Mackinac County

Data Types	Deliverable/ Product	Source	Date of Data Collection	Level
Average Annualized Loss Data (AAL)	Discovery Map	Federal Emergency Management Agency (FEMA)	June 2012	Nationwide
Bathymetry and Topography	Discovery Report	USACE	2012/2013	Lakewide
Census Blocks	Discovery Map	U.S. Census Bureau	June 2012	Countywide
Contacts	Discovery Report	Local Community Websites, State/FEMA updates	June 2012	Countywide
Community Assistance Visits (CAVs)	Discovery Report	FEMA Community Information System (CIS)	July 2012	Countywide
Community Rating System (CRS)	Discovery Report	FEMA's "Community Rating System Communities and Their Classes"	July 2012	Nationwide
Comprehensive Plans	Discovery Report	Local Community Websites	July 2012	Countywide
Coastal Barrier Resources System (CBRS)	Discovery Map	U.S. Fish and Wildlife Service	July 2012	Nationwide
Coastal Structures	Discovery Map/Tabular Data	U.S. Army Corps of Engineers (USACE)	August 2012	Nationwide
Coordinated Needs Management Strategy (CNMS)	Discovery Map	FEMA	July 2012	Countywide
Critically Erosion Beach Areas	Discovery Report	Local Stakeholders	August 2012	Statewide
Critical Facilities	Discovery Report	Local Mitigation Plan	July 2012	Countywide
Dams	Discovery Report	USACE, National Inventory of Dams, Flood Insurance Rate Map (FIRM) Database	July 2012	Countywide
Declared Disasters	Discovery Report	FEMA's "Disaster Declarations Summary"	June 2012	Nationwide
Demographics, Industry	Discovery Report	U.S. Census Bureau, Local Mitigation Plans	June 2012	Countywide
Effective Floodplains	Discovery Map	FEMA Map Service Center and Mapping Information Platform	June 2012	Countywide
Flood Insurance Policies	Discovery Report	FEMA CIS	July 2012	Nationwide
Hazard Mitigation Plans and Status	Discovery Report	Local Mitigation Plans	July 2012	Countywide

Table 1. Data Collected for Mackinac County

Data Types	Deliverable/ Product	Source	Date of Data Collection	Level
Hazard Mitigation Assistance Program Grants Received	Discovery Report	FEMA’s “Hazard Mitigation Program Summary” Community Input	June 2012	Nationwide
Hazard Mitigation Projects	Discovery Report	Local Mitigation Plans	July 2012	Countywide
High Water Marks	Discovery Report	Effective Flood Insurance Study (FIS)	August 2012	Countywide
Historical Flooding	Discovery Report	Effective Flood Insurance Study (FIS), Local Mitigation Plans	July 2012	Countywide
Historical Storm Events	Discovery Report	Effective FIS, Local Mitigation Plans	July 2012	Countywide
Individual/Public Assistance	Discovery Report	FEMA’s “Public Assistance Subgrantee Summary”	June 2012	Nationwide
Letters of Map Change (LOMCs)	Discovery Map	FEMA’s Mapping Information Platform	July 2012	Countywide
Meteorological Gages	Discovery Map	National Oceanic and Atmospheric Administration (NOAA) Great Lakes Environmental Research Laboratory	July 2012	Regionwide
Oblique Imagery	Discovery Report	USACE	2012	Lakewide
Ordinance	Discovery Report	Local Community Websites	July 2012	Countywide
Repetitive Loss	Discovery Report	FEMA CIS	July 2012	Countywide
Proposed Draft Transects	Discovery Map	FEMA	February 2013	Lakewide
Shoreline Classification	Discovery Map	USACE	July 2012	Regionwide
Stream Gages	Discovery Map	USGS	July 2012	Countywide
Water Level Gages	Discovery Map	NOAA Department of Fisheries and Oceans	July 2012	Regionwide
Wave Gages	Discovery Map	NOAA	July 2012	Regionwide

i. Data that can be used for future Coastal Flood Risk Products

During the Discovery process, the project team created a database of available flood hazard and flood risk assessment data. This database not only provides an inventory of available data, but helps identify gaps in the flood hazard data. State, county, and government geographic information system (GIS) websites can provide some of the pertinent data, but local knowledge of flooding and mitigation projects is critical to help accurately determine flood risks and mapping needs. Therefore, local and regional data were also used where available. The subsections below provide details on the data determined to be available within the project area.

I.IV.i.1 Average Annualized Loss (AAL) Data

Average Annualized Loss (AAL) data provides a general understanding of the dollar losses associated with a certain frequency of flood events within a county and is used to get a relative comparison of flood risk. They are determined by FEMA's Multi-Hazard Risk Assessment and Loss Estimation Program, otherwise known as Hazus-MH.

Hazus, a free risk assessment software application from FEMA, is the most widely used flood risk assessment tool available. Hazus can run different scenario floods (riverine and coastal) to determine how much damage might occur as a result. Hazus can also be used by community officials to evaluate flood damage that can occur based on new or proposed mitigation projects or future development patterns and practices, and it can run specialized risk assessments, such as what happens when a dam or levee fails.

Hazus-MH includes national datasets that can be supplemented with local data. If local detailed data are available, users may consider using this data to perform more refined Hazus analyses. Hazus-MH is flexible and allows users to update Hazus-MH with local data or use a combination of both local and national. Augmenting the Hazus-MH provided data with local data can improve the accuracy and resolution of analysis results. Additional information about the Hazus-MH process and tool can be found at <http://www.fema.gov/protecting-our-communities/hazus>.

The Hazus-MH analysis used in this report is based on approximate flood boundaries and national datasets. The calculation is based on flood elevation estimates using the 10-meter Digital Elevation Model (DEM) on streams with drainage areas of at least 10 square miles.

The results shown in Table 2 include data for the entire county, as opposed to only the coastal project area. Information can also be obtained from the report titled FEMA *Hazus AAL Usability Analysis*, dated April 13, 2011 (Federal Emergency Management Agency, 2011). AAL data summarized at the census block level are shown on the draft Discovery Maps (Attachment C).

Table 2. Hazus AAL Data for Mackinac County

FIPS Code	County	Total Losses for Building and Content (in thousands of \$)
26097	Mackinac County	\$29,936

Source: FEMA

FIPS = Federal Information Processing Standards

I.IV.i.2 Coastal Recession

Coastal erosion is the recession of land and the removal of beach or dune sediments. It affects all of the beaches and coasts in the world, including those of Lake Michigan. Important factors in coastal erosion are the types of rock or soil being eroded, the presence or absence of beaches or human-made structures, and how the shore is oriented with respect to prevailing winds and waves, water levels, climatology, and groundwater and surface drainage.

In Michigan, areas prone to erosion along the Lake Michigan shoreline are subject to special setback requirements established by the Michigan Department of Environmental Quality (MDEQ). From MDEQ’s website, high risk erosion areas are those shorelands of the Great Lakes and connecting waters where recession of the zone of active erosion has been occurring at a long-term average rate of one foot or more per year. The erosion can be caused from one or several factors, including high water levels, storms, wind, ground water seepage, surface water runoff, and frost. The high risk erosion area regulations require setback distances to protect new structures from erosion for a period of 30 to 60 years, depending on the size, number of living units and type of construction. Approximately 300 miles of shoreline are classified as high risk erosion area. Updates of the recession rate studies, which form the basis of the setbacks, are periodically conducted to reflect changing water levels and shore protection efforts.

Table 3 lists the communities within Mackinac County that have mapped High Risk Erosion Areas.

Table 3. Availability of Michigan DEQ High Risk Erosion Area Maps

County	Community
Mackinac	Garfield Township
	Moran Township
	Newton Township

Additional information, including High Risk Erosion Area maps, can be found at the Department of Environmental Quality’s High Risk Erosion Areas website at http://www.michigan.gov/deq/0,1607,7-135-3313_3677_3700-10860--,00.html . The complete set of High Risk Erosion Areas can also be found in Appendix U of the Lake Michigan basin-wide Discovery Report (Federal Emergency Management Agency, 2013).

If users of this Discovery Report have any additional erosion or recession data or photographs that you would like to submit, please contact FEMA Region V Mitigation Division.

I.IV.i.3 Federal Land

Federal lands data were obtained from the National Atlas at <http://nationalatlas.gov/mld/fedlanp.html>. This data is also available from the National Discovery Data Repository located on FEMA’s Mapping Information Platform (MIP) at <https://hazards.fema.gov>. The map layer shows those lands owned or administered by the Federal Government, including the Bureau of Land Management, the Bureau of Reclamation, the U.S. Department of Agriculture Forest Service, the Department of Defense, the U.S. Fish and Wildlife Service, the National Park Service, and other agencies. Only areas of 640 acres or more are included.

Mackinac Wilderness is part of the Hiawatha National Forest and is a Federal Land that exists along the Lake Michigan shoreline of Mackinac County. It is administered by the Forest Service.

I.IV.i.4 Jurisdictional Boundaries

Jurisdictional boundaries were obtained for Mackinac County and Incorporated Areas from a derived set of TIGER line files available through the U.S. Census Bureau geography division. TIGER line files were last derived from the TIGER database in 1997. To find out more about TIGER line files and other Census TIGER database derived data sets visit <http://www.census.gov/geo/www/tiger>.

Jurisdictional boundaries may also be extracted from the “Michigan Geographic Framework” dataset available through Michigan CGI (Center for Geographic Information) at <http://www.mcgi.state.mi.us/mgdl/>.

I.IV.i.5 Local Data

As part of this Discovery process, communities were asked to fill out a Coastal Data Request Form and provide information on data that they had available at the local level that may be of use during the coastal flood study update, and during the development of the coastal flood risk products discussed earlier in this report. The Coastal Data Request Form (Attachment A) included data requests for base map data, coastal data, historic flood data, risk assessment information, mitigation information, and community plans and projects.

The table in Attachment G compiles all the information collected for Mackinac County from the completed Coastal Data Request Forms, during the Discovery Meeting, or through phone conversations and email. Hudson Township provided information via the Coastal Data Request Form through email.

In summary, Hudson Township noted they did not have digital data or information related to coastal flooding at the local level, but noted they were interested in learning more about existing flood risk in the community. No local information or data for other coastal communities was provided for Mackinac County during this Discovery process.

I.IV.i.6 Publicly Owned Land

The Michigan CGI Geographic Data Library Catalog at <http://www.mcgi.state.mi.us/mgdl/> currently contains over 60 unique statewide datasets including the state’s base map, aerial imagery, geology, hydrography, land ownership, topography, and much more. Publicly owned lands (national, state, and local parks, forests, etc.) were found in “DNR Land and Mineral Ownership” dataset available through Michigan CGI.

I.IV.i.7 Shoreline Information

A shoreline feature dataset was generated by USACE Detroit District (U.S. Army Corps of Engineers, 2012) using 2012 oblique photographs (see “Topography, Bathymetry, and Oblique Imagery” subsection in this report). The dataset captures shoreline types, land uses, coverage, and vegetation types along the entire Great Lakes shoreline, including Lake Michigan. The dataset includes identification of “artificial” shoreline, which may be indicative of local coastal flood protection structures. This dataset does not identify the level of protection of any coastal structures, and it does not validate whether or not a coastal structure exists. The current dataset contains data at one-mile spacing. The dataset does not include field-based reconnaissance or sediment/subsurface soil collection. The dataset can be downloaded from <http://www.greatlakescoast.org/> under the “Technical Resources” section.

From the USACE shoreline feature dataset, the approximate shoreline along Mackinac County that is covered by this study is 91.7 miles. The shoreline classification information for Mackinac County is summarized in Tables 4 through 7, including shoreline types, land uses, coverage, and vegetation types, respectively.

Table 4. Summary of Shoreline Types

County	Total Shoreline (mile)	Artificial Shoreline (mile)	Boulders, Bedrock (mile)	Cohesive Clays and Silts (mile)	Sand (mile)	Shingles, Pebbles, Cobbles (Mile)
Mackinac County	91.7	4.4	--	--	43.2	44.1

Source: USACE 2012, Lake Michigan Shoreline Classification

Table 5. Summary of Shoreline by Land Use

County	Total Shoreline (mile)	Commercial/Industrial (mile)	Forested (mile)	Low Density Residential (mile)	Moderate Density Residential (mile)	Park Land (mile)
Mackinac County	91.7	5.9	34.8	36.7	1.9	12.4

Source: USACE 2012, Lake Michigan Shoreline Classification

Table 6. Summary of Shoreline Coverage

County	Total Shoreline (mile)	Bluff 2'-10' (mile)	Coastal Wetland (mile)	Dune 2'-10' (mile)	Flat Coast (mile)	High Bluff 10'+ (mile)	High Dune 10'+ (mile)	Other (mile)
Mackinac County	91.7	5.6	0.6	53.2	31.1	--	0.6	0.6

Source: USACE 2012, Lake Michigan Shoreline Classification

Table 7. Summary of Shoreline Vegetation Types

County	Total Shoreline (mile)	High Density Shrubs/Trees (mile)	Low Density Shrubs/Trees (mile)	Manicured Lawn (mile)	Moderate Density Shrubs/Trees (mile)	None (mile)	Unmaintained Non-Woody Vegetation (mile)
Mackinac County	91.7	42.3	16.2	3.7	26.4	1.9	1.2

Source: USACE 2012, Lake Michigan Shoreline Classification

I.IV.i.8 Stream Lines/Hydrograph

Stream lines were obtained from USGS's National Hydrography Dataset (NHD). The NHD is a digital vector dataset used by Geographic Information Systems (GIS). It contains features such as lakes, ponds, streams, rivers, canals, dams and stream gages. The datasets are designed to be used in general mapping and in the analysis of surface-water systems. Data can be downloaded from <http://nhd.usgs.gov/data.html>.

I.IV.i.9 Topography, Bathymetry, and Oblique Imagery

New Data Collected for Great Lakes Coastal Flood Study

As part of the GLCFS, Light Detection and Ranging (LiDAR) was collected to develop topographic and bathymetric data along the Lake Michigan shoreline. Topography is the configuration of natural and man-made features of a surface area and their relative position and elevations. Bathymetry is the underwater equivalent to topography.

LiDAR is an optical remote sensing technology that can measure the distance to, or other properties of, a target by illuminating the target with light, often using pulses from a laser. A narrow laser beam can be used to map physical features with very high resolution. Downward-looking LiDAR instruments fitted to aircraft and satellites are used for surveying and mapping. LiDAR can be used to create DTM (Digital Terrain Models) and DEM (Digital Elevation Models), which is a digital model or 3-dimensional representation of the terrain's surface.

The LiDAR data for this study was collected within a 1500 meter buffer (500 meters inland and 1000 meters seaward of the land/water interface). Where water clarity permitted, data was collected to cover all federal navigation projects. Flight lines were

flown along the channel alignment to ensure the best possible coverage of inlets and structures.

For quality control purposes, one cross line was used every 25 miles along shore or more frequently to ensure 90 percent of all planned lines within the area were crossed by a cross line. In areas of the coast where natural or artificial barriers prevent aircraft operations, the cross line(s) were collected at the nearest possible location to the required interval, but no closer than five (5) miles to an adjacent planned cross line. Overlapping lines and datasets were compared to each other and to cross lines and the differences calculated.

At the time this report was generated, the quality control process was not yet completed on the LiDAR dataset. However, as part of that process, the vertical difference between the LiDAR and ground truth data will be calculated. Ground truth refers to a process in which a pixel on a satellite image is compared to what is there in reality. This is especially important in order to relate LiDAR data to real features and materials on the ground. The collection of ground truth data enables calibration of the LiDAR data, and aids in the interpretation and analysis of what is being sensed. Using this process, all systematic errors will be identified and eliminated and remaining errors should have a normal distribution. Differences between a DEM created from the LiDAR data representing bare ground and the ground truth data will be unbiased and within +/-15 cm (RMSE³) in flat terrain and within +/-30 cm (RMSE³) in hilly terrain. Horizontal positions will be accurate to +/- 1.5m (RMSE³). Data will be processed to 2ft contours.

The processing of the bathymetric data for this study will be performed based on the strongest return of each LiDAR pulse, assuming this depth represents the bottom. Data will be processed to produce bottom reflectance data from the LiDAR data.

As of the date of this report, the LiDAR data is expected to become available in the spring of 2013 for this study area. There is a delay in the schedule to collect new bathymetric data; therefore, existing bathymetric data may be used for the transect-based coastal flood hazard analysis. Existing high-resolution bathymetric and topographic data is currently available at <http://csc.noaa.gov> .

As part of the GLCFS, USACE collected oblique imagery for the entire Great Lakes coastline in 2012. Oblique imagery is captured at an angle, as compared to an overhead view provided by orthophotos, and allows users a 3-dimensional view of landscape, buildings, and other features. This dataset may be useful to communities during emergency response, planning, and identification of shoreline types and obstructions; and management of assets, critical facilities, and public properties along the Lake Michigan shoreline. The oblique imagery is current available via a web-based browser at <http://greatlakes.usace.army.mil/>.

³ Root-mean-square-error is a measure of the differences between values predicted by a model or an estimator and the values actually observed.

Other Data Available:

The NOAA Coastal Services Center, Digital Coast, hosts a variety of digital coastal data, including bathymetric and topographic data, and is located at <http://www.csc.noaa.gov/digitalcoast> .

I.IV.i.10 Transportation

The Bing Map service has been used as a basemap layer on the Discovery Map, and includes a transportation layer. For more information on Bing Map services and how they can be used in GIS, please visit <http://www.arcgis.com/home> and search for “Bing Maps”.

Transportation data can also be found in the “Michigan Geographic Framework” dataset available through Michigan CGI (Center for Geographic Information) at <http://www.mcgi.state.mi.us/mgdl/>.

I.IV.i.11 Watershed Boundaries

U.S. Geological Survey (USGS) Hydrologic Unit Code 8 (HUC8) watershed boundaries were obtained from the National Atlas 2011 “Raw Data Download” (<http://nationalatlas.gov/atlasftp.html>). Mackinac County contains portions of five HUC8 watersheds: Tahquamenon (04020202), Manistique (04060106), Brevoort-Millecoquins (04060107), St. Marys (04070001), and Carp-Pine (04070002).

ii. Other Data and Information

Mackinac County is located in the Eastern Upper Peninsula of the state of Michigan. According to the U.S. Census Bureau, the 2010 population estimate for Mackinac County is 11,113 and there is a total area of approximately 2,100 square miles, 1,079 of which is water. It is bordered by both Lake Michigan and Lake Huron, as well the counties of Chippewa, Schoolcraft, and Luce. Much of the county is rural and characterized by low population density. The county’s geographic location is fairly remote from large urban areas of Michigan (U.S. Census Bureau, 2010).

Mackinac County gets an average of 29 inches of rain per year and snowfall totals 77 inches. The number of days with any measurable precipitation is 124. On average, there are 156 sunny days per year in Mackinac County. The July high is around 77 degrees Fahrenheit and the January low is 10 (U.S. Census Bureau, 2010).

Additional information about Mackinac County can be found on their county website at www.mackinacounty.net .

I.IV.ii.1 Coastal Barrier Resources Systems

Coastal barriers are unique land forms that protect distinct aquatic habitats and serve as the mainland’s first line of defense against damage from coastal storms and erosion. The Coastal Barrier Resources System (CBRS) defines a coastal barrier as a landform composed of unconsolidated shifting sand or other sedimentary material that is generally long and narrow and entirely or almost entirely surrounded by water. They are sufficiently

above normal tides so that they usually have dunes and terrestrial vegetation. The CBRS boundaries were downloaded from U.S. Fish and Wildlife Service http://www.fws.gov/CBRA/Maps/Data_Disclaimer_Shapefiles.html and are dated June 15, 2010.

Mackinac County has ten designated units of the coastal barriers along the Lake Michigan shoreline within this study area (fourteen in total for the entire county).

I.IV.ii.2 Coastal Flood Protection Measures

Coastal structures along Lake Michigan will be reviewed in more detail during the engineering analysis portion of the Lake Michigan study and were not analyzed as part of this Discovery process. A summary of information collected regarding existing coastal structures and flood protection measures is described below.

FEMA's Midterm Levee Inventory (MLI) project compiled a database of structures that were designed to provide at least the minimum level of protection from the base flood level (1- percent-annual-chance flood). For this Discovery process, the November 2011 MLI Status Report published by FEMA was reviewed. The MLI Levee database showed no levee segments in Mackinac County that provide protection from the 1-percent-annual-chance flood.

The USACE Coastal & Hydraulics Laboratory (CHL), a member of the Engineer Research & Development Center (ERDC), has compiled an inventory of coastal structures called the Enterprise Coastal Inventory Database (ECID). The ECID application and database houses information on more than 900 coastal structures in the U.S. and uses a Google Earth interface for users to access information on the structures including project reports, aerial photographs, wave and water level and bathymetric data. The database and application are available at <http://chl.ercdc.usace.army.mil/chl.aspx?p=s&a=Projects;246> . These maintained coastal structures protect harbors and shore-based infrastructure, provide beach and shoreline stability control, provide flood protection to varying degrees, and protect coastal communities, roadways and bridges, etc. These structures include seawalls, bulkheads, revetments, dikes and levees, breakwaters, groins, sills/perched beaches, and jetties and piers.

While several of these structures exist along the Lake Michigan shoreline, none were identified in Mackinac County.

I.IV.ii.3 Community Assisted Visits

Statewide Community Assistance Visits (CAVs) are part of the evaluation and review process used by FEMA and local officials to ensure that each community adequately enforces local floodplain management regulations to remain in compliance with NFIP requirements. Generally, a CAV consists of a tour of the floodplain, an inspection of community permit files, and meetings with local appointed and elected officials. During a CAV, observations and investigations focus on identifying issues in various areas, such as the community's floodplain management regulations (ordinance), community

administration and enforcement procedures, engineering or other issues within the FIRMs, other problems in the community’s floodplain management, and problems with the biennial report data. Any administrative problems or potential violations identified during a CAV are documented in the CAV findings report. The community is notified and given the opportunity to correct those administrative procedures and remedy the violations to the maximum extent possible within established deadlines. The summary of CAV visits were extracted from FEMA’s Community Information System (CIS) at <https://portal.fema.gov> in July 2012. The State has conducted a total of seven CAVs in the Townships of Clark, Garfield, Hendricks, Hudson, Moran, Newton, and St. Ignace, as well as in the City of St. Ignace. No CAV records were found for the Townships of Bois Blanc and Marquette, or the City of Mackinac Island. Table 8 shows the summary of CAV dates by community:

Table 8. Summary of Community Assisted Visits

Community	CAV Date
Bois Blanc, Township of	None
Clark, Township of	1/9/1995
Garfield, Township of	9/20/2001
Hendricks, Township of	7/25/2003
Hudson, Township of	9/6/2005
Mackinac Island, City of	None
Marquette, Township of	None
Moran, Township of	9/6/2000
Newton, Township of	N/A
St. Ignace, City of	9/6/2000
St. Ignace, Township of	9/6/2000

CAV = Community Assisted Visit

I.IV.ii.4 Community Rating System

The Community Rating System (CRS) is a voluntary incentive program to provide flood insurance premium discounts to NFIP-participating communities that take extra measures to manage floodplains above the minimum requirements. A point system is used to determine a CRS rating. The more measures a community takes to minimize or eliminate exposure to floods, the more CRS points are awarded and the higher the discount on flood insurance premiums. The list of CRS communities is available on FEMA’s Website site at <http://www.fema.gov/library/viewRecord.do?id=3629>, which was accessed in July 2012.

No coastal communities in Mackinac County coastal study area participate in the CRS program.

I.IV.ii.5 Comprehensive Plans

A comprehensive plan is a land use document providing framework and policy direction for land use decisions. Comprehensive plans usually include chapters detailing policy

direction affecting land use, transportation, housing capital facilities, utilities, coastal and rural areas. Comprehensive plans identify where and how growth needs will be met.

In Mackinac County, a County Master Plan exists to address land use and development. From the Master Plan, the plan's purpose is "the coordinated, adjusted and harmonious development of the County". Land use issues may be addressed by the plan, and planners may project 20 years or more into the future. The Master Plan for Mackinac County was adopted April 25, 2007 and a copy can be found at their website at <http://www.mackinacounty.net/county-info-a-links/master-plan.html> .

No comprehensive plans for the coastal communities within Mackinac County were collected as part of this Discovery process, though plans may exist.

I.IV.ii.6 Coordinated Needs Management Strategy (CNMS) and NFIP Mapping Needs

During FEMA's Flood Map Modernization program from 2003 to 2008, FEMA adhered to Procedure Memorandum No. 56 which states that, "Section 575 of the National Flood Insurance Program Reform Act of 1994 mandates that at least once every five years FEMA assess the need to review and update all floodplain areas and flood risk zones identified, delineated, or established under Section 1360 of the National Flood Insurance Act, as amended." This requirement was fulfilled through the Mapping Needs Assessment process. Other mechanisms such as the Mapping Needs Update Support System (MNUSS) and scoping reports were used to capture information describing conditions on the FIRMS and the potential for a map update.

FEMA's Coordinated Needs Management Strategy (CNMS) was initiated through FEMA's Risk MAP program in 2009 to update the way FEMA organizes, stores, and analyzes flood hazard mapping needs information for communities. CNMS defines an approach and structure for the identification and management of flood hazard mapping needs that provides support to data-driven planning and the flood map update investment process in a geospatial environment. The goal is to identify areas where existing flood maps are not up to FEMA's mapping standards. More information about the CNMS can be found at <http://www.fema.gov/library/viewRecord.do?id=4628> .

There are three classifications within the CNMS: "Valid," "Unverified," and "Unknown." New and updated studies (those with new hydrologic and hydraulic models) performed during FEMA's Map Modernization program were automatically determined to be "Valid" and the remaining studies went through a 17-element validation process with 7 critical and 10 secondary elements. Validation elements apply physical, climatological, and environmental factors to stream studies to determine validity. A stream study has to pass all of the critical elements and at least seven secondary elements to be classified as "Valid." The remaining streams are classified as "Unverified" or "Unknown". Studies for which flood hazard data are identified as having critical or significant secondary change characteristics are classified as "Unverified." Streams with a status of "Unknown" are those that have a study underway, will be evaluated in the future, or do not have sufficient

information to determine whether they are “Valid” or “Unverified” (Federal Emergency Management Agency, 2010).

Table 9 summarizes the draft results of the county-wide validation analysis obtained from CNMS in June 2012. CNMS only captures riverine studies at this time.

Table 9. CNMS Status for Mackinac County

County	FIPS	Unknown (stream miles)	Unverified (stream miles)	Valid (stream miles)	Total (stream miles)
Mackinac County, MI	26097	189	0	0	189

I.IV.ii.7 Critical Facilities

Critical facilities are the facilities that can impact the delivery of vital services, cause greater damages to other sectors of a community, or put special populations at risk. Hospitals, roads, schools, and shelters are all examples of critical facilities that play a central role in disaster response and recovery. Understanding which facilities are exposed, and the degree of that exposure, can help reduce or eliminate service interruptions and costly redevelopment. Incorporating this information into development planning helps communities get back on their feet faster.

The assessment of the flood risk posed to critical facilities is an important aspect of a hazard mitigation plan. The 2006 Mackinac County Hazard Mitigation Plan (expired May 16, 2011) noted that while critical facilities do exist in the county, the details on the each site are not publically available and interested parties should contact the Mackinac County Office of Emergency Services to receive additional detail on each critical facility site. The critical facility locations can be found in maps with the 2006 Mackinac County Hazard Mitigation Plan, which can be downloaded at http://www.eup-planning.org/index.php?page=Natural_Hazards_Mitigation_Planning#HM12.

I.IV.ii.8 Critically Eroded Beaches and Beach Nourishment/Dune Replacement Projects

According to the Critical Dune Area Maps maintained by MDEQ at http://www.michigan.gov/deq/0,4561,7-135-3311_4114_4236-70207--,00.html (accessed July 2012), critical dunes are located along Mackinac County shoreline. Appendix U of the basin-wide Lake Michigan Discovery Report contains an overview map that depicts the location of critical dune areas (Federal Emergency Management Agency, 2013).

Critically eroded beaches and beach nourishment/dune replacement projects were not identified in Mackinac County during this Discovery process.

I.IV.ii.9 Dams

The National Inventory of Dams (NID) is a congressionally authorized database that documents dams in the United States and its territories. The current NID, published in 2010, includes information on 84,000 dams that are more than 25 feet high, hold more than 50 acre-feet of water, or are considered a significant hazard if they fail. The NID is maintained and published by the USACE, in cooperation with the Association of State Dam Safety Officials, the States and territories, and Federal dam-regulating agencies. The database contains information about the dams' locations, sizes, purposes, types, last inspections, regulatory facts, and other technical data. The information contained in the NID is updated approximately every 2 years. The NID is available at the USACE Website <https://nid.usace.army.mil/>.

No dams were identified in the coastal areas of Mackinac County.

I.IV.ii.10 Declared Disasters

The FEMA Disaster Declarations Summary is a summarized dataset describing all federally declared disasters. This information begins with the first disaster declaration in 1953 and features all three disaster declaration types: major disaster, emergency, and fire management assistance. The dataset includes declared recovery programs and geographic areas (County data not available before 1964; fire management records are considered partial because of the historical nature of the dataset).

The list of FEMA's disaster declarations is available at <http://www.fema.gov/data-feeds> and also by county through <https://explore.data.gov/Other/FEMA-Disaster-Declarations-Summary/uihf-be6u>. Table 10 lists the major disaster declarations that have been declared in Mackinac County.

Table 10. Declared Disasters in Mackinac County

Disaster Number	Declaration Date	Incident Type	Description
1028	5/10/1994	Snow	Severe deep freeze
3035	3/2/1977	Drought	Drought
3057	1/27/1978	Snow	Blizzards & snowstorms
3225	9/7/2005	Hurricane	Hurricane Katrina evacuation*

*Refers to the federal disaster aid that was made available to Michigan to supplement its efforts to assist evacuees from areas struck by Hurricane Katrina.

I.IV.ii.11 Flood Insurance Policies

A community's agreement to adopt and enforce floodplain management ordinances, particularly with respect to new construction, is an important element in making flood insurance available to home and business owners. For this Discovery project, data on flood insurance policies were also gathered.

Table 11 summarizes the numbers and premiums of insurance policies, the total coverage, and the numbers and dollar amounts of paid losses in communities of the Mackinac County project area. The claim information is not specific to Lake Michigan flooding. The data is based on Community Summary Reports that were extracted from FEMA’s CIS website (<https://portal.fema.gov/famsVuWeb/home>) in July 2012.

Table 11. Summary of Flood Insurance Policies and Claims

Community	CID	No. Policies	Total Premium	Total Coverage	Number of claims since 1978	Dollar (\$) paid for claims since 1978
Bois Blanc, Township of	260795	0	--	--	--	--
Clark, Township of	260759	19	\$14,208	\$3,211,800	0	\$0
Garfield, Township of	260766	11	\$6,983	\$1,818,900	2	\$2,257
Hendricks, Township of	260806	0	--	--	--	--
Hudson, Township of	260807	4	\$2,824	\$652,500	0	\$0
Mackinac Island, City of	260764	0	--	--	--	--
Marquette, Township of	260750	0	--	--	--	--
Moran, Township of	260443	6	\$4,387	\$799,200	0	\$0
Newton, Township of	None	N/A	--	--	--	--
St. Ignace, City of	260767	0	--	--	--	--
St. Ignace, Township of	260444	9	\$3,600	\$1,350,400	1	\$0

CID = Community Identification

Source: FEMA’s CIS Summary Report “Insurance Reports”

I.IV.ii.12 Gage Data

The NOAA Coastal Services Center, Digital Coast, hosts a variety of digital coastal data, including gage data, and is located at <http://www.csc.noaa.gov/digitalcoast>.

Meteorological Stations:

The National Data Buoy Center (NDBC) is a part of the NOAA National Weather Service (NWS). NDBC designs, develops, operates, and maintains a network of data collecting buoys and coastal stations. NDBC provides hourly observations from a network of about 90 buoys and 60 Coastal Marine Automated Network (C-MAN) stations to help meet these needs. All stations measure wind speed, direction, and gust; atmospheric pressure; and air temperature. Water level is measured at selected stations. The historical and current data are available at the NDBC Website <http://www.ndbc.noaa.gov/>.

Table 12 shows the meteorological station identification number and location for the gages in the Lake Michigan’s Mackinac County project area.

Table 12. NOAA Meteorological Stations on Lake Michigan in Mackinac County

Station ID	Location	Owner	Data	Years of Historical Data
NABM4	Naubinway, MI	National Weather Service Central Region	Meteorological Observation	2006-Present
PNLM4	Port Inland, MI	NOAA's National Ocean Service	Water Level, Meteorological Observation	2006-Present

In addition, the Great Lakes Environmental Research Laboratory is a part of NOAA focused on the Great Lakes. It maintains multiple datasets, including a collection of meteorological data for both the United States and Canada. The datasets can be found online at <http://www.glerl.noaa.gov>.

Stream Gages:

The USGS National Water Information System Web Interface (<http://waterdata.usgs.gov/nwis>, provides real-time data for any given stream gage location. Table 13 below shows the gage identification numbers and locations for the gages in the study areas of Mackinac County. All USGS stream gage locations are shown on the Discovery Map.

Table 13. Stream Gage Stations in Mackinac County

County	Gage ID	Begin Date	End Date	Gage Location
Mackinac	04046000	10/1/1951	9/30/2000	Black River near Garnet, MI

Water Level Station:

NOAA’s Center for Operational Oceanographic Products and Services (CO-OPS) maintains several water level stations along Lake Michigan. CO-OPS’ primary motivation is the collection and dissemination of high quality and accurate measurements of lake level for scientific studies.

Great Lakes water levels constitute one of the longest high quality hydrometeorological data sets in North America with reference gage records beginning about 1860 with sporadic records back to the early 1800's. The station information and water level data are available at NOAA CO-OPS Website:

http://tidesandcurrents.noaa.gov/station_retrieve.shtml?type=Great Lakes Water Level Data&state=LakeMichigan . The monthly high and low water level data from the year

1918 to 2011 at Lake Michigan are available at the USACE Website:

<http://www.lre.usace.army.mil/greatlakes/hh/greatlakeswaterlevels/>.

Figure 2 depicts Historic Great Lakes Water Levels from 1918 to 2011 (U.S. Army Corps of Engineers, 2012).

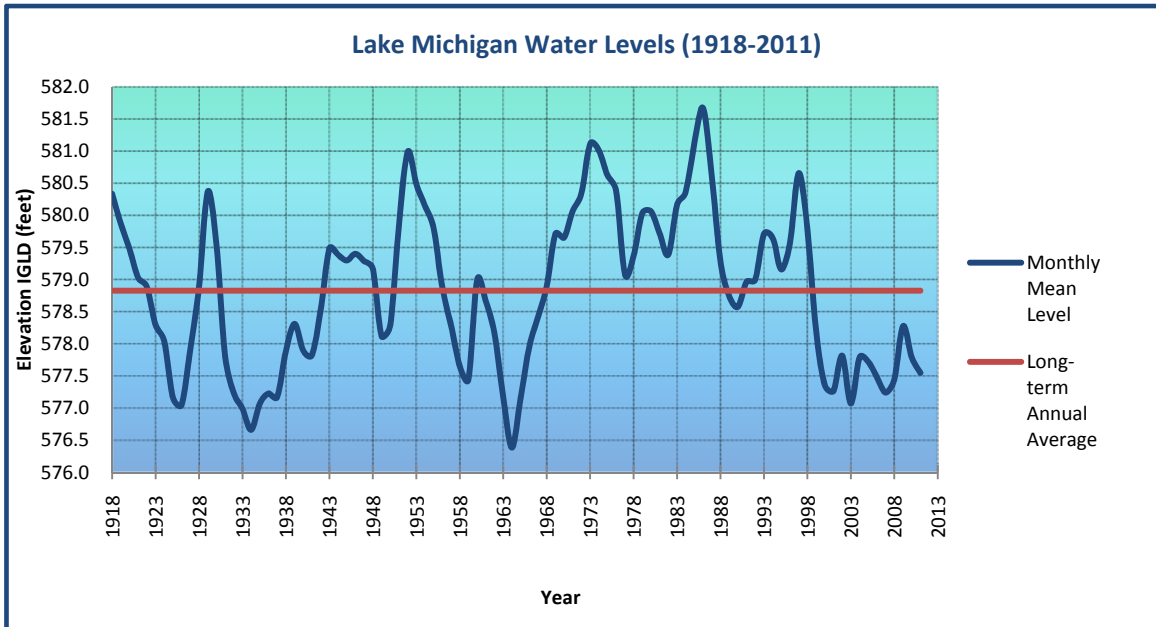


Figure 2: USACE Historic Great Lakes Water Level Data (1918-2011)

The Great Lakes Water Levels Report provides daily mean water levels of Lake Michigan for the past three months. The data are available at the USACE website: <http://www.lre.usace.army.mil/greatlakes/hh/greatlakeswaterlevels/currentconditions/greatlakeswaterlevels/>.

Wave Gage/Buoy Stations:

The NDBC is a part of the NOAA National Weather Service (NWS). NDBC designs, develops, operates, and maintains a network of data collecting buoys and coastal stations. NDBC provides hourly observations from a network of about 90 buoys and 60 C-MAN stations to help meet these needs. In addition to standard meteorological observation, all buoy stations, and some C MAN stations, measure sea surface temperature and wave height and period. Conductivity and water current are measured at selected stations. The historical and current data are available at NDBC website <http://www.ndbc.noaa.gov/>.

I.IV.ii.13 Great Lakes Coastal Restoration Grants

The Great Lakes received \$475 million for restoration efforts in 2010, as part of the Great Lakes Restoration Initiative, or GLRI. Michigan Sea Grant was awarded more than \$1.5 million to help restore particular areas in the region and is leading two projects while assisting on five others. The projects focus on endangered fish, invasive species, beach contamination, water pollution and sound boating and marina operations. Additional information can be found at Michigan Sea Grant website <http://www.miseagrant.umich.edu/explore/restoration/>.

I.IV.ii.14 Hazard Mitigation Plans

Hazard mitigation plans are prepared to assist communities to reduce their risk to natural hazard events. The plans are used to develop strategies for risk reduction and to serve as a guide for all mitigation activities in the given county or community.

A local hazard mitigation plan is a long-term strategic/guidance document used by an entity to reduce future risk to life, property, and the economy in a community. A hazard mitigation plan has the following elements:

- A public participation process for bringing together diverse stakeholders in the jurisdiction(s) to provide an array of input into the plan
- A risk assessment to identify the hazards, determine the people and property subject to those hazards, and estimate vulnerability
- A mitigation strategy that contains goals, objectives, and an action plan to implement priority mitigation actions that reduce risk
- A maintenance process to ensure the plan is reviewed and updated
- An adoption requirement to ensure the support from participating jurisdictions

Local mitigation plans are required to be updated every 5 years to maintain eligibility for FEMA Hazard Mitigation Assistance grant programs. The status of current hazard mitigation plans is shown in Table 14. The data was obtained from FEMA’s Plan Approval Status Report based on Regional reports for the end of June 2012 (Federal Emergency Management Agency, May 2012).

Table 14. Hazard Mitigation Plan Status for Mackinac County

Jurisdiction	Approval Date	Expiration Date
Mackinac County	5/16/2006	5/16/2011

The 2006 Hazard Mitigation Plan expired May 16, 2011. Mackinac County Hazard Mitigation plan is currently being updated by the Eastern Upper Peninsula Regional Planning & Development Commission. Additional information about the 2012 County Hazard Mitigation Plan 5 Year Update can be found at http://www.eup-planning.org/index.php?page=Natural_Hazards_Mitigation_Planning#HM12 .

I.IV.ii.15 Hazard Mitigation Grant Program

After a major disaster declaration, the Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.

A variety of hazard mitigation projects have been submitted for FEMA’s HMGP. A summary of HMGP projects can be downloaded from <https://explore.data.gov/catalog/raw>.

I.IV.ii.16 Historical Flooding & High Water Marks

According to the 2006 Mackinac County Hazard Mitigation Plan, flooding caused by too much precipitation and shoreline flooding is most common in Mackinac County.

Shoreline flooding is the flooding and erosion that occurs along shoreline areas caused by high Great Lakes water levels, storm surges, and winds (Eastern Upper Peninsula Regional Planning & Development Commission, 2005).

During times of excessive precipitation, flooding tends to occur in streets when rainwater cannot flow into a storm sewer. Basements tend to flood in those situations when rainwater cannot flow away from the house or when sewers back up. These problems are usually not caused by heavy local rains and are often not related to overbank flooding or current floodplain locations.

In 1993, three flooding events were recorded in January, March, and April. Mackinac County was affected, but not nearly as much as the Lower Michigan counties.

On July 31, 1999, a few inches of standing water developed on local streets. A bow echo moved east across much of the eastern upper and northern lower Michigan ahead of a cold front moving over the upper Midwest. Numerous reports of straight line wind damage were associated with the bow. Storms with heavy rain ahead of the bow caused some flooding across Mackinac County.

In April 2001, a combination of runoff from snowmelt and rainfall resulted in minor flooding primarily along the Pine River in the Upper Peninsula.

Garfield Township has experienced flooding in Mill Pond Park when water levels were high. Some walkways and sitting structures were exposed to the increased water level. Increased development along lake shorelines also can be exposed to flooding situations when water levels are high.

Bois Blanc Island Township has experienced flooding problems when lake levels are high, which has caused erosion and problems with septic systems.

All townships, with the exception of Portage Township, have Great Lake shorelines which, during times of high water tables, are exposed to flooding and erosion (Eastern Upper Peninsula Regional Planning & Development Commission, 2005).

During the Discovery process, stakeholders identified the following additional areas of historical flooding:

- Ice build-up at the mouth of Black and Pine Rivers during winter snow melts causes a jam where the rivers meet at Lake Michigan. The Rivers then back up and can cause serious flooding and well contamination issues.
- Depending on lake levels, there are some potential flooding issues near St. Ignace.

- Past flooding issues have occurred in the Brevort area when lake levels were higher.

No high water mark data was collected during this Discovery process. If local stakeholders have available high water mark data, historical flooding information, or historic flooding photographs they are encouraged to submit them to FEMA Region V Mitigation Division.

I.IV.ii.17 Land Use

The Mackinac County Master Plan discusses existing and future land use for Mackinac County, and can be found at <http://www.mackinacounty.net/county-info-a-links/master-plan.html>. The purpose of the master plan was to help in the development of goals, objectives and future recommendations as it relates to land use. Current planning efforts in Mackinac County build upon prior accomplishments in local planning and zoning. Local Master Plans can be downloaded at <http://www.mediafire.com/euprpd#61bcgix8vjcq1>

A Comprehensive Plan for Mackinac County was adopted in 1966. Currently, the county has no zoning in place, and there is no intent to establish countywide zoning. Eight of the eleven townships in Mackinac County operate their own planning and zoning programs. The three remaining townships, Hendricks, Hudson, and Newton, have no local plans or zoning ordinances because they have smaller populations and large public land space. In Michigan land use law, township-level plans and zoning ordinances take priority over county actions and counties may not plan or zone for incorporated communities. The City of St. Ignace and the City of Mackinac Island administer their own separate planning and zoning programs. Thus, the Mackinac County Master Plan does not replace adopted township or municipal plans and zoning ordinances, but instead the county plan seeks to compliment and incorporate existing local plans (Mackinac County Planning Commission, 2007).

I.IV.ii.18 Letters of Map Change

A Letter of Map Change (LOMC) is a letter that reflects an official revision to an effective NFIP map. LOMCs are issued in place of the physical revision and republication of the effective FIRM. LOMCs include completed cases of Letters of Map Amendment (LOMAs) and Letters of Map Revision (LOMRs), including LOMRs based on fill (LOMR-Fs), and conditional LOMRs. The lists of LOMC cases were obtained from the FEMA Mapping Information Platform Website (<https://hazards.fema.gov/femaportal/wps/portal>) in June 2012.

Table 15 lists the number of LOMCs in the county. No Conditional LOMAs or Conditional LOMR-Fs were included. The LOMCs are shown on the Discovery Maps. Clusters of LOMCs indicate a need for updated maps.

Table 15. Summary of LOMC cases in Mackinac County

County	Number of Letters of Map Amendments	Number of Letters of Map Revisions – Based on Fill	Number of Letters of Map Revisions
Mackinac County	35	2	0

I.IV.ii.19 Locally Identified Mitigation Actions

Table 16 lists the potential mitigation actions and strategies as pulled from the 2006 Mackinac County Hazard Mitigation Plan (Eastern Upper Peninsula Regional Planning & Development Commission, 2005).

Table 16. Hazard Mitigation Actions

Action	Vulnerable Areas	Specific Hazard Addressed	Benefits
Alert Warning Systems	Mackinac Island, Bois Blanc Island, areas of Mackinac County lacking coverage.	Wildfire, Extreme Temperatures, Flooding, Thunderstorms, High Wind.	Improved capabilities of warning public in emergency situations, improved confidence in government.
Larger Storm Water Detention Basins	Chamber St., Church St., High St., Airport Road, Truckey St. - City of St. Ignace	Flooding, Environmental Contamination, Infrastructure Failure	Reduce flooding/erosion of roads, more improved infrastructure.
Acquire Flood-prone NFIP Properties	Clark Township, Hudson Township, Hendricks Township	Flooding	Reduce property damage caused by flooding.
Ditching along US-2	Moran Township	Infrastructure Failure, High Wind, Shoreline Erosion, Flooding	This project would prevent sand/snow drifting across US-2 as well as improve run-off from rain and melting snow.
Warning Sensors for Rivers - Review the gauging network to determine if additional rain and stream gauges are necessary. Seek funding to purchase the best equipment available.	Clark Township, Hudson Township, Hendricks Township, Portage Township, Moran Township, Garfield Township	Riverine/Lake Flooding, Transportation Accidents, Infrastructure Failure	Early warning of potential flooding to provide for possible evacuation of buildings and residences or traffic re-routing due to road closures caused by flooding.

Users of this report should note that the Mackinac County Hazard Mitigation Plan expired in May of 2006 and an update is currently underway as of the date of this report. The 2006 plan, plus information about the efforts to update the plan, is located at http://www.eup-planning.org/index.php?page=Natural_Hazards_Mitigation_Planning#HM06

The State Hazard Mitigation Plan, updated March 2011, sets forth a State-wide plan for mitigation planning and provides guidance to local communities for identifying mitigation strategies and implementing mitigation actions. While the plan addresses a variety of hazards within the State, the following was captured from the plan regarding flooding (Michigan Department of State Police, Emergency Management and Homeland Security Division, 2011):

In developing mitigation recommendations and implementation strategies for the hazards addressed in this plan, the following general guiding principles have been followed to the extent possible:

- *Non-structural measures have been emphasized over structural measures.*
- *Voluntary measures have been emphasized over mandatory measures.*
- *Education-based compliance and cooperation has been emphasized over legislated mandates.*
- *The least expensive alternative has, in general, been emphasized over more expensive alternatives*

Furthermore, the following additional principles will govern the development and implementation of flood hazard mitigation recommendations:

- *NFIP-participating communities will have priority over non-participating communities.*
- *Communities / sites suffering repetitive losses will have greater emphasis.*
- *Flood mitigation projects will, to the extent possible, be implemented in the following order of priority:*
 1. *Acquisition and relocation or elevation of flood prone structures.*
 2. *Drainage projects (culverts, channels, retention / detention ponds, etc.).*
 3. *Wet and dry flood proofing of structures.*
 4. *Structural measures (floodwalls, dikes, jetties, etc.).*

The State of Michigan has issued a comprehensive document listing Hazard Mitigation Success Stories and may be a good resource for communities looking for mitigation action ideas that address their local risk concerns. The document was prepared by the Emergency Management and Homeland Security Division, Michigan Department of State Police and Michigan Citizen-Community Emergency Response Coordinating Council (MCCERCC) and was issued in 2011. Michigan Hazard Mitigation Success Stories can be downloaded from

http://www.michigan.gov/documents/msp/Michigan_Hazard_Mitigation_Success_Stories_May_2011_Final_Edition_web_355580_7.pdf

During this Discovery process, Areas of Mitigation Interest (AoMI) were identified by the local stakeholders and should be considered for future mitigation actions and incorporation into Hazard Mitigation Plan updates:

- Ice build-up at the mouth of Black and Pine Rivers during winter snow melts causes a jam where the rivers meet at Lake Michigan. The Rivers then back up and can cause serious flooding and well contamination issues. Mitigation action identified was to elevate well heads.
- Depending on lake levels, there are some potential flooding issues near St. Ignace.
- Past flooding issues have occurred in the Brevort area when lake levels were higher.

I.IV.ii.20 Ordinances

Local regulations regarding development within known flood hazard areas can range from ordinances with minimum NFIP requirements to strong, pro-active ordinances that not only regulate and protect new and improved development in existing Special Flood Hazard Areas (SFHAs) but also seek to mitigate the growth of SFHAs caused by increased runoff from developed areas and the degradation of natural flood control areas, such as wetlands and forests.

Title 44 of the Code of Federal Regulations Sections 60.3(a)–(e) describes the NFIP floodplain ordinance levels and provides the minimum requirements for community participation in the NFIP. The proper ordinance level for each community is determined by the type of flooding that is present within the community. Ordinance levels are shown in the table below:

<u>Ordinance Level</u>	<u>Description</u>
A	Floodplains have not been identified
B	Floodplains with no base flood elevations (BFEs)
C	Floodplains with BFEs or coastal flooding with no high-hazard areas (Zone V)
D	Floodplains with BFEs and floodways
E	Coastal high-hazard areas identified, but no floodways
D & E	Both floodways and coastal high-hazard areas

Ordinance level information for Mackinac County communities within the project area was researched using FEMA’s Community Information System (CIS) in December 2012. CIS contained no information on ordinance level for Mackinac County communities in the project area and therefore the data could not be compiled for this Discovery Report.

I.IV.ii.21 Proposed Draft Transects

Transects are profiles along which coastal flooding analysis is performed. Transects are used to transform offshore conditions to the shoreline and are used to define coastal flood risks inland of the shoreline. They are placed to define representative profiles for a shoreline reach. The transect layout for coastal hazards analysis and subsequent floodplain delineation is determined by physical factors such as changes in topography, bathymetry, shoreline orientation, and land cover data, in addition to societal factors such as variations

in development and density. The base maps listed earlier in this section (i.e. LiDAR, bathymetry) were reviewed, or will be reviewed once available, to determine revisions to the draft placement for hazard modeling transects along the Lake Michigan shoreline.

The originally proposed draft transect layout is shown on the draft Discovery Map for Mackinac County (Attachment C) and includes an identification number per transect. Note that these identification numbers will change as the draft transects are revised in the future.

Stakeholders were provided with the proposed draft transect shapefiles (GIS digital data) upon request, and the proposed draft transects (Attachment D) were also reviewed by stakeholders during and after the Discovery Meeting. Input from local officials was requested regarding the placement and the number of transects. The detailed comments collected can be found in Attachment E, Stakeholder Comments from Discovery Process. The ID numbers in this table correspond to the location of the comment, which is shown on the Final Discovery Maps in Appendix R of the basin-wide Lake Michigan Discovery Report and is not an attachment within this county-based report (Federal Emergency Management Agency, 2013).

Below is a summary of the comments received and addressed for the proposed draft transects along the Lake Michigan shoreline in Mackinac County:

- Stakeholders identified a large area of the shoreline as being part of a State Park and Federal Land with few to no structures and suggested transects be removed in this area.
- Stakeholders identified areas of flood concern where draft transects had already been placed.

All comments were reviewed and incorporated where possible and a revised proposed draft transect layout was created. This revised transect layout can be found on the Final Discovery Maps in Appendix R of the Lake Michigan basin-wide report (Federal Emergency Management Agency, 2013). It should be noted that these transects remain subject to change pending future coastal analysis and additional discussions with stakeholders regarding further reduction in the number of transects.

I.IV.ii.22 Pre-Disaster Mitigation Program

The Pre-Disaster Mitigation (PDM) program is a nation-wide competitive grant program that was created to assist State and local governments, including Indian Tribe governments, with the funding to implement cost-effective hazard mitigation activities prior to disasters. The intent of this program is to reduce overall risk to people and property, while also minimizing the cost of disaster recovery. Grants awarded during past fiscal years can be downloaded from the Pre-Disaster Mitigation Archives at <http://www.fema.gov/pre-disaster-mitigation-grant-program/pre-disaster-mitigation-archives> .

I.IV.ii.23 Public Assistance (PA) Grant Program

The mission FEMA’s Public Assistance (PA) Grant Program is to provide assistance to State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from declared disasters or emergencies.

Through the PA Program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. The PA Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process.

Detailed project descriptions for completed PA projects can be downloaded from <https://explore.data.gov/catalog/raw> .

I.IV.ii.24 Regulatory Mapping

The effective mapping status for communities in the Mackinac County project area is listed in Table 17. Mackinac County has not yet been modernized to digital mapping.

Table 17. Effective Mapping Status of Mackinac County

County	Community	CID	Status	Effective Date
Mackinac County	Bois Blanc, Township of	260795	Participating	NSFHA*
Mackinac County	Clark, Township of	260759	Participating	11/4/1992
Mackinac County	Garfield, Township of	260766	Participating	11/20/2000
Mackinac County	Hendricks, Township of	260806	Participating	11/4/1992
Mackinac County	Hudson, Township of	260807	Participating	11/4/1992
Mackinac County	Mackinac Island, City of	260764	Participating	NSFHA*
Mackinac County	Marquette, Township of	260750	Participating	NSFHA*
Mackinac County	Moran, Township of	260443	Participating	11/20/2000
Mackinac County	Newton, Township of	None	N/A	N/A
Mackinac County	St. Ignace, City of	260767	Participating	NSFHA*
Mackinac County	St. Ignace, Township of	260444	Participating	11/20/2000

CID = community identification

*NSFHA = No Special Flood Hazard Areas identified

Effective FIRMs and FISs can be downloaded from FEMA’s Map Service Center (MSC) at <https://msc.fema.gov> .

I.IV.ii.25 Repetitive Loss/Severe Repetitive Loss

A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling ten-year period, since 1978. A

RL property may or may not be currently insured by the NFIP. There are currently over 122,000 repetitive loss properties nationwide.

Structures that flood frequently strain the National Flood Insurance Fund. In fact, the RL properties are the biggest draw on the Fund. FEMA has paid almost \$3.5 billion dollars in claims for RL properties. RL properties not only increase the NFIPs annual losses and the need for borrowing funds from Congress, they drain funds needed to prepare for catastrophic events. Community leaders and residents are also concerned with the RL problem because residents' lives are disrupted and may be threatened by the continual flooding.

Over the years, there have been a number of efforts aimed at addressing repetitive losses. Depending on individual circumstances, appropriate mitigation measures commonly include elevating buildings above the level of the base flood, demolishing buildings, and removing buildings from the SFHA as part of a flood control project. Sometimes, mitigation takes the form of a local drainage-improvement project that meets NFIP standards and removes a property or properties from RL or Repetitive Loss Target Group (RLTG) status.

The Repetitive Flood Claims (RFC) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108–264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). Up to \$10 million is available annually for FEMA to provide RFC funds to assist states and communities reduce flood damages to insured properties that have had one or more claims to the NFIP. Additional information on this program and other related programs is available at <http://www.fema.gov/hazard-mitigation-assistance>.

Repetitive losses were reviewed in FEMA's CIS "Community Disaster Detail – Flood Insurance" report. No repetitive loss data was found for the communities in Mackinac County in this study area.

I.IV.ii.26 Socio-Economic Analysis

Information on demographics and socioeconomic trends can be found at the Eastern Upper Peninsula Regional Planning & Development website at http://www.eup-planning.org/index.php?page=Data_Center_-_Census_Information and Michigan Department of Technology, Management, and Budget at <http://www.michigan.gov/cgi/0,1607,7-158-54534---,00.html>.

In Mackinac, tourism has become the main industry in recent decades. These Upper Peninsula counties have extensive coastline on Lake Michigan and ample areas of state and national forests, which contribute to the tourism opportunities.

Over the past 10 years, the Mackinac County population experienced a decline of 6.9 percent, from 11,943 people in 2000 to 11,113 people in 2010 (U.S. Census Bureau, 2010). From the Eastern Upper Peninsula Regional Planning & Development website, a group of

stakeholders are beginning the process of developing a Regional Growth Strategy for the Eastern Upper Peninsula Region. Regional Planning will be assisting this group in facilitating discussions to identify strategies and tactics in order to develop this plan.

In 2009, lake-related businesses in Mackinac County provided 26.3 percent of the total jobs in the County. This accounted just over 1,100 jobs, \$25 million in wages, and \$63 million in goods & services. This represents a 12 percent decrease in lake jobs since 2005 (National Oceanic & Atmospheric Administration, 2009).

I.IV.ii.27 State-level Datasets, Programs, and Information

The information in this section was compiled by the project team throughout this Discovery process based on research of the project area and discussions with local and regional stakeholders.

Michigan Coastal Zone Enhancement Program Assessment and Strategy (2011-2016):

Every five years, the Coastal Zone Management Act encourages states and territories to conduct self-evaluations of their coastal management programs to assess significant changes in the state's coastal resources and management practices, identify critical needs, and prioritize areas for enhancement under the Coastal Zone Enhancement Program. More information on this program can be found at

<http://coastalmanagement.noaa.gov/enhanc.html>. The Coastal Zone Enhancement Program Assessment and Strategy can be downloaded at <http://coastalmanagement.noaa.gov/mystate/docs/mi3092011.pdf>.

The Michigan Coastal Management Program website located at www.mi.gov/coastalmanagement provides information on the Program including information on its permitting, coastal planning, and technical assistance programs. Michigan's Coastal Management Program was developed under the federal Coastal Zone Management Act and approved in 1978. Since then, the Program has assisted organizations in protecting and enhancing their coastal areas, funded studies related to coastal management, and helped to increase recreational opportunities in Michigan's Great Lakes coastal area.

Coastal Zone Boundary maps can be downloaded at http://www.michigan.gov/deq/0,4561,7-135-3313_3677_3696-90802--,00.html

A list of previously awarded coastal management grants can be found here: http://www.michigan.gov/deq/0,4561,7-135-3313_3677_3696-171451--,00.html

V. Risk MAP Projects and Needs

This section provides information about the planned next steps for the Lake Michigan GLCFS, including information about the upcoming coastal analysis, potential for mitigation technical assistance within the project area, potential for changes in compliance as a result of the coastal flood study, future communications, and how unmet needs will be addressed.

i. Future Coastal Study

Information and data collected as part of this Discovery effort and provided in this report will be utilized in the upcoming coastal flood study for Lake Michigan.

A summary of the GLCFS project, as well as project updates, can be found at <http://www.greatlakescoast.org/> under the “Great Lakes Coastal Analysis & Mapping” section.

The following work is expected to be performed for Lake Michigan as part of the GLCFS, pending congressional funding. The scope of work described in this section is therefore subject to change and may not be performed within all Lake Michigan communities.

All engineering and mapping analysis performed as part of this study will follow guidance provided within FEMA’s Draft *Guidelines and Specifications for Coastal Studies Along the Great Lakes*, issued on May 8, 2012 (Federal Emergency Management Agency, 2012). The upcoming study is expected to include the following tasks: creation of bathymetric and topographic data, base map acquisition, coastal flood hazard analysis, and risk assessment product development. A summary is provided below and additional detail may be found in FEMA’s basin-wide Lake Michigan Discovery Report (Federal Emergency Management Agency, 2013).

Engineering & Mapping:

Coastal flood hazard analyses for the coastal communities of the United States located along the Lake Michigan shoreline will be performed. This analysis will include the creation of bathymetric and topographic map data inventory, base map acquisition, and coastal flood hazard analysis.

Draft coastal flood maps (or workmaps) will be produced for the study area. The workmaps will include the 1-percent- and 0.2-percent-annual chance flood hazard areas, Coastal High Hazard (VE Zone) and Coastal A Zone (AE Zone), Base Flood Elevations (BFEs), and Limit of Moderate Wave Action (LiMWA) boundary. The LiMWA boundary identifies the 1.5-foot wave height line and alerts property owners that although their property is in a Zone AE area, it may also be affected by waves 1.5 feet or higher. Communities will be provided with an opportunity to review the workmaps after the coastal analysis is complete and prior to FIRM production.

National Flood Insurance Program Integration:

Regulatory FIRM files may be updated through the FEMA’s Physical Map Revision (PMR) process using the results from the work performed in the Engineering and Mapping task described above.

The final production and distribution of updated FIRMs will be dependent on the results of the coastal analysis, discussions with the communities, and congressional funding. Therefore, it cannot be identified at this time the exact communities that will receive updated FIRMs that may require adoption. The risk assessment products and their distribution, discussed below, are also dependent on the results of the coastal analysis and further community discussions and are subject to change.

Risk Assessment Products:

Depending on available data, results of coastal analysis, local needs identified, local partnerships, and fiscal year funding, the coastal flood risk products such as Flood Risk Map, Flood Risk Report, Changes Since Last FIRM (CSLF), Flood Depth and Analysis Grids, and Hazus-MH analyses may be generated for identified coastal communities. Optional Flood Risk Assessment products such as coastal wave height grids, erosion risk determination, and wave hazard severity area datasets have not yet been funded. Table 18 summarizes the products projected for the coastal communities in this project area.

Table 18. Potential Flood Risk Products

County	State	Flood Risk Map and Flood Risk Report	Changes Since Last FIRM	Flood Depth and Analysis Grids	Optional Flood Risk Assessment Products
Mackinac	MI	✓	-	✓	TBD

ii. Potential for Mitigation Assistance

As part of a Risk MAP project, Mitigation Planning Technical Assistance (MPTA) may be available to help communities plan for and reduce risks by providing communities with specialized assistance. MPTA includes risk assessment, mitigation planning, and traditional hazard identification (flood mapping) activities. Technical assistance through MPTA can be performed at any time during the hazard mitigation planning process.

Determining which communities receive MPTA is dependent on identification of a need, the willingness of a community to partner with FEMA, local resources and data availability, and federal funding availability. Unfortunately, not every community will be able to receive MPTA as part of a Risk MAP project. Forming a partnership between FEMA and a local community is an essential part of initiating a MPTA project. Assistance will be prioritized after all data and information is collected and assessed by FEMA in coordination with the local communities to determine where MPTA resources would be

beneficial. Communities should alert FEMA of any resources that are available at the local level, and of actions they are interested in implementing in partnership with FEMA. Technical assistance activities should be based on the needs of the community and assist with already established capabilities.

Some technical assistance activities could include (but are not limited to):

- Advising in the creation of initial Hazard Mitigation Plans
- Advising in the update of existing Hazard Mitigation Plans
- Training to improve a community's capabilities for reducing risk
- Assistance in incorporating flood risk datasets and products into potential and effective community legislation, guidance, regulations, procedures, etc.
- Assistance with the creation, acquisition and incorporation of GIS data into potential and effective maps, planning mechanisms, emergency management procedures, etc.
- Facilitating the identification of data gaps and interpret technical data to identify risk reduction deficiencies that should be corrected.

Stakeholders noted during this Discovery process that the Mackinac County Hazard Mitigation Plan update is currently underway. It is recommended additional discussion occur between FEMA and these stakeholders as this coastal flood study moves forward to see if MPTA would be an appropriate and beneficial supplemental option.

Continued discussion regarding FEMA partnership with local communities to assist in developing new mitigation actions and moving those actions forward will be essential as this coastal project moves forwards.

iii. **Compliance**

FEMA uses a number of tools to determine a community's compliance with the minimum regulations of the NFIP. Among them are Community Assisted Contacts (CACs), Community Assistance Visits (CAVs), the Letter of Map Change (LOMC) process, and Submit-for-Rates. These tools help assess a community's implementation of their flood damage reduction regulations and identify any floodplain management deficiencies and violations.

If administrative problems or potential violations are identified, the community will be notified and given the opportunity to correct those administrative procedures and remedy the violations to the maximum extent possible within established deadlines. FEMA or the state will work with the community to help them bring their program into compliance with NFIP requirements. In extreme cases where the community does not take action to bring itself into compliance, FEMA may initiate an enforcement action against the community.

After coastal analysis is completed for this study, communities may be faced with adopting

new regulations related to coastal high hazard areas. An understanding of regulations associated with coastal areas will be important so that communities remain compliant. During this Discovery process, stakeholders were provided with information regarding NFIP requirements that are associated with coastal hazard zones, as well as information about new FEMA guidance related to moderate wave action.

These compliance topics, including coastal Special Flood Hazard Areas (SFHAs), building requirements in VE Zones, and Limit of Moderate Wave Action (LiMWA), are discussed in detail at <http://www.greatlakescoast.org> and in the basin-wide Lake Michigan Discovery Report (Federal Emergency Management Agency, 2013).

iv. **Communication**

Throughout this Discovery process, community representatives and local stakeholders indicated the need to be kept informed about the results of Discovery, the upcoming coastal flood study, and opportunities for public input throughout the study process.

Throughout this study process, Federal, State, and local stakeholders will be kept informed via email, phone calls, letters, newsletters, and meetings as appropriate. A dedicated email account was created (GreatLakesFloodStudy@STARR-Team.com) to distribute project information, meeting reminders, and summaries.

Stakeholder involvement will continue to be important through the remainder of the project. The GLCFS website <http://www.greatlakescoast.org> is an excellent resource where stakeholders can obtain the most update-to-date information about the status of the Great Lakes flood study projects, data collection, upcoming meetings, new technical reports, the latest methodologies, factsheets, and additional information. FEMA encourages stakeholders to remain involved throughout the study process and will seek to identify partnership opportunities during the study process.

v. **Unmet Needs**

During this Discovery process, stakeholders provided FEMA with a wide variety of information. Some of the information, while valuable, may not be able to be utilized in the upcoming coastal study. In addition, some questions may be unresolved as of the end of this Discovery process. This section seeks to summarize those unmet needs and to provide the steps that may be taken to address them in the future.

During the Discovery Meetings and throughout the Discovery process, Lake Michigan stakeholders were concerned about what to expect in terms of extent of new SFHA boundaries, the possible introduction of VE Zones, the number of property owners who would be affected, and the additional NFIP requirements and flood insurance costs that may go along with a flood map revision. FEMA acknowledged this concern, adding that upcoming engineering and mapping tasks include the distribution of workmaps and other

flood risk products designed to give local stakeholders an opportunity to review and comment on flood risk data before the data is carried into NFIP FIRM maps.

In addition, comments related to the proposed draft transects were provided during the Discovery Meeting by local stakeholders. Those comments were incorporated into an updated draft transect layout where possible. However, it should be noted that the draft transects proposed in this report remain subject to change pending future coastal analysis and discussions with stakeholders regarding reduction in the total number of transects along the shoreline. Stakeholders will be made aware of revised transect locations via the future workmaps that will be provided to local communities for review as the study moves forward.

VI. Close

Federal, State, and local stakeholders that were involved in this Discovery process contributed valuable information about Lake Michigan, including information and data that may be utilized in the upcoming Lake Michigan coastal flood study. The data and opportunities presented in this report will be considered as the study process moves forward and will assist the project team as the Lake Michigan coastal flood study proceeds. FEMA encourages continued participation and engagement from stakeholders throughout this coastal flood study.

The ultimate goal of this Discovery process and the future coastal flood study is to provide updated flood risk information to local stakeholders and to increase awareness of those flood risks, which in turn leads to actions that reduce risk.

VII. References

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VIII. Attachments

Discovery data and information, as well as this report and appendices, have been stored digitally on FEMA's Mapping Information Platform (MIP) Discovery Data Repository at J:\FEMA\DISCOVERY_DATA_REPOSITORY\R05_DATA\ and can be accessed by FEMA authorized users. The MIP can be accessed from <https://hazards.fema.gov/>. A username and password is required to access certain data within the MIP.

The final Discovery Report and appendices are also available for download from <http://www.greatlakescoast.org/>.

- Attachment A. Coastal Data Request Form (sample)
- Attachment B. Mackinac County Pre-Meeting Correspondence
- Attachment C. Draft Discovery Maps
- Attachment D. Proposed Draft Transect Figures
- Attachment E. Stakeholder Comments from Discovery Meeting
- Attachment F. Mackinac County Discovery Meeting Documents
- Attachment G. Coastal Data Request Form Compilation

ATTACHMENT A
COASTAL DATA REQUEST FORM



FEMA

Community Discovery Coastal Data Request Form

Thank you for taking the time to complete this questionnaire. We are interested in obtaining coastal-specific data for your community. It will provide important information to help FEMA understand coastal flood risk issues in your community and to work with you in increasing your community's resilience to coastal flooding through implementation of the Risk MAP program. In addition, this form can be used as a way to prepare for the upcoming Discovery Meeting, as the topics on this form will be discussed throughout the meeting.

Once you have completed the questionnaire, please return the form:

Via e-mail: GreatLakesFloodStudy@starr-team.com
By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, IL 60606

Please provide as much information as possible. If you have any questions about the Discovery process or about completing this questionnaire, please contact:

Laura Keating, Laura.Keating@starr-team.com, 925-296-8048

Contact Information	
Community/Organization	
Name:	
Title:	
Address:	
E-mail:	
Phone:	
Contact Preference	<input type="checkbox"/> Email <input type="checkbox"/> Phone <input type="checkbox"/> Mail



FEMA

Base Map Data		<i>Please select available data type</i>	
	Topography (e.g., LiDAR or contour data)	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
	Property information (e.g., Building footprints, parcel data, tax assessor's data)	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
Coastal Data			
	Coastal structures (e.g., seawalls, levees, jetties, groins, etc.)	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
	Coastal features (i.e., dunes and bluffs)	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
	Shoreline change data	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
	Locations of beach nourishment or dune restoration projects	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
	Areas of significant beach or dune erosion	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
	Mean high water	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
	Mean lake level	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
Other Data			
	Hydraulic structures (e.g., bridges, culverts, levees, dams) with inspection status, if available	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
	Elevated roads	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
	Critical facilities	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
	Other known hazards with geographical boundaries, i.e., landslide hazard areas, storm surge inundation zones, wildfire hazard areas, etc.	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>
	Other relevant data	<input type="checkbox"/> <i>Hard copy</i>	<input type="checkbox"/> <i>Digital</i>



Please provide the following information about the community:

Historical Flood Data		
Are you aware of any coastal flooding issues not represented on effective FIRMs:	<input type="checkbox"/> yes <input type="checkbox"/> no	If yes, please explain and provide inundation areas of historic flooding events if available.
Risk Assessment		
Does your community have HAZUS-based loss estimates from average annualized loss?	<input type="checkbox"/> yes <input type="checkbox"/> no	If yes, please describe:
Does your community have other risk assessment data?	<input type="checkbox"/> yes <input type="checkbox"/> no	If yes, please describe:



FEMA

<i>Flood Mitigation Information</i>		
<p>Does your community have a hazard mitigation plan?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>	<p>If yes, what is the status of the hazard mitigation plan?</p> <p><input type="checkbox"/> being reviewed <input type="checkbox"/> it has been adopted <input type="checkbox"/> it is currently being updated <input type="checkbox"/> it is planned for updates</p>
<p>Does the plan reflect any coastal flood hazards?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>	<p>If yes, please explain:</p>
<p>Does the hazard mitigation plan indicate any data deficiencies for flood hazards that could be addressed through a flood study, especially near coastal zones?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>	<p>If yes, please explain:</p>
<p>Does your community have on-going mitigation projects, such as acquisition, elevation, flood control, soil stabilization, natural systems restoration, floodproofing, etc.</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>	<p>If yes, please describe the projects and their locations:</p>



FEMA

Any specific coastal mitigation projects?	<input type="checkbox"/> yes <input type="checkbox"/> no	If yes, please explain:
Does your community have experience with coastal flood disasters and flood disaster recovery?	<input type="checkbox"/> yes <input type="checkbox"/> no	If yes, please explain:
Does your community coordinate floodplain management programs with programs for the management and planning of open space? If possible, any coastal specific?	<input type="checkbox"/> yes <input type="checkbox"/> no	If yes, please explain:



FEMA

<p>Have you had any prior proactive mitigation actions and planning efforts that resulted in reduced losses? If possible, any coastal specific?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>	<p>If yes, please describe:</p>
<p>Has your community applied and granted Individual Assistance/Public Assistance grants for declared disasters?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>	<p>If yes, please describe and provide the locations of these grants projects:</p>
<p>Has your community applied for FEMA Hazard Mitigation Grants program or other mitigation funds (USACE, NRCS, USGS, state Hazard Mitigation officer, etc.) in the past?</p>	<p><input type="checkbox"/> yes <input type="checkbox"/> no</p>	<p>If yes, please describe and provide the locations of on-going/planned/finished grants projects/structures:</p>



FEMA

How would you rank the community's ability to implement mitigation actions and to communicate flood risk to citizens?		<input type="checkbox"/> high <input type="checkbox"/> medium <input type="checkbox"/> low
<i>Community Plans and Projects</i>		
Does your community have a comprehensive plan?	<input type="checkbox"/> yes <input type="checkbox"/> no	If you answered yes and you have a hazard mitigation plan, was your hazard mitigation plan coordinated with the comprehensive plan? <input type="checkbox"/> yes <input type="checkbox"/> no
Does your community's comprehensive plan have a special consideration for coastal areas?	<input type="checkbox"/> yes <input type="checkbox"/> no	If yes, please explain elements/regulations that affect coastal area development.
Does your community have a coastal zone management plan?	<input type="checkbox"/> yes <input type="checkbox"/> no	If yes, please provide a digital or hard copy of the plan.
Does your community have planning staff or a planning/zoning commission and other measures, such as ordinances, administrative plans, or other programs contributing to effective administration of floodplain zoning, building codes, open space preservation, and coastal zone management?	<input type="checkbox"/> yes <input type="checkbox"/> no	If yes, please explain this group's role in floodplain management and provide examples of the types of programs in place:



FEMA

<p>Does your community have areas of recent or planned development/re-development and areas of high growth or other natural land changes (e.g., wildfires or landslides):</p>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If yes, please describe:</p>
<p>Are there any locations of other ongoing studies or projects and studied areas that have been modified since the effective map and require an updated study (e.g., highway improvement, seawall improvement, etc.)</p>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If yes, please describe:</p>
<p>Any other comments/concerns based on local knowledge:</p>		

ATTACHMENT B
MACKINAC COUNTY
PRE-MEETING CORRESPONDENCE

Core Stakeholder Pre-Meeting Documents

Information Exchange Session Documents

Hard Copy Discovery Meeting Invitations

Email Discovery Meeting Invitation

Keating, Laura

Subject: FEMA Invitation to Lake Michigan/Lake St. Clair Discovery Kickoff Meeting WebEx for Michigan Core Stakeholders

Location: NEW Phone: (877) 537-6647 Conference ID: 31578 and NEW WebEx

Start: Thu 6/21/2012 11:00 AM
End: Thu 6/21/2012 12:30 PM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Organizer: Keating, Laura

Required Attendees: 'Alan Luloff'; 'Byron Lane (MDEQ)'; 'Catrina Covino'; 'Eric Kuklewski'; 'Erin Maloney'; 'Ernie Sarkipato (MDEQ)'; 'Greg Mausolf (USACE)'; 'Heather Stirratt (NOAA)'; 'Hillier, Timothy'; 'Holly Davis'; 'Jennifer Day (NOAA)'; 'Jerry Fulcher (MI CZM)'; 'Joel Pepper'; 'Julie Tochor'; 'Keating, Laura'; 'Ken Hinterlong'; 'Les Thomas (MDEQ)'; 'Linda Burke (MDEQ)'; 'Maria Zingas (MDEQ)'; 'Mary Weidel (USACE)'; 'Matt Occhipinti (MDEQ)'; 'Matt Schnepf'; 'Michelle Hohn'; 'Mike Hanke'; 'Patrick Durack (MDEQ)'; 'Randhawa, Jaspreet'; 'Richard Foody'; 'Sheila Meier (MDEQ)'; 'Stephen Aichele (USGS)'; 'Susan Conradson (MDEQ)'; 'Tom Smith'; 'Wayne Lasch'; breederl@msu.edu; 'Roberts, Stacey'; Denick, Roger (Roger.Denick@stantec.com); jread@glos.us

Optional Attendees: Luce, Janet K; Breederland, Mark; Tabar, Jeffrey R

Good Afternoon,

In preparation for this call tomorrow at 1pm CT/2pm ET, please find attached the agenda, as well as a couple handouts that we will discuss during the call.



Michigan_Core_Sta3LCFS_LiMWA_Fact_keeper_preD...



Sheet.pdf



MAF-Form.pdf

Also, please note the updated WebEx and call-in number:

WebEx information:

Participant Join URL: <https://atkinglobalna.webex.com/atkinglobalna/j.php?J=652104155>

Meeting Number: 652 104 155

Meeting Password: This meeting does not require a password.

Audio Conference information:

Phone: (877) 537-6647

Conference ID: 31578

Thanks,
Laura Keating

Good Afternoon,

Please note the date change that was made to better accommodate schedules.

As you may know, the Federal Emergency Management Agency (FEMA), in cooperation with the U.S Army Corps of Engineers (USACE), the Association of State Floodplain Managers (ASFPM), and other partners, is conducting a comprehensive study of flood hazards for Lake Michigan coastal communities and along the United States shoreline in other areas of the Great Lakes system. Data from this study will eventually be used to revise Flood Insurance Rate Maps (FIRMs) for coastal communities throughout the region.

As part of the Great Lakes Coastal Flood Mapping and Outreach initiative, STARR (which stands for Strategic Alliance for Risk Reduction) has been contracted by FEMA to perform Discovery for all Lake Michigan coastal communities within Wisconsin, Illinois, Indiana, and Michigan. In addition, STARR will perform Discovery for St. Clair, Macomb and Wayne Counties along Lake St. Clair in Michigan. The Discovery process allows us to engage the communities and other local stakeholders to initiate risk discussions and increase visibility of flood risk information.

You have been identified as a Core Stakeholder for the Lake Michigan and Lake St. Clair Discovery Projects in the State of Michigan. FEMA and STARR would like to hold a one-hour Kickoff Meeting via WebEx/conference call to introduce you to the Discovery process, including identifying Discovery goals and objectives for the Lake Michigan and Lake St. Clair coastal communities in the State of Michigan. We will also review the Lake Michigan and Lake St. Clair Discovery Meeting Plan and discuss State-specific requirements.

You may have recently received a similar Discovery Kickoff Meeting invitation for another State. Although some of the information presented at the other WebEx meetings will be the same, we will be discussing items specific to those counties in Michigan and request that you attend this WebEx as well.

In the past few months, STARR may have already contacted you to participate in a Lake Michigan or Lake St. Clair Technical Workshops. Discovery is another part of the project, and we require your input and feedback to ensure study success. The community-based Discovery Meetings are held following Technical Workshops. Below are the tentative Lake Michigan and Lake St. Clair Discovery Meeting dates for the State of Michigan:

Lake Michigan:

Counties	Venue	Address	Date, Time
Vanburen Berrien	Berrien County Administrative Building	701 Main Street St. Joseph, MI 49085	Monday 09/10/2012 3:00 - 5:00 pm
Ottawa Allegan	Ottawa County Fillmore Street Complex Board Room	12220 Fillmore Street, Rm 310 West Olive, MI 49460	Tuesday 09/11/2012 3:30 - 5:30 pm
Oceana Muskegon	Louis A. McMurray Conference and	2624 Sixth Street Muskegon Heights, MI	Wednesday 09/12/2012 9:00 - 11:00 am

	Transportation Center	49444	
Manistee Mason	Community Room	400 S. Harrison Street Ludington, MI 49431	Wednesday 09/12/2012 3:00 - 5:00 pm
Grand Traverse Benzie Leelanau	Training Room	400 Boardman Avenue Traverse City, MI 49684	Thursday 09/13/2012 1:00 - 3:00 pm
Antrim Charlevoix Emmet	Bellaire Community Hall	202 North Bridge Street Bellaire, MI	Friday 09/14/2012 9:00 - 11:00 am
Mackinac	TBD	TBD	Tentatively planned - Monday 08/13/2012; 3:00 - 5:00 pm
Delta Schoolcraft Menominee	Bay de Noc Community College, Rooms 958 & 962, Escanaba, MI	2001 N. Lincoln Road, Escanaba, MI 49829	Tuesday 08/14/2012; 3:00 - 5:00 PM

Lake St. Clair

Counties	Venue	Address	Date, Time
St. Clair	TBD	TBD	Tentatively planned - 8/20/2012; 9:00 - 11:00 AM
Macomb	Macomb County Verkuilen Building - Tentative as of 3/27/2012	21885 Dunham Rd., Clinton Twp, MI 48036	8/20/2012; 3:00 - 5:00 PM
Wayne	TBD	TBD	Tentatively planned - 8/21/2012; 9:00 - 11:00 AM

Please let me know if the proposed time on this meeting invitation (**1pm CDT/2pm EDT**) is acceptable. We are trying to determine the best time for everyone to participate in the Lake Michigan and Lake St. Clair Discovery Kickoff Meeting WebEx for the State of Michigan.

We look forward to discussing this project with you during the call. Please do not hesitate to contact me if you have any questions.

Sincerely,

Laura Keating, CFM
STARR

Laura.Keating@starr-team.com

Phone/fax: 925-296-8048

NEW WebEx information:

Participant Join URL: <https://atkinglobalna.webex.com/atkinglobalna/j.php?J=652104155>

Meeting Number: 652 104 155

Meeting Password: This meeting does not require a password.



Project Name:	Lake Michigan/Lake St. Clair Discovery Project
Meeting:	Lake Michigan/Lake St. Clair Pre-Discovery Kickoff Meeting for Michigan Core Stakeholders
Date and Time:	Thursday, June 21, 2012 at 1pm CDT/2pm EDT
Place:	<p>Audio Conference information: Phone: (877) 537-6647 Conference ID: 31578</p> <p>Participant Join URL: https://atkinsglobalna.webex.com/atkinsglobalna/j.php?J=652104155 Meeting Number: 652 104 155 Meeting Password: This meeting does not require a password.</p>
Facilitator:	FEMA, STARR

Core Stakeholder Pre-Discovery Kickoff Meeting Agenda

Great Lakes Coastal Flood Study Overview

- Objectives
- Status
- Schedule

Hazard Mitigation Resources, Strategies, and Actions

- Improving Mitigation Strategies
- Introduction to Mitigation Action Form

Discovery Process Overview

- Scope and Schedule
- Discovery Meeting Outcomes
- Introduction to Discovery-phase Data Collection Activities
- Final Discovery Products

Coastal Focus – Information to be Aware Of

- Coastal Flood Risk Datasets
- Transects
- Erosion and Erosion Control Revetments
- LiMWA
- Coastal Zone Mapping

Next Steps

- Community contact lists, draft transects, meeting minutes
- Stakeholder Input

Questions/Comments?

Keating, Laura

Subject: FEMA's Great Lakes Coastal Flood Study: Discovery Information Exchange Session for Mackinac County
Location: Call in number: 1-866-398-2885 Participant Code: 197462 and WebEx
Start: Wed 7/25/2012 7:00 AM
End: Wed 7/25/2012 8:00 AM
Show Time As: Tentative
Recurrence: (none)
Meeting Status: Not yet responded
Organizer: Keating, Laura
Required Attendees: Hinterlong, Ken; Keating, Laura
Optional Attendees: bprice6051@yahoo.com; moransup@lighthouse.net; moranzoning@lighthouse.net; supervisor@cedarville.net; inspector@cedarville.net; mackclerk@lighthouse.net; Randhawa, Jaspreet; Holly.Davis@atkinglobal.com

Good Afternoon,

You are receiving this meeting invitation because you have been identified as a *Lake Michigan* local community stakeholder. You should have recently received an invitation in the mail from the Federal Emergency Management Agency (FEMA), regarding the *Great Lakes Coastal Flood Study* effort, inviting you to attend a Discovery Meeting in August, as well as this information exchange session, scheduled for **Wednesday, July 25th at 10am ET**. More information about the *Great Lakes Coastal Flood Study* may be found at <http://www.greatlakescoast.org>.

While the WebEx and call-in information was provided in the letter, I wanted to also provide this information to you via email to serve as a reminder. Below is the call-in and WebEx information:

Date/Time: Wednesday, July 25, 2012; 10:00 - 11:00 am ET
Link to WebEx: <http://e-meetings.verizonbusiness.com/nc/join.php>
Meeting Number: 445288484
Call in number: 1-866-398-2885
Participant Code: 197462

This informal session will begin the process of learning about your available local coastal data, hazard mitigation strategies, and what the critical flooding issues are in your community so that we can then work with you to determine how to best utilize that information during FEMA's Great Lakes study. A data request form is attached to help facilitate the discussion. We encourage open discussions throughout this meeting and will use the information to better cater our upcoming Discovery Meetings as well. Attendees of this conference call, as well as the Discovery Meetings, may include, but certainly are not limited to, community leaders, emergency managers, GIS specialists, engineers, outreach specialists, and local planners.

We look forward to speaking with you on Wednesday, and appreciate your participation in this process. If you have any questions, or are not able to attend this session but would like to learn more, please do not hesitate to contact me directly. My information can be found below.



LAKE MICHIGAN
Discovery Coasta...

Thanks,
Laura



FEMA

Information Exchange Session for Lake Michigan Discovery

Mackinac County
July 25, 2012
10am - 11am



RiskMAP

Increasing Resilience Together



*Great Lakes
Coastal Flood Study*

Lake Michigan Discovery Report Appendix C - Mackinac County

greatlakescoast.org



Purpose of Information Exchange

- Introduction to Risk MAP
- Introduction to Great Lakes Flood Study and Discovery
- Learn more about your areas of concern, coastal flood risk, and coastal mitigation
- Bring the right people to the table early
- Identify data gaps



RiskMAP

Increasing Resilience Together

*Great Lakes
Coastal Flood Study*

Lake Michigan Discovery Report Appendix C - Mackinac County

greatlakescoast.org



Risk MAP (Mapping, Assessment, and Planning) Vision



Goals

1. Address gaps in flood hazard data
2. Increase risk awareness to encourage risk reduction
3. Risk-based Mitigation Planning resulting in risk reduction actions
4. Enhanced digital platform to improve communication and sharing of risk data
5. Align programs and develop synergies



Overview of Great Lakes Coastal Flood Study



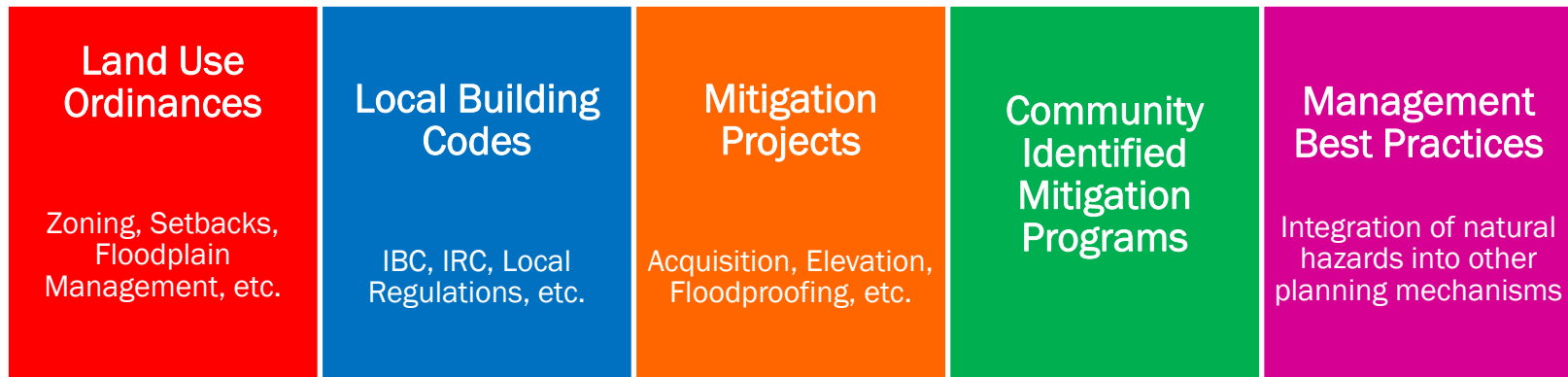
- Latest models, data, and technology
- Deliver updated flood maps and flood risk datasets
- Equip Federal Agencies, eight States and hundreds of coastal communities with data and planning tools to facilitate actions to enhance resiliency of the Great Lakes ecosystem



Hazard Mitigation Resources, Strategies & Actions



- Recent community hazard mitigation experiences?
 - *Public Works*
 - *Building Standards*
 - *Community Planning and Hazard Mitigation Plan Update*
 - *Communication Processes, GIS, etc.*
- New option to document ideas and actions through the FEMA Mitigation Action Form



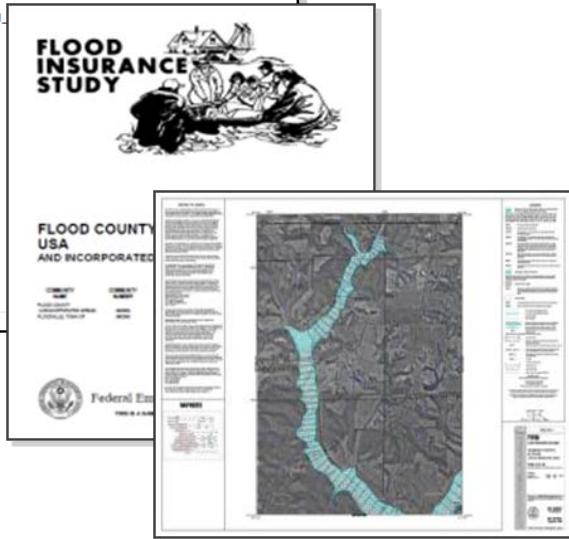
Products and Datasets: Regulatory and Non-regulatory



Traditional Regulatory Products

DFIRM Database

- Flood_Hazard_Data
- Political_Boundaries
- Public_Land_Survey_System
- TopoData
- Community_Panel
- L_Comm_Info
- L_MT1_LOMC
- L_Pan_Revis
- L_Pol_FHBM
- L_Riv_Model
- L_Stn_Start
- L_Wtr_Nm
- S_Bfe
- S_DOQ_Index
- S_Firm_Pan
- S_Gen_Struct
- S_Label_Id
- S_Label_Pt
- S_LOMR
- S_Perm_Bmk
- S_Quad
- S_Riv_Mrk
- S_Trnsport_Ar

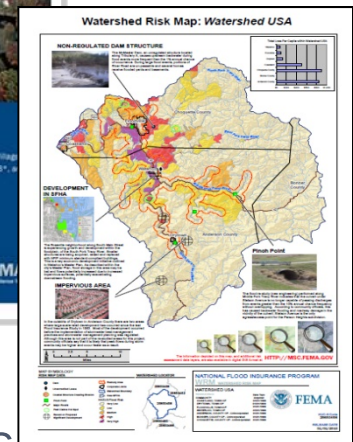
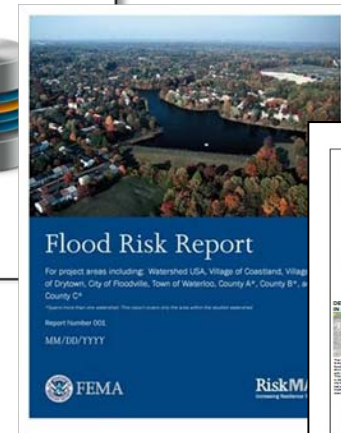


Subject to statutory due-process requirements

Non-Regulatory Products

Flood Risk Database

- Community_Panel_Info
- L_Comm_Info
- L_MT1_LOMC
- L_Pan_Revis
- L_Pol_FHBM
- L_Riv_Model
- L_Stn_Start
- L_Wtr_Nm
- S_Bfe
- S_DOQ_Index
- S_Firm_Pan
- S_Gen_Struct
- S_Label_Id
- S_Label_Pt
- S_LOMR
- S_Perm_Bmk
- S_Quad
- S_Riv_Mrk
- S_Trnsport_Ar



Not subject to statutory due-process requirements



Products and Datasets: Coastal Products in Development



Erosion



Red Lantern Restaurant, Lake Michigan, IN

Lake Levels



Lake Michigan Shoreline
[Reference](#)

Shoreline Feature Dataset



Upper Peninsula Shoreline
[Reference](#)



Risk MAP Overview: Shoreline Features Database



Shoreline Material
Sand
Cohesive
Cobble
Diamicton*
Shingle
Bedrock
Artificial

Primary Land Use
High Density Residential
Moderate Density Residential
Low Density Residential
Commercial/Industrial
Park Land
Farm Land
Forested

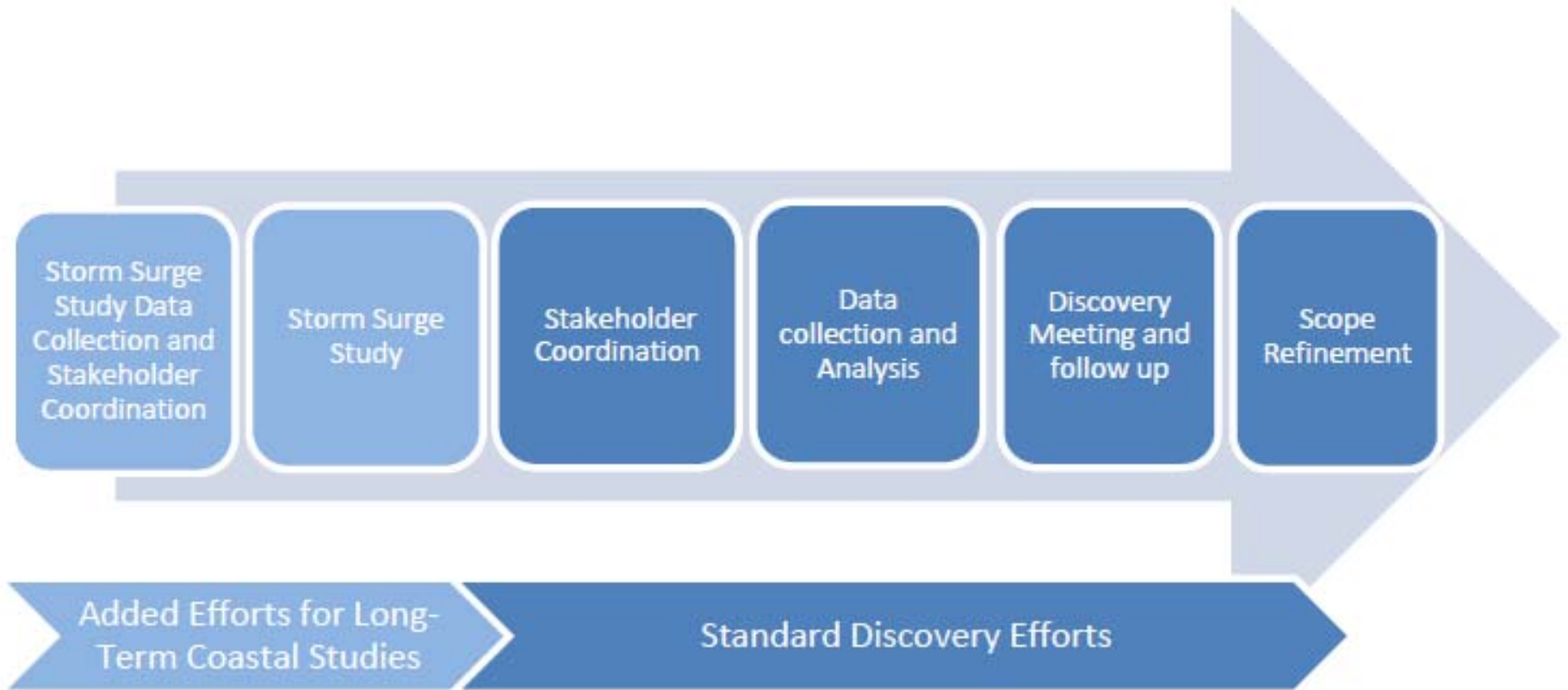
Primary Coast Type
High Dune, 10'+
Dune, 2' - 10'
High Bluff, 10'+
Bluff, 2' - 10'
Coastal Wetland
Flat Coast

Primary Vegetation
None
High Density Shrubs/Trees
Moderate Density Shrubs/Trees
Low Density Shrubs/Trees
Manicured Lawn
Native Vegetation

- Contains primary and secondary Land Use tables – same for coast type and vegetation.
- Current project collects data at one-mile spacing, for scoping and cost
- Current project does not include field-based reconnaissance or sediment/subsurface soils collection



Great Lakes Coastal Flood Study Discovery Process Overview



Great Lakes Coastal Flood Study Discovery Meeting



Discovery Meeting Venue	Discovery Meeting Address	Discovery Meeting Date, Time
St. Ignace Public Library	110 W. Spruce Street St. Ignace, MI 49781	Monday 08/13/2012; 1:00 - 3:00 pm ET



Draft Discovery Meeting Agenda

- Why are we here?
- Coastal mapping and flood risk topics to be aware of
- How does this apply to my community?
 - NFIP compliance, hazard mitigation opportunities, and grant funding
- Interactive Session
 - Utilization of Coastal Flood Risk Products for Planning and Mitigation, Identification of Existing Local Coastal Data, View and Discuss Local Coastal Areas of Concern Using the Discovery Map, Discuss Mitigation Action Opportunities and Introduce the Mitigation Action Form
- Wrap Up

Draft Transect Map Station: Talk to technical staff about draft transects and view draft transects in GIS

Mitigation Resources, Strategies, and Actions Station: Talk with FEMA and State staff about areas of concern and potential mitigation actions to help reduce risk. Fill out Mitigation Action Form.



Great Lakes Coastal Flood Study Discovery Products



■ Final Discovery Report

- Single, comprehensive report for all of Lake Michigan, with appendices for each coastal community by county
- Includes pre-discovery data, meeting agenda, sign-in sheets, discussion topics, decisions made, etc.

■ Final Discovery Maps

- Including feedback from participants
- Visual representation of meeting outcomes



Who Should Attend the Discovery Meeting?



- **Community Officials**
 - CEO and Floodplain Administrators (FPAs)
 - Planners, GIS Specialists, Engineers, Outreach Specialists, Emergency Managers, and Community Leaders
- **State Representatives**
 - State Hazard Mitigation Officer (SHMO), National Flood Insurance Program (NFIP) Coordinators, Cooperating Technical Partners (CTPs)
- **Other Federal Agencies (NOAA, USACE, USGS)**
- **Regional Planning Agencies**
- **Great Lakes Organizations**

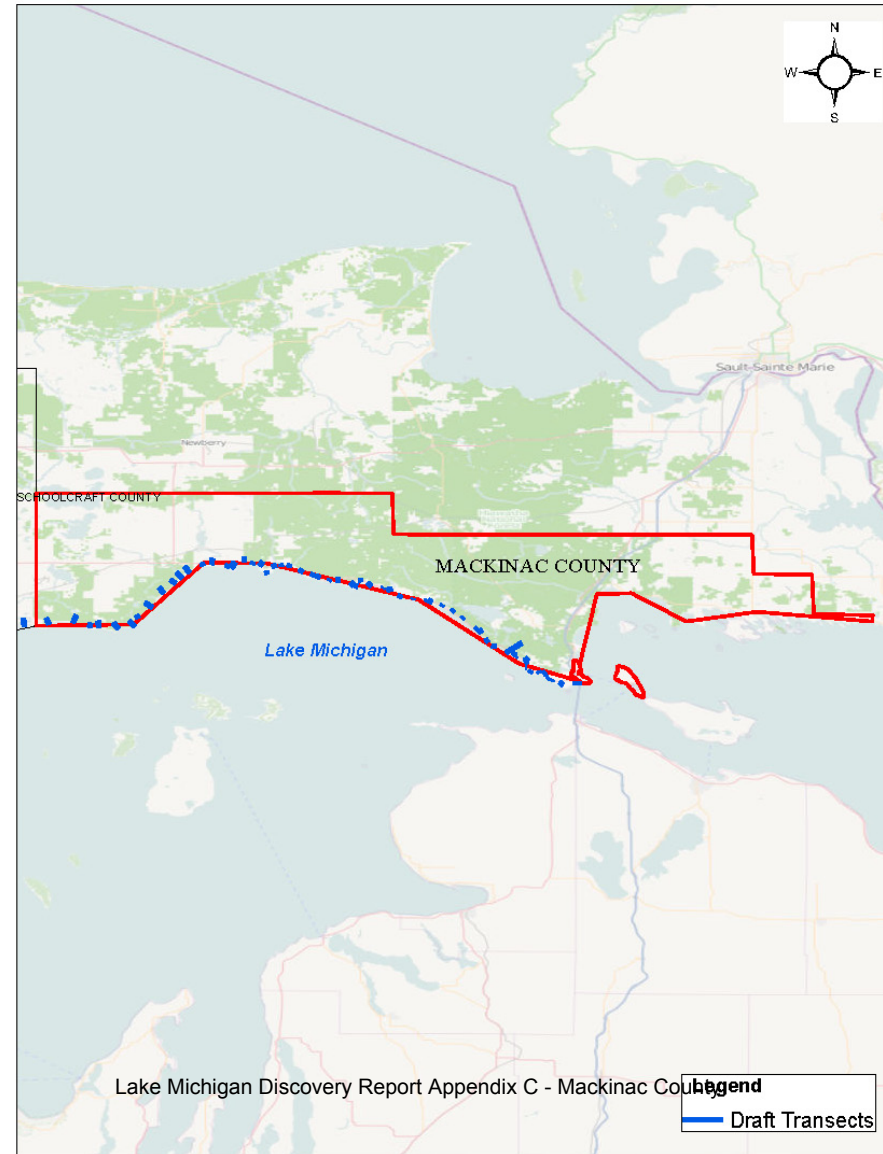


Great Lakes Coastal Flood Study Discovery Study Area




Lake Michigan coastal communities in Mackinac County:


- Mackinac County
- Bois Blanc
- Clark
- Garfield
- Hendricks
- Hudson
- Mackinac Island
- Marquette
- Moran
- Newton
- St. Ignace (Township and City)



Data Request Form Overview

- Contact Information
- Base Map Data
- Coastal Data
- Other Data
- Historic Flood Data
- Risk Assessment
- Flood Mitigation Information
- Community Plans and Projects
- Any Other Comments/ Concerns Based on Local Knowledge





RiskMAP
Increasing Resilience Together

Community Discovery Coastal Data Request Form

Thank you for taking the time to complete this questionnaire. We are interested in obtaining coastal-specific data for your community. It will provide important information to help FEMA understand coastal flood risk issues in your community and to work with you in increasing your community's resilience to coastal flooding through implementation of the Risk MAP program. In addition, this form can be used as a way to prepare for the upcoming Discovery Meeting, as the topics on this form will be discussed throughout the meeting.

Once you have completed the questionnaire, please return the form:

Via e-mail:
By mail:
Or by fax:

Please provide as much information as possible. If you have any questions about the Discovery process or about completing this questionnaire, please contact:

Contact Information	
Community/Organization	
Name:	
Title:	
Address:	
E-mail:	
Phone:	
Contact Preference	<input type="checkbox"/> Email <input type="checkbox"/> Phone <input type="checkbox"/> Mail

FEMA Region V
Lake Michigan Discovery
Community Discovery Coastal Data Request Form Page 1 of 7





Review of Data Collected To Date

- Draft Transects
- Shoreline Classification Dataset
- Hazard Mitigation Plans
- Hazard Mitigation Grants Program (HMGP) projects
- Pre-Disaster Mitigation Program projects
- Declared Disasters
- Repetitive loss claims by community



Next Steps and Opportunity to Get Involved



- Assessment of data and information provided
- Identification of best practices:
 - Do you have an example of a local coastal mitigation best practice?
- Discovery meeting involvement:
 - Are you be interested in participating in Discovery Meeting facilitation?

THANK YOU FOR YOUR PARTICIPATION!



Who to Contact

- For more information: <http://www.greatlakescoast.org/>
- Send completed questionnaires to:
 - GreatLakesFloodStudy@starr-team.com
- FEMA Region V
 - Ken Hinterlong @ ken.hinterlong@fema.dhs.gov
 - Erin Maloney @ Erin.Maloney@fema.dhs.gov
- STARR
 - Laura Keating @ laura.keating@starr-team.com
 - Jaspreet Randhawa @ Jaspreet.Randhawa@starr-team.com



Questions?





FEMA

July 12, 2012

Ms. Ginny Dahlin
Supervisor and Assessor, Bay De Noc Township
Township Hall
5870 County 513 T Road
Rapid River, Michigan 49878

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Ms. Dahlin:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

The goal of Risk MAP is to support actions that make communities safer from flooding. The Risk MAP program wants to achieve continued improvement of flood hazard information for the National Flood Insurance Program (NFIP); to promote increased awareness and understanding of flood risk; to increase community engagement; and to identify and support actions that local stakeholders can take to reduce natural hazard risks. For additional information on the Risk MAP Program, please visit http://www.fema.gov/plan/prevent/fhm/rm_main.shtm.

The first phase of the Risk MAP process is Discovery. Through Discovery, input provided by communities will help FEMA to better understand local coastal flood risk data and needs, and characterize local conditions that contribute to coastal flood risk.

Your Discovery Meeting is scheduled to occur:

Date/Time:	Tuesday, August 14, 2012; 2:00 - 4:00 pm ET
Location:	Bay de Noc Community College, Rooms 958 & 962
Address:	2001 North Lincoln Road Escanaba, Michigan 49829

Please save this date on your calendar. At the meeting, we will review the coastal flood risk data we have gathered to date and discuss your community's coastal floodplains, mitigation plan and projects, coastal flood risk concerns, and coastal floodplain management activities. This discussion will allow us to better identify your community's coastal flood hazard needs and subsequent Risk MAP regulatory and non-regulatory products and datasets that can be delivered during the Risk MAP project. We will also discuss how the coastal flood risks and needs are related to mapping, risk assessment, Hazard Mitigation planning, and grant programs available to eligible communities. To best facilitate this discussion, we would like to request your help in inviting community leaders, emergency managers, GIS specialists, engineers, outreach specialists, and local planners to the meeting. Please RSVP to FEMA's study contractor (STARR) Scott

Ms. Ginny Dahlin
July 12, 2012
Page 2

Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

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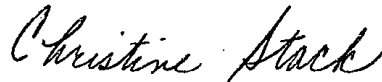
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Link to WebEx: <http://e-meetings.verizonbusiness.com/nc/join.php>
Meeting Number: 445288484
Call in number: 1-866-398-2885
Participant Code: 197462

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Via e-mail: GreatLakesFloodStudy@starr-team.com
By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

We look forward to working with you to reduce the risks associated with coastal flooding and increase your community's resiliency for the long term. To learn more about Discovery, please visit <http://www.fema.gov/library> and search keywords "Discovery brochure" or contact Ken Hinterlong, FEMA Region V Senior Engineer, at (312) 408-5529, or by email at ken.hinterlong@fema.dhs.gov. We look forward to discussing this with you during the Information Exchange call and/or seeing you at the upcoming Discovery Meeting.

Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Emma Sundstrom, Clerk, Bay De Noc Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Dennis Maufort
Supervisor, Brampton Township
6737 Oak Bluff 23.7 Drive
Gladstone, Michigan 49837

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Maufort:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Mr. Dennis Maufort
July 12, 2012
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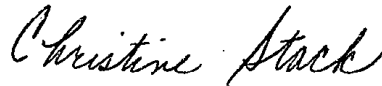
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By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc:

Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

The Honorable Leo Evans
Mayor, City of Escanaba
City Hall
410 Ludington Street
Escanaba, Michigan 49829

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mayor Evans:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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The Honorable Leo Evans
July 12, 2012
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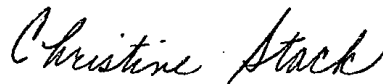
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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc:

Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

The Honorable Darin Hunter
Mayor, City of Gladstone
P.O. Box 32
Gladstone, Michigan 49837

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mayor Hunter:

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The Honorable Darin Hunter
July 12, 2012
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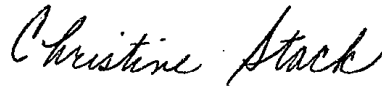
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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Renee Barron, Community Development Director, City of Gladstone
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Ms. Tracy Lantagne
Commissioner's Office, Delta County
310 Ludington Street
Escanaba, Michigan 49829

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Ms. Lantagne:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Ms. Tracy Lantagne
July 12, 2012
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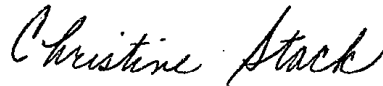
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Christine Stack
Division Director
Mitigation Division, FEMA Region V

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cc: Nancy Kolich, County Clerk, Delta County
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. John Wolf
Supervisor and Assessor, Ensign Township
9332 County 511 W.5 Road
Rapid River, Michigan 49878

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

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The first phase of the Risk MAP process is Discovery. Through Discovery, input provided by communities will help FEMA to better understand local coastal flood risk data and needs, and characterize local conditions that contribute to coastal flood risk.

Your Discovery Meeting is scheduled to occur:

Date/Time:	Tuesday, August 14, 2012; 2:00 - 4:00 pm ET
Location:	Bay de Noc Community College, Rooms 958 & 962
Address:	2001 North Lincoln Road Escanaba, Michigan 49829

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Mr. John Wolf
July 12, 2012
Page 2

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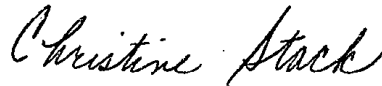
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Meeting Number: 445288484
Call in number: 1-866-398-2885
Participant Code: 197462

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By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Lynn Forhart, Treasurer, Ensign Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Kevin Dubord
Supervisor and Assessor, Escanaba Township
7893 County 416 J Road
Gladstone, Michigan 49873

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Dubord:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Mr. Kevin Dubord
July 12, 2012
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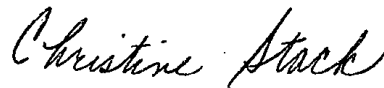
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By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Patricia Beauchamp, Clerk, Escanaba Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Ron Collins
Supervisor, Fairbanks Township
Township Hall
11th Road
Garden, Michigan 49835

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Collins:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Mr. Ron Collins
July 12, 2012
Page 2

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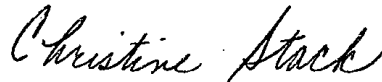
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By mail: Scott Banjavcic
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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Kathryn Denholm, Clerk, Fairbanks Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Charlie Detiege
Supervisor, Ford River Township
2125 H Road
Bark River, Michigan 49807

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Detiege:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Mr. Charlie Detiege
July 12, 2012
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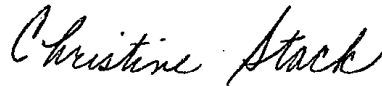
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By mail: Scott Banjavcic
CDM Smith/STARR
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Chicago, Illinois 60606

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Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc:

Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Morgan Tatrow
Supervisor, Garden Township
Township Hall
6313 State Street
Post Office Box 224
Garden, Michigan 49835

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Tatrow:

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Mr. Morgan Tatrow
July 12, 2012
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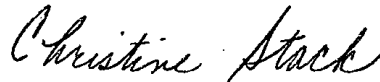
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Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc:

Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Peter Brock
Supervisor, Assessor, Masonville Township
10697 S.75 Road
Rapid River, Michigan 49878

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Brock:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Mr. Peter Brock
July 12, 2012
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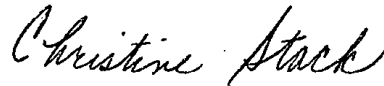
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Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc:

Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Ms. Cindy Bradshaw
Supervisor, Nahma Township
9751 EE.25 Road
Rapid River, Michigan 49787

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Ms. Bradshaw:

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Your Discovery Meeting is scheduled to occur:

Date/Time:	Tuesday, August 14, 2012; 2:00 - 4:00 pm ET
Location:	Bay de Noc Community College, Rooms 958 & 962
Address:	2001 North Lincoln Road Escanaba, Michigan 49829

Please save this date on your calendar. At the meeting, we will review the coastal flood risk data we have gathered to date and discuss your community's coastal floodplains, mitigation plan and projects, coastal flood risk concerns, and coastal floodplain management activities. This discussion will allow us to better identify your community's coastal flood hazard needs and subsequent Risk MAP regulatory and non-regulatory products and datasets that can be delivered during the Risk MAP project. We will also discuss how the coastal flood risks and needs are related to mapping, risk assessment, Hazard Mitigation planning, and grant programs available to eligible communities. To best facilitate this discussion, we would like to request your help in inviting community leaders, emergency managers, GIS specialists, engineers, outreach specialists, and local planners to the meeting. Please RSVP to FEMA's study contractor (STARR) Scott Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

Ms. Cindy Bradshaw
July 12, 2012
Page 2

So that we can better prepare for the upcoming Discovery Meeting, we are asking local communities to participate in an Information Exchange conference call and WebEx. This call will provide an overview of FEMA's Risk MAP program and the Discovery process, and will allow us to review with you our request for the exchange of coastal flood risk and hazard mitigation data, and to learn more about your community's coastal flood hazard risks and needs, in advance of the Discovery Meeting. The partnership and exchange of data between FEMA, the State, and your community is vital to the success of identifying flood risks and needs that may impact your citizens.

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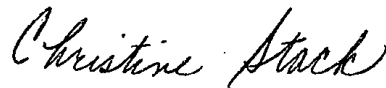
Date/Time: Thursday, July 26, 2012; 10:00 - 11:00 am ET
Link to WebEx: <http://e-meetings.verizonbusiness.com/nc/join.php>
Meeting Number: 445288484
Call in number: 1-866-398-2885
Participant Code: 197462

If you or another community representative is unable to attend the Information Exchange conference call, we ask that you fill out and return the enclosed data request form by **August 3, 2012**. This is the same data request form that will be discussed during the conference call. The completed form can be sent to:

Via e-mail: GreatLakesFloodStudy@starr-team.com
By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

We look forward to working with you to reduce the risks associated with coastal flooding and increase your community's resiliency for the long term. To learn more about Discovery, please visit <http://www.fema.gov/library> and search keywords "Discovery brochure" or contact Ken Hinterlong, FEMA Region V Senior Engineer, at (312) 408-5529, or by email at ken.hinterlong@fema.dhs.gov. We look forward to discussing this with you during the Information Exchange call and/or seeing you at the upcoming Discovery Meeting.

Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc:

Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Ms. Connie Wilson
Village President, Village of Garden
Village Hall
15951 Garden Avenue
Post Office Box 147
Garden, Michigan 49835

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Ms. Wilson:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Location:	Bay de Noc Community College, Rooms 958 & 962
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Ms. Connie Wilson
July 12, 2012
Page 2

Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

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125 S. Wacker Drive, Suite 600
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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc:

Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. William Farley
Supervisor, Wells Township
6436 North 8th Street
P.O. Box 188
Wells, Michigan 49894

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Farley:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Mr. William Farley
July 12, 2012
Page 2

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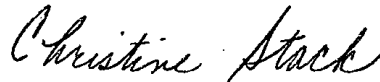
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Meeting Number: 445288484
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Participant Code: 197462

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Via e-mail: GreatLakesFloodStudy@starr-team.com
By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc:

Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Brent Sharpe
Supervisor, Bois Blanc Township
Township Hall
Post Office Box 895
Pointe Aux Pins, Michigan 49775

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Sharpe:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Your Discovery Meeting is scheduled to occur:

Date/Time:	Monday, August 13, 2012; 1:00 - 3:00 pm ET
Location:	Saint Ignace Public Library
Address:	110 West Spruce Street Saint Ignace, Michigan 49781

Please save this date on your calendar. At the meeting, we will review the coastal flood risk data we have gathered to date and discuss your community's coastal floodplains, mitigation plan and projects, coastal flood risk concerns, and coastal floodplain management activities. This discussion will allow us to better identify your community's coastal flood hazard needs and subsequent Risk MAP regulatory and non-regulatory products and datasets that can be delivered during the Risk MAP project. We will also discuss how the coastal flood risks and needs are related to mapping, risk assessment, Hazard Mitigation planning, and grant programs available to eligible communities. To best facilitate this discussion, we would like to request your help in inviting community leaders, emergency managers, GIS specialists, engineers, outreach specialists, and local planners to the meeting. Please RSVP to FEMA's study contractor (STARR) Scott

Mr. Brent Sharpe
July 12, 2012
Page 2

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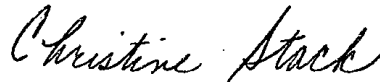
Date/Time: Wednesday, July 25, 2012; 10:00 - 11:00 am ET
Link to WebEx: <http://e-meetings.verizonbusiness.com/nc/join.php>
Meeting Number: 445288484
Call in number: 1-866-398-2885
Participant Code: 197462

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By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Joan Schroka, Township Clerk, Bois Blanc Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

The Honorable Margaret Doud
Mayor, City of Mackinac Island
City Hall
Post Office Box 455
Mackinac, Michigan 49757

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mayor Doud:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Your Discovery Meeting is scheduled to occur:

Date/Time:	Monday, August 13, 2012; 1:00 - 3:00 pm ET
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Address:	110 West Spruce Street Saint Ignace, Michigan 49781

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The Honorable Margaret Doud
July 12, 2012
Page 2

Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

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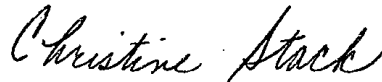
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Call in number: 1-866-398-2885
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CDM Smith/STARR
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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Dennis Dombroski, Building Inspector, City of Mackinac Island
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

The Honorable Paul Grondin
Mayor, City of St. Ignace
City Hall
396 North State Street
Saint Ignace, Michigan 49781

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mayor Grondin:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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The Honorable Paul Grondin
July 12, 2012
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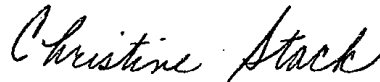
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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Les Therrian, City Manager, City of St. Ignace
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Gerald Hill
Supervisor, Clark Township
Township Hall
Post Office Box 367
Cedarville, Michigan 49719

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Hill:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Address:	110 West Spruce Street Saint Ignace, Michigan 49781

Please save this date on your calendar. At the meeting, we will review the coastal flood risk data we have gathered to date and discuss your community's coastal floodplains, mitigation plan and projects, coastal flood risk concerns, and coastal floodplain management activities. This discussion will allow us to better identify your community's coastal flood hazard needs and subsequent Risk MAP regulatory and non-regulatory products and datasets that can be delivered during the Risk MAP project. We will also discuss how the coastal flood risks and needs are related to mapping, risk assessment, Hazard Mitigation planning, and grant programs available to eligible communities. To best facilitate this discussion, we would like to request your help in inviting community leaders, emergency managers, GIS specialists, engineers, outreach specialists, and local planners to the meeting. Please RSVP to FEMA's study contractor (STARR) Scott

Mr. Gerald Hill
July 12, 2012
Page 2

Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

So that we can better prepare for the upcoming Discovery Meeting, we are asking local communities to participate in an Information Exchange conference call and WebEx. This call will provide an overview of FEMA's Risk MAP program and the Discovery process, and will allow us to review with you our request for the exchange of coastal flood risk and hazard mitigation data, and to learn more about your community's coastal flood hazard risks and needs, in advance of the Discovery Meeting. The partnership and exchange of data between FEMA, the State, and your community is vital to the success of identifying flood risks and needs that may impact your citizens.

The Information Exchange conference call is scheduled to occur:

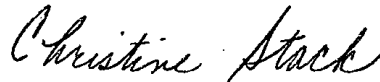
Date/Time: Wednesday, July 25, 2012; 10:00 - 11:00 am ET
Link to WebEx: <http://e-meetings.verizonbusiness.com/nc/join.php>
Meeting Number: 445288484
Call in number: 1-866-398-2885
Participant Code: 197462

If you or another community representative is unable to attend the Information Exchange conference call, we ask that you fill out and return the enclosed data request form by **August 3, 2012**. This is the same data request form that will be discussed during the conference call. The completed form can be sent to:

Via e-mail: GreatLakesFloodStudy@starr-team.com
By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

We look forward to working with you to reduce the risks associated with coastal flooding and increase your community's resiliency for the long term. To learn more about Discovery, please visit <http://www.fema.gov/library> and search keywords "Discovery brochure" or contact Ken Hinterlong, FEMA Region V Senior Engineer, at (312) 408-5529, or by email at ken.hinterlong@fema.dhs.gov. We look forward to discussing this with you during the Information Exchange call and/or seeing you at the upcoming Discovery Meeting.

Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Ken Waybrant, Building Inspector, Clark Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Cleo Smith
Supervisor, Garfield Township
Township Hall
Post Office Box 148
Engadine, Michigan 49827

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Smith:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

The goal of Risk MAP is to support actions that make communities safer from flooding. The Risk MAP program wants to achieve continued improvement of flood hazard information for the National Flood Insurance Program (NFIP); to promote increased awareness and understanding of flood risk; to increase community engagement; and to identify and support actions that local stakeholders can take to reduce natural hazard risks. For additional information on the Risk MAP Program, please visit http://www.fema.gov/plan/prevent/fhm/rm_main.shtm.

The first phase of the Risk MAP process is Discovery. Through Discovery, input provided by communities will help FEMA to better understand local coastal flood risk data and needs, and characterize local conditions that contribute to coastal flood risk.

Your Discovery Meeting is scheduled to occur:

Date/Time:	Monday, August 13, 2012; 1:00 - 3:00 pm ET
Location:	Saint Ignace Public Library
Address:	110 West Spruce Street Saint Ignace, Michigan 49781

Please save this date on your calendar. At the meeting, we will review the coastal flood risk data we have gathered to date and discuss your community's coastal floodplains, mitigation plan and projects, coastal flood risk concerns, and coastal floodplain management activities. This discussion will allow us to better identify your community's coastal flood hazard needs and subsequent Risk MAP regulatory and non-regulatory products and datasets that can be delivered during the Risk MAP project. We will also discuss how the coastal flood risks and needs are related to mapping, risk assessment, Hazard Mitigation planning, and grant programs available to eligible communities. To best facilitate this discussion, we would like to request your help in inviting community leaders, emergency managers, GIS specialists, engineers, outreach specialists, and local planners to the meeting. Please RSVP to FEMA's study contractor (STARR) Scott

Mr. Cleo Smith
July 12, 2012
Page 2

Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

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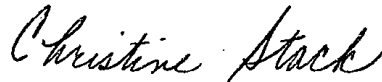
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Call in number: 1-866-398-2885
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By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: David Kovar, Building Inspector, Garfield Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Russell Nelson
Supervisor, Hendricks Township
6051 West US 2
Naubinway, Michigan 49762

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Nelson:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Date/Time:	Monday, August 13, 2012; 1:00 - 3:00 pm ET
Location:	Saint Ignace Public Library
Address:	110 West Spruce Street Saint Ignace, Michigan 49781

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Mr. Russell Nelson
July 12, 2012
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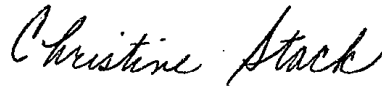
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Meeting Number: 445288484
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Participant Code: 197462

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By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Barbara Price, Clerk, Hendricks Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Al Garavaglia
Supervisor, Hudson Township
W7803 Hiawatha Trail
Naubinway, Michigan 49762

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Garavaglia:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Your Discovery Meeting is scheduled to occur:

Date/Time: Monday, August 13, 2012; 1:00 - 3:00 pm ET
Location: Saint Ignace Public Library
Address: 110 West Spruce Street
Saint Ignace, Michigan 49781

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Mr. Al Garavaglia
July 12, 2012
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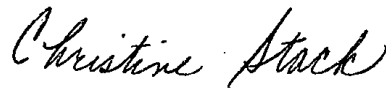
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Meeting Number: 445288484
Call in number: 1-866-398-2885
Participant Code: 197462

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By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

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Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: David Kovar, Building inspector, Hudson Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Ms. Mary Kay Tamlyn
Chief Deputy Clerk, Mackinac County
100 South Marley
Room 10
Saint Ignace, Michigan 49781

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Ms. Tamlyn:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Address:	110 West Spruce Street Saint Ignace, Michigan 49781

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Ms. Mary Kay Tamlyn
July 12, 2012
Page 2

Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

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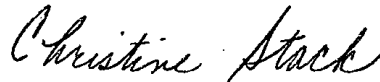
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Meeting Number: 445288484
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Participant Code: 197462

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By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc:

Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. John Kronemeyer
Supervisor, Marquette Township
Township Hall
7177 East James Street
Pickford, Michigan 49774

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Kronemeyer:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Mr. John Kronemeyer
July 12, 2012
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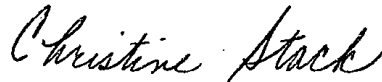
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Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Frank Sims, Building Inspector, Marquette Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Patrick Durm
Supervisor, Moran Township
Township Hall
West 362 US 2
Post Office Box 364
Saint Ignace, Michigan 49781

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Durm:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Mr. Patrick Durm
July 12, 2012
Page 2

Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

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The Information Exchange conference call is scheduled to occur:

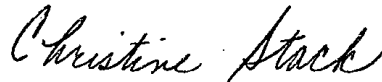
Date/Time: Wednesday, July 25, 2012; 10:00 - 11:00 am ET
Link to WebEx: <http://e-meetings.verizonbusiness.com/nc/join.php>
Meeting Number: 445288484
Call in number: 1-866-398-2885
Participant Code: 197462

If you or another community representative is unable to attend the Information Exchange conference call, we ask that you fill out and return the enclosed data request form by **August 3, 2012**. This is the same data request form that will be discussed during the conference call. The completed form can be sent to:

Via e-mail: GreatLakesFloodStudy@starr-team.com
By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

We look forward to working with you to reduce the risks associated with coastal flooding and increase your community's resiliency for the long term. To learn more about Discovery, please visit <http://www.fema.gov/library> and search keywords "Discovery brochure" or contact Ken Hinterlong, FEMA Region V Senior Engineer, at (312) 408-5529, or by email at ken.hinterlong@fema.dhs.gov. We look forward to discussing this with you during the Information Exchange call and/or seeing you at the upcoming Discovery Meeting.

Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Mark Spencer, Zoning Administrator, Moran Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Bob Brotherton
Supervisor, Newton Township
Township Hall
N6164 South Gould City Road
Gould, Michigan 49838

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Brotherton:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

The goal of Risk MAP is to support actions that make communities safer from flooding. The Risk MAP program wants to achieve continued improvement of flood hazard information for the National Flood Insurance Program (NFIP); to promote increased awareness and understanding of flood risk; to increase community engagement; and to identify and support actions that local stakeholders can take to reduce natural hazard risks. For additional information on the Risk MAP Program, please visit http://www.fema.gov/plan/prevent/fhm/rm_main.shtm.

The first phase of the Risk MAP process is Discovery. Through Discovery, input provided by communities will help FEMA to better understand local coastal flood risk data and needs, and characterize local conditions that contribute to coastal flood risk.

Your Discovery Meeting is scheduled to occur:

Date/Time:	Monday, August 13, 2012; 1:00 - 3:00 pm ET
Location:	Saint Ignace Public Library
Address:	110 West Spruce Street Saint Ignace, Michigan 49781

Please save this date on your calendar. At the meeting, we will review the coastal flood risk data we have gathered to date and discuss your community's coastal floodplains, mitigation plan and projects, coastal flood risk concerns, and coastal floodplain management activities. This discussion will allow us to better identify your community's coastal flood hazard needs and subsequent Risk MAP regulatory and non-regulatory products and datasets that can be delivered during the Risk MAP project. We will also discuss how the coastal flood risks and needs are related to mapping, risk assessment, Hazard Mitigation planning, and grant programs available to eligible communities. To best facilitate this discussion, we would like to request your help in inviting community leaders, emergency managers, GIS specialists, engineers, outreach specialists, and local planners to the meeting. Please RSVP to FEMA's study contractor (STARR) Scott

Mr. Bob Brotherton
July 12, 2012
Page 2

Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

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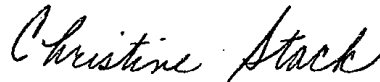
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Meeting Number: 445288484
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Participant Code: 197462

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Via e-mail: GreatLakesFloodStudy@starr-team.com
By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Richard Oliver, Building Inspector, Newton Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Ms. Linda Peterson
Supervisor, Cedarville Township
N10663 County Road 551
Cedar River, Michigan 49887

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Ms. Peterson:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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The first phase of the Risk MAP process is Discovery. Through Discovery, input provided by communities will help FEMA to better understand local coastal flood risk data and needs, and characterize local conditions that contribute to coastal flood risk.

Your Discovery Meeting is scheduled to occur:

Date/Time:	Tuesday, August 14, 2012; 2:00 - 4:00 pm ET
Location:	Bay de Noc Community College, Rooms 958 & 962
Address:	2001 North Lincoln Road Escanaba, Michigan 49829

Please save this date on your calendar. At the meeting, we will review the coastal flood risk data we have gathered to date and discuss your community's coastal floodplains, mitigation plan and projects, coastal flood risk concerns, and coastal floodplain management activities. This discussion will allow us to better identify your community's coastal flood hazard needs and subsequent Risk MAP regulatory and non-regulatory products and datasets that can be delivered during the Risk MAP project. We will also discuss how the coastal flood risks and needs are related to mapping, risk assessment, Hazard Mitigation planning, and grant programs available to eligible communities. To best facilitate this discussion, we would like to request your help in inviting community leaders, emergency managers, GIS specialists, engineers, outreach specialists, and local planners to the meeting. Please RSVP to FEMA's study contractor (STARR) Scott Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

Ms. Linda Peterson
July 12, 2012
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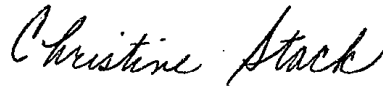
Date/Time: Thursday, July 26, 2012; 10:00 - 11:00 am ET
Link to WebEx: <http://e-meetings.verizonbusiness.com/nc/join.php>
Meeting Number: 445288484
Call in number: 1-866-398-2885
Participant Code: 197462

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By mail: Scott Banjavcic
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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc:

Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

The Honorable Jean Stegeman
Mayor, City of Menominee
2511 10th Street
Menominee, Michigan 49858

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mayor Stegeman:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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The first phase of the Risk MAP process is Discovery. Through Discovery, input provided by communities will help FEMA to better understand local coastal flood risk data and needs, and characterize local conditions that contribute to coastal flood risk.

Your Discovery Meeting is scheduled to occur:

Date/Time:	Tuesday, August 14, 2012; 2:00 - 4:00 pm ET
Location:	Bay de Noc Community College, Rooms 958 & 962
Address:	2001 North Lincoln Road Escanaba, Michigan 49829

Please save this date on your calendar. At the meeting, we will review the coastal flood risk data we have gathered to date and discuss your community's coastal floodplains, mitigation plan and projects, coastal flood risk concerns, and coastal floodplain management activities. This discussion will allow us to better identify your community's coastal flood hazard needs and subsequent Risk MAP regulatory and non-regulatory products and datasets that can be delivered during the Risk MAP project. We will also discuss how the coastal flood risks and needs are related to mapping, risk assessment, Hazard Mitigation planning, and grant programs available to eligible communities. To best facilitate this discussion, we would like to request your help in inviting community leaders, emergency managers, GIS specialists, engineers, outreach specialists, and local planners to the meeting. Please RSVP to FEMA's study contractor (STARR) Scott Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

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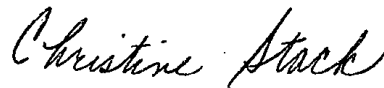
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By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

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Division Director
Mitigation Division, FEMA Region V

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Community Discovery Coastal Data Request Form

cc: Thomas Lesperance, Building Inspector, City of Menominee
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

The Honorable Paul Anderson
Supervisor, Ingallston Township
Township Hall
W3790 Town Hall Lane
Number 13.5
Wallace, Michigan 49893

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mayor Anderson:

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Date/Time:	Tuesday, August 14, 2012; 2:00 - 4:00 pm ET
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Address:	2001 North Lincoln Road Escanaba, Michigan 49829

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The Honorable Paul Anderson
July 12, 2012
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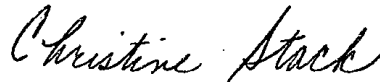
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Christine Stack
Division Director
Mitigation Division, FEMA Region V

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Community Discovery Coastal Data Request Form

cc: Kay Keefer, Clerk, Ingallston Township
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. James Furlong
County Board Chair, Menominee County
4208 North Shore Drive
Menominee, Michigan 49858

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Furlong:

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Mr. James Furlong
July 12, 2012
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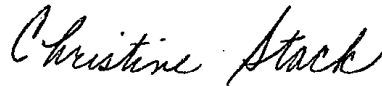
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Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Daniel Menacher, Building Inspector, Menominee County
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Ken Goffin
Supervisor, Menominee Township
N4561 County Road 577
Wallace, Michigan 49893

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Goffin:

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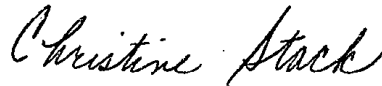
Date/Time: Thursday, July 26, 2012; 10:00 - 11:00 am ET
Link to WebEx: <http://e-meetings.verizonbusiness.com/nc/join.php>
Meeting Number: 445288484
Call in number: 1-866-398-2885
Participant Code: 197462

If you or another community representative is unable to attend the Information Exchange conference call, we ask that you fill out and return the enclosed data request form by **August 3, 2012**. This is the same data request form that will be discussed during the conference call. The completed form can be sent to:

Via e-mail: GreatLakesFloodStudy@starr-team.com
By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

We look forward to working with you to reduce the risks associated with coastal flooding and increase your community's resiliency for the long term. To learn more about Discovery, please visit <http://www.fema.gov/library> and search keywords "Discovery brochure" or contact Ken Hinterlong, FEMA Region V Senior Engineer, at (312) 408-5529, or by email at ken.hinterlong@fema.dhs.gov. We look forward to discussing this with you during the Information Exchange call and/or seeing you at the upcoming Discovery Meeting.

Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc:

Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

The Honorable David Peterson
Mayor, City of Manistique
City Hall
300 North Maple Street
Post Office Box 515
Manistique, Michigan 49854

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mayor Peterson:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

The goal of Risk MAP is to support actions that make communities safer from flooding. The Risk MAP program wants to achieve continued improvement of flood hazard information for the National Flood Insurance Program (NFIP); to promote increased awareness and understanding of flood risk; to increase community engagement; and to identify and support actions that local stakeholders can take to reduce natural hazard risks. For additional information on the Risk MAP Program, please visit http://www.fema.gov/plan/prevent/fhm/rm_main.shtm.

The first phase of the Risk MAP process is Discovery. Through Discovery, input provided by communities will help FEMA to better understand local coastal flood risk data and needs, and characterize local conditions that contribute to coastal flood risk.

Your Discovery Meeting is scheduled to occur:

Date/Time:	Tuesday, August 14, 2012; 2:00 - 4:00 pm ET
Location:	Bay de Noc Community College, Rooms 958 & 962
Address:	2001 North Lincoln Road Escanaba, Michigan 49829

Please save this date on your calendar. At the meeting, we will review the coastal flood risk data we have gathered to date and discuss your community's coastal floodplains, mitigation plan and projects, coastal flood risk concerns, and coastal floodplain management activities. This discussion will allow us to better identify your community's coastal flood hazard needs and subsequent Risk MAP regulatory and non-regulatory products and datasets that can be delivered during the Risk MAP project. We will also discuss how the coastal flood risks and needs are related to mapping, risk assessment, Hazard Mitigation planning, and grant programs available to eligible communities. To best facilitate this discussion, we would like to request your help in inviting community leaders, emergency managers, GIS specialists, engineers, outreach specialists, and local planners to the meeting. Please RSVP to FEMA's study contractor (STARR) Scott

The Honorable David Peterson
July 12, 2012
Page 2

Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

So that we can better prepare for the upcoming Discovery Meeting, we are asking local communities to participate in an Information Exchange conference call and WebEx. This call will provide an overview of FEMA's Risk MAP program and the Discovery process, and will allow us to review with you our request for the exchange of coastal flood risk and hazard mitigation data, and to learn more about your community's coastal flood hazard risks and needs, in advance of the Discovery Meeting. The partnership and exchange of data between FEMA, the State, and your community is vital to the success of identifying flood risks and needs that may impact your citizens.

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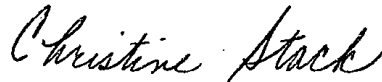
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Meeting Number: 445288484
Call in number: 1-866-398-2885
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Via e-mail: GreatLakesFloodStudy@starr-team.com
By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

We look forward to working with you to reduce the risks associated with coastal flooding and increase your community's resiliency for the long term. To learn more about Discovery, please visit <http://www.fema.gov/library> and search keywords "Discovery brochure" or contact Ken Hinterlong, FEMA Region V Senior Engineer, at (312) 408-5529, or by email at ken.hinterlong@fema.dhs.gov. We look forward to discussing this with you during the Information Exchange call and/or seeing you at the upcoming Discovery Meeting.

Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Fred Peterson, City Tax Assessor, City of Manistique
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Mr. Allen Grimm
County Board Chair, Schoolcraft County
300 Main Street
Manistique, Michigan 49854

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Mr. Grimm:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Address:	2001 North Lincoln Road Escanaba, Michigan 49829

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Mr. Allen Grimm
July 12, 2012
Page 2

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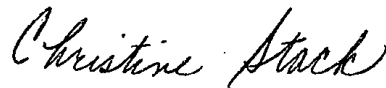
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By mail: Scott Banjavcic
CDM Smith/STARR
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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc: Robert Madden, Emergency Management Director, Schoolcraft County
Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality



FEMA

July 12, 2012

Ms. Theresa Lund
Township Board Supervisor, Thompson Township
Township Hall
Pine Street US 2
Post Office Box 174
Manistique, Michigan 49854

Re: Invitation to Attend Community Meetings Regarding Lake Michigan Coastal Flood Risk

Dear Ms. Lund:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. Please see enclosed Risk MAP Flood Risk Products Fact Sheet. More information about the Great Lakes Coastal Flood Study may be found at <http://www.greatlakescoast.org>.

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Location:	Bay de Noc Community College, Rooms 958 & 962
Address:	2001 North Lincoln Road Escanaba, Michigan 49829

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Ms. Theresa Lund
July 12, 2012
Page 2

Banjavcic at (312) 780-7755 or email to GreatLakesFloodStudy@starr-team.com no later than **August 3, 2012**. Please reference the Discovery Meeting date and time in your RSVP.

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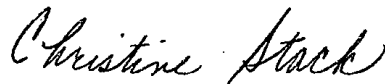
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Meeting Number: 445288484
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Participant Code: 197462

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Via e-mail: GreatLakesFloodStudy@starr-team.com
By mail: Scott Banjavcic
CDM Smith/STARR
125 S. Wacker Drive, Suite 600
Chicago, Illinois 60606

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Sincerely,



Christine Stack
Division Director
Mitigation Division, FEMA Region V

Enclosures: Risk MAP Flood Risk Products Fact Sheet
Community Discovery Coastal Data Request Form

cc:

Linda Burke, Michigan Department of Environmental Quality
Les Thomas, Michigan Department of Environmental Quality
Byron Lane, Michigan Department of Environmental Quality

Keating, Laura

From: Banjavcic, Scott
Sent: Tuesday, August 07, 2012 9:13 AM
To: Keating, Laura
Subject: FW: Test Message - Text Format: Invitation to Michigan Community Meetings Re: Lake Michigan Coastal Flood Risk

-----Original Message-----

From: Great Lakes Coastal Flood Study [mailto:Great_Lakes_Coastal_Flood_Study@mail.vresp.com]
Sent: Friday, July 27, 2012 1:55 PM
To: Banjavcic, Scott
Subject: Test Message - Text Format: Invitation to Michigan Community Meetings Re: Lake Michigan Coastal Flood Risk

Dear State of Michigan Lake Michigan Coastal Flood Study Stakeholders:

The Federal Emergency Management Agency (FEMA) is conducting a comprehensive study of flood hazards for Lake Michigan and the rest of the United States Great Lakes through FEMA's Risk Mapping, Assessment, and Planning (MAP) Program. Data from this study will eventually be used to convey coastal flood hazard risk through revised Flood Insurance Rate Maps (FIRMs), also known as regulatory products, and new risk planning and assessment products and datasets, also referred to as non-regulatory products and datasets. More information about the Great Lakes Coastal Flood Study may be found at <http://cts.vresp.com/c/?OPP/1877897f4f/TEST/d963a8f31e> .

The goal of Risk MAP is to support actions that make communities safer from flooding. The Risk MAP program wants to achieve continued improvement of flood hazard information for the National Flood Insurance Program (NFIP); to promote increased awareness and understanding of flood risk; to increase community engagement; and to identify and support actions that local stakeholders can take to reduce natural hazard risks. For additional information on the Risk MAP Program, please visit <http://cts.vresp.com/c/?OPP/1877897f4f/TEST/c2cd6b8fb3> .

The first phase of the Risk MAP process is Discovery. Through Discovery, input provided by local stakeholders will help FEMA to better understand local coastal flood risk data and needs, and characterize local conditions that contribute to coastal flood risk.

We would like to invite you to attend one of the following Discovery Meetings being held in Michigan for Lake Michigan. Although each Discovery Meeting will give the same overall message, each meeting will be catered to the coastal communities within the counties listed below:

Vanburen County and Berrien County (Discovery Meeting) Monday, September 10, 2012 2:00 - 4:00 pm Berrien County Administrative Building
701 Main Street
St. Joseph, MI 49085

Ottawa County and Allegan County (Discovery Meeting) Tuesday, September 11, 2012 9:00 - 11:00 am Ottawa County Fillmore Street Complex Board Room 12220 Fillmore Street, Room 310 West Olive, MI 49460

Oceana County and Muskegon County (Discovery Meeting) Wednesday, September 12, 2012 9:00 - 11:00 am Louis A. McMurray Conference and Transportation Center
2624 Sixth Street
Muskegon Heights, MI 49444

Manistee County and Mason County (Discovery Meeting) Wednesday, September 12, 2012 3:00 - 5:00 pm Community Room 400 S. Harrison Street Ludington, MI 49431

Grand Traverse County, Benzie County and Leelanau County (Discovery Meeting)
Thursday, September 13, 2012
1:00 - 3:00 pm
Training Room
400 Boardman Avenue
Traverse City, MI 49684

Antrim County, Charlevoix County and Emmet County (Discovery Meeting) Friday, September 14, 2012 9:00 - 11:00 am
Bellaire Community Hall
202 North Bridge Street
Bellaire, MI

Mackinac County (Discovery Meeting)
Monday, August 13, 2012
1:00 - 3:00 pm
St. Ignace Public Library
110 W. Spruce Street,
St. Ignace, MI 49781

Delta County, Schoolcraft County and Menominee County (Discovery Meeting)
Tuesday, August 14, 2012
2:00 - 4:00 pm
Bay de Noc Community College, Rooms 958 & 962
2001 N. Lincoln Road
Escanaba, MI 49829

Please save this date on your calendar. At the meetings, we will review the coastal flood risk data we have gathered to date and discuss local coastal floodplains, mitigation plan and projects, coastal flood risk concerns, and coastal floodplain management activities. This discussion will allow us to better identify local coastal flood hazard needs and subsequent Risk MAP regulatory and non-regulatory products and datasets that can be delivered during the Risk MAP project. We will also discuss how the coastal flood risks and needs are related to mapping, risk assessment, hazard mitigation planning, and grant programs available to eligible communities.

Please RSVP to FEMA's study contractor (STARR) Holly Davis at (904) 363-8451 or email to GreatLakesFloodStudy@starr-team.com no later than one week prior to the meeting you are attending. Please reference the Discovery Meeting date and time in your RSVP.

A Community Coastal Data Request Form was recently mailed to local community officials, along with the Discovery Meeting invitation.

This form is also available online at:

<http://cts.vresp.com/c/?OPP/1877897f4f/TEST/f62289beff> .

If you have data or information that you would like to provide to FEMA or discuss with us in advance of the Discovery Meetings, please also contact Holly Davis of STARR at (904) 363-8451 or by email at GreatLakesFloodStudy@starr-team.com .

We look forward to working with you to reduce the risks associated with coastal flooding and increase resiliency for the long term. To learn more about Discovery, please visit <http://cts.vresp.com/c/?OPP/1877897f4f/TEST/a06a5a30cc> and search keywords "Discovery brochure" or contact Ken Hinterlong, FEMA Region V Senior Engineer, at (312) 408-5529, or by email at ken.hinterlong@fema.dhs.gov . We look forward to seeing you at the upcoming Discovery Meeting.

For additional information on the Great Lakes Coastal Flood Study, please visit: <http://cts.vresp.com/c/?OPP/1877897f4f/TEST/84afb74985> .

- <http://cts.vresp.com/c/?OPP/1877897f4f/TEST/ed8183944d>

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<http://cts.vresp.com/c/?OPP/1877897f4f/TEST/38e5050317>

Like [GreatLakesCoast](#) on Facebook

[Click to view this email in a browser](#)

<http://hosted.verticalresponse.com/290205/1877897f4f/TEST/TEST/>

If you want to "Unsubscribe" from this list and no longer receive emails regarding the Great Lakes Coastal Flood Study, please click on the following link:

<http://cts.vresp.com/u?1877897f4f/TEST/TEST>

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[Great Lakes Coastal Flood Study](#)

[2809 Fish Hatchery Road, Suite 204](#)

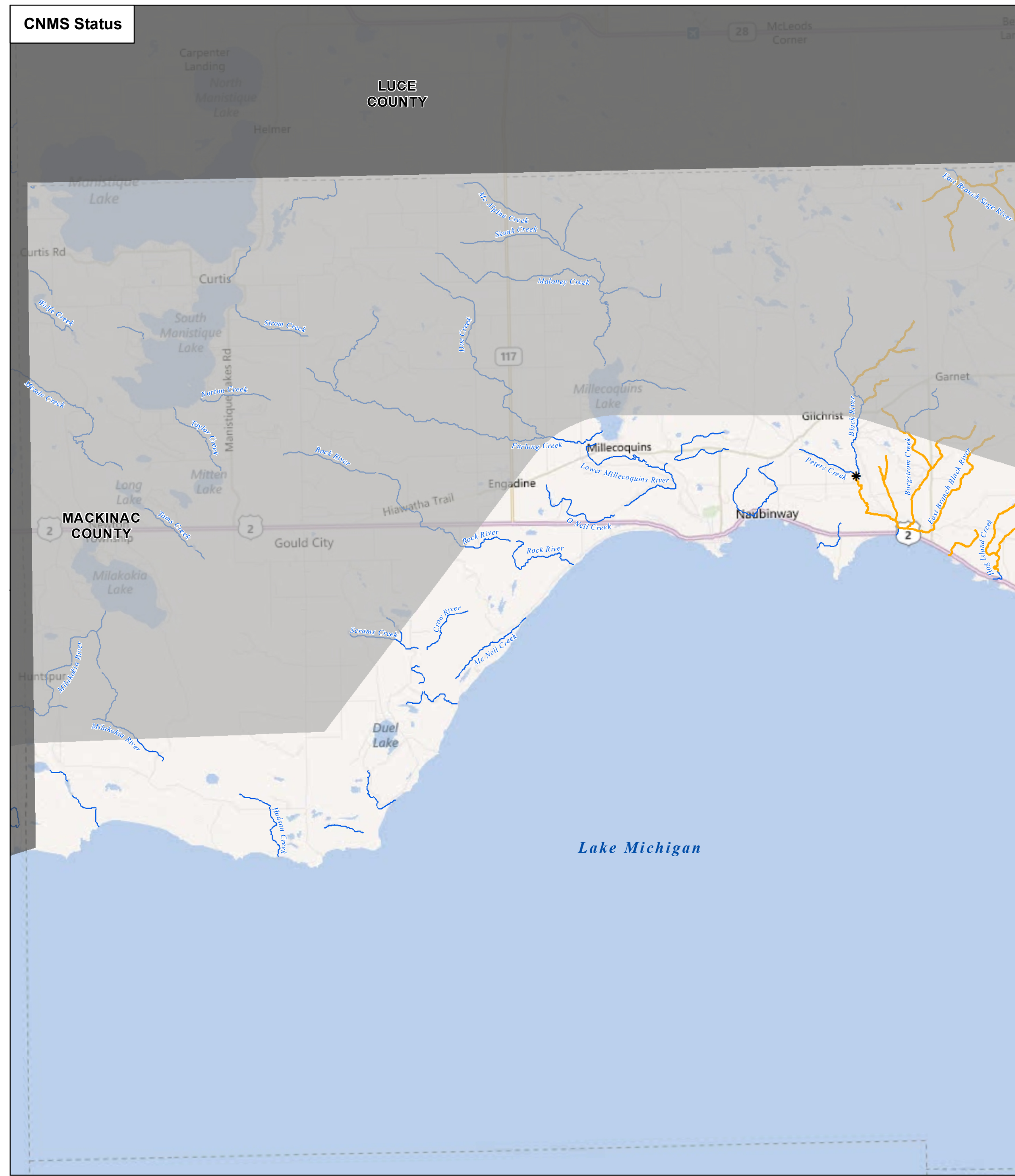
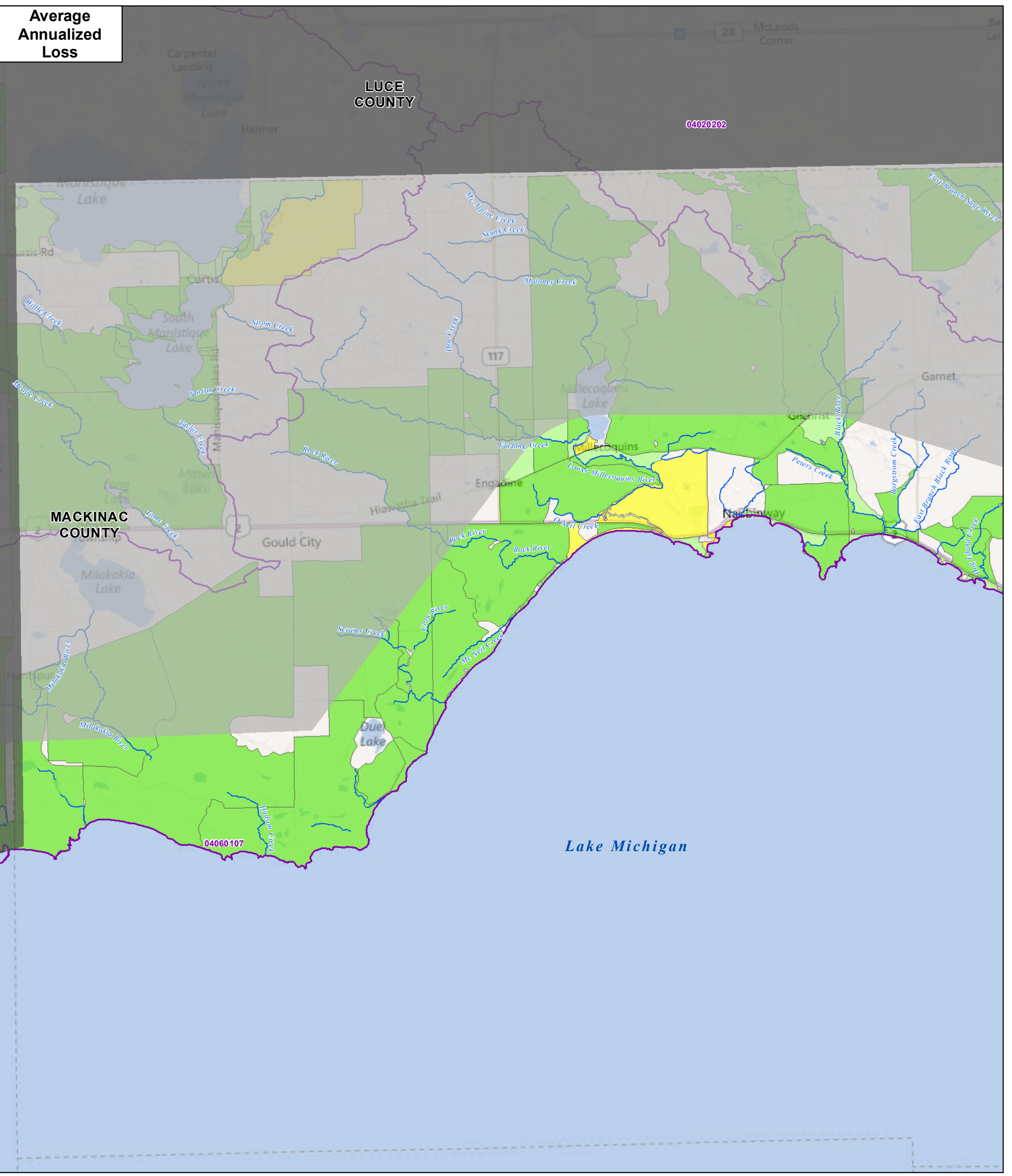
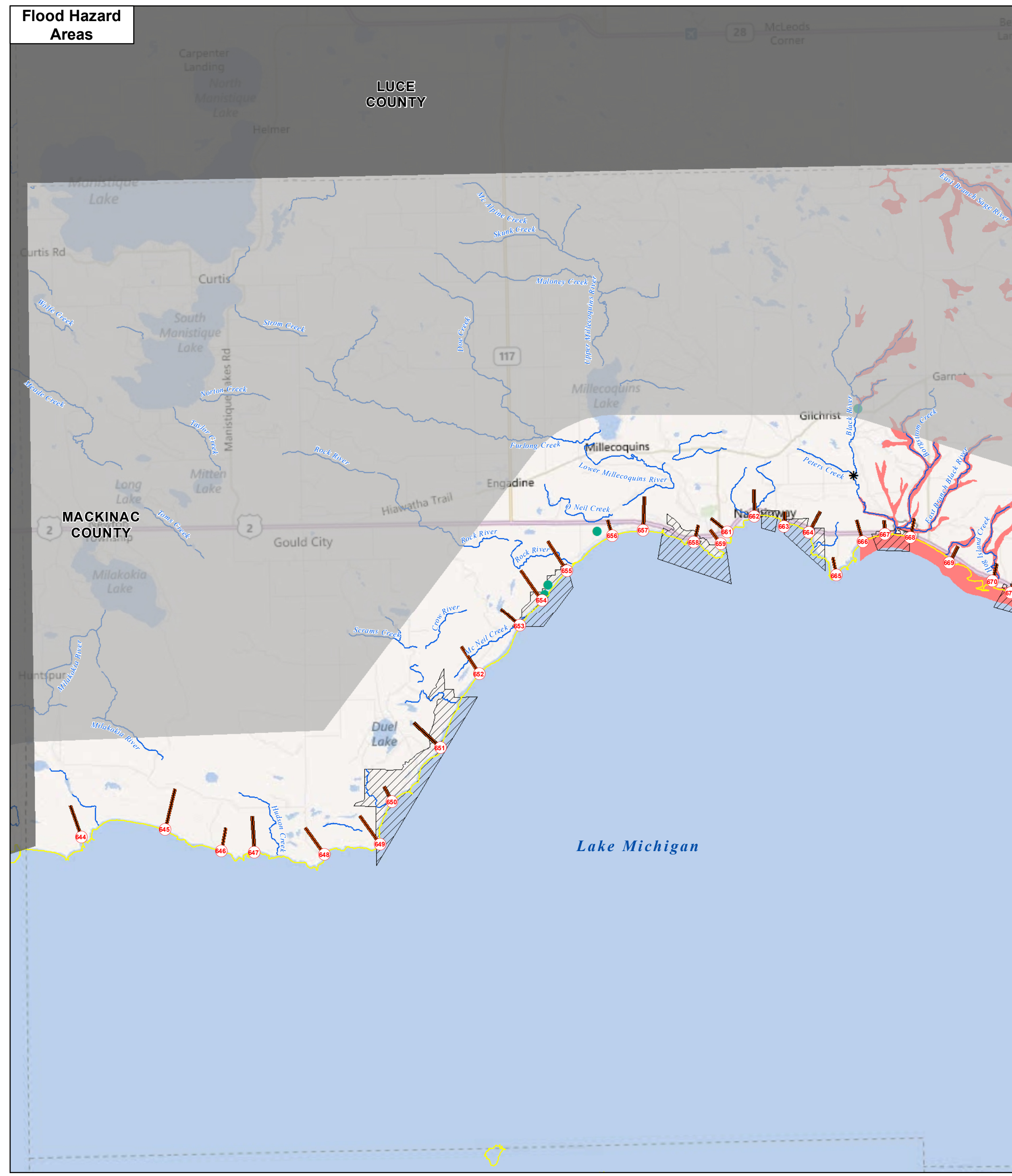
[Madison, WI 53713](#)

[US](#)

Read the [VerticalResponse](#) marketing policy:

http://www.verticalresponse.com/content/pm_policy.html

ATTACHMENT C
MACKINAC COUNTY
DRAFT DISCOVERY MAPS



Declared Disasters						
Lake	State	Declared County/Area	Declaration Date	Disaster Type	Incident Type	Description
Lake Michigan	MI	Mackinac (County)	5/10/1994	DR	Snow	SEVERE DEEP FREEZE
Lake Michigan	MI	Mackinac (County)	3/2/1977	EM	Drought	DROUGHT
Lake Michigan	MI	Mackinac (County)	1/27/1978	EM	Snow	BLIZZARDS & SNOWSTORMS
Lake Michigan	MI	Mackinac (County)	9/7/2005	EM	Hurricane	HURRICANE KATRINA EVACUATION

Summary of Flood Insurance Policies and Claims									
Lake	State	County	Community	OID	No. Policies	Total Premium	Total Coverage	Number of claims since 1978	Dollar (\$) paid for claims since 1978
Lake Michigan	MI	Mackinac	Mackinac County	260795	0	\$0	\$0	0	\$0
Lake Michigan	MI	Mackinac	Bois Blanc, Township of	260759	19	\$14,208	\$3,211,800	0	\$0
Lake Michigan	MI	Mackinac	Clark, Township of	260766	11	\$6,983	\$1,818,900	2	\$2,257
Lake Michigan	MI	Mackinac	Garfield, Township of	260806	1	\$247	\$105,000	0	\$0
Lake Michigan	MI	Mackinac	Hendricks, Township of	260807	4	\$2,824	\$652,500	0	\$0
Lake Michigan	MI	Mackinac	Hudson, Township of	260764	0	\$0	\$0	0	\$0
Lake Michigan	MI	Mackinac	Mackinac Island, Township of	260443	0	\$0	\$0	0	\$0
Lake Michigan	MI	Mackinac	Marquette, Township of	260447	6	\$4,387	\$799,200	0	\$0
Lake Michigan	MI	Mackinac	Moran, Township of	260879	0	\$0	\$0	0	\$0
Lake Michigan	MI	Mackinac	Newton, Township of	260767	0	\$0	\$0	0	\$0
Lake Michigan	MI	Mackinac	St. Ignace, City of	260444	9	\$3,600	\$1,350,400	1	\$0

Mitigation Action		
Name of Plan	Plan Expiration Date	Identified Hazard Mitigation Action
Mackinac County Hazard Mitigation Plan, November 2005	5/6/2011	Alert warning systems
Mackinac County Hazard Mitigation Plan, November 2005	5/6/2011	Larger storm water detention basins
Mackinac County Hazard Mitigation Plan, November 2005	5/6/2011	Acquire flood-prone NFIP properties
Mackinac County Hazard Mitigation Plan, November 2005	5/6/2011	Ditching along US-2
Mackinac County Hazard Mitigation Plan, November 2005	5/6/2011	Warning sensors for rivers - Review the gauging network to determine if additional rain and stream gauges are necessary. Seek funding to purchase the best equipment available.

MAP SYMBOLOGY

LEGEND

- Dams
- LOMCs
- USGS Gages
- Transects
- Shoreline
- Streams
- Watersheds (HUC 8)
- Coastal Barrier Resource System
- Coastal Discovery Area
- Surrounding Counties
- Municipal Boundaries
- EFFECTIVE SFHA**
 - A
 - AE
 - 0.2% PCT ANNUAL CHANCE FLOOD
- AAL DATA**
 - Total Average Annualized Losses per Census Block
 - Less than \$10,000
 - \$10,001 - \$100,000
 - \$100,001 - \$1,000,000
 - \$1,000,001 - \$5,000,000
 - Greater than \$5,000,000
- Coordinated Needs Management Strategy (CNMS) Validation Status**
 - Unverified
 - Unknown
 - Valid

COASTAL STUDY LOCATOR



NATIONAL FLOOD INSURANCE PROGRAM
Discovery Map
LAKE MICHIGAN COASTAL STUDY
MACKINAC COUNTY, MICHIGAN COASTAL STUDY COMMUNITIES
 PAGE 1 of 2

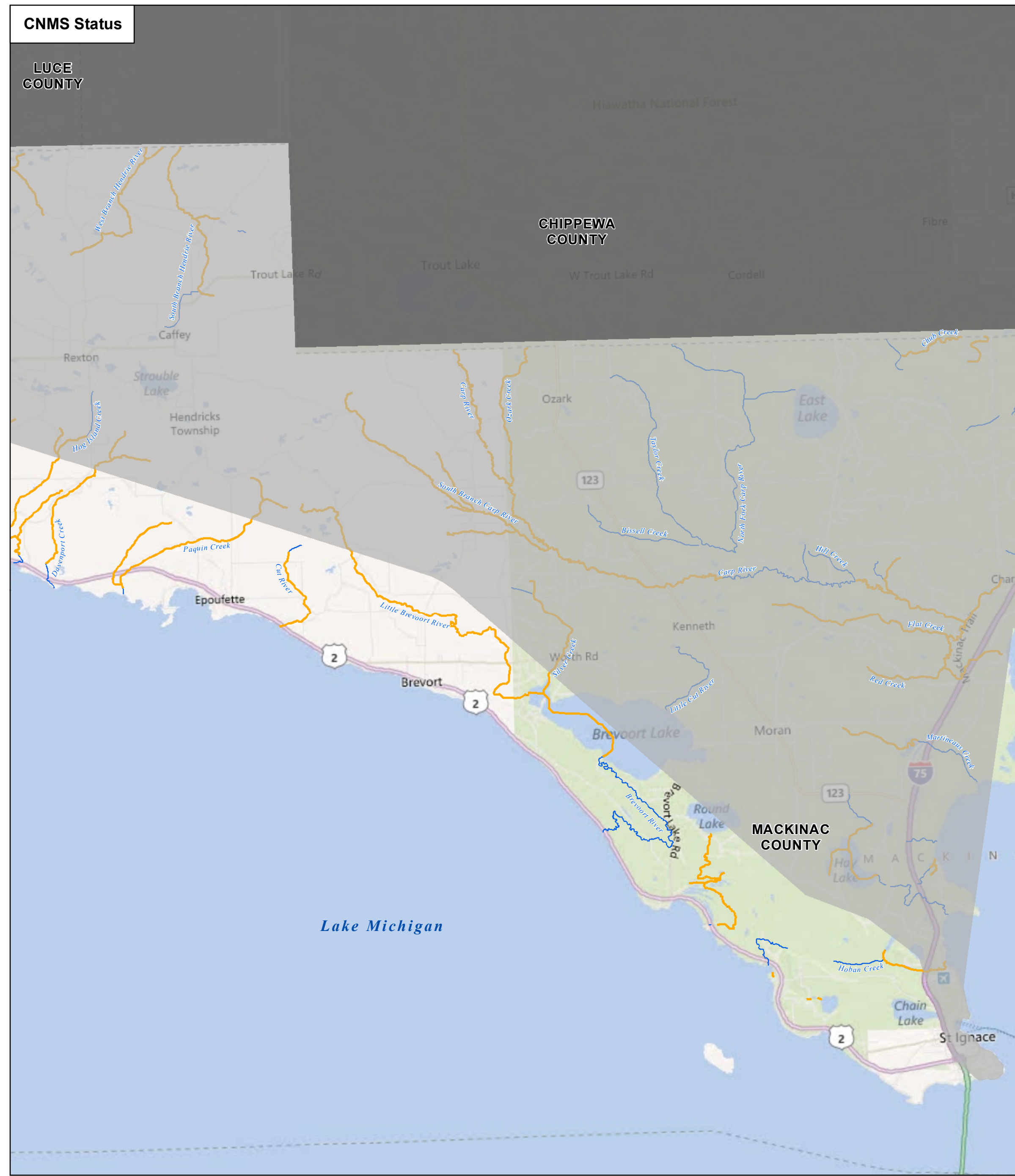
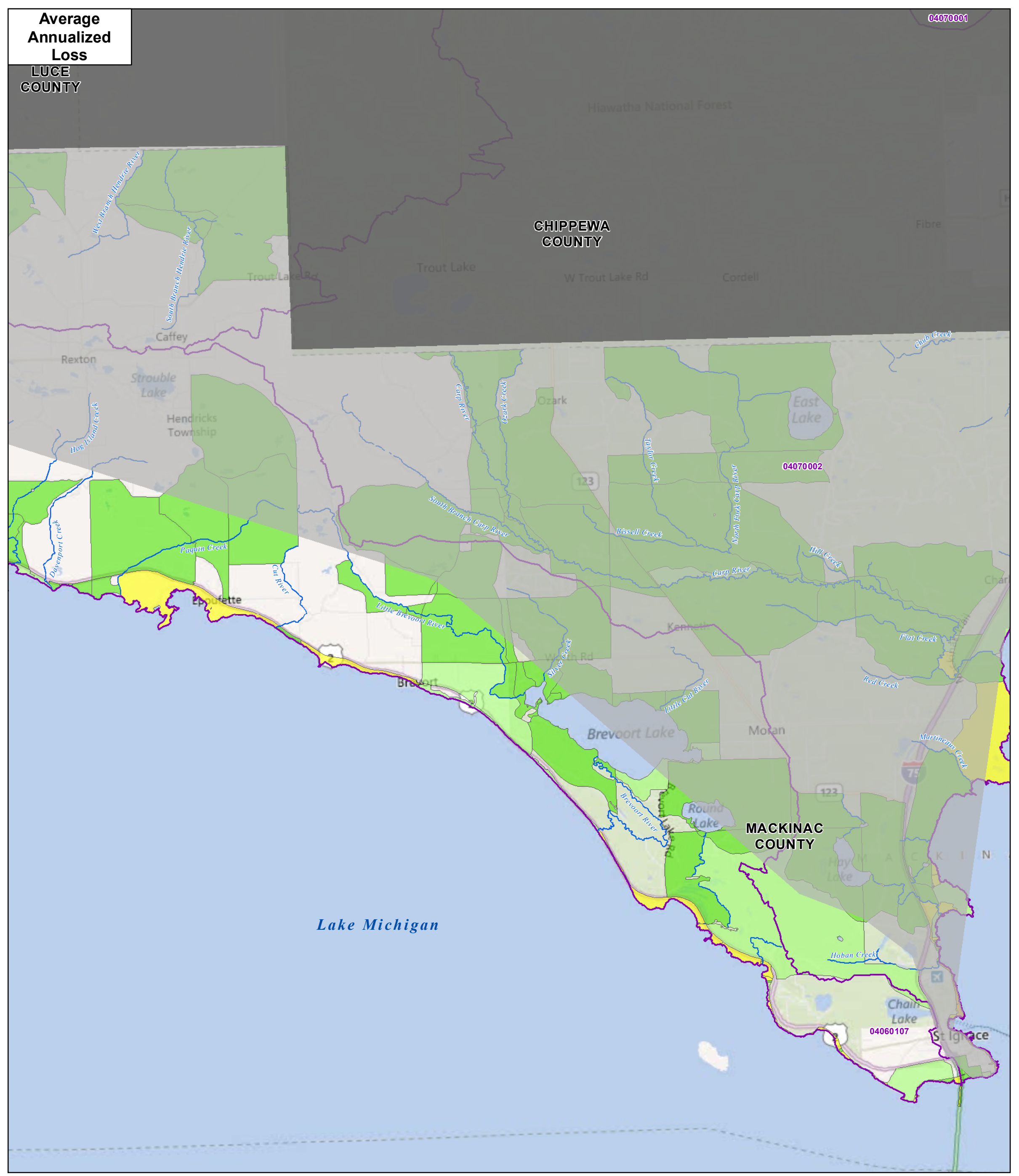
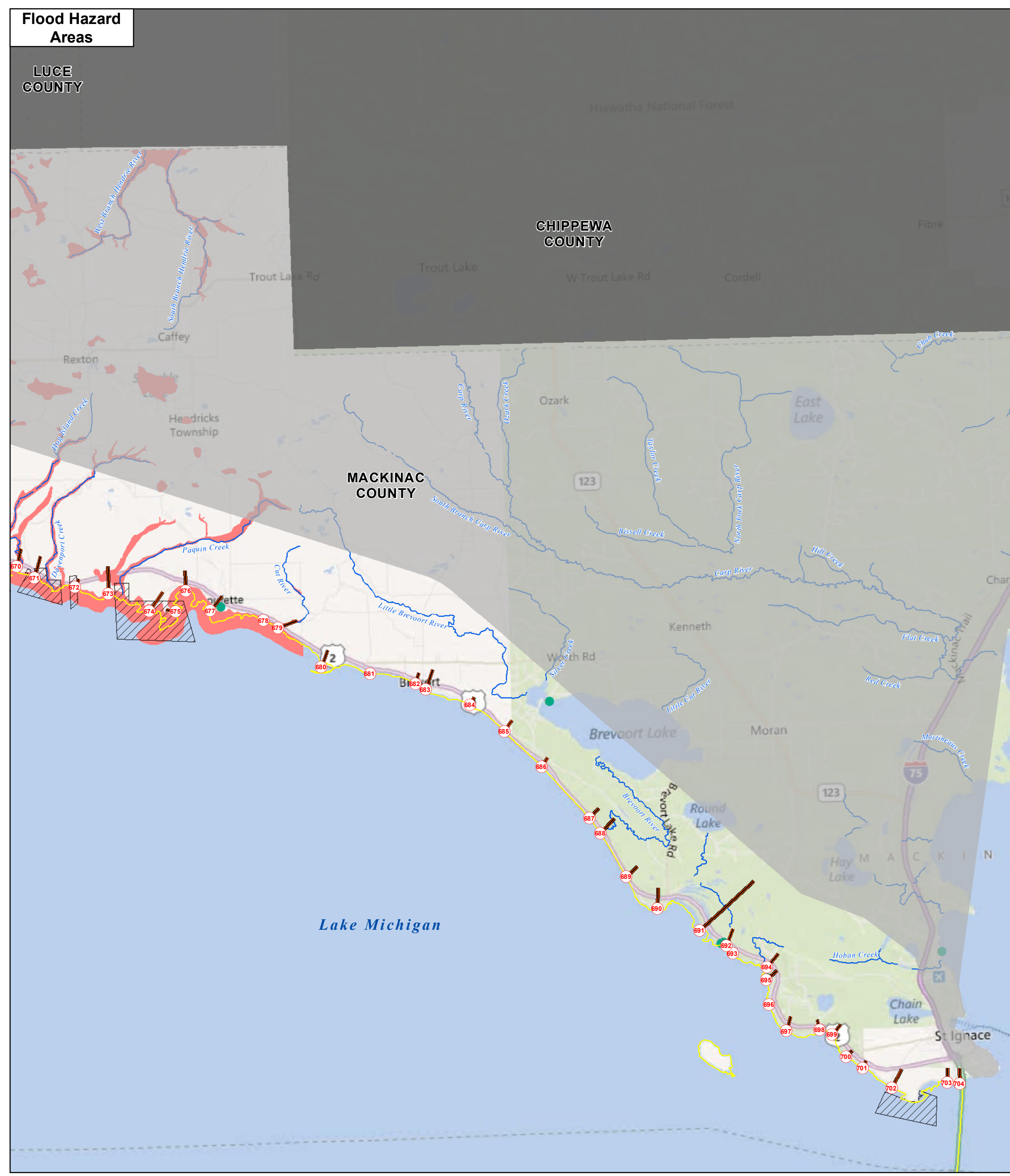
Mackinac County
 Bois Blanc, Township of
 Clark, Township of
 Garfield, Township of
 Hendricks, Township of
 Hudson, Township of
 Mackinac Island, City of

Marquette, Township of
 Moran, Township of
 Newton, Township of
 St. Ignace, City of
 St. Ignace, Township of

STARR

FEMA

Lake Michigan Discovery Report Appendix C - Mackinac County



Declared Disasters						
Lake	State	Declared County/Area	Declaration Date	Disaster Type	Incident Type	Description
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Lake Michigan	MI	Mackinac (County)	1/27/1978	EM	Snow	BLIZZARDS & SNOWSTORMS
Lake Michigan	MI	Mackinac (County)	9/7/2005	EM	Hurricane	HURRICANE KATRINA EVACUATION

Summary of Flood Insurance Policies and Claims									
Lake	State	County	Community	OID	No. Policies	Total Premium	Total Coverage	Number of claims since 1978	Dollar (\$) paid for claims since 1978
Lake Michigan	MI	Mackinac	Mackinac County	260795	0	\$0	\$0	0	\$0
Lake Michigan	MI	Mackinac	Bois Blanc, Township of	260759	19	\$14,208	\$3,211,800	0	\$0
Lake Michigan	MI	Mackinac	Clark, Township of	260766	11	\$6,983	\$1,818,900	2	\$2,257
Lake Michigan	MI	Mackinac	Garfield, Township of	260806	1	\$247	\$105,000	0	\$0
Lake Michigan	MI	Mackinac	Hendricks, Township of	260807	4	\$2,824	\$652,500	0	\$0
Lake Michigan	MI	Mackinac	Hudson, Township of	260764	0	\$0	\$0	0	\$0
Lake Michigan	MI	Mackinac	Mackinac Island, Township of	260443	0	\$0	\$0	0	\$0
Lake Michigan	MI	Mackinac	Marquette, Township of	260647	6	\$4,387	\$799,200	0	\$0
Lake Michigan	MI	Mackinac	Moran, Township of	260679	0	\$0	\$0	0	\$0
Lake Michigan	MI	Mackinac	Newton, Township of	260767	0	\$0	\$0	0	\$0
Lake Michigan	MI	Mackinac	St. Ignace, City of	260444	9	\$3,600	\$1,350,400	1	\$0

Mitigation Action		
Name of Plan	Plan Expiration Date	Identified Hazard Mitigation Action
Mackinac County Hazard Mitigation Plan, November 2005	5/6/2011	Alert warning systems
Mackinac County Hazard Mitigation Plan, November 2005	5/6/2011	Larger storm water detention basins
Mackinac County Hazard Mitigation Plan, November 2005	5/6/2011	Acquire flood-prone NFIP properties
Mackinac County Hazard Mitigation Plan, November 2005	5/6/2011	Ditching along US-2
Mackinac County Hazard Mitigation Plan, November 2005	5/6/2011	Warning sensors for rivers - Review the gauging network to determine if additional rain and stream gauges are necessary. Seek funding to purchase the best equipment available.

MAP SYMBIOLOGY

LEGEND			
• Dams	Coastal Discovery Area	AAL DATA	Coordinated Needs Management Strategy (CNMS)
• LOMCs	Surrounding Counties	Total Average Annualized Losses per Census Block	Validation Status
* USGS Gages	Municipal Boundaries	Less than \$10,000	Unverified
— Transsects	EFFECTIVE SFHA	\$10,001 - \$100,000	Unknown
— Shoreline	A	\$100,001 - \$1,000,000	Valid
— Streams	AE	\$1,000,001 - \$5,000,000	
— Watersheds (HUC 8)	0.2% PCT ANNUAL CHANCE FLOOD	Greater than \$5,000,000	
— Coastal Barrier Resource System			

COASTAL STUDY LOCATOR



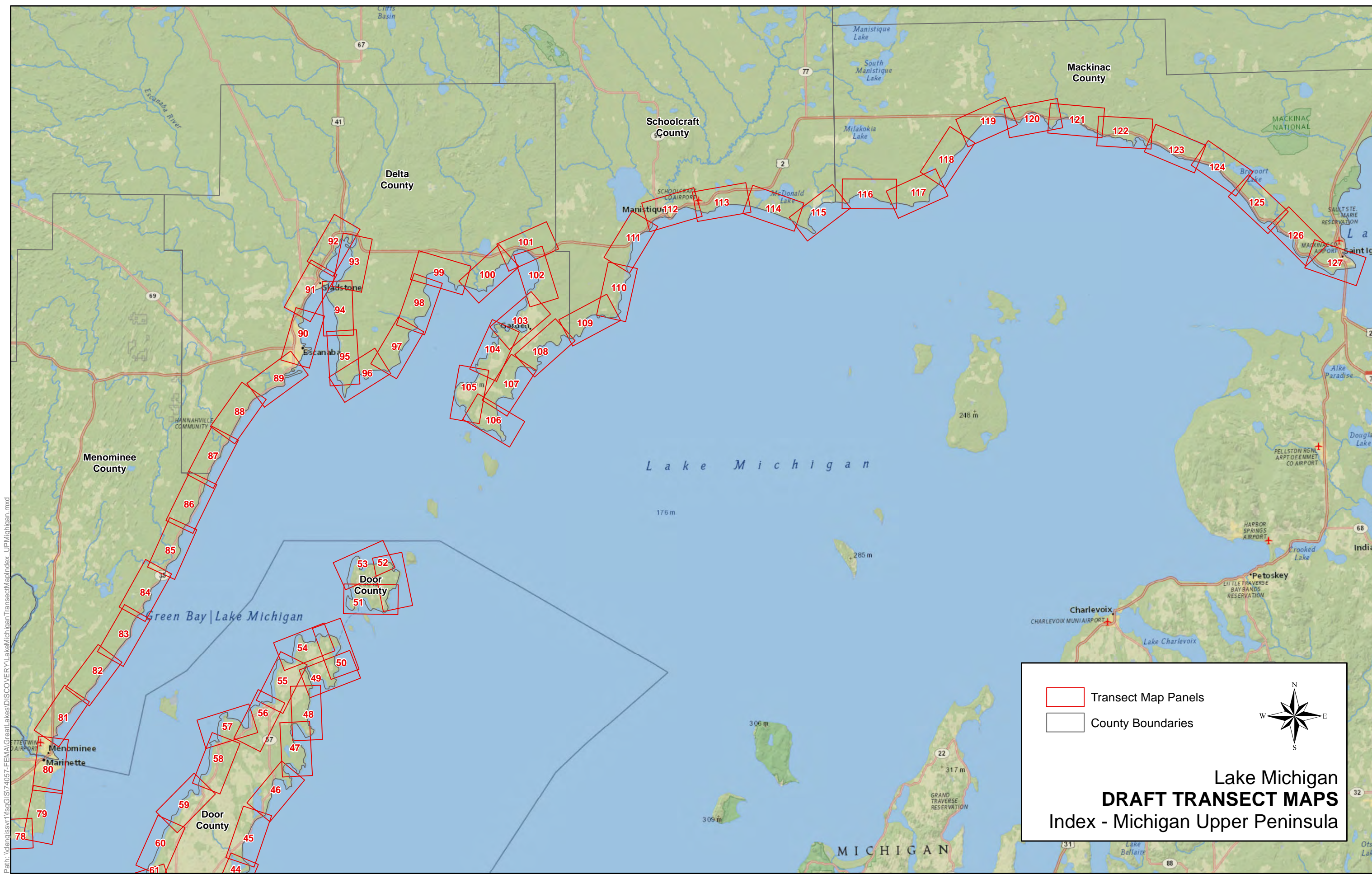
NATIONAL FLOOD INSURANCE PROGRAM
Discovery Map
LAKE MICHIGAN COASTAL STUDY
MACKINAC COUNTY, MICHIGAN COASTAL STUDY COMMUNITIES
 PAGE 2 of 2

Mackinac County
 Bois Blanc, Township of
 Clark, Township of
 Garfield, Township of
 Hendricks, Township of
 Hudson, Township of
 Mackinac Island, City of

Marquette, Township of
 Moran, Township of
 Newton, Township of
 St. Ignace, City of
 St. Ignace, Township of

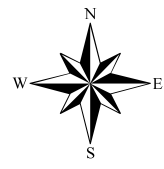
STARR **FEMA**

ATTACHMENT D
PROPOSED DRAFT TRANSECTS FIGURES

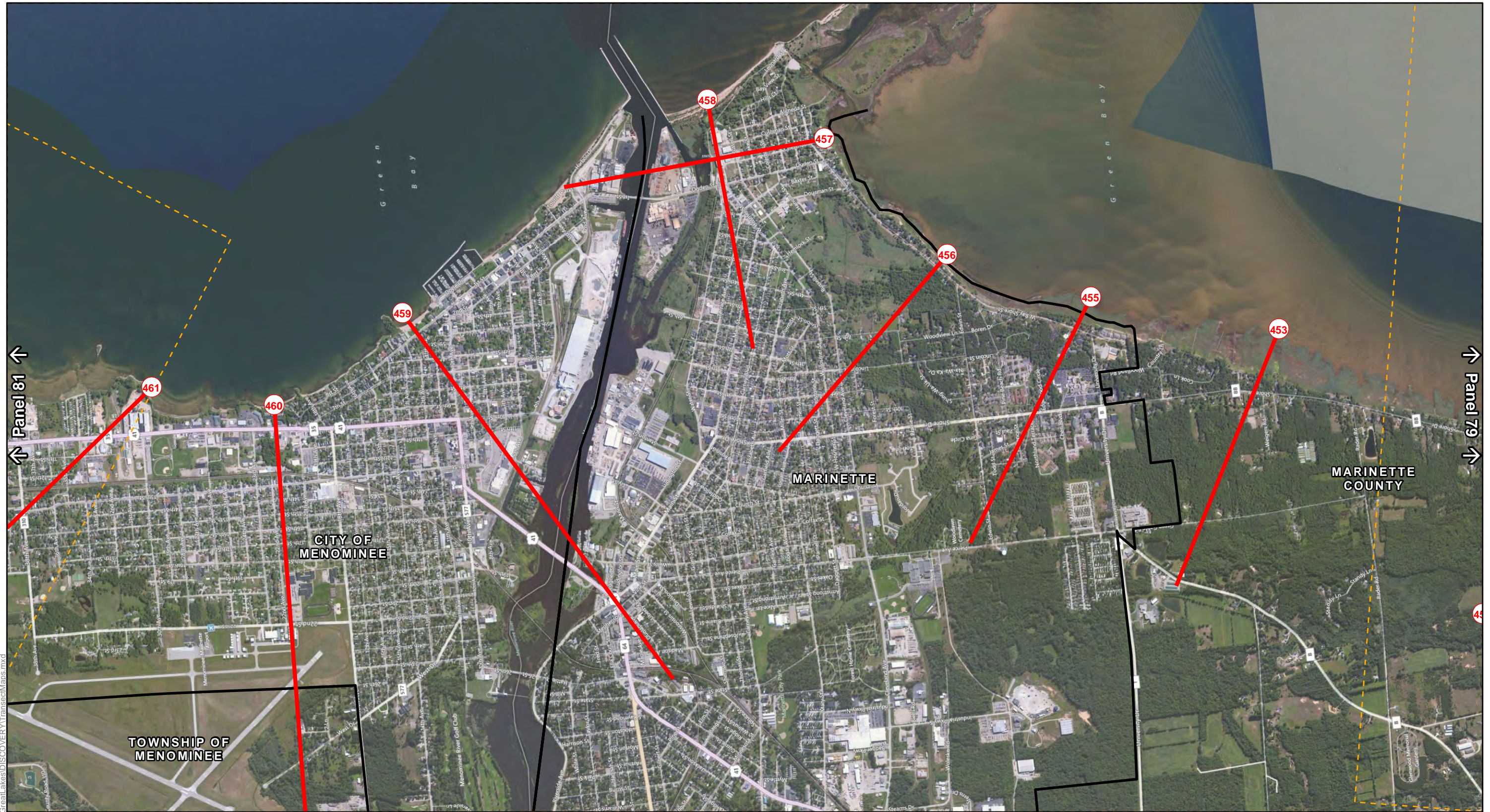


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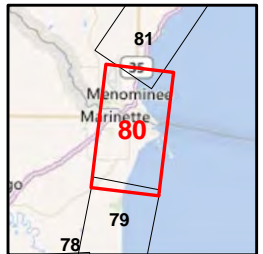
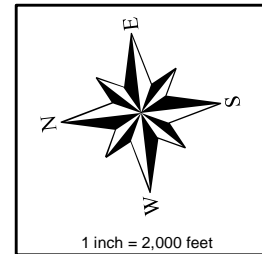
Transect Map Panels
 County Boundaries



Lake Michigan
DRAFT TRANSECT MAPS
Index - Michigan Upper Peninsula



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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

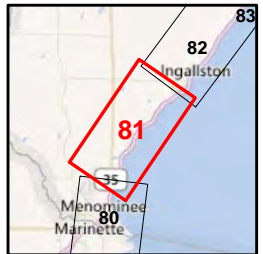
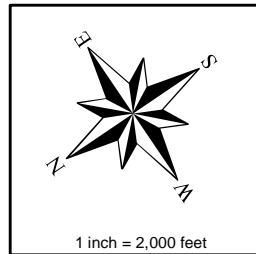
COUNTIES
 MARINETTE COUNTY
 MENOMINEE COUNTY

COMMUNITIES
 CITY OF MENOMINEE
 MARINETTE
 TOWNSHIP OF MENOMINEE

**Lake Michigan
 DRAFT TRANSECTS
 Panel 80 of 127**



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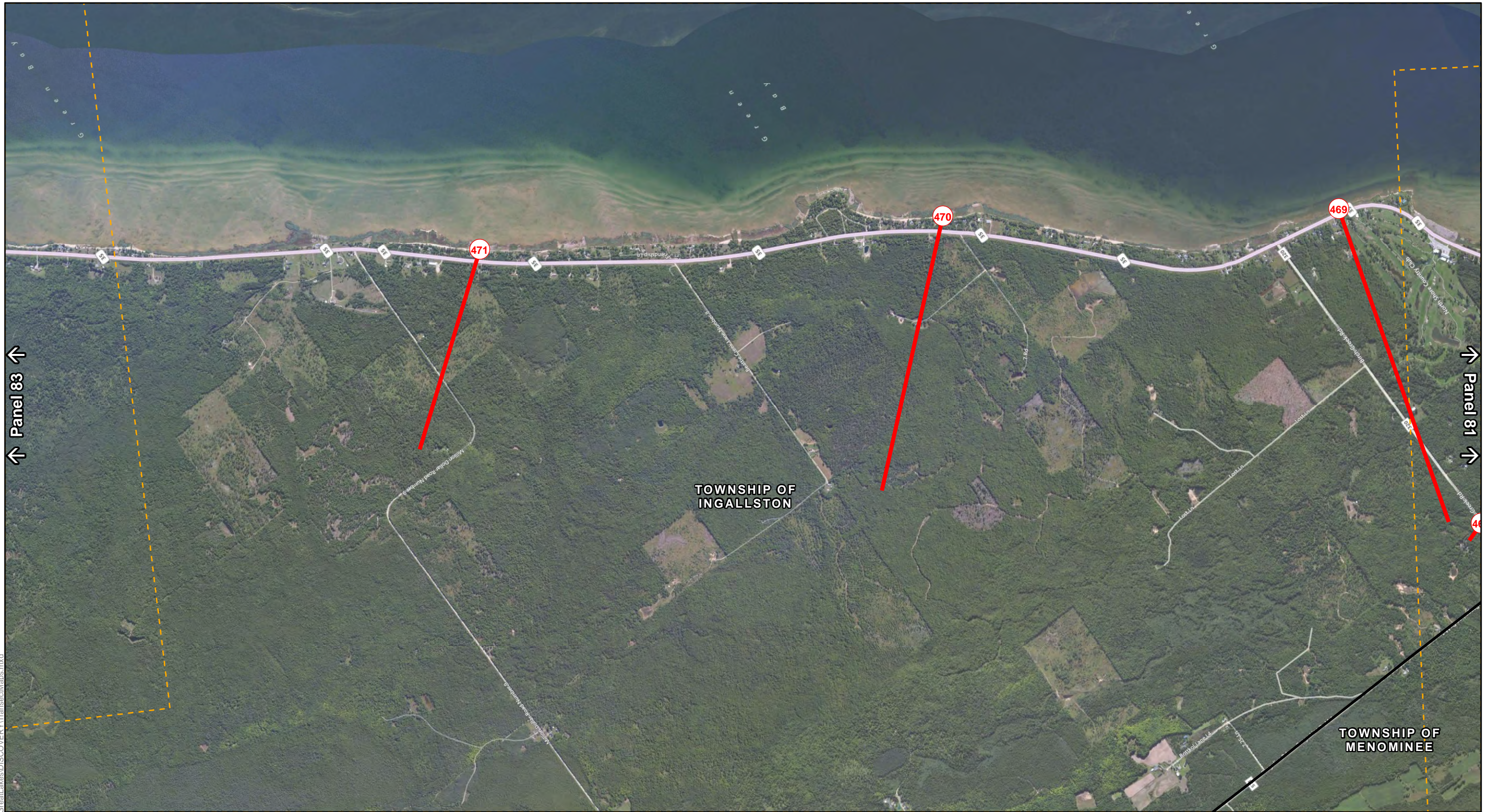
- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

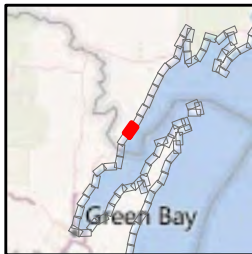
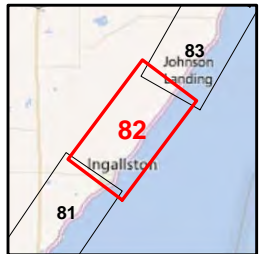
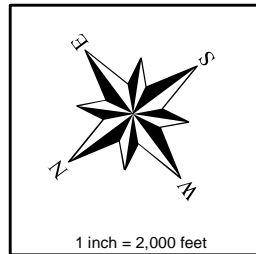
COUNTIES
MENOMINEE COUNTY

COMMUNITIES
CITY OF MENOMINEE
TOWNSHIP OF INGALLSTON
TOWNSHIP OF MENOMINEE

Lake Michigan
DRAFT TRANSECTS
Panel 81 of 127



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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

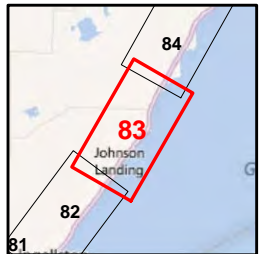
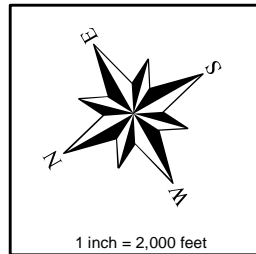
COUNTIES
MENOMINEE COUNTY

COMMUNITIES
TOWNSHIP OF INGALLSTON
TOWNSHIP OF MENOMINEE

Lake Michigan
DRAFT TRANSECTS
Panel 82 of 127



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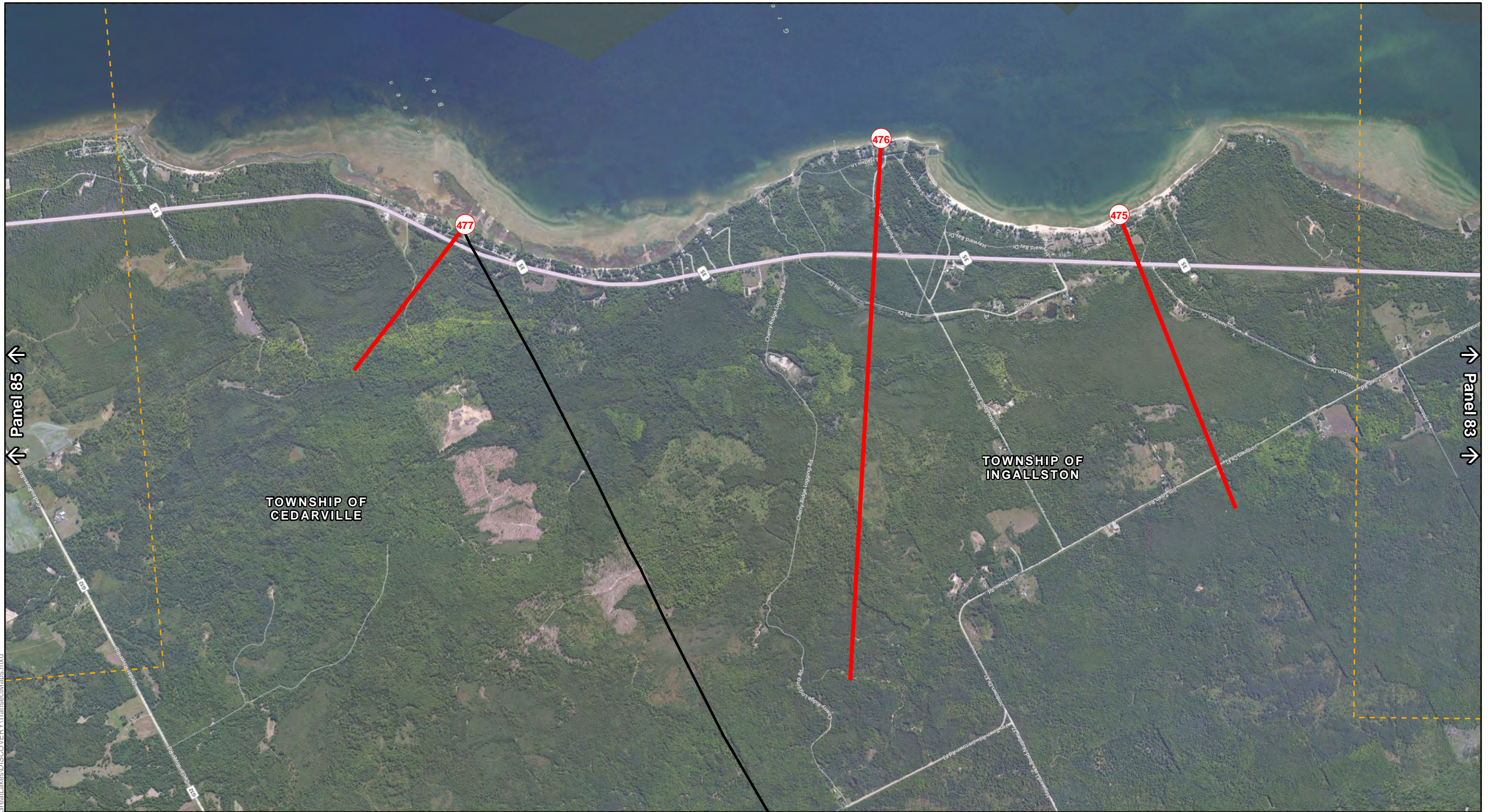
- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

COUNTIES
MENOMINEE COUNTY

COMMUNITIES
TOWNSHIP OF INGALLSTON

Lake Michigan
DRAFT TRANSECTS
Panel 83 of 127



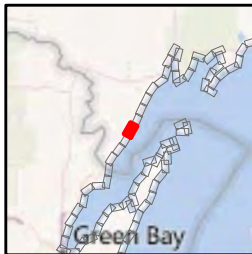
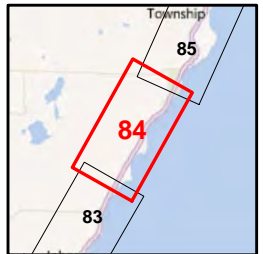
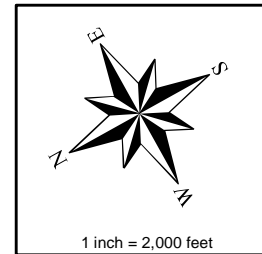
↑ Panel 85 ↑

↑ Panel 83 ↓

TOWNSHIP OF CEDARVILLE

TOWNSHIP OF INGALLSTON

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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

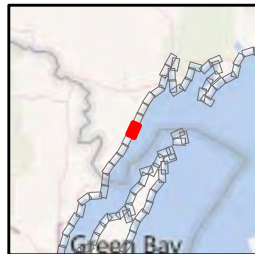
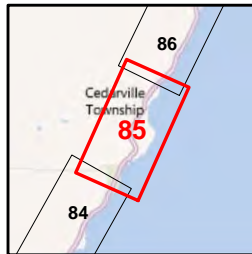
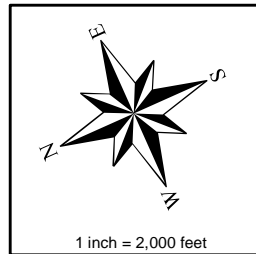
COUNTIES
MENOMINEE COUNTY

COMMUNITIES
TOWNSHIP OF CEDARVILLE
TOWNSHIP OF INGALLSTON

Lake Michigan
DRAFT TRANSECTS
Panel 84 of 127



Path: \\denoissvr1\isc\GIS\74057-FEMA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

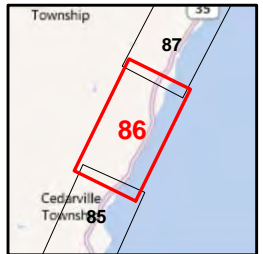
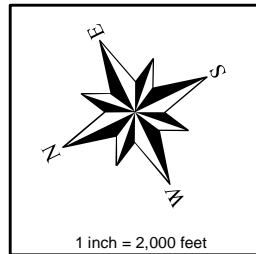
COUNTIES
MENOMINEE COUNTY

COMMUNITIES
TOWNSHIP OF CEDARVILLE

**Lake Michigan
DRAFT TRANSECTS
Panel 85 of 127**



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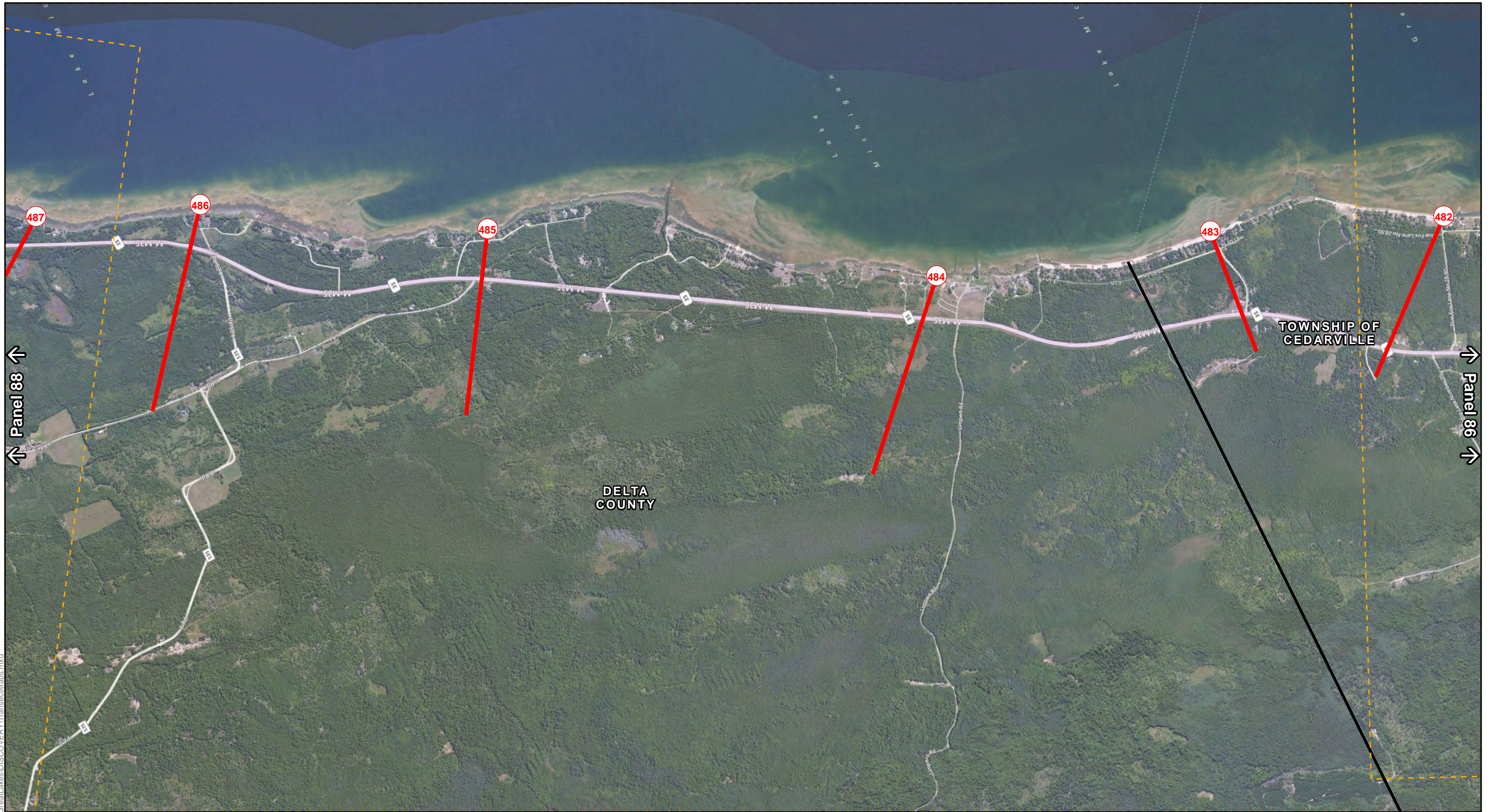
- Transects
- Adjoining Panel Edge
- Political Boundary

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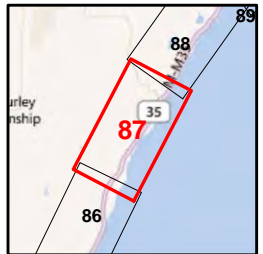
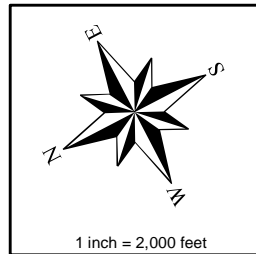
COUNTIES
MENOMINEE COUNTY

COMMUNITIES
TOWNSHIP OF CEDARVILLE

**Lake Michigan
DRAFT TRANSECTS
Panel 86 of 127**



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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

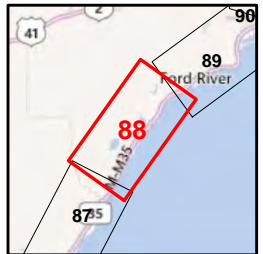
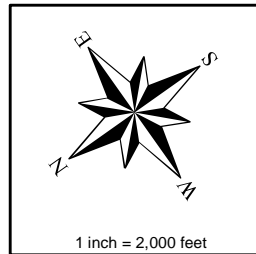
COUNTIES
 DELTA COUNTY
 MENOMINEE COUNTY

COMMUNITIES
 TOWNSHIP OF CEDARVILLE

**Lake Michigan
 DRAFT TRANSECTS**
 Panel 87 of 127



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- Transects
- Adjoining Panel Edge
- Political Boundary

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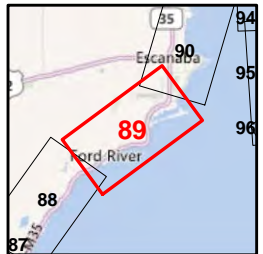
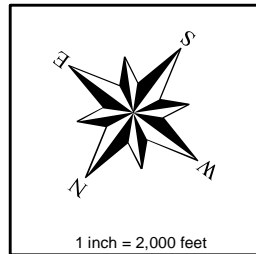
COUNTIES
DELTA COUNTY

COMMUNITIES

**Lake Michigan
DRAFT TRANSECTS
Panel 88 of 127**



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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

COUNTIES
DELTA COUNTY

COMMUNITIES
ESCANABA

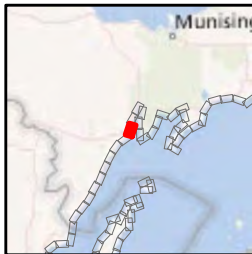
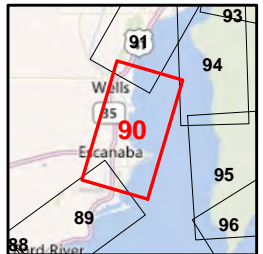
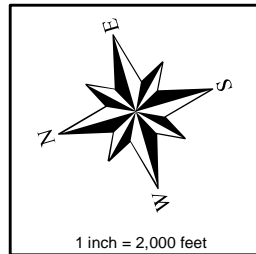
Lake Michigan
DRAFT TRANSECTS
Panel 89 of 127



↑ Panel 91 ↑

↑ Panel 89 ↑

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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

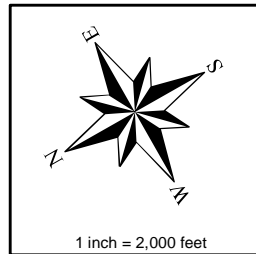
COUNTIES
DELTA COUNTY

COMMUNITIES
ESCANABA

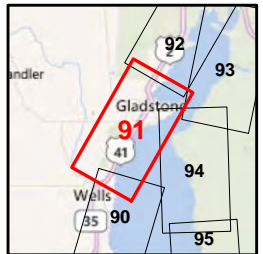
**Lake Michigan
DRAFT TRANSECTS**
Panel 90 of 127



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1 inch = 2,000 feet



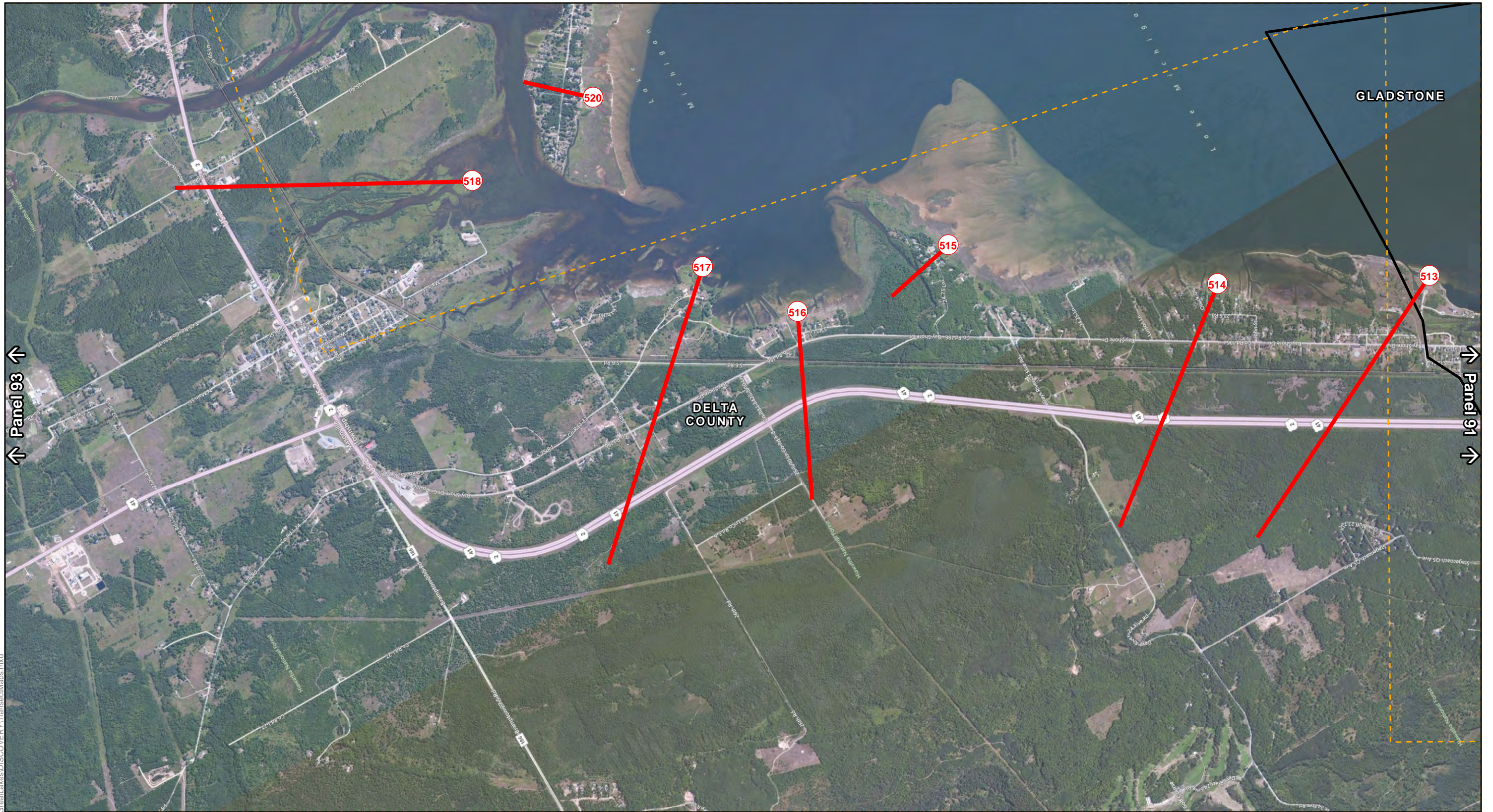
- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

COUNTIES
DELTA COUNTY

COMMUNITIES
GLADSTONE

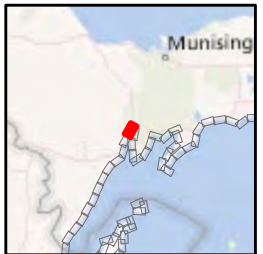
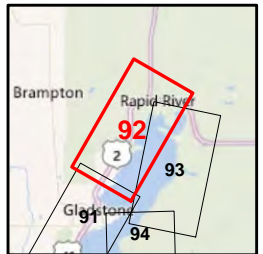
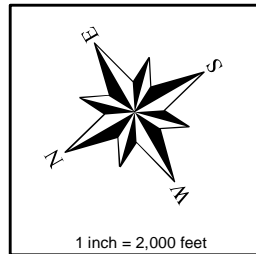
**Lake Michigan
DRAFT TRANSECTS
Panel 91 of 127**



↑ Panel 93
↑

↓ Panel 91
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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

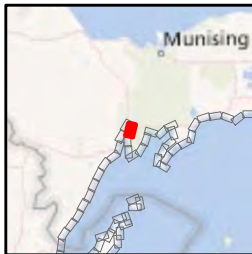
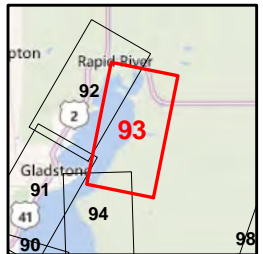
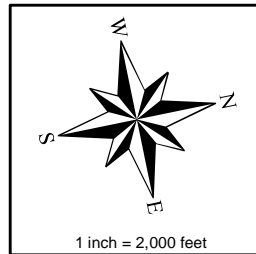
COUNTIES
DELTA COUNTY

COMMUNITIES
GLADSTONE

Lake Michigan
DRAFT TRANSECTS
Panel 92 of 127



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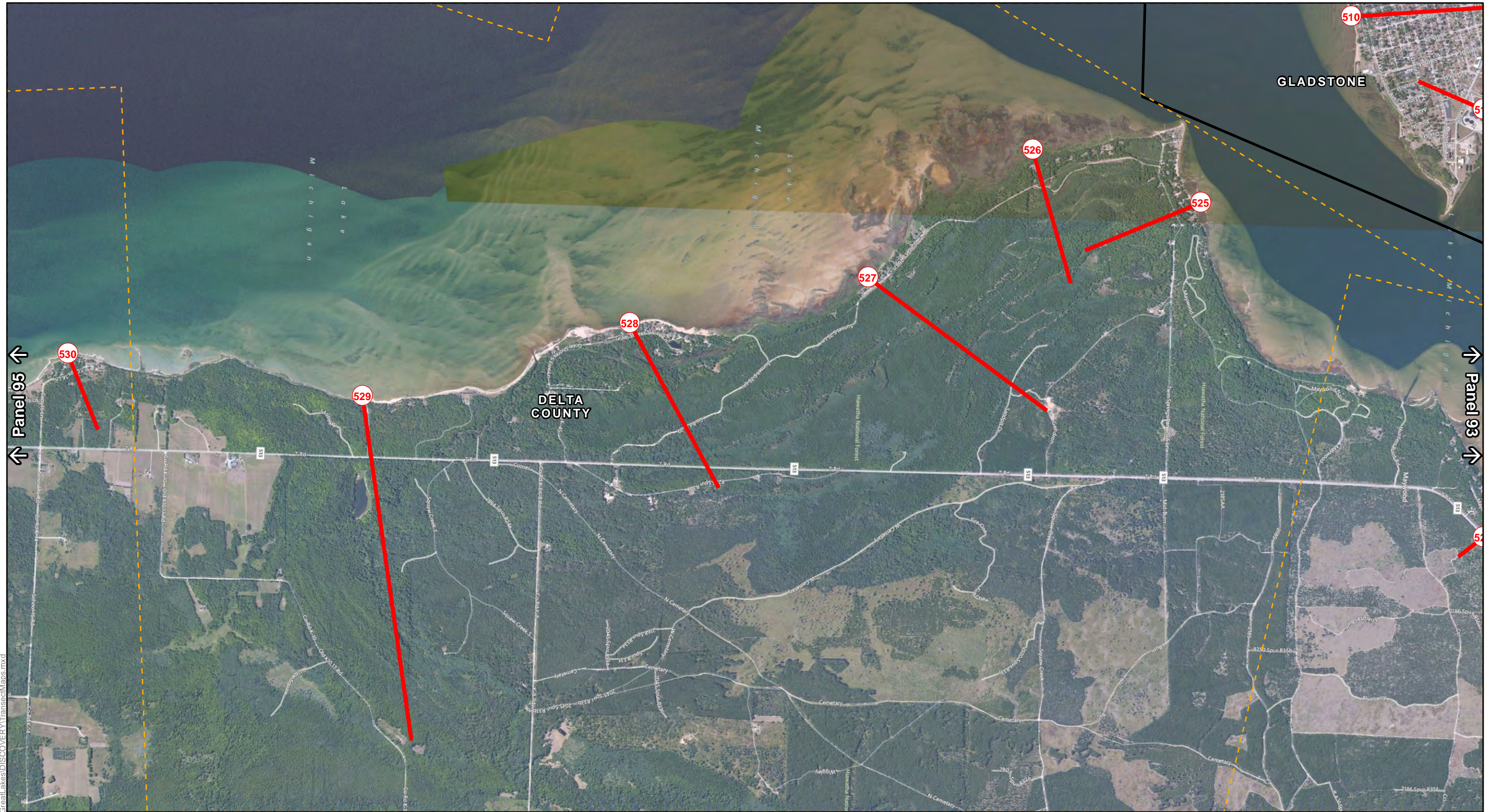
- Transects
- Adjoining Panel Edge
- Political Boundary

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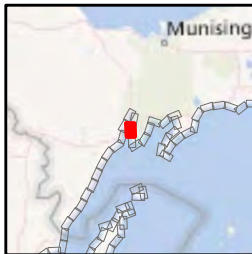
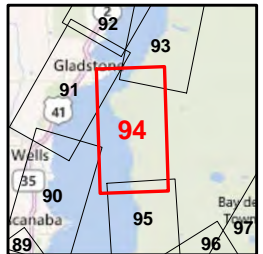
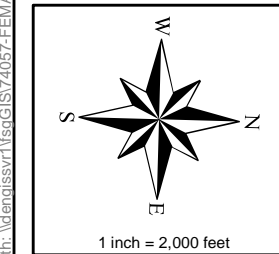
COUNTIES
DELTA COUNTY

COMMUNITIES
GLADSTONE

**Lake Michigan
DRAFT TRANSECTS
Panel 93 of 127**



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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

COUNTIES
DELTA COUNTY

COMMUNITIES
GLADSTONE

**Lake Michigan
DRAFT TRANSECTS
Panel 94 of 127**

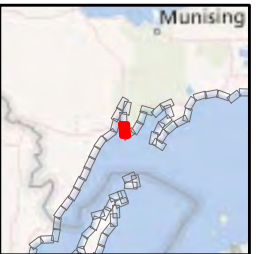
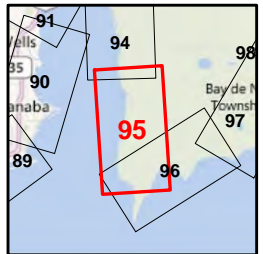
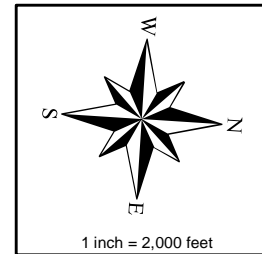


↑ Panel 96

↑ Panel 94

DELTA COUNTY

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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

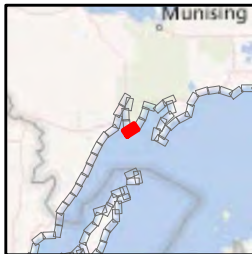
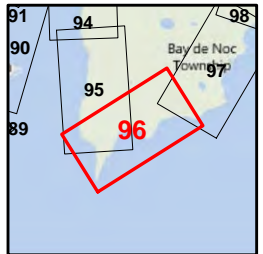
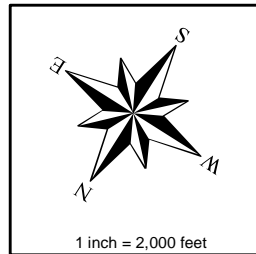
COUNTIES
DELTA COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 95 of 127



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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

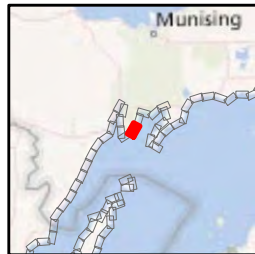
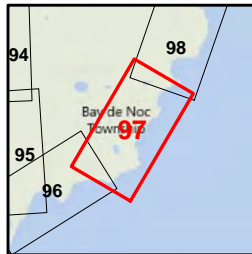
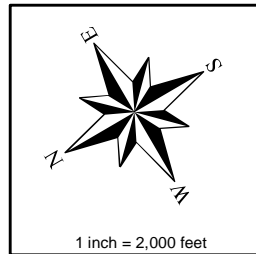
COUNTIES
DELTA COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 96 of 127



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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

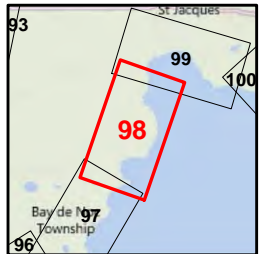
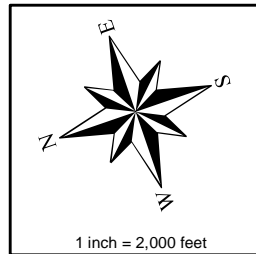
COUNTIES
DELTA COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 97 of 127



Path: \\dendissvr1\iscg\ISV74057-FEMA\GreatLakes\DISCOVERY\TransectMaps.mxd



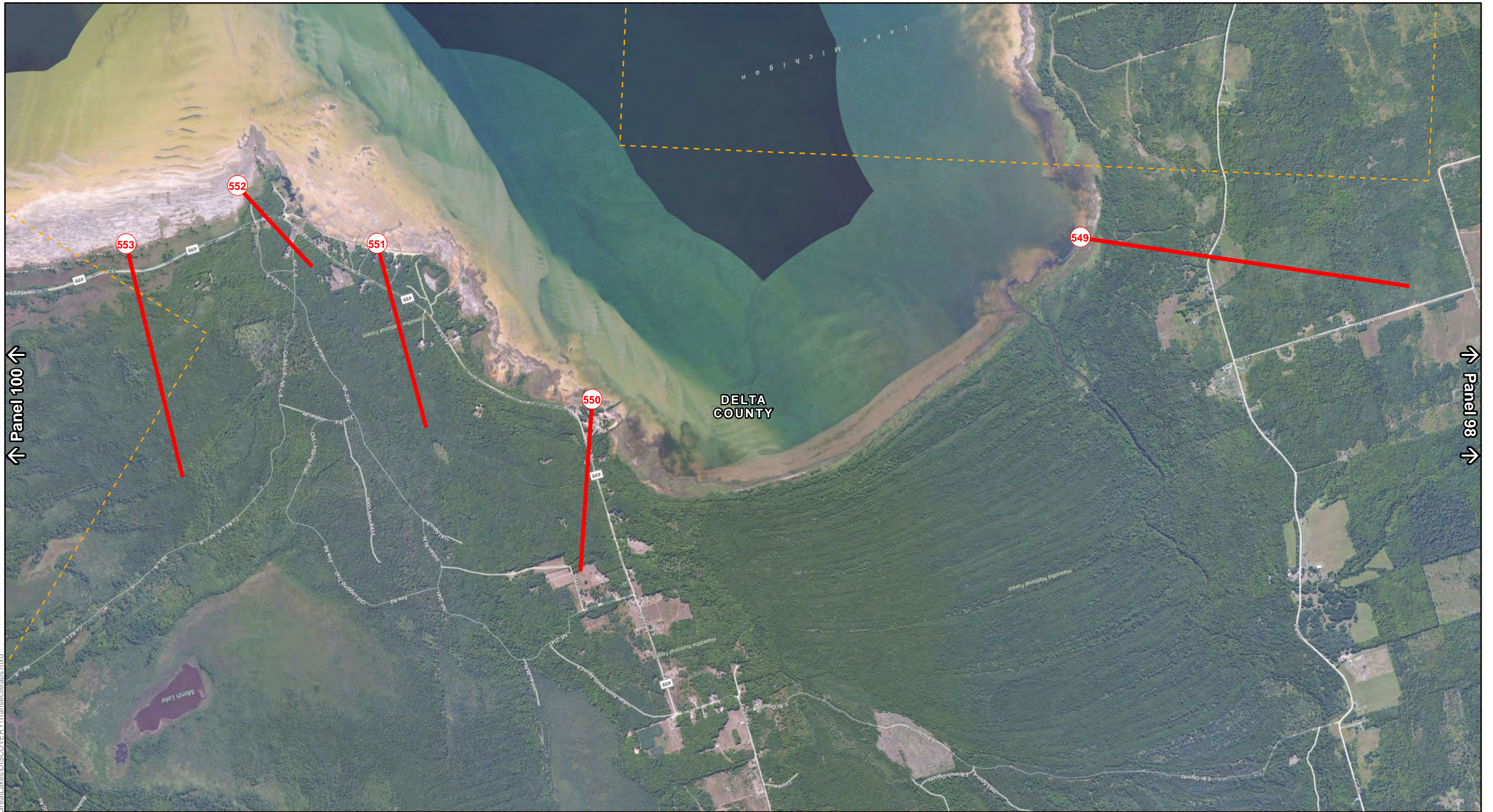
- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

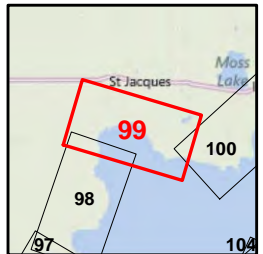
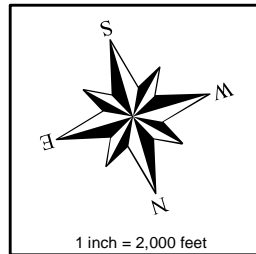
COUNTIES
DELTA COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 98 of 127



Path: \dendissur1\src\GIS\74057-FEMA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

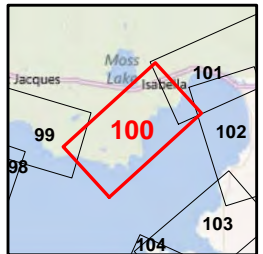
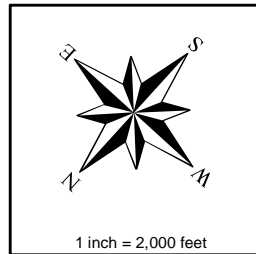
COUNTIES
DELTA COUNTY

COMMUNITIES

**Lake Michigan
DRAFT TRANSECTS
Panel 99 of 127**



Path: \\denpissvr1\iscg\ISV74057\FEMA\GreatLakes\DISCOVER\VERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

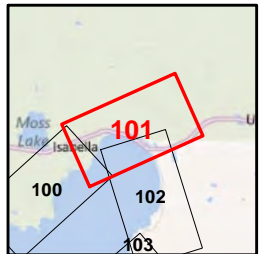
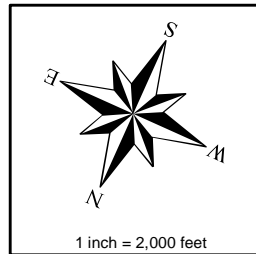
COUNTIES
DELTA COUNTY

COMMUNITIES

**Lake Michigan
DRAFT TRANSECTS
Panel 100 of 127**



Path: \\denissvr1\iscg\ISV74057-EE\MA\G\at\akes\DISCOVER\VERY\Transect\Maps.mxd



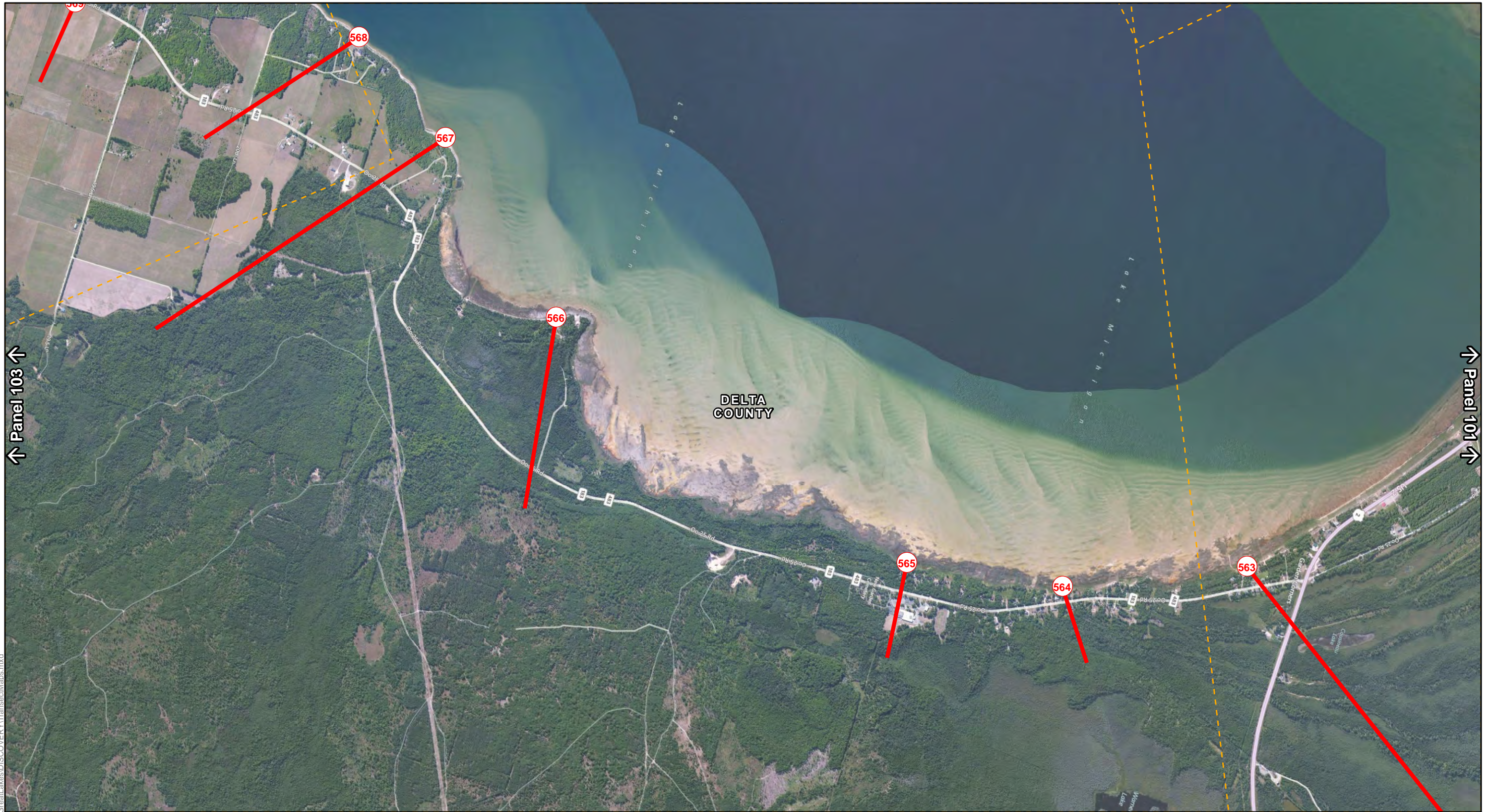
- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

COUNTIES
 DELTA COUNTY
 SCHOOLCRAFT COUNTY

COMMUNITIES

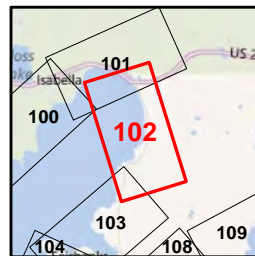
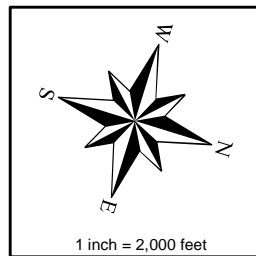
Lake Michigan
DRAFT TRANSECTS
 Panel 101 of 127



↑ Panel 103 ↑

↓ Panel 101 ↓

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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

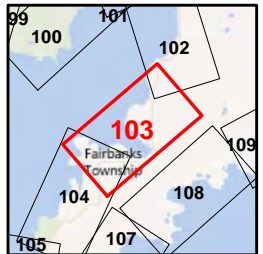
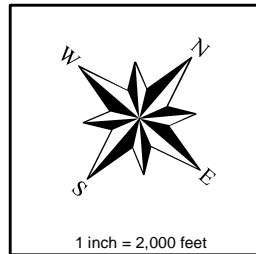
COUNTIES
DELTA COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 102 of 127



Path: \\dendissvr1\iscg\ISV74057-FEMA\GreatLakes\DISCOVER\VERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

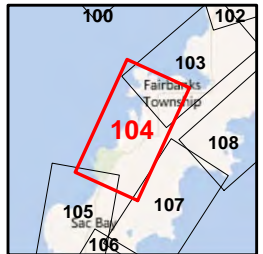
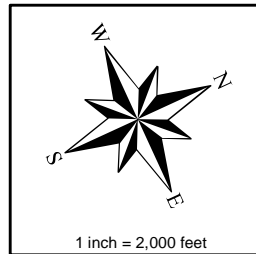
COUNTIES
DELTA COUNTY

COMMUNITIES
GARDEN

**Lake Michigan
DRAFT TRANSECTS
Panel 103 of 127**



Path: \\dendissvr1\iscg\IS74057-FEMA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

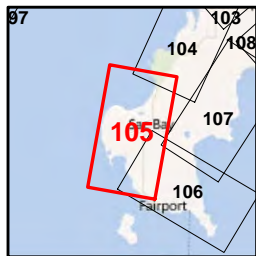
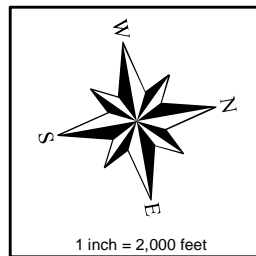
COUNTIES
DELTA COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 104 of 127



Path: \\dendissvr1\fsq\GIS\74057-FEMA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- - - Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

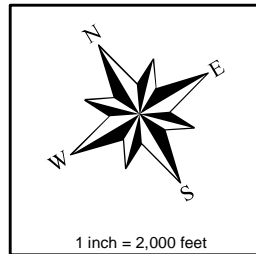
COUNTIES
DELTA COUNTY

COMMUNITIES

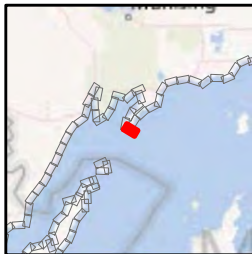
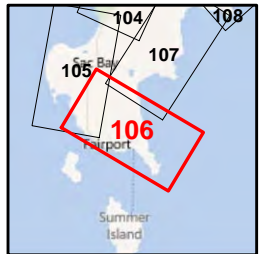
Lake Michigan
DRAFT TRANSECTS
Panel 105 of 127



Path: \\dendissvr1\iscg\ISV74057-FEMA\GreatLakes\DISCOVERY\TransectMaps.mxd



1 inch = 2,000 feet



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

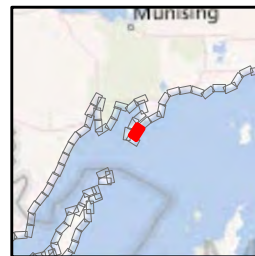
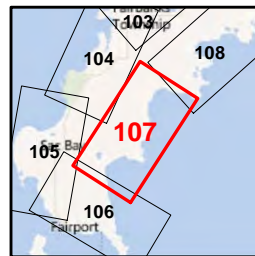
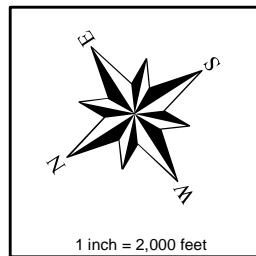
COUNTIES
DELTA COUNTY

COMMUNITIES

**Lake Michigan
DRAFT TRANSECTS
Panel 106 of 127**



Path: \\denpissvr1\iscg\ISV74057\FEMA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

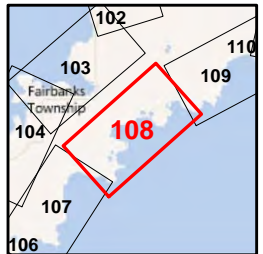
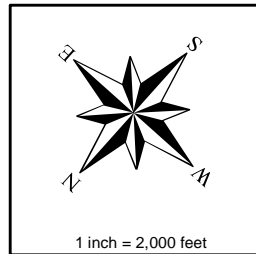
COUNTIES
DELTA COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 107 of 127



Path: \\denon\ssvr1\iscg\ISV74057-EE\MA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

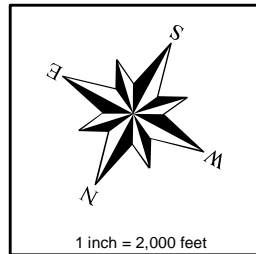
COUNTIES
DELTA COUNTY

COMMUNITIES

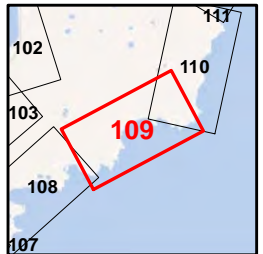
Lake Michigan
DRAFT TRANSECTS
Panel 108 of 127



Path: \\denon\ssvr1\iscg\ISV74057-FEMA\GreatLakes\DISCOVER\VERY\TransectMaps.mxd



1 inch = 2,000 feet



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

COUNTIES
 DELTA COUNTY
 SCHOOLCRAFT COUNTY

COMMUNITIES

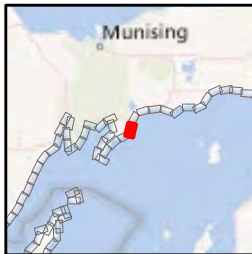
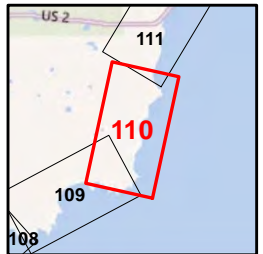
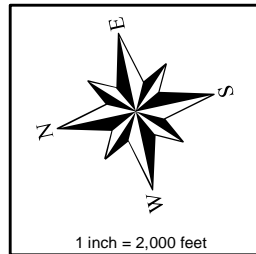
Lake Michigan
DRAFT TRANSECTS
 Panel 109 of 127



↑ Panel 111 ↑

↓ Panel 109 ↓

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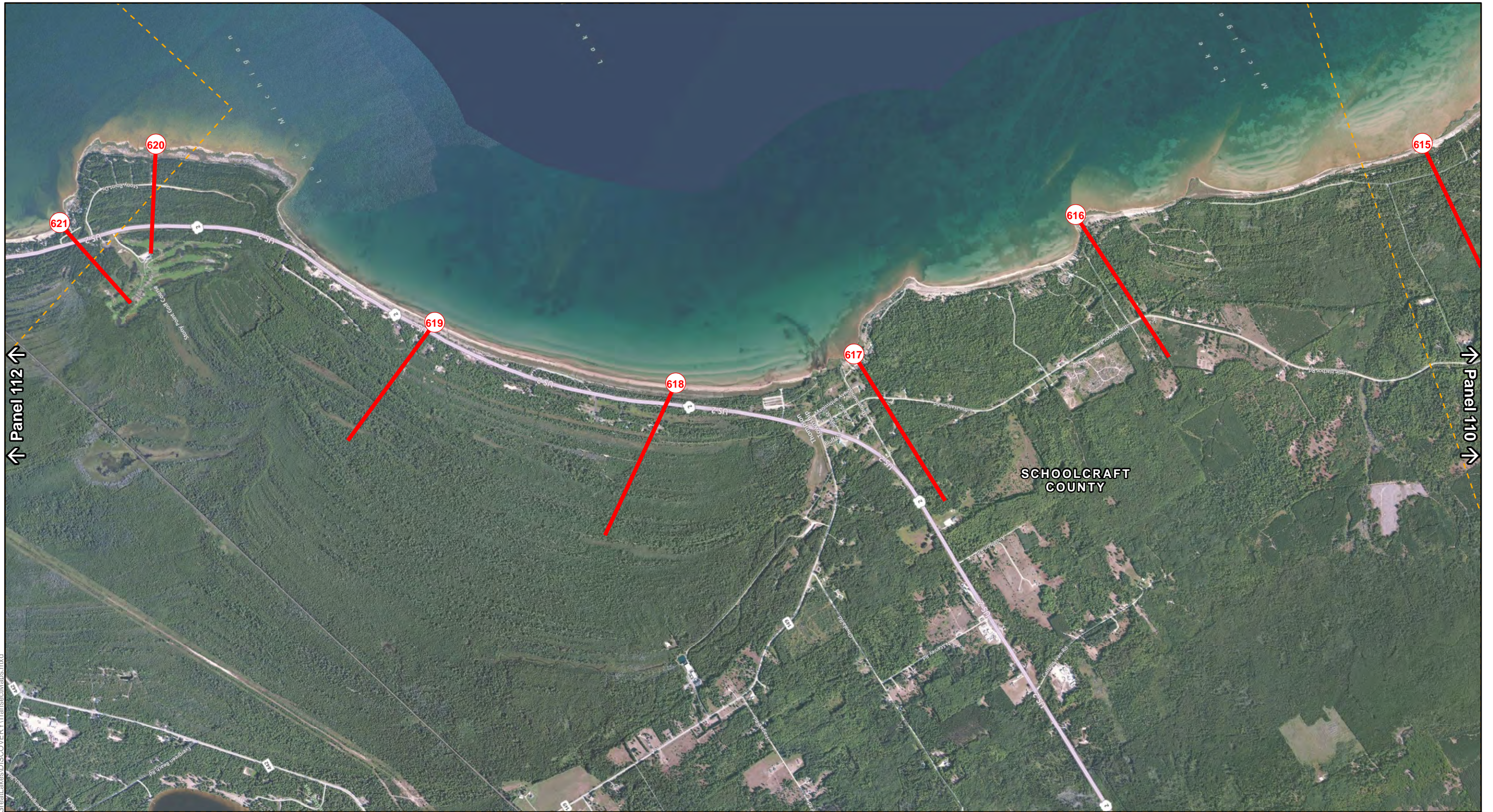
- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

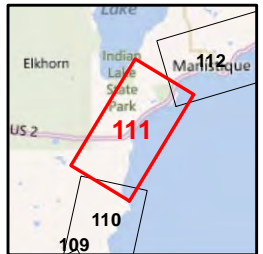
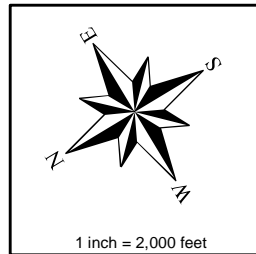
COUNTIES
SCHOOLCRAFT COUNTY

COMMUNITIES

**Lake Michigan
DRAFT TRANSECTS
Panel 110 of 127**



Path: \\denpissvr1\iscg\GIS\74057-FEMA\GreatLakes\DISCOVER\VERY\TransectMaps.mxd



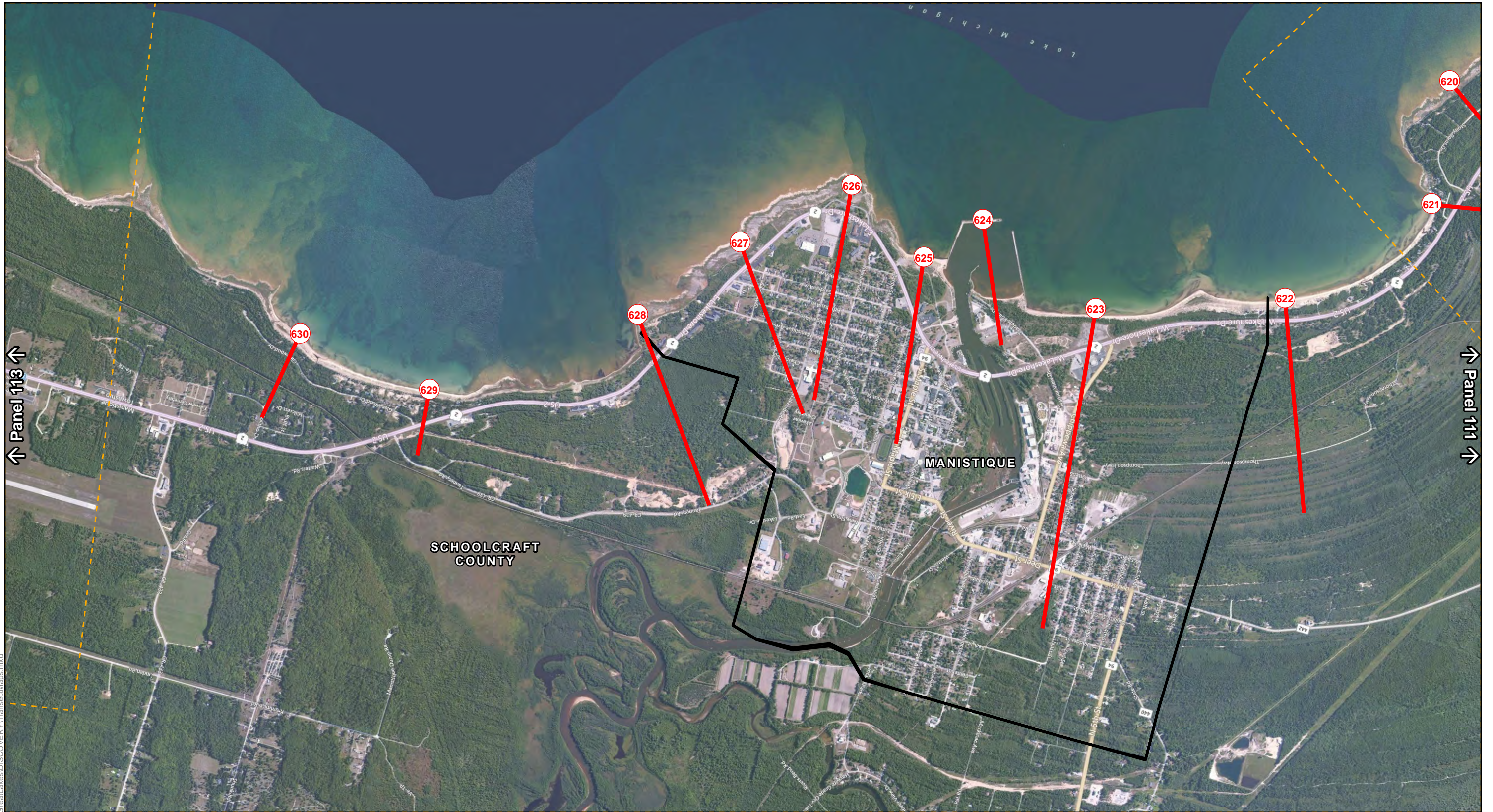
- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

COUNTIES
SCHOOLCRAFT COUNTY

COMMUNITIES

**Lake Michigan
DRAFT TRANSECTS
Panel 111 of 127**



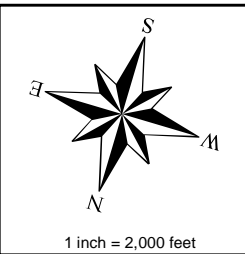
↑ Panel 113

↓ Panel 111

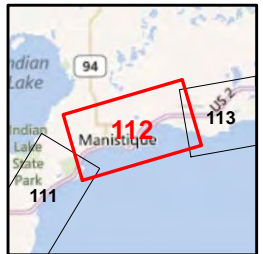
SCHOOLCRAFT COUNTY

MANISTIQUE

Path: \\denissur1\iscg\IS74057-EE\MA\GreatLakes\DISCOVER\XYT\TransectMaps.mxd



1 inch = 2,000 feet



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

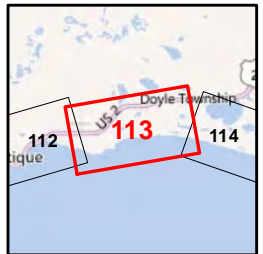
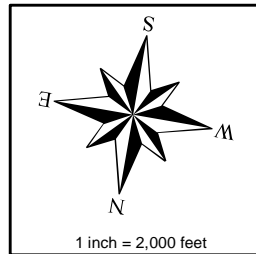
COUNTIES
SCHOOLCRAFT COUNTY

COMMUNITIES
MANISTIQUE

Lake Michigan
DRAFT TRANSECTS
Panel 112 of 127



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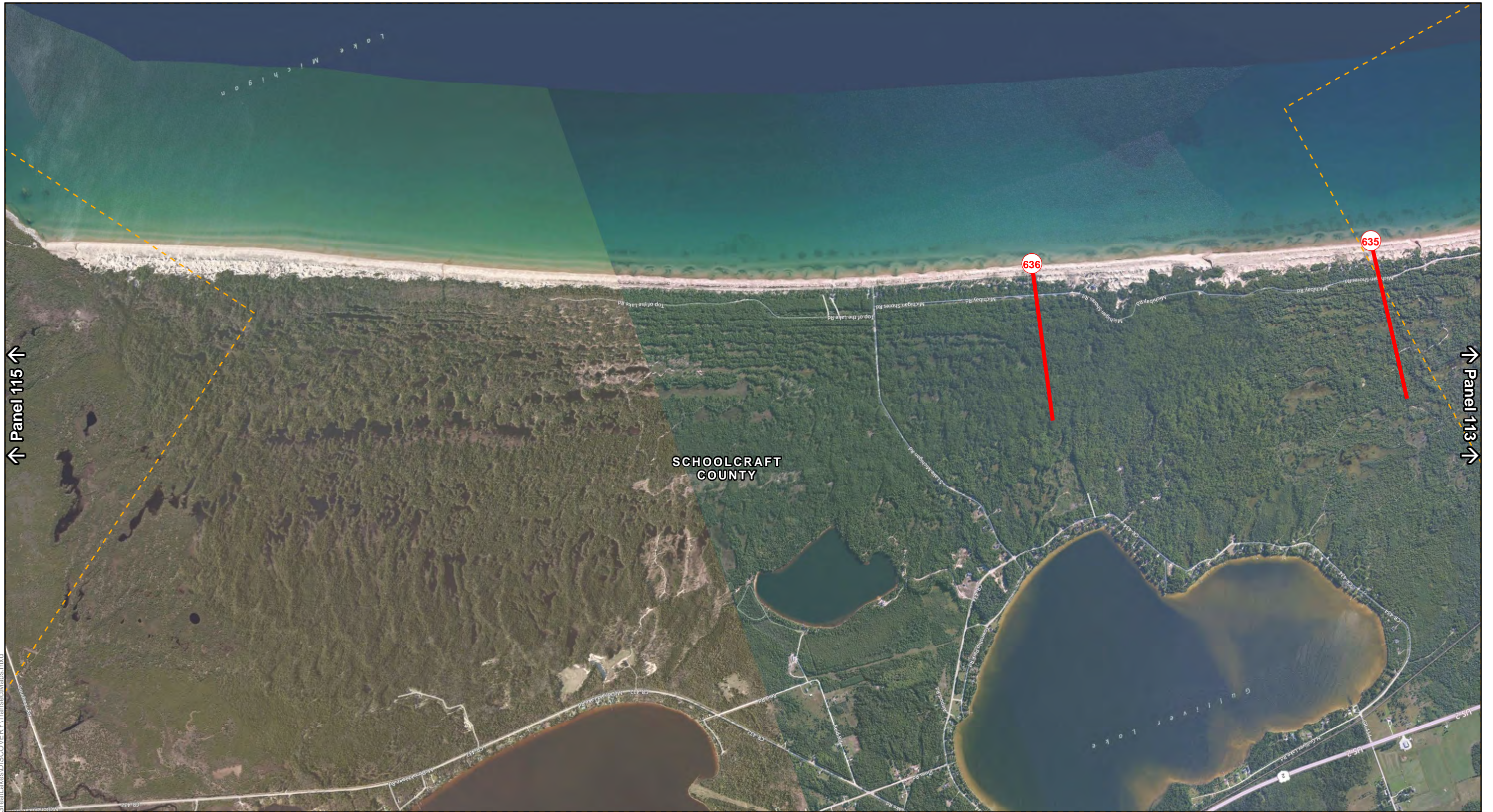
- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

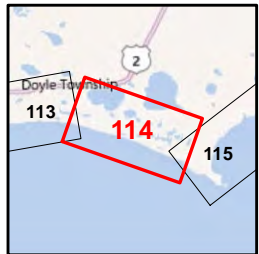
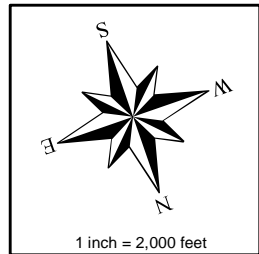
COUNTIES
SCHOOLCRAFT COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 113 of 127



Path: \\denpissvr1\isc\GIS\74057-EE\MA\G\at\akes\DISCOVER\Y\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

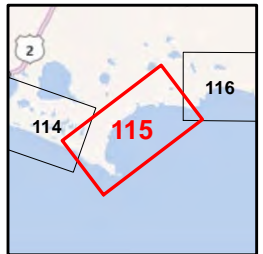
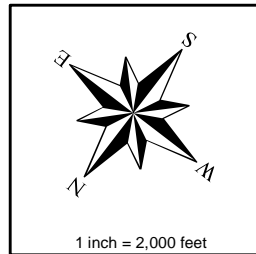
COUNTIES
SCHOOLCRAFT COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 114 of 127



Path: \\denpissvr1\iscg\IS74057-EE\MA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

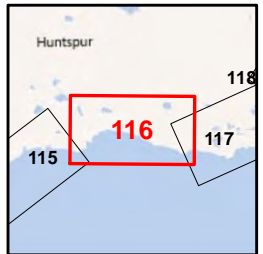
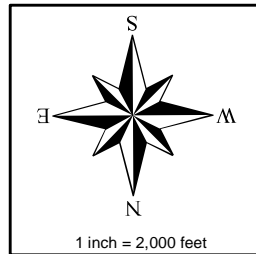
COUNTIES
 MACKINAC COUNTY
 SCHOOLCRAFT COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
 Panel 115 of 127



Path: \dendissur1\src\GIS\74057-FEMA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

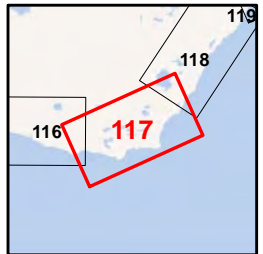
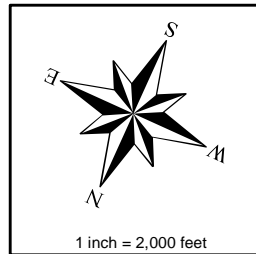
COUNTIES
MACKINAC COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 116 of 127



Path: \\denpissur1\isc\GIS\74057-EE\A\GreatLakes\DISCOVER\VERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

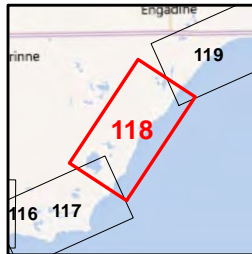
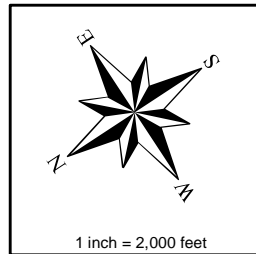
COUNTIES
MACKINAC COUNTY

COMMUNITIES

**Lake Michigan
DRAFT TRANSECTS
Panel 117 of 127**



Path: \\denon\ssur1\isc\GIS\74057-FEMA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

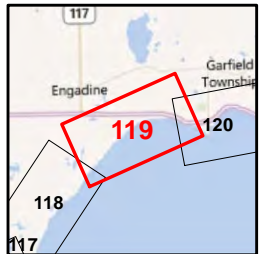
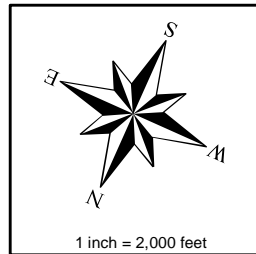
COUNTIES
MACKINAC COUNTY

COMMUNITIES

**Lake Michigan
DRAFT TRANSECTS
Panel 118 of 127**



Path: \\denon\ssur1\iscg\ISV74057-EE\MA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

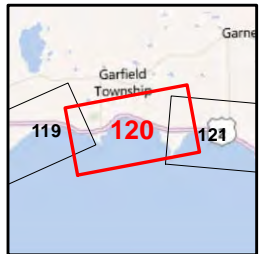
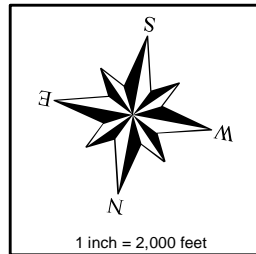
COUNTIES
MACKINAC COUNTY

COMMUNITIES

**Lake Michigan
DRAFT TRANSECTS
Panel 119 of 127**



Path: \\denpissvr1\fsq\GIS\74057-EE\MA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

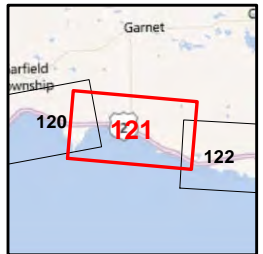
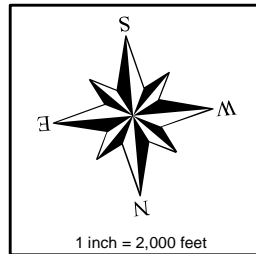
COUNTIES
MACKINAC COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 120 of 127



Path: \dendissvr1\iscg\IS74057-EE\A\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

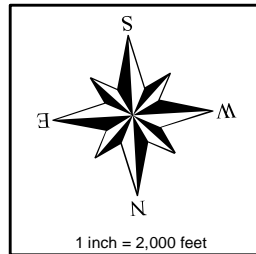
COUNTIES
MACKINAC COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 121 of 127



Path: \\denotissvr1\fsq\GIS\74057-EE\MA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

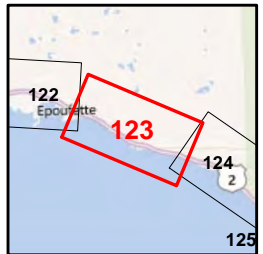
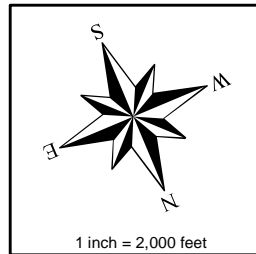
COUNTIES
MACKINAC COUNTY

COMMUNITIES

**Lake Michigan
DRAFT TRANSECTS
Panel 122 of 127**



Path: \\denissur1\iscg\IS74057-FEMA\GreatLakes\DISCOVERY\TransectMaps.mxd



- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

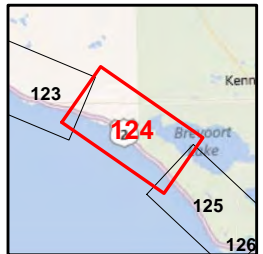
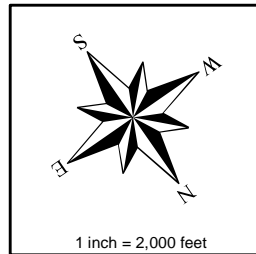
COUNTIES
MACKINAC COUNTY

COMMUNITIES

Lake Michigan
DRAFT TRANSECTS
Panel 123 of 127



Path: \\denpissvr1\iscg\IS74057-FEMA\GreatLakes\DISCOVERY\TransectMaps.mxd



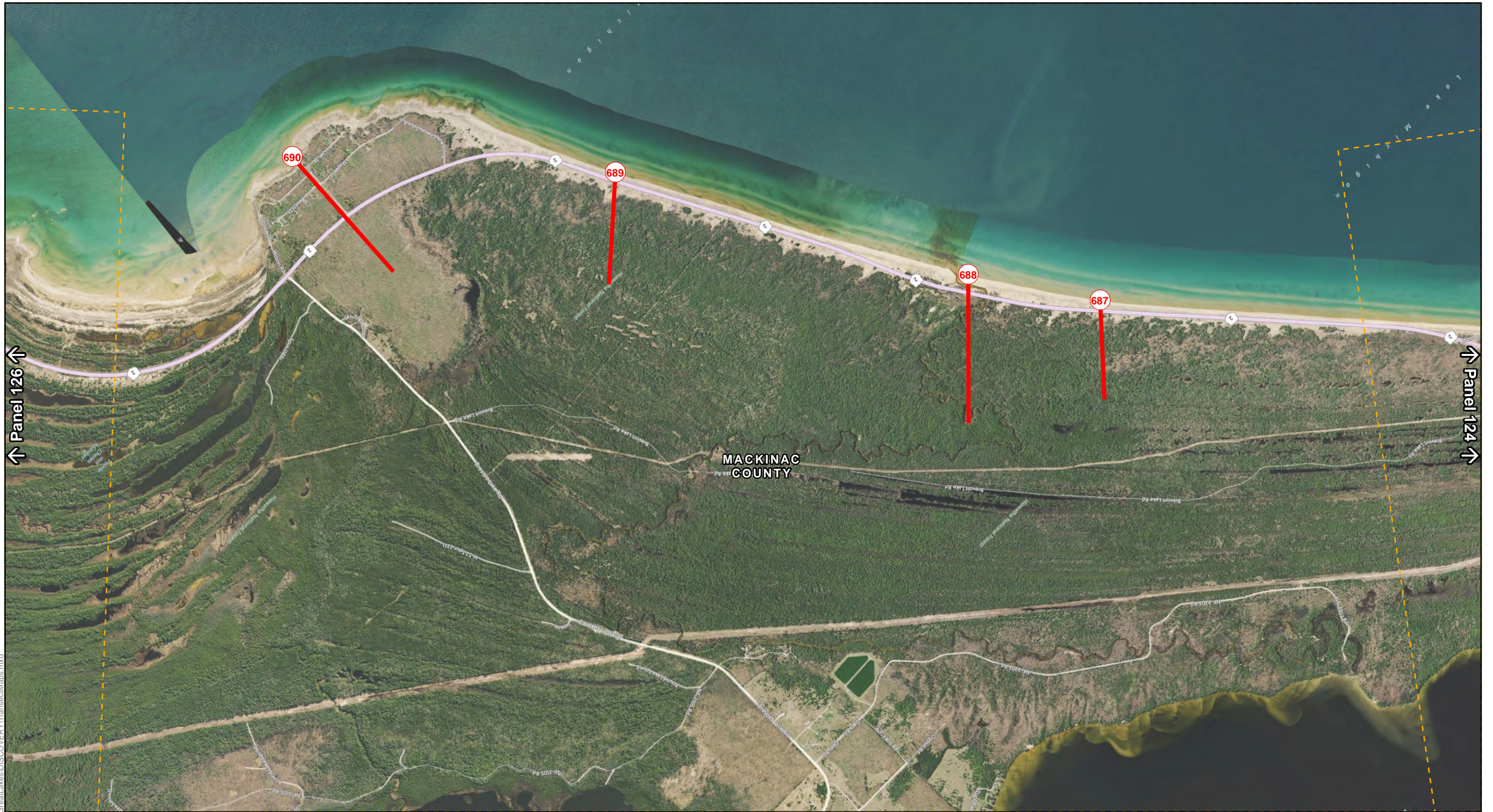
- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

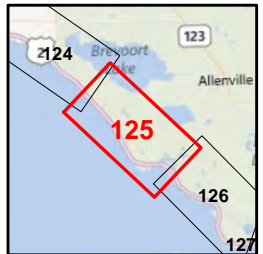
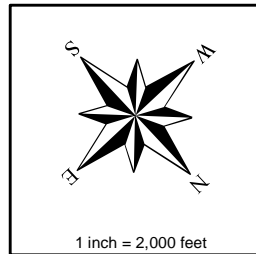
COUNTIES
MACKINAC COUNTY

COMMUNITIES

**Lake Michigan
DRAFT TRANSECTS
Panel 124 of 127**



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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

COUNTIES
MACKINAC COUNTY

COMMUNITIES

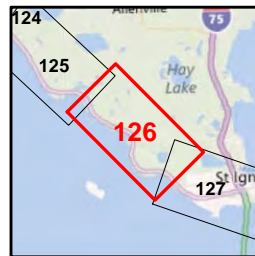
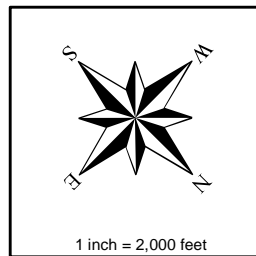
Lake Michigan
DRAFT TRANSECTS
Panel 125 of 127



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↓ Panel 125 ↓

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- Transects
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- Political Boundary

Basemap Source: Microsoft BING map service

COUNTIES
MACKINAC COUNTY

COMMUNITIES

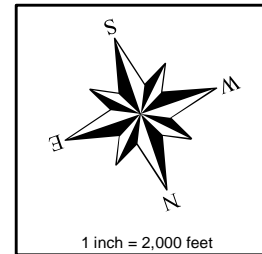
Lake Michigan
DRAFT TRANSECTS
Panel 126 of 127



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↑ Panel 126 ↓

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- Transects
- Adjoining Panel Edge
- Political Boundary

Basemap Source: Microsoft BING map service

COUNTIES
MACKINAC COUNTY

COMMUNITIES
ST. IGNACE

**Lake Michigan
DRAFT TRANSECTS
Panel 127 of 127**

ATTACHMENT E
STAKEHOLDER COMMENTS FROM DISCOVERY MEETING

Stakeholder Comments from Discovery Meeting

ID (Corresponds to Final Discovery Map)	State	County	Location of Comment	FIPS	CID	Comment (from Discovery Meetings or on draft Discovery Map/transect figures) ⁱ	Type
MAC-26	Michigan	Mackinac	Hudson, Township of	26097	260807	Mouth of Black River flooding concerns due to ice build-up/snow melt; Houses and flooding issues	General Comment
MAC-27	Michigan	Mackinac	Moran, Township of	26097	260443	High banks; Erosion	General Comment
MAC-28	Michigan	Mackinac	Moran, Township of	26097	260443	Dune Area	General Comment
MAC-29	Michigan	Mackinac	Moran, Township of	26097	260443	Resort lake dam controlled: Brevort Lake	General Comment
MAC-30	Michigan	Mackinac	Moran, Township of	26097	260443	Stakeholder circled location; no comment	General Comment
MAC-31	Michigan	Mackinac	Moran, Township of	26097	260443	Potential development	General Comment
MAC-32	Michigan	Mackinac	Mackinac Island	26097	260764	Most expensive properties in the county	General Comment
MAC-33	Michigan	Mackinac	Moran, Township of	26097	260443	Maybe reduce transects in federal land and where no structures are located	General Comment
MAC-34	Michigan	Mackinac	Moran, Township of	26097	260443	Electricity & pipelines; Connects UP & LP	General Comment
MAC-35	Michigan	Mackinac	Moran, Township of	26097	260443	Past flooding issues when higher water (lake level)	General Comment
MAC-36	Michigan	Mackinac	Moran, Township of	26097	260443	Pointe Aux Clenes; Check	General Comment
MAC-37	Michigan	Mackinac	Garfield, Township of	26097	260766	Populated and lower	General Comment
MAC-38	Michigan	Mackinac	Moran, Township of	26097	260443	State wilderness; Scattered houses	General Comment
MAC-90	Michigan	Mackinac	St. Ignace, Township of	26097	260444	Flooding	General Comment

ⁱ Due to the various methods used to collect flood risk information and transect comments, including discussions during Discovery Meetings, maps marked up with comments, and emails or letters sent containing comments, the meaning of some comments may not be clear in this table and are subject to interpretation.

ATTACHMENT F
MACKINAC COUNTY DISCOVERY MEETING DOCUMENTS

Discovery Meeting Agenda
Discovery Meeting Sign-In Sheets
Discovery Meeting Minutes
Discovery Meeting Presentation



Project Name:	FEMA Region V Discovery
Meeting:	MACKINAC COUNTY Great Lakes Coastal Discovery Meeting
Date and Time:	MONDAY, AUGUST 13, 2012; 1:00 – 3:00 PM ET
Place:	ST. IGNACE PUBLIC LIBRARY
Facilitator:	LEE TRAEGER, FEMA JASPREET RANDHAWA, SCOTT BANJAVCIC, TROY THIELEN, STARR

Discovery Meeting Agenda

1. Why are we here? (1:00 – 1:15 PM ET)

- Great Lakes Coastal Flood Study Overview and Schedule
- Discovery Process and Outcomes

2. Coastal mapping and flood risk topics to be aware of (1:15 – 1:40 PM ET)

3. How does this apply to my community? (1:40 – 1:50 PM ET)

4. Interactive Session A (1:50 – 2:15 PM ET)

- View and Discuss Local Coastal Areas of Concern Using the Discovery Map and Community Risk MAP Questionnaire

5. Hazard mitigation opportunities and grant funding (2:15 – 2:25 PM ET)

6. Interactive Session B (2:25 – 2: 50 PM ET)

- Discuss Mitigation Action Opportunities
- Introduce the Mitigation Action Form and Mitigation Action Tracker









7. Wrap Up (2:50 – 3:00 PM ET)

- Review of action items and next steps

Optional Interactive Stations (30 minutes - 1hr following meeting)

- *Draft Transect Map Station: Talk to technical staff about draft transects and view draft transects in GIS*
- *Mitigation Resources, Strategies, and Actions Station: Talk with FEMA and State staff about areas of concern and potential mitigation actions to help reduce risk. Fill out Mitigation Action Form.*

August 13, 2012 MACKINAC COUNTY DISCOVERY MEETING SIGN-IN SHEET
 Please verify contact information and initial meeting attendance.

No.	Sign Initials	Affiliation	Title	Name First	Name Last	Street Address	Phone	Email Address
1		City of Mackinaw City	Architect	Richard	Clements			richardlee523@live.com
2		Hudson Township	Supervisor	Al	Garavaglia	W7803 Hiawatha Trail Naubinway, MI 49762	(906) 595-7202	altay@alphacomm.net
3		Mackinac County	Equalization Director	Jim	Fenlon	100 S. Marley St. St. Ignace Mi. 49719		
4		Mackinac County	Emergency Management Coordinator	Mike	Kasper	100 S. Marley St. St. Ignace Mi. 49719	(906) 430 1466	emd49@mackinacounty.net
5		Mackinac County	911 Director	Bryce	Tracy	100 S. Marley St. St. Ignace Mi. 49719		
6		FEMA Region V	Senior Engineer	Lee	Traeger	536 South Clark St., 6th Floor Chicago, IL 60605	(312) 408-5500	lee.traeger@fema.dhs.gov
7		STARR	Engineer	Scott	Banjavcic	125 South Wacker Drive Chicago, IL 60606	(312) 346-5000	banjavcics@cdmsmith.com
8		STARR	Engineer	Jaspreet	Randhawa	125 South Wacker Drive Chicago, IL 60606	(312) 346-5000	randhawa@cdmsmith.com
9		STARR	GIS	Troy	Thielen	125 South Wacker Drive Chicago, IL 60606	(312) 346-5000	thielentr@cdmsmith.com
10		EWR290C	Planner / GIS	Nathan	Fazer	125 Arlington St PO Box 520 Sault Ste Marie 49783	906 635 1581	Afazer@exp-planning.org

August 13, 2012 MACKINAC COUNTY DISCOVERY MEETING SIGN-IN SHEET
 Please verify contact information and initial meeting attendance.

No.	Sign Initials	Affiliation	Title	Name First	Name Last	Street Address	Phone	Email Address
11	Richard Element							
12	Neil	MACKINAC COUNTYLAND SURVEYS	Professional Surveyor	Neil	Hill	429 ELLSWORTH ST	906 643 9418	NEIL @ MACKINACSURVEYS.COM
13								
14								
15								
16								
17								
18								
19								
20								



Meeting schedule: Monday, August 13, 2012 pm 1:00 – 3:00 pm (ET)

Meeting Location: St. Ignace Public Library; St. Ignace, MI

Discovery Area: Coastal communities in Mackinac County, MI

Attendees: 10 people attended the Lake Michigan Discovery Meeting. Please see attached sign-in sheet for a complete list of attendees

FACILITATORS

FEMA

Lee Traeger

STARR Contractor

Jaspreet Randhawa

Scott Banjavcic

Troy Thielen

MEETING AGENDA:

1. Why are we here? (15 minutes)

- Great Lakes Coastal Flood Study Overview and Schedule
- Discovery Process and Outcomes

2. Coastal mapping and flood risk topics to be aware of (25 minutes)

3. How does this apply to my community? (10 minutes)

4. Interactive Session A (25 minutes)

- View and Discuss Local Coastal Areas of Concern Using the Discovery Map and Community Risk MAP Questionnaire

5. Hazard mitigation opportunities and grant funding (10 minutes)

6. Interactive Session B (25 minutes)

- Discuss Mitigation Action Opportunities
Introduce the Mitigation Action Form and Mitigation Action Tracker

7. Wrap Up (10 minutes)

- Review of action items and next steps

Optional Interactive Stations (30 minutes - 1hr following meeting)

- *Draft Transect Map Station: Talk to technical staff about draft transects and view draft transects in GIS*
- *Mitigation Resources, Strategies, and Actions Station: Talk with FEMA and State staff about areas of concern and potential mitigation actions to help reduce risk. Fill out Mitigation Action Form.*

INTERACTIVE DISCUSSION:

- Nathan Fazer from Eastern Upper Peninsula Regional Planning and Development mentioned that Mackinac County is starting to update their hazard mitigation plan.



- Nathan Fazer from Eastern Upper Peninsula Regional Planning and Development mentioned that Mackinac County will be developing GIS parcels to be completed by July 2013.
- Mike Kasper, Coordinator Mackinac County Emergency Management, identified two hazard areas for the county. Ice build-up at the mouth of Black and Pine Rivers during winter snow melts causes a jam at the mouth of the river where it meets Lake Michigan. The river then backs up and can cause serious flooding and well contamination issues. Mitigation action that was identified is to elevate well heads.
- Mike Kasper, Coordinator Mackinac County Emergency Management, also mentioned that depending on lake levels there are some potential flooding issues near St. Ignace.
- Clark, Marquette, and St. Ignace townships need to be eliminated from Lake Michigan Discovery area because they are located in Lake Huron.
- James Fenlon from the Mackinac County Equalization Department has new high resolution 12" aerials that can be provided to FEMA Study team upon request.
- Al Garavaglia, Hudson Township, asked about the possibility of sand build-up at the mouth of the Black River causing the ice build-up and flooding.

FEATURES NOTED ON MAPS:

- Important electrical substations and natural gas pipelines are located between transects 702 and 703 near Mackinac Bridge in St. Ignace.
- Past flooding issues have occurred in the Brevort area between transects 691 and 697 when lake levels were higher.
- Check transect 690, Pointe Aux Chenes, for placement on important structure and in low spot.
- Labeled Mouth of Black River in reference to ice build-up related flooding, Transects 667 and 668.
- Lower more populated areas of the county are located near Naubinway, Transects 662-664.
- Largely, un-populated State wilderness is located between transects 644 and 657, west of Naubinway to county boundary with Schoolcraft County. Number of transects can be reduced in these areas.
- High banks with potential for erosion are located between Transects 680-683 i.e. Brevort area along Highway 2.

MITIGATION ACTIONS:

- Raise well head elevations to prevent contamination due to flooding along Black River.
- Commitment by Eastern Upper Michigan Regional Planning Commission to update Hazard Mitigation Plan.
- Need for bank erosion protection in Brevort area along Highway 2



FEMA

Lake Michigan Discovery Mackinac County, MI

August 13, 2012
1 pm to 3 pm

St. Ignace Public Library



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*Great Lakes
Coastal Flood Study*

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Introductions

Who's here?

■ State Representatives

- MDEQ
- SHMO

■ Risk MAP Project Team

- FEMA
- STARR

■ Local Stakeholders

- CEOs
- Floodplain Administrators
- Planners
- Engineers
- Emergency Managers
- Community Leaders
- Regional Planning Agencies
- Coastal Organizations



Effective Map Status

- Bois Blanc Twp - No map
- Clark Twp - Yes 11/4/92
- Garfield Twp - Yes 11/20/00
- Hendricks Twp - 11/4/92
- Hudson Twp - 11/4/92
- Mackinac Island - No map
- Marquette Twp - No map
- Moran Twp - yes 11/20/00
- Portage Twp - no map
- St. Ignace Twp - yes 11/20/00
- City of St Ignace - no map



Discovery Meeting Agenda

- **Why are we here?**
 - Risk MAP Program, Great Lakes Study, and Discovery
- **Coastal mapping and flood risk topics**
- **How does this apply to my community?**
 - NFIP compliance, local impacts of coastal study, hazard mitigation, and grant funding
- **Interactive Sessions**
 - View and Discuss Local Coastal Areas of Concern Using the Discovery Map and Community Risk MAP Questionnaire
 - Discuss Mitigation Action Opportunities and Introduce the Mitigation Action Form
- **Wrap Up**
- **Optional Interactive Stations**



Risk Mapping, Assessment and Planning

Risk MAP



Through collaboration with State, Local, and Tribal entities, Risk MAP aims to deliver quality data that increases public awareness and leads to action that reduces risk to life and property



Great Lakes Coastal Flood Study



U.S. Army Corps of Engineers, Detroit District

RiskMAP

Increasing Resilience Together

Great Lakes
Coastal Flood Study

Lake Michigan Discovery Report Appendix C - Mackinac County

greatlakescoast.org



Great Lakes Coastal Flood Study Overview



- Latest models, data, and technology
- Deliver updated flood maps and flood risk datasets
- Equip Federal Agencies, eight States and hundreds of coastal communities with data and planning tools to facilitate flood risk actions to enhance resiliency along the Great Lakes
- Partners Involved:
 - FEMA
 - USACE
 - Engineering Research Development Center (ERDC)
 - ASFPM
 - States
 - FEMA Contractors



Lake Michigan Discovery

- 34 counties in total
 - 4 counties in UP Michigan
 - 11 counties in Wisconsin
 - 2 counties in Illinois
 - 3 counties in Indiana
 - 14 counties in lower Michigan

- 226 coastal communities



Great Lakes Coastal Flood Study Discovery Study Area



Lake Michigan coastal communities in Mackinac County:

Do we have all coastal communities
identified?

Mackinac County

Clark

Garfield

Hendricks

Hudson

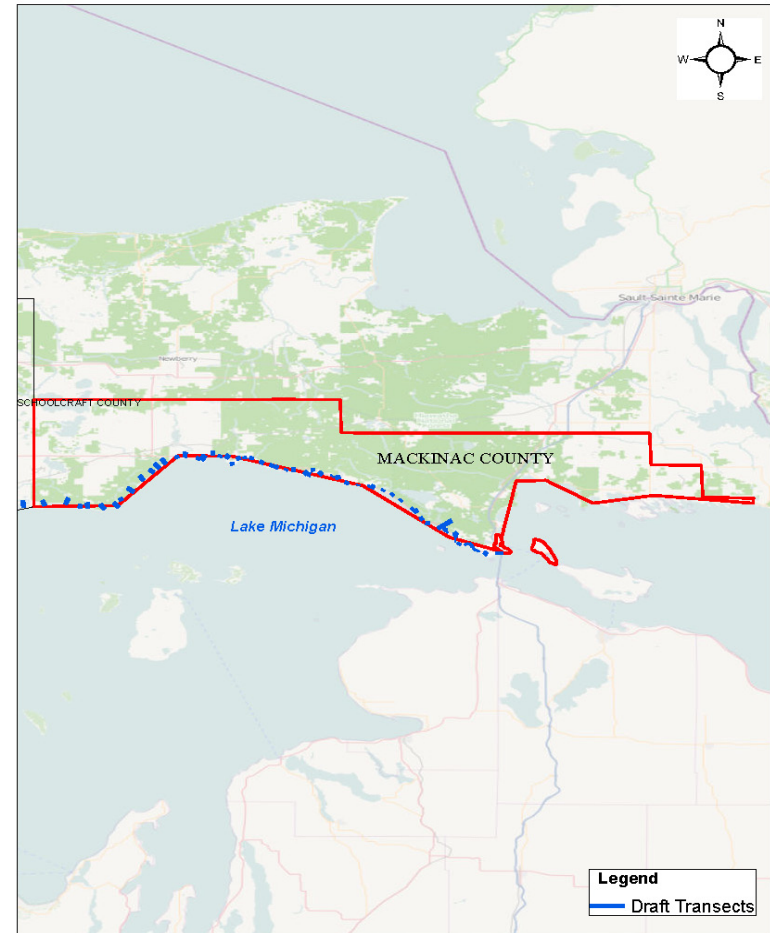
Mackinac Island

Marquette

Moran

Newton

St. Ignace (Township and City)



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Great Lakes
Coastal Flood Study

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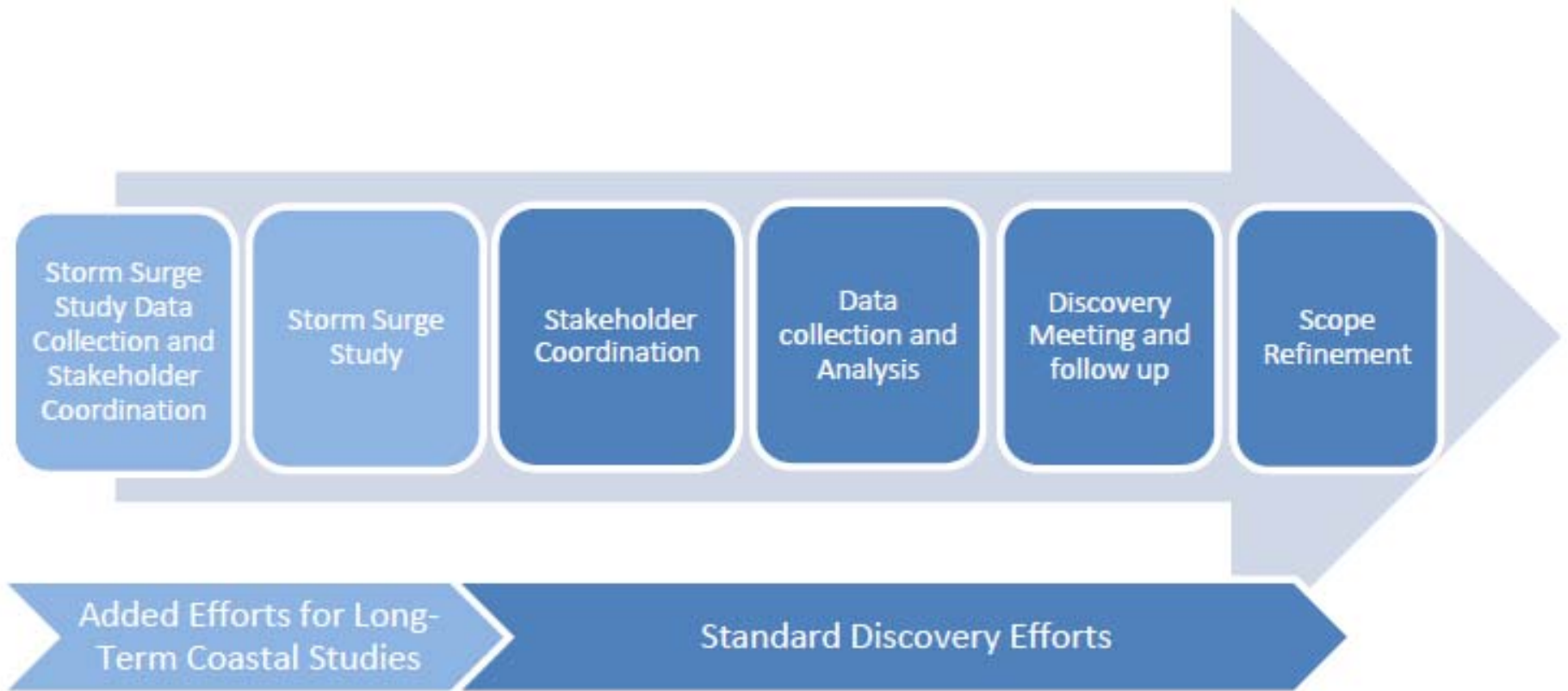


Discovery Meeting Objectives

- Continue and expand upon stakeholder engagement
- Discuss data inputs from Federal, state and local
- Identify local coastal flood hazard needs and areas of concern
- Identify products and datasets that best advance coastal mitigation action
- NFIP regulatory updates
- Discovery schedule and deliverables



Discovery Schedule Overview



Lake Michigan Discovery

Schedule of Activities

- Identify Draft Transect Locations – Completed
- Research available data – Completed
- Information Exchange with Community Stakeholders – July 2012
- Prepare draft Discovery Maps and Reports – August 2012
- Establish inventory of coastal structures based on oblique imagery – October 2012
- Facilitate Discovery Meetings – August/September 2012
- Final Discovery Report and Maps – November 2012
- Create library of digital data – November 2012



Great Lakes Coastal Flood Study Discovery Products



■ Final Discovery Report

- Single, comprehensive report for all of Lake Michigan, with appendices for each Discovery meeting
- Includes pre-discovery data, meeting agenda, sign-in sheets, discussion topics, decisions made, etc.

■ Final Discovery Maps

- Including feedback from participants
- Visual representation of meeting outcomes
- Delivered in digital format



Discovery Outcomes

- **Explain the Project**
 - Regulatory and non-regulatory products/datasets
 - Analysis, concepts, timelines
- **Encourage Community Participation**
 - Transect Locations
 - Areas of concern and need
 - Data to improve upon products and datasets
- **Introduce Mitigation Action**
 - Mitigation Action Form
 - Action Tracker
 - Mitigation strategies for coastal flood and erosion



Data Collection in progress

- New high quality USACE Topographic – Light Detection and Ranging (LiDAR) and Bathymetry Data
- Base data – boundaries, streams, census blocks, etc.
- Average Annualized Loss data
- Shoreline classification Dataset
- Dams
- Federal and State disaster information
- Repetitive loss data
- Hazard Mitigation plans
- Hazard Mitigation Grants Program (HMGP) projects
- Stream, wave, and water level gage locations
- Pre-Disaster Mitigation Program projects
- Draft Transects



Data Gaps

- Building footprints
- Critically eroded beach areas
- Coastal construction control line
- Critical Facilities (in GIS format)
- High water marks
- Areas of recent or planned development
- Areas of high growth
- Recent land changes due to development, erosion, etc.
- Known flooding issues not represented on effective FIRMs or listed in CNMS





FEMA

Coastal Mapping and Flood Risk Topics

- Draft Transects
- Coastal Guidance Updates
- VE Zone Mapping and LiMWA
- Coastal Flood Risk Products

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Coastal Flood Study*

Lake Michigan Discovery Report Appendix C - Mackinac County

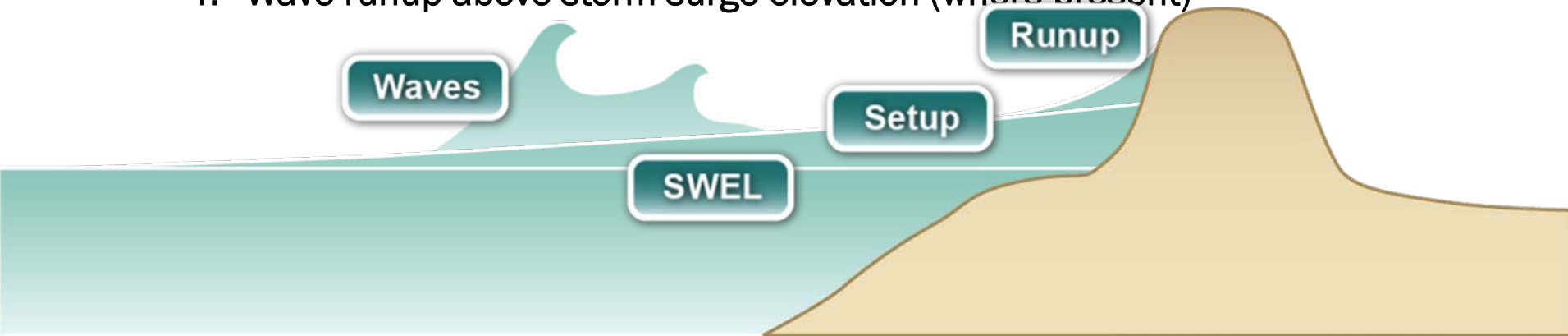
greatlakescoast.org



Basic Elements of a Coastal Hazard Analysis

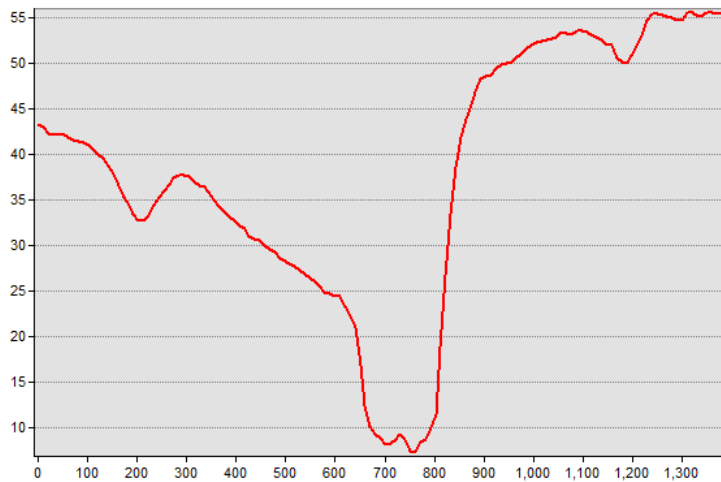
Base Flood Elevation on FIRM includes 4 components:

1. Storm surge stillwater elevation (SWEL) – determined from storm surge model
2. Amount of wave setup
3. Wave height above storm surge (stillwater) elevation
4. Wave runup above storm surge elevation (where present)

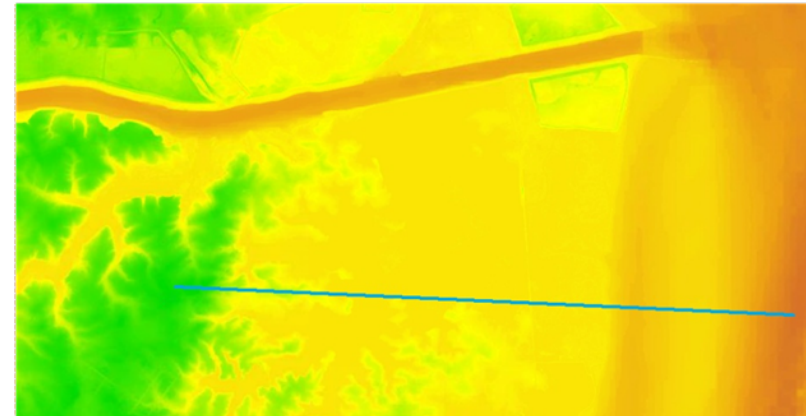
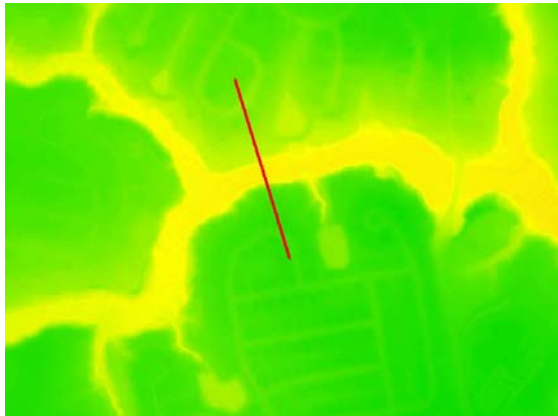
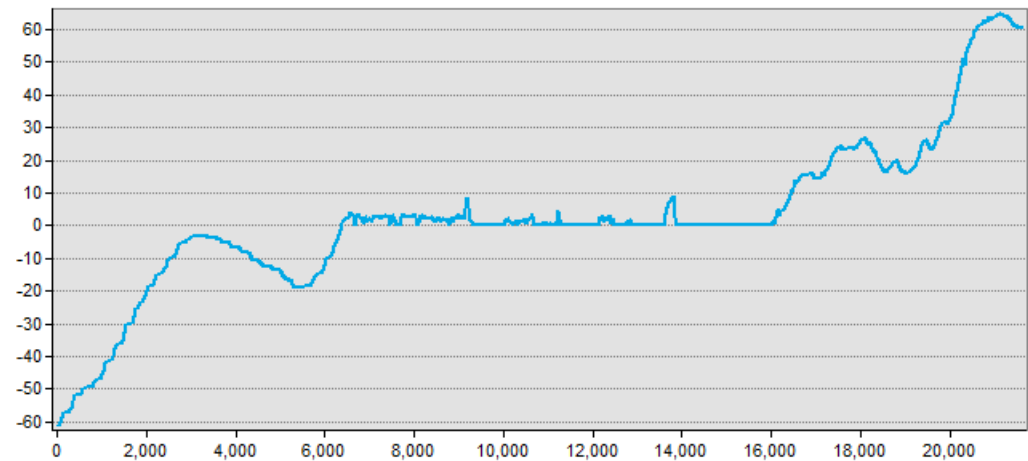


Riverine XS vs Coastal Transect

Riverine XS

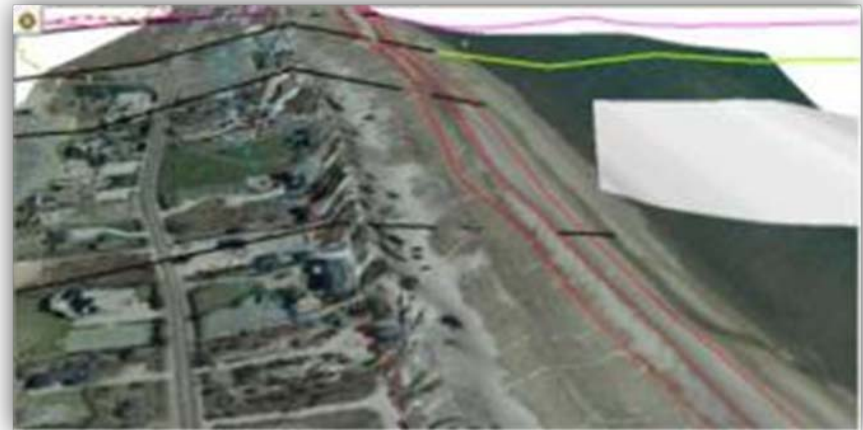


Coastal Transect



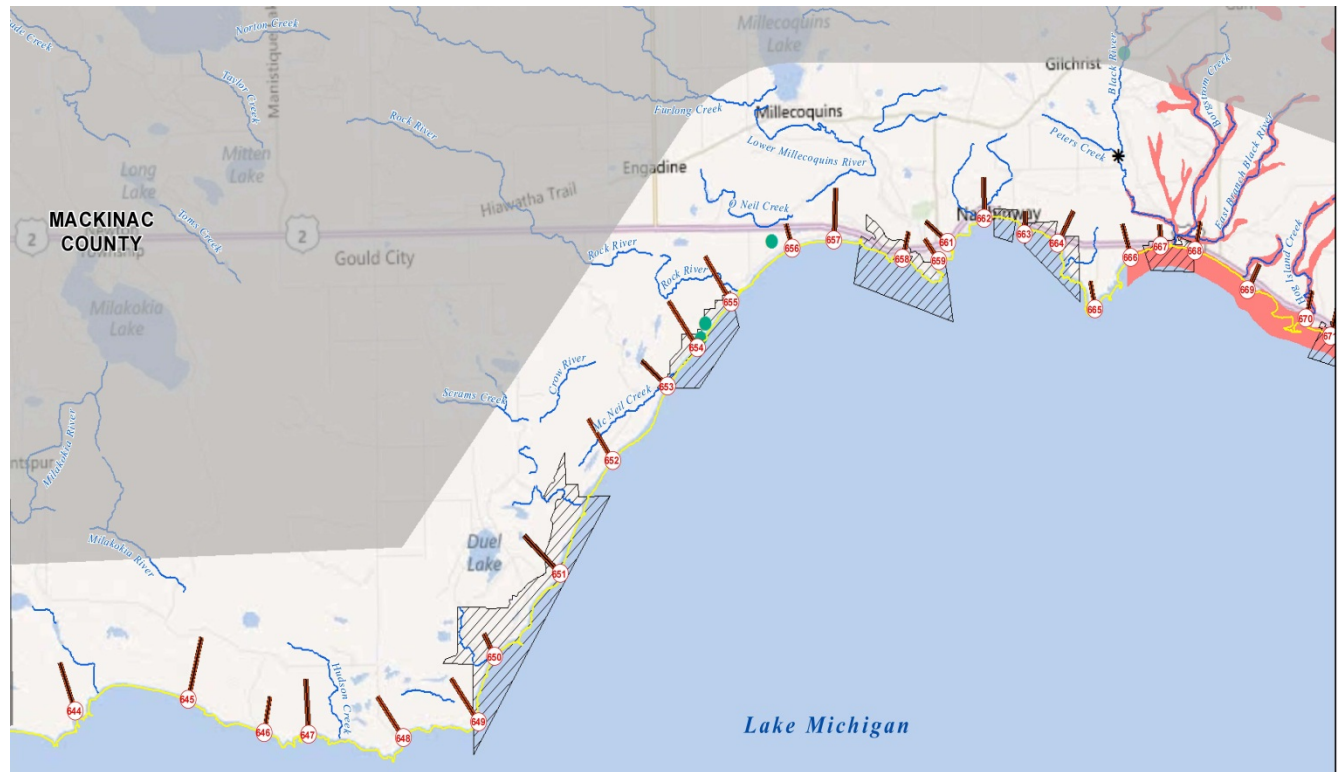
Transect Placement

- Transects are placed to define representative profiles for a shoreline reach
- Transect spacing depends on upland development
 - Developed areas – As dense as 1,000 ft
 - Rural areas – Spacing can be 1-2 miles
- Transects are:
 - Profiles along which flooding analysis is performed
 - Used to transform offshore conditions to shoreline
 - Use to define coastal flood risks inland of shoreline



Draft Transect Layout Mackinac County

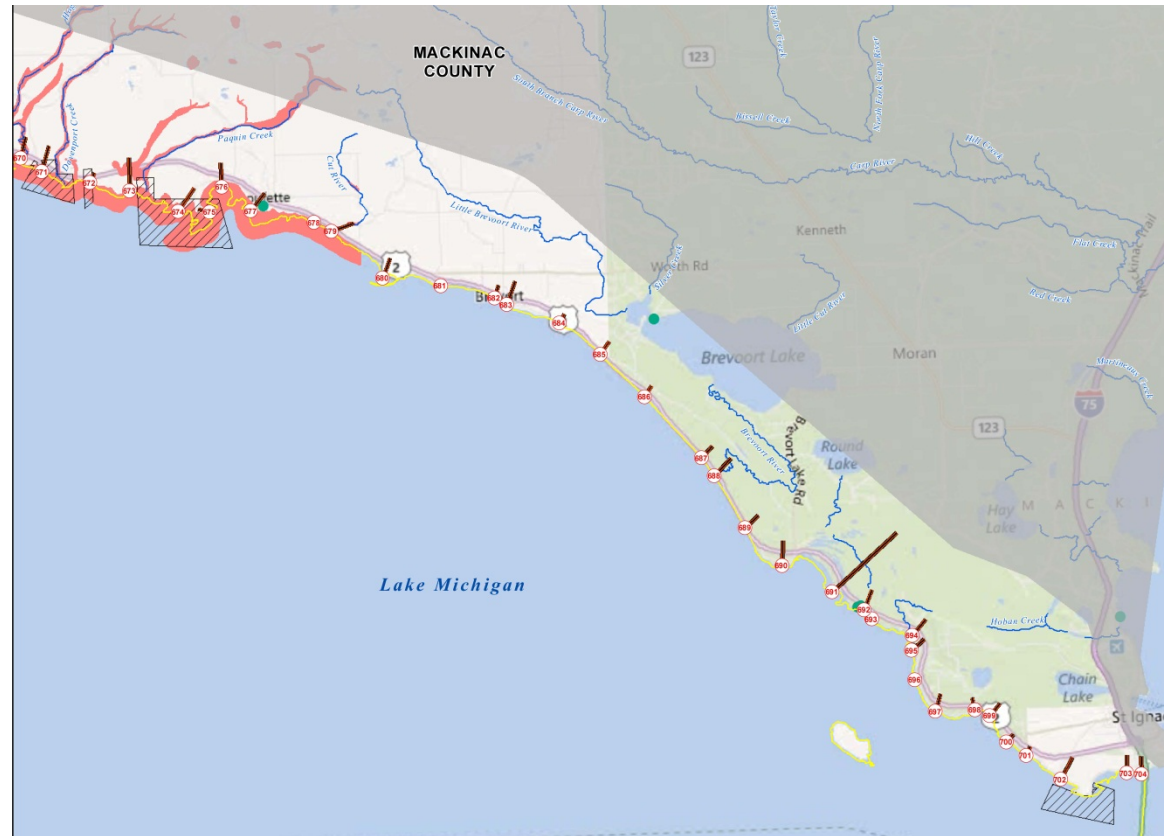
- 72 transects
- 92 miles of shoreline along Lake Michigan



Draft Transect Layout Mackinac County



- 72 transects
- 92 miles of shoreline along Lake Michigan



Coastal Flood Hazard Zones

■ Hazard Zones

- **Zone VE** – Areas expected to be affected by high velocity wave impact in 100-year event (wave heights or runup depth at or greater than 3 feet)
 - Base Flood Elevation established
- **Zone AE** – Areas expected to be flooded by inundation in 100-year event
 - Base Flood Elevation established (wave heights and runup depth less than 3 feet)
- **Zone X** – Areas not expected to be flooded in 100-year event
 - Shaded X – Areas expected to be flooded in 500-year event
 - Base Flood Elevations not established
- **LiMWA** – Areas subject to wave heights of at least 1.5 feet
 - Non-Regulatory

■ Gutters

- Internal zone breaks where Base Flood Elevation changes
- VE/AE Gutter - Location where risk of damage due to wave action diminishes



VE Zones in the Great Lakes

- From the revised Appendix D.3:
 - “VE zones may also be mapped where the engineering analysis indicates their presence“
 - “The typical study finding is a narrow VE zone, making its usefulness uncertain on maps at usual scales“
 - “Relatively small numbers of existing coastal buildings are likely to be affected by possible VE zone designations along some Great Lakes”
 - “Only with prior approval from the FEMA study representative should the VE zones be mapped”



How is LiMWA Defined?

- LiMWA is the line mapped to delineate the inland extent of wave heights of at least 1.5 feet
 - Wave heights as small as 1.5 feet can cause significant damage to structures
- LiMWA alerts people that are not in the high wave hazard zone (Zone VE) that they may still be affected by wave action in the Zone
- CRS benefit for communities requiring Zone VE construction standards in areas defined by LiMWA or areas subject to waves greater than 1.5 ft



Wave Action - Structural Risk

- US Army Corps of Engineers – 1973
 - Breaking wave height of 3 feet
 - “area subject to high velocity waters, including but not limited to hurricane wave wash”
- FEMA – 2000
 - Coastal Construction Manual
 - Additional post-storm damage assessments identified 1.5 wave also can knock a structure off a foundation



http://www.fema.gov/pdf/rebuild/mat/coastal_a_zones.pdf

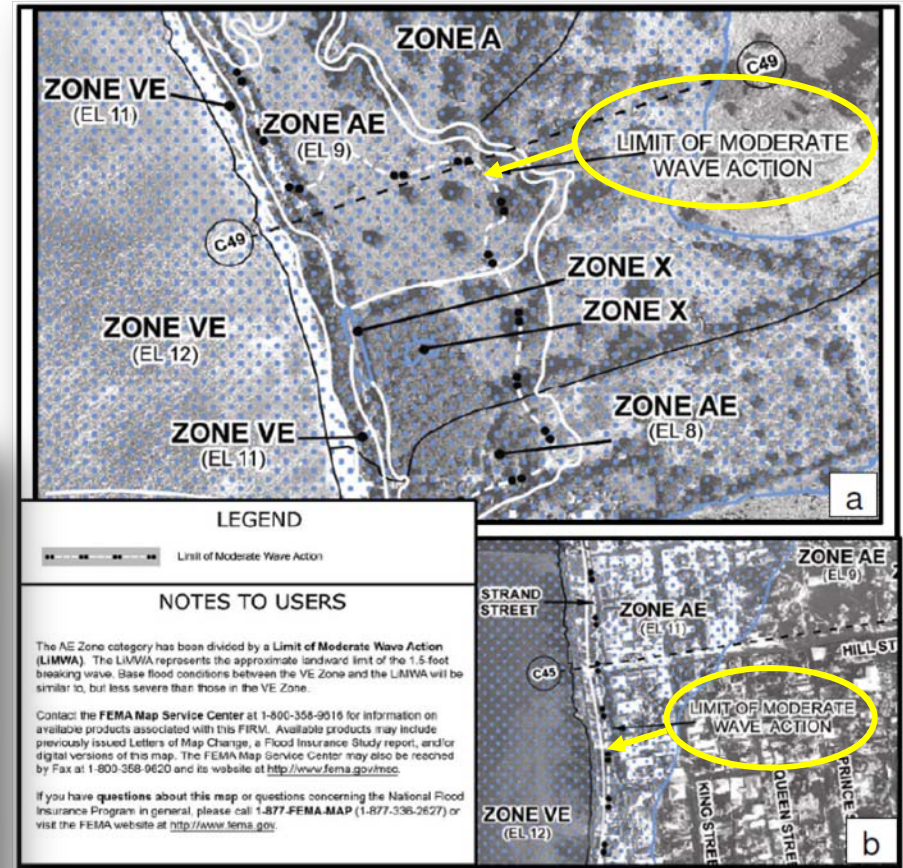
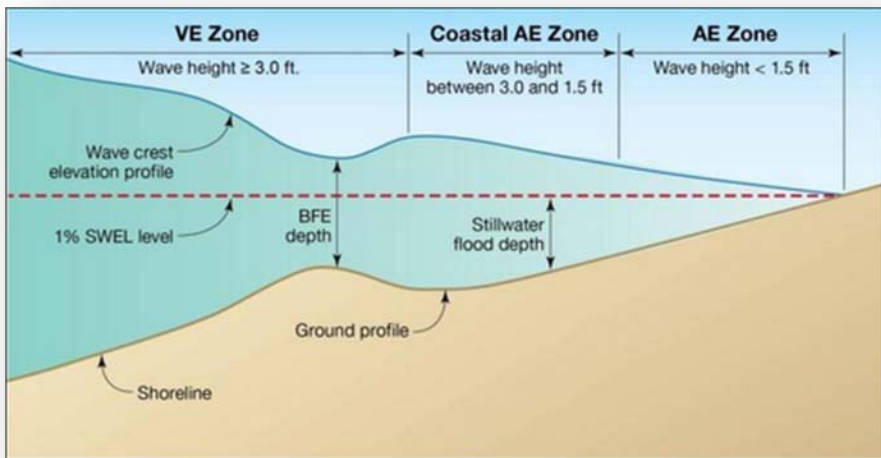


Limit of Moderate Wave Action (LiMWA)



FEMA Procedure Memorandum No. 50, 2008

- Not a regulatory requirement
- No Federal Insurance requirements tied to LiMWA





FEMA

Coastal Flood Risk Products

- Coastal Depth Grids and HAZUS
- Changes Since Last FIRM
- Coastal Non-Regulatory Products

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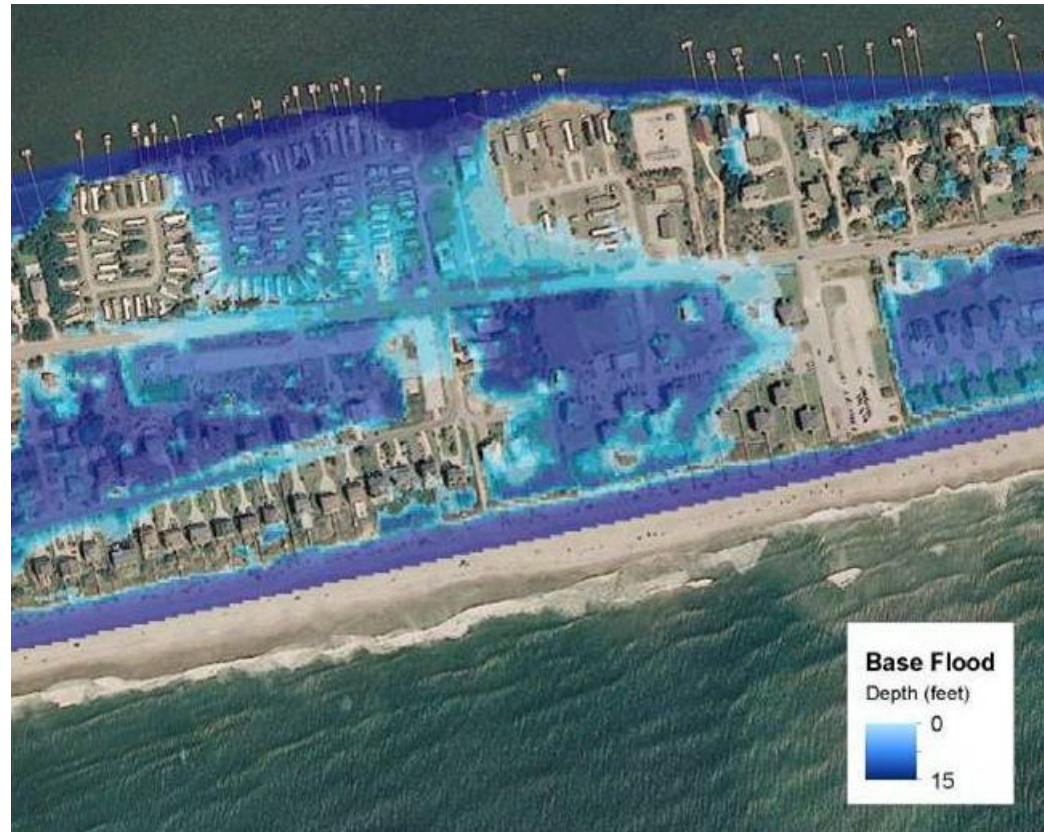
Standard Flood Risk Products

- Coastal Depth Grids
- Flood Risk Assessment (HAZUS)



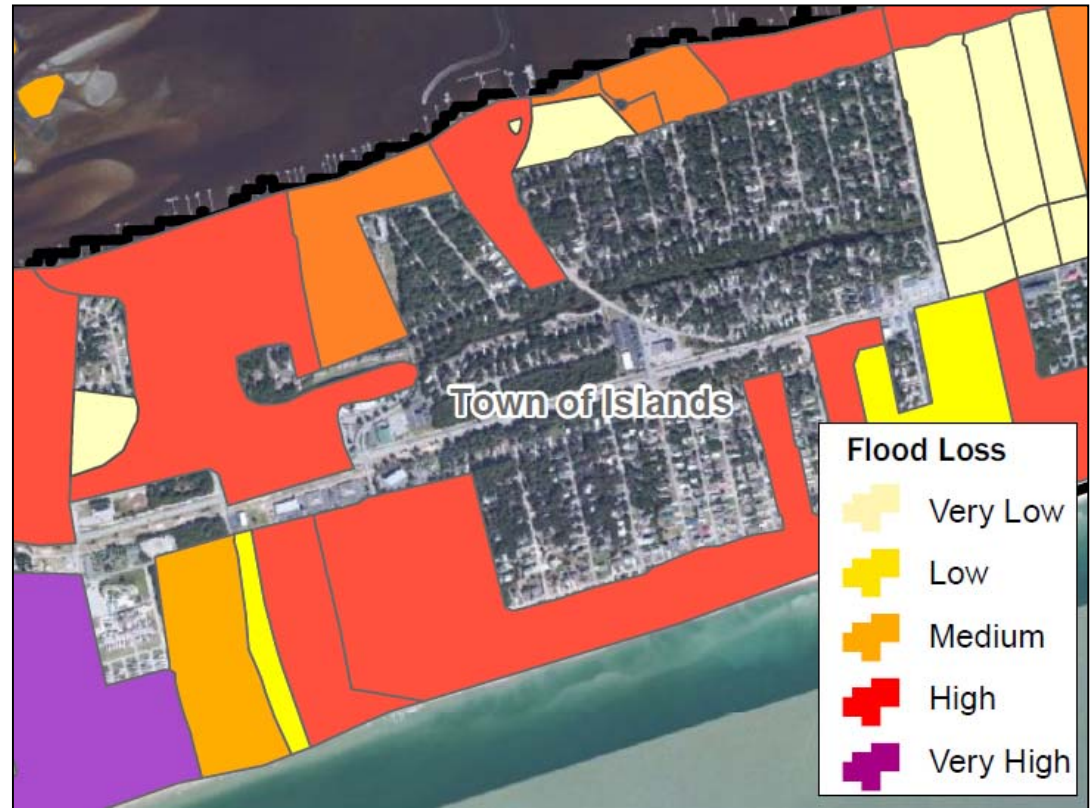
Coastal Depth Grid

- Should reflect total depth (i.e. stillwater and waves) – typically only produced for the 1% annual chance flood
- Created using the regulatory mapping and associated zone breaks as input



Coastal Flood Risk Assessments

- Similar to Flood Risk Assessments for riverine, but using the coastal depth grids as input for the refined analysis
- Hazus analysis and data can support adoption of higher regulatory standards for structures in high loss areas
- Provides justification to fund mitigation actions



Changes Since Last FIRM



Data Fields Include	Example Data Values
Old Study Date	e.g. 1985
Old Model Type(s)	e.g. HEC-1 / HEC-2
Old Zone Type	e.g. Zone A
Old Topography	e.g. USGS 10-ft
New Study Info/Methods	Dates, Models, etc.
New Study Zone	e.g. Zone AE
New Topography	e.g. LiDAR 2-ft
New Study Engineering Factors / Changes	e.g. new structures, gages, topo, landuse, etc.
Estimated Structures	e.g. 9
Estimated Population	e.g. 27



Coastal Non-Regulatory Products in Development



Erosion



Red Lantern Restaurant, Lake Michigan, IN

Lake Levels



Lake Michigan Shoreline
[Reference](#)

Shoreline Feature Dataset



Upper Peninsula Shoreline
[Reference](#)



Shoreline Features Database

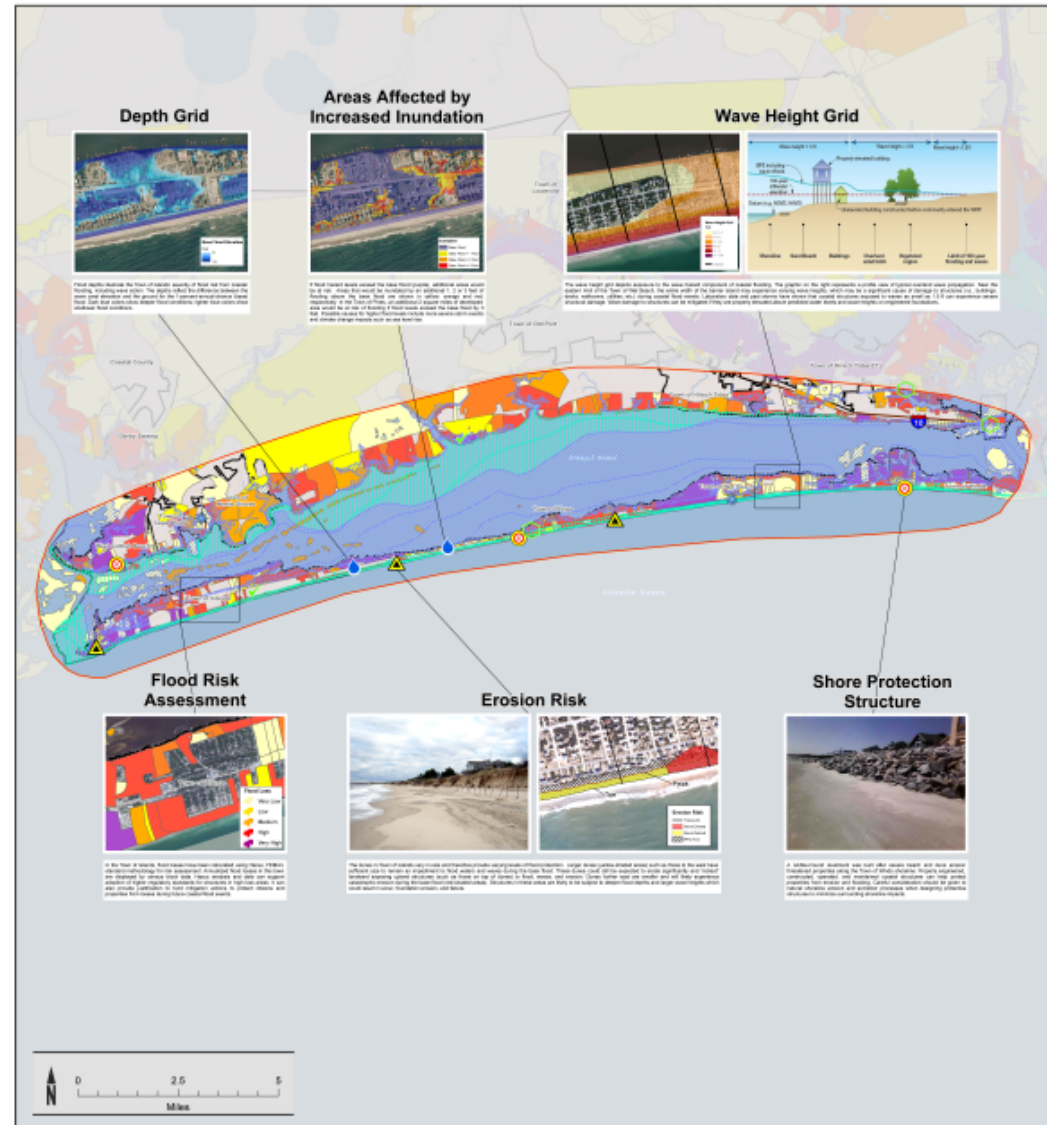
Shoreline Material	Primary Land Use	Primary Coast Type	Primary Vegetation
Sand	High Density Residential	High Dune, 10'+	None
Cohesive	Moderate Density Residential	Dune, 2' - 10'	High Density Shrubs/Trees
Cobble	Low Density Residential	High Bluff, 10'+	Moderate Density Shrubs/Trees
Diamicton*	Commercial/Industrial	Bluff, 2' - 10'	Low Density Shrubs/Trees
Shingle	Park Land	Coastal Wetland	Manicured Lawn
Bedrock	Farm Land	Flat Coast	Native Vegetation
Artificial	Forested		

- Contains primary and secondary Land Use tables – same for coast type and vegetation
- Current project collects data at one-mile spacing, for scoping and cost
- Current project does not include field-based reconnaissance or sediment/subsurface soils collection



Coastal FRM

- Similar to riverine map
- Highlights area where datasets were produced
- Use of callout boxes
- Should drive the conversation towards mitigation



MAP SYMBOLOLOGY			COASTAL STUDY LOCATOR		
Base Data	Flood Data	Flood Risk	Areas of Mitigation Interest	COASTAL STUDY LOCATOR	
<ul style="list-style-type: none"> Composite Limits Major Roads Watershed Boundary State Boundary 	<ul style="list-style-type: none"> Rivers and Streams Resubdiv Area Low New OFPR Coastal Range Influence Area New Zone VE 	<ul style="list-style-type: none"> Very Low Low Medium High Very High 	<ul style="list-style-type: none"> Accretion Lines Non-Subsided Levels Diems Coastal Structures Stream Flow Constrictors Coastal Protection Prepared Flooding Events All Risk Essential Facility 	<ul style="list-style-type: none"> Individual Assistance (IA) and Public Assistance (PA) Data Significant Land Use Changes (within the past 5 years and looking forward 5 years) Areas of Significant Riverine or Coastal Erosion Non-Loss Areas of Mitigation Success Other 	



Coastal Updates to Flood Risk Report



- Explanations of coastal non-regulatory datasets and their use in risk communication and mitigation planning
- References to other publications and resources that provide information on coastal risks
- Captures and reports increases and decreases in Coastal High Hazard Areas (VE & V Zones) within the Changes Since Last FIRM tables in the FRR

Area of Study	Total Area (mi ²)	Increase (mi ²)	Decrease (mi ²)	Net Change (mi ²)
Within SFHA	23.8	1.6	0.4	1.2
Within Floodway	1.4	0.2	0.0	0.2
Within CHHA (VE or V Zone)	7.8	0.9	0.5	0.4



Non-Regulatory Product Usage and Action



- Risk MAP Products and Datasets help communities make good decisions to reduce flood risk:
 - Hazard Mitigation Planning
 - Floodplain Management and Community Rating System
 - Community Comprehensive or General Planning
 - Community Investment - Capital Improvement Planning
 - Public Outreach
 - Hazard Mitigation Assistance Grant Application Prioritization and Support
 - Other Non-FEMA Grants to Reduce Flood Risk
 - Response and Recovery Planning
- Mitigation Action Form





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How does this apply to my community?

- NFIP Compliance
- Local impacts of coastal study

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National Flood Insurance Program

- Allows property owners to purchase flood insurance at reduced rates
- Community responsibilities
 - adopt and enforce compliant regulations
- FOCUS is in building the local floodplain management capability



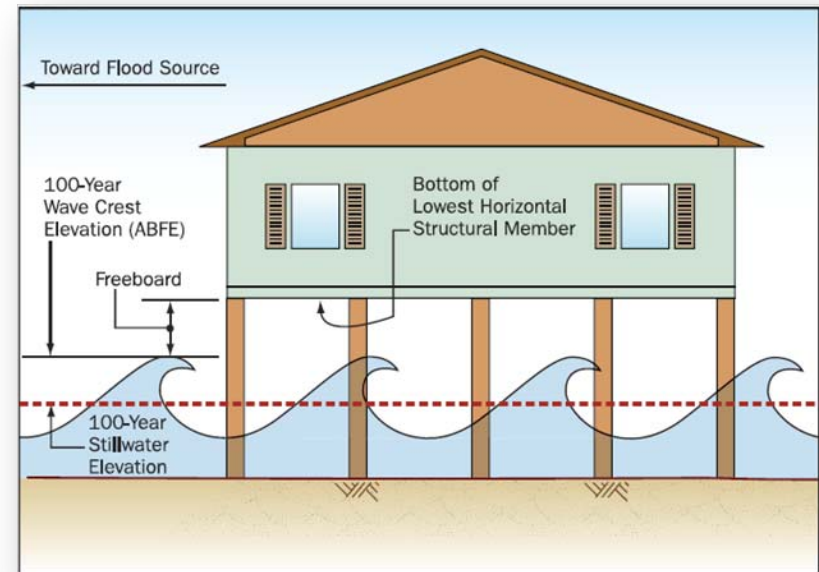
V Zones for Lake Michigan?

- Lake Michigan communities currently do not have V/VE Zones. Majority of the communities have coastal A/AE zones.
- If coastal AE and VE Zones are added on maps where they did not exist before, all affected communities must update regulations to include coastal requirements.
 - State will provide regulations assistance and technical support if/when coastal flood zones are added.



Coastal Zones and NFIP Compliance

- Must meet minimum NFIP and community coastal requirements
- NFIP design and construction requirements are more stringent in V zones due to wave, debris, and erosion hazards in V zones
- Recommendations for exceeding the minimum NFIP requirements (Coastal A Zones)
 - Can obtain CRS credits for Coastal A Zone Requirements
- Resources Available



Community Rating System (CRS)

- Flood insurance premium rates discounted to reward community actions that reduce flood losses, facilitate accurate insurance ratings, and promote the awareness of flood insurance
- Class rating system from 1 to 10
- 18 creditable activities organized under four categories:
 - Public Information
 - Flood Damage Reduction
 - Mapping and Regulations
 - Flood Preparation
- <http://training.fema.gov/EMIWeb/CRS/>





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Interactive Session A

- View and Discuss Local Coastal Areas of Concern Using the Discovery Map

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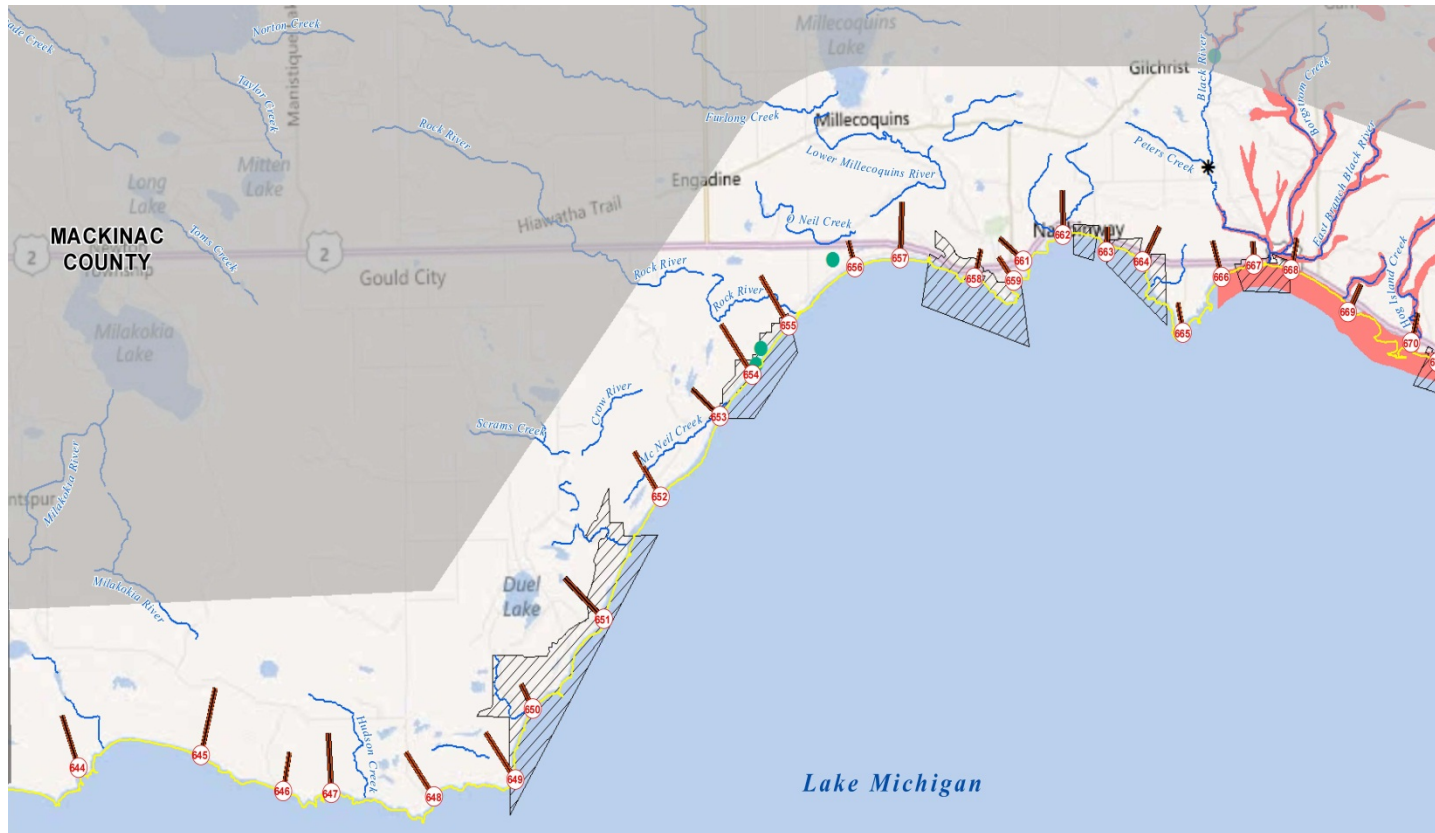
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Mackinac County, MI Discovery Map – Flood Hazard Areas



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Mackinac County, MI Discovery Map – Flood Hazard Areas



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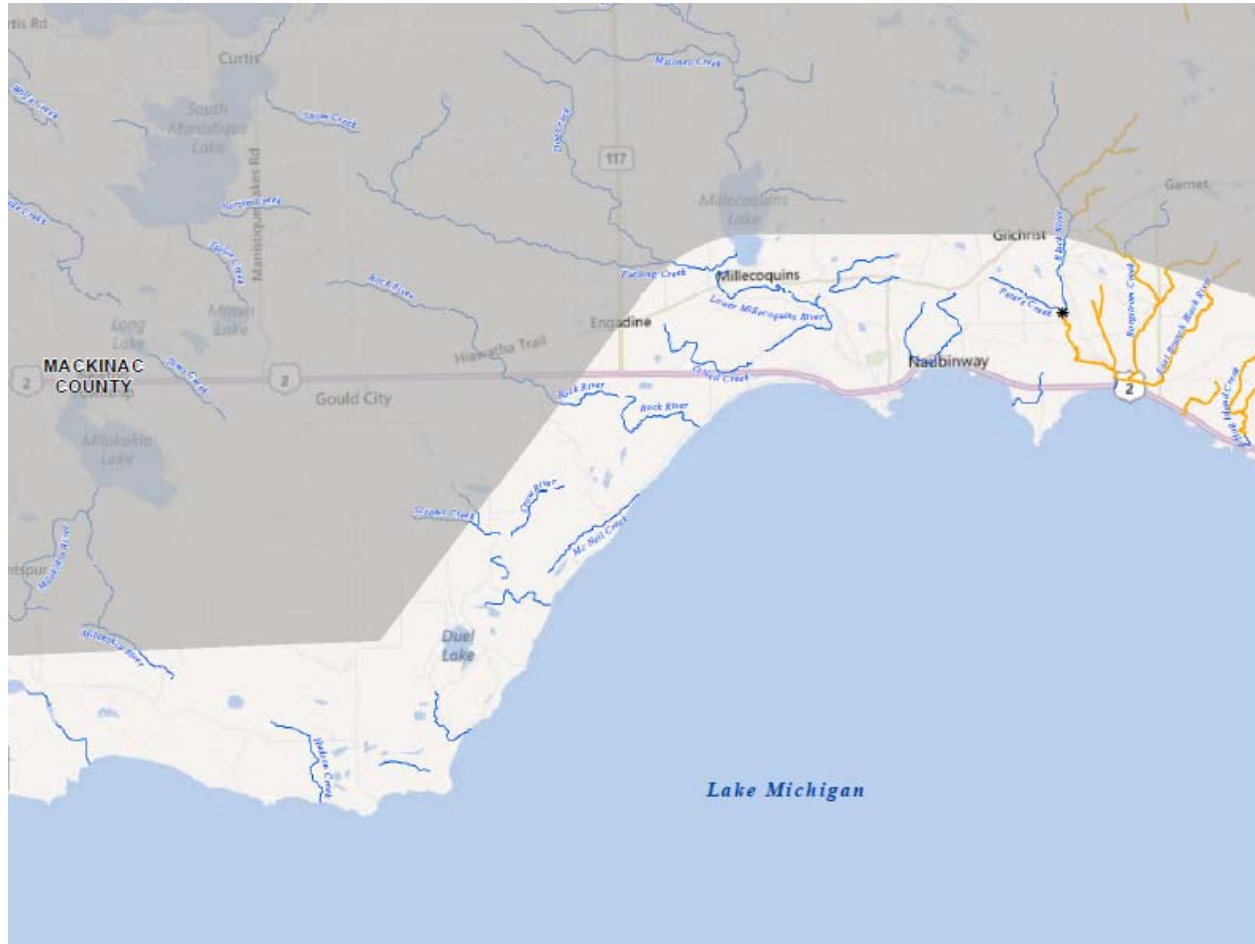
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Mackinac County, MI Discovery Map – CNMS Status



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Mackinac County, MI Discovery Map – CNMS Status



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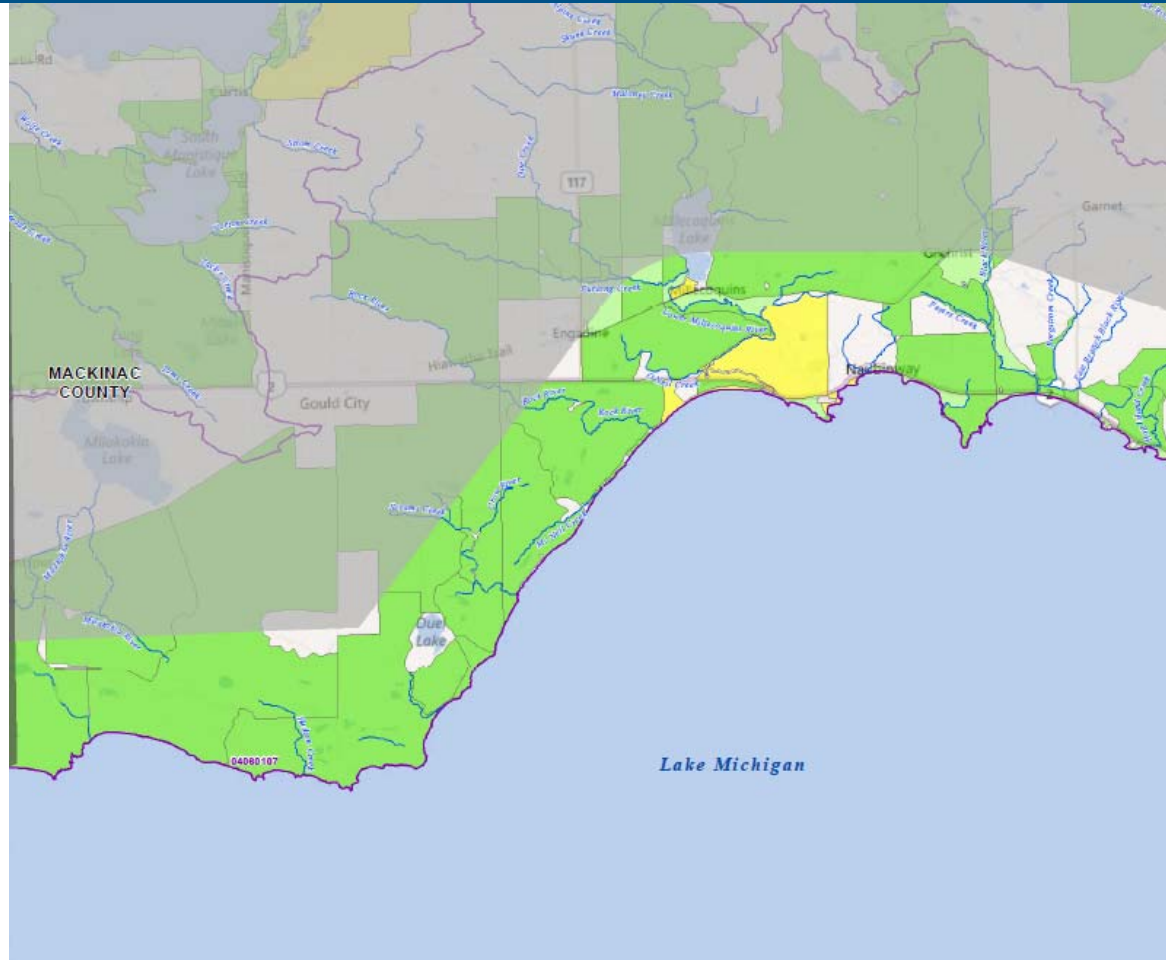
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Mackinac County, MI Discovery Map – AAL



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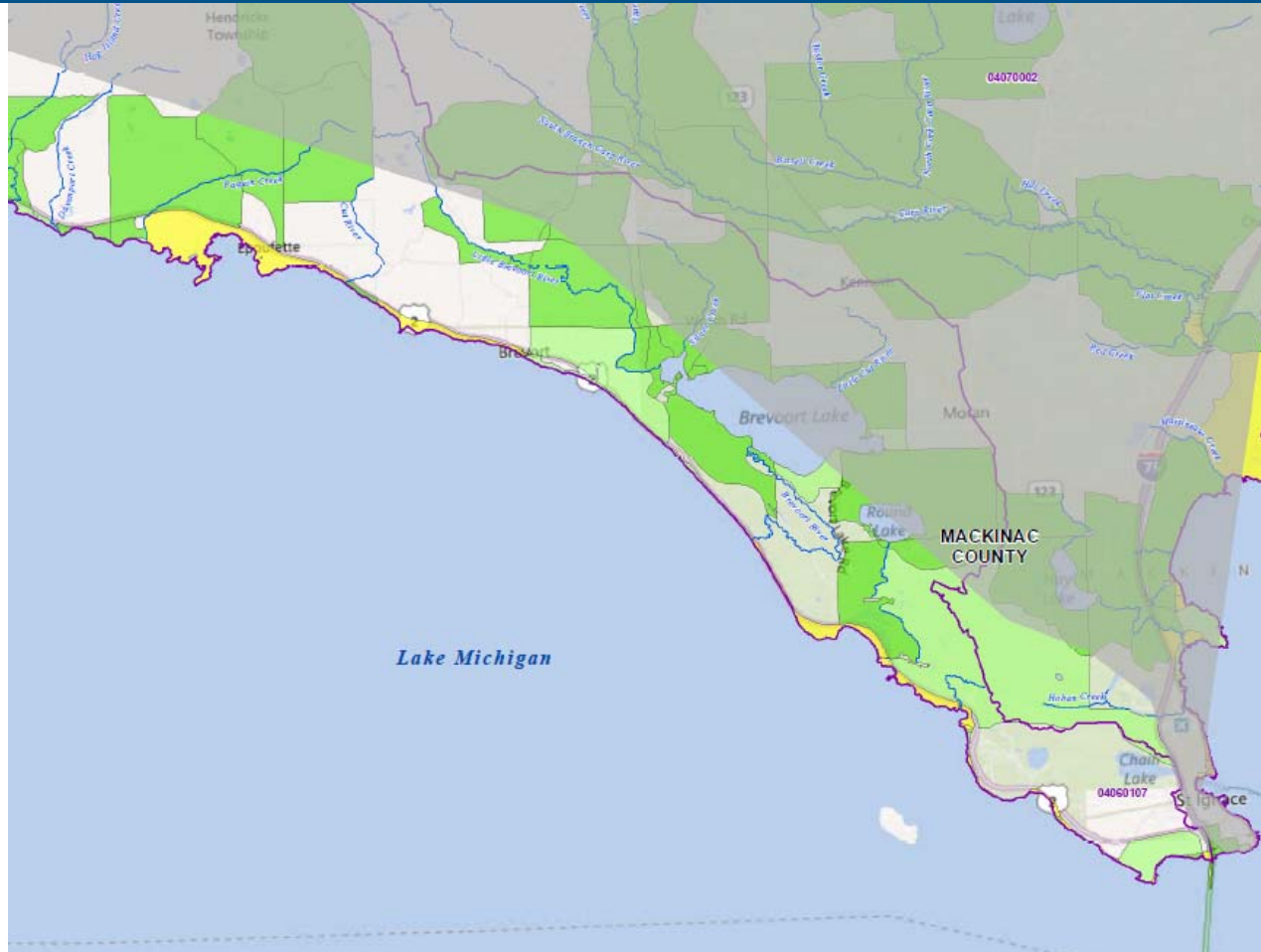
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Mackinac County, MI Discovery Map – AAL



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Hazard Mitigation

- Opportunities
- Grant Funding

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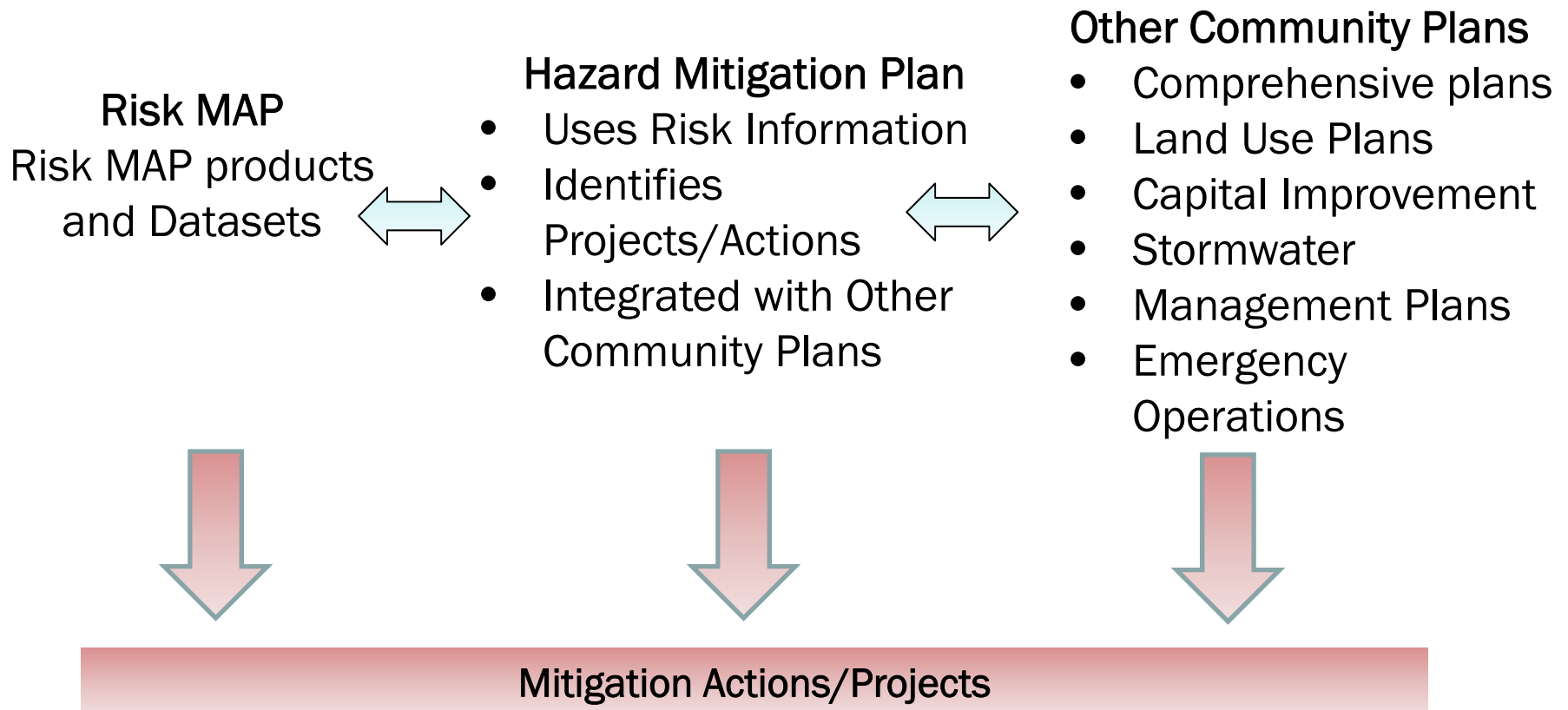
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Local Hazard Mitigation Plans



Mitigation Activities

- Mackinac County Hazard Mitigation Plan
 - Plan Adopted: May 2006
 - Plan expired: May 2011
- Identified mitigation activities from plan:
 - Larger Storm Water detention basins
 - Acquire Flood-prone NFIP properties
 - Ditching along US-2
 - Alert Warning Systems



Identifying Actions

Local Plans and Regulations

Community Identified Programs

Structure and Infrastructure Projects

Mitigation Action Form



Part B : Reference Sheet

Category Types and SubTypes

Use for answering Question 11.

Local Plans and Regulations

- **Building Codes**
 - Enforcement
 - International Building Code
 - International Residential Code
 - Higher Standards
 - Post Disaster Code Enforcement
 - Other
- Capital Improvement Plan
- Coastal Zone Management
- Comprehensive Plan
- Easements
- Floodplain Management
- Master Plan
- Open Space Preservation
- Setbacks
- Stormwater Management
- Subdivision Ordinance
- Zoning
- Other

Community Identified Program

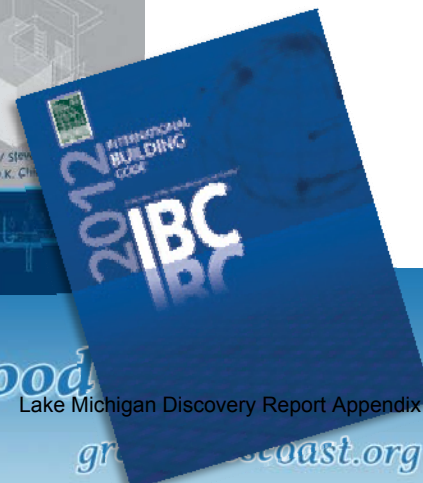
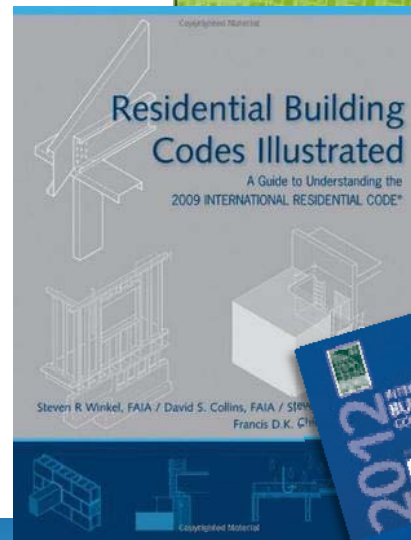
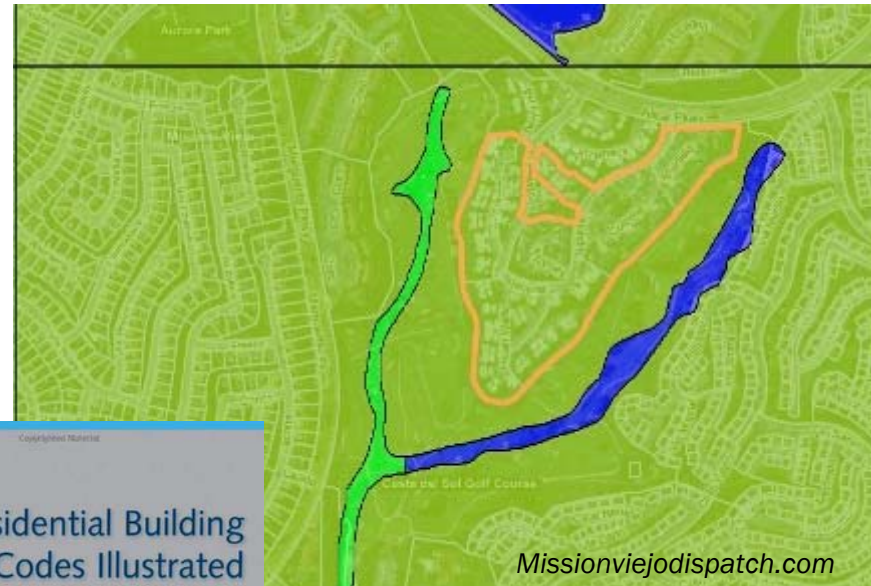
- Funding Mechanisms for Local Risk Reduction
- Incentives for Local Risk Reduction
- Mitigation Program
 - Fire Protection
 - Stream Maintenance
 - Tree Management
 - Other

Structure and Infrastructure Projects

- Acquisition
- UHI Albedo Enhancement
- Elevation
 - Structure
 - Utilities
 - Other
- Flood Control/Management
 - Culvert
 - Bridge Expansion
 - Detention Basin
 - Dams
 - Drainage Improvements
 - Green Roofs
 - Jetties
 - Levees
 - Permeable Paving
 - Rain Gardens
 - Revetments
 - Seawalls
 - Other
- Forest or Vegetation Management
- Natural Systems
 - Beach Nourishment
 - Dune Rehabilitation/Protection
 - Ground Water Recharge
 - Sediment Trapping Vegetation
 - Wetlands Restoration
 - Other
- Retrofit
 - Structural
 - Non-Structural
 - Other
- Safe Room Construction
- Soil Stabilization or Erosion Control
 - Sloping/Grading
 - Vegetation
 - Terracing
 - Rip Rap
 - Geotextile Fabric
- Underground Utilities
- Other

Local Plans and Regulations

- Open Space Preservation
- Zoning
- Building Codes
- Considering risk reduction across departments
 - Comprehensive Plans
 - Master Plans



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Community Identified Program

- Funding Mechanisms (e.g. stormwater utility)
- Incentives for Local Risk Reduction
- Stream Maintenance Program

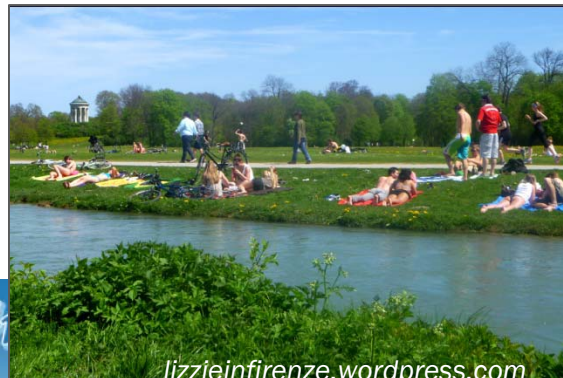


NM Energy, Minerals and Natural Resources Dept



Structure and Infrastructure Projects

- Acquisition and Elevation
- Soil Stabilization and Erosion Control
- Retrofitting
- Vegetation Management



FEMA Funding Opportunities

- Hazard Mitigation Assistance includes both post-disaster and pre-disaster grants



HMGP is a post-disaster grant program.

PDM, FMA, RFC and SRL are available annually, subject to Congressional appropriations.



- Mitigation Plan Requirement
- Local/State Cost Share
- States Manage Programs and Set Funding Priorities
- State Hazard Mitigation Officer (SHMO) is contact



Mitigation Grants/Programs: OFAs



US Army Corps
of Engineers®





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Interactive Session B

- Discuss Mitigation Action Opportunities and Introduce the Mitigation Action Form

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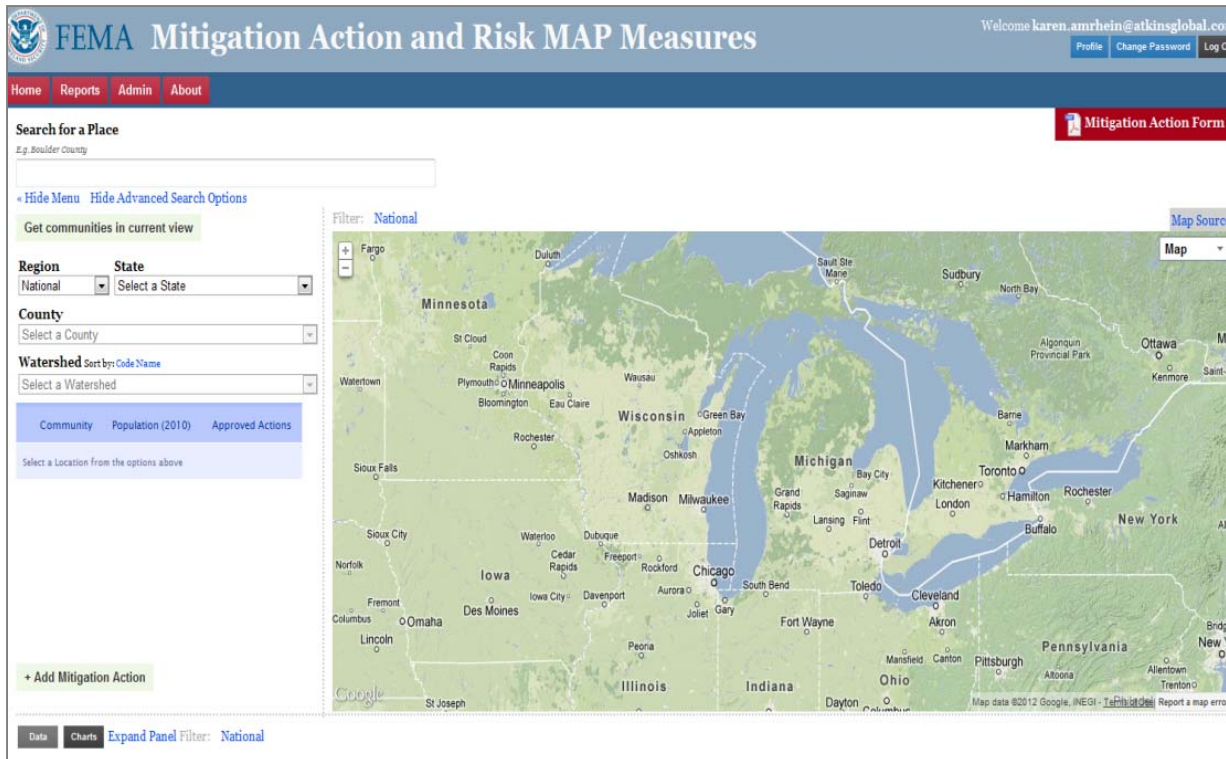
Meet the Action Form



Mitigation Action Form

Contact Information	6. Hazard Type? <input type="checkbox"/> Flood <input type="checkbox"/> Erosion <input type="checkbox"/> Storm Sur <input type="checkbox"/> Landslide <input type="checkbox"/> Lighting <input type="checkbox"/> Seve <input type="checkbox"/> Wind <input type="checkbox"/> Multiple Hazards <input type="checkbox"/>	9. Who is the Responsible Agency? <input type="checkbox"/> Building Code Department <input type="checkbox"/> Planning Other _____ <input type="checkbox"/> Community Development <input type="checkbox"/> Public Works <input type="checkbox"/> Emergency Management <input type="checkbox"/> State DOT	
Please enter the primary contact a 1. Full Name: _____ 2. Title and Organization : _____ 3. Jurisdiction Name(s) : _____			10. What is the expected/potential funding source? <input type="checkbox"/> Community <input type="checkbox"/> FEMA <input type="checkbox"/> Private Sector, including Foundations <input type="checkbox"/> Other Federal Agency <input type="checkbox"/> Regional Water Management District <input type="checkbox"/> Property Owner <input type="checkbox"/> County <input type="checkbox"/> Other _____ <input type="checkbox"/> State
Mitigation Action Informatio			
4. Mitigation Activity Name _____ 5. Describe the natural hazard and mitig _____ _____ _____	8. How was this action/strategy identi <input type="checkbox"/> Risk Map Process <input type="checkbox"/> Comprehensive Land Use Plan <input type="checkbox"/> Capital Improvement Plan	11. What is the commitment for this action? <input type="checkbox"/> new <input type="checkbox"/> strengthen existing <input type="checkbox"/> maintain existing	
	9. Who is the Responsible Agency? <input type="checkbox"/> Building Code Department <input type="checkbox"/> Community Development <input type="checkbox"/> Emergency Management	12. What is the status of this action? <input type="checkbox"/> identified <input type="checkbox"/> scoped <input type="checkbox"/> in progress <input type="checkbox"/> complete	

Action Tracker



- New mitigation tool
- Houses community-identified mitigation actions
- Actions can be edited by community officials
- A tool for communities to support future mitigation planning efforts

We will input your community's action into the Action Tracker and send you a report and a link - <http://fema.starr-team.com>



Next Steps

- **Communities:**
 - Provide data and Mitigation Action Forms to STARR with a target date of September 14, 2012

- **STARR/FEMA will:**
 - Assess data and information provided
 - Email summary of today's Discovery Meeting to you within one month
 - Prepare final Discovery Maps and Discovery Report
 - Follow-up regarding Risk MAP Project





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Questions?

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Optional Interactive Stations

- **Draft Transect Map Station**
 - View draft transect locations and oblique imagery in data viewer
 - Discuss draft transect locations with technical staff
- **Mitigation Resources, Strategies, and Actions Station**
 - Talk with FEMA and State representatives about areas of concern and potential mitigation actions to help reduce risk
 - Fill out Mitigation Action Form



Contact

- FEMA Region V
 - Ken Hinterlong @ ken.hinterlong@fema.dhs.gov
 - Lee Traeger @ Lee.traeger@fema.dhs.gov
- Michigan Partners
 - Les Thomas@ Thomasl@michigan.gov
- STARR
 - Brian Caufield (technical) @ caufieldac@cdmsmith.com
 - Jaspreet Randhawa (outreach) @ randhawajg@cdmsmith.com
- Online
 - info@greatlakescoast.org



ATTACHMENT G
COASTAL DATA REQUEST FORM COMPILATION

Lake Michigan Coastal Data Request Form Compilation
Risk Assessment and Flood Mitigation Information
 *Please refer to sample Coastal Data Request Form found in Attachment A

CONTACT INFORMATION					RISK ASSESSMENT		FLOOD MITIGATION INFORMATION										
Community, County or State Organization	County	State	Contact Name	Contact Title	Does your community have HAZUS-based loss estimates from average annualized loss?	Does your community have other risk assessment data?	Does your community have a hazard mitigation plan?	Does the plan reflect any coastal flood hazards?	Does the hazard mitigation plan indicate any data deficiencies for flood hazards that could be addressed through a flood study, especially near coastal zones?	Does your community have on-going mitigation projects, such as acquisition, elevation, flood control, soil stabilization, natural systems restoration, floodproofing, etc.	Any specific coastal mitigation projects?	Does your community have experience with coastal flood disasters and flood disaster recovery?	Does your community coordinate floodplain management programs with programs for the management and planning of open space? If possible, any coastal specific?	Have you had any prior proactive mitigation actions and planning efforts that resulted in reduced losses? If possible, any coastal specific?	Has your community applied and granted Individual Assistance/Public Assistance grants for declared disasters?	Has your community applied for FEMA Hazard Mitigation Grants program or other mitigation funds (USACE, NRCS, USGS, state Hazard Mitigation officer, etc.) in the past?	How would you rank the community's ability to implement mitigation actions and to communicate flood risk to citizens?
Hudson Township	Mackinac	MI	Allyn Garavaglia	Supervisor	No	No	No	No	No	No	No	No	No	No	No	No	Low

Lake Michigan Coastal Data Request Form Compilation

Other Data and Historical Flood Data

***Please refer to sample Coastal Data Request Form found in Attachment A**

CONTACT INFORMATION					OTHER DATA					HISTORICAL FLOOD DATA
Community, County or State Organization	County	State	Contact Name	Contact Title	Hydraulic Structures (i.e. bridges, culverts, levees, dams) with inspection status, if available	Elevated roads	Critical Facilities	Other known hazards with geographical boundaries, i.e., landslide hazard areas, storm surge inundation zones, wildfire hazard areas, etc.	Other relevant data	Are you aware of any coastal flooding issues not represented on effective FIRMs:
Hudson Township	Mackinac	MI	Allyn Garavaglia	Supervisor						No

Lake Michigan Coastal Data Request Form Compilation

Basemap Data and Coastal Data

***Please refer to sample Coastal Data Request Form found in Attachment A**

CONTACT INFORMATION					BASE MAP DATA	COASTAL DATA							
Community, County or State Organization	County	State	Contact Name	Contact Title	Topography	Property Information (Building Footprints, Parcel Data, Tax Assessor's Data)	Coastal Structure Inventory (Seawalls, Jetties, etc)	Coastal Feature Inventory (dunes, bluffs, etc)	Shoreline Change Data	Locations of beach nourishment or dune restoration projects	Areas of significant beach or dune erosion	Mean high water	Mean lake level
Hudson Township	Mackinac	MI	Allyn Garavaglia	Supervisor									

Lake Michigan Coastal Data Request Form Compilation
Community Plans and Projects and Other GIS Data
 *Please refer to sample Coastal Data Request Form found in Attachment A

CONTACT INFORMATION				COMMUNITY PLANS AND PROJECTS							GIS DATA
Community, County or State Organization	County	Contact Name	Contact Title	Does your community have a comprehensive plan? If so, was your hazard mitigation plan coordinated with the comprehensive plan?	Does your community's comprehensive plan have a special consideration for coastal areas?	Does your community have a coastal zone management plan?	Does your community have planning staff or a planning/zoning commission and other measures, such as ordinances, administrative plans, or other programs contributing to effective administration of floodplain zoning, building codes, open space preservation, and coastal zone management? If so, explain the role in floodplain management and provide examples of programs in place.	Does your community have areas of recent or planned development/re-development and areas of high growth or other natural land changes (e.g., wildfires or landslides)?	Are there any locations of other ongoing studies or projects and studied areas that have been modified since the effective map and require an updated study (e.g., highway improvement, seawall improvement, etc.)	Any other comments/concerns based on local knowledge:	Other GIS Data Available - include type of data, date of data, data sources, etc if available
Hudson Township	Mackinac	Allyn Garavaglia	Supervisor	No	No	No	No	No	No	Would like to know of any areas in Hudson that may fall in the floodplain. Want to protect our citizens from any issues we should be aware of.	