

Coastal Scoping Report – (Draft)

Great Lakes Coastal Flood Study

Lake Huron

Iosco County and Arenac County, Michigan

Individual Coastal Scoping Report

Report Number 01

April 2014



FEMA

U.S. Department of Homeland Security
Federal Emergency Management Agency Region V
536 South Clark Street, 6th Floor
Chicago, Illinois 60605

SUBMITTED BY:



6110 Frost Place
Laurel MD, 20707-2927

Date Submitted: April 2014

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 data sets, 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 data sets or FISs and FIRMs.

Iosco County*	Arenac County*
East Tawas, City of	Au Gres, City of
Tawas City, City of	Arenac, Township of
Alabaster, Township of	Au Gres, Township of
Au Sable, Township of	Sims, Township of
Baldwin, Township of	Standish, Township of
Oscoda, Township of	Whitney, Township of
Tawas, Township of	
Wilber, Township of	

*In Michigan, only those jurisdictions known to be responsible for administering floodplain ordinances and potentially affected by the upcoming Lake Huron coastal flood study were included in this Coastal Scoping process. However, all coastal communities are encouraged to participate in the future Lake Huron coastal flood study process and may request to be included in future correspondence regarding the Lake Huron coastal flood study.

Table of Contents

Acronyms and Abbreviations.....	vi
I. Coastal Scoping Overview	1
i. Great Lakes Coastal Flood Study	1
ii. Purpose of Great Lakes Coastal Scoping.....	2
iii. Coastal Flood Risk Products.....	3
II. Stakeholder Communication and Coordination	5
i. Lake Huron Coastal Scoping Stakeholder Coordination.....	5
III. Coastal Scoping Meeting.....	6
IV. Summary of Data Analysis.....	9
i. Data that can be used for future Coastal Flood Risk Products	11
I.IV.i.1 Average Annualized Loss Data.....	11
I.IV.i.2 Coastal Recession.....	12
I.IV.i.3 Federal Land.....	13
I.IV.i.4 Jurisdictional Boundaries	13
I.IV.i.5 Local Data	13
I.IV.i.6 Publicly Owned Land.....	14
I.IV.i.7 Shoreline Information.....	14
I.IV.i.8 Stream Lines/Hydrograph	15
I.IV.i.9 Topography, Bathymetry, and Oblique Imagery.....	16
I.IV.i.10 Transportation	17
I.IV.i.11 Watershed Boundaries.....	17
ii. Other Data and Information.....	18
I.IV.ii.1 Coastal Barrier Resources Systems	18
I.IV.ii.2 Coastal Flood Protection Measures	18
I.IV.ii.3 Community Assisted Visits	20
I.IV.ii.4 Community Rating System	21
I.IV.ii.5 Coordinated Needs Management Strategy and NFIP Mapping Needs	21
I.IV.ii.6 Critically Eroded Beaches and Beach Nourishment/Dune Replacement Projects.....	22
I.IV.ii.7 Dams.....	23
I.IV.ii.8 Declared Disasters	23
I.IV.ii.9 Flood Insurance Policies	24

I.IV.ii.10	Gage Data	25
I.IV.ii.11	Historical Flooding and High Water Marks	27
I.IV.ii.12	Letters of Map Change	27
I.IV.ii.13	Ordinance Level.....	28
I.IV.ii.14	Proposed Draft Transects.....	29
I.IV.ii.15	Regulatory Mapping	30
I.IV.ii.16	Repetitive Loss	31
I.IV.ii.17	State-level Data sets, Programs, and Information.....	32
V.	Risk MAP Projects and Needs	32
i.	Future Coastal Study.....	32
ii.	Potential for Mitigation Assistance.....	32
iii.	Compliance	33
iv.	Communication.....	34
v.	Unmet Needs.....	34
VI.	Close	35
VII.	References	35
VIII.	Attachments.....	35

Table of Contents - continued

List of Tables

Table 1. Data Collected for Iosco and Arenac Counties.....	10
Table 2. Hazus AAL Data for Iosco and Arenac Counties.....	12
Table 3. Summary of Shoreline Types.....	15
Table 4. Summary of Shoreline by Land Use.....	15
Table 5. Summary of Shoreline Coverage.....	15
Table 6. Summary of Shoreline Vegetation Types.....	15
Table 7. USACE Coastal Structure Inventory.....	20
Table 8. Summary of Community Assisted Visits in Iosco and Arenac Counties.....	21
Table 9. CNMS Status for Iosco and Arenac Counties.....	22
Table 10. Declared Disasters in Iosco and Arenac Counties.....	23
Table 11. Summary of Flood Insurance Policies and Claims for Iosco and Arenac Counties.....	24
Table 12. NOAA Meteorological Stations on Lake Huron near Iosco and Arenac Counties.....	25
Table 13. Summary of LOMC cases in Iosco and Arenac Counties.....	28
Table 14. Program Status and Ordinance Level.....	28
Table 15. Effective Mapping Status.....	30
Table 16. Repetitive Loss.....	31

List of Figures

Figure 1: Sample Proposed Draft Transect Panel.....	8
Figure 2: USACE Historic Great Lakes Water Level Data (1918 to 2012).....	27

Attachments

- Attachment A. Coastal Data Request Form (sample)
- Attachment B. Iosco and Arenac Counties Pre-Meeting Correspondence
- Attachment C. Draft Coastal Scoping Maps
- Attachment D. Proposed Draft Transect Figures
- Attachment E. Stakeholder Comments from Coastal Scoping Meeting
- Attachment F. Iosco and Arenac Counties Coastal Scoping Meeting Documents
- Attachment G. Coastal Data Request Form Compilation

Acronyms and Abbreviations

AAL	Average Annualized Loss
ASFPM	Association of State Floodplain Managers
BEF	Base Flood Elevations
CAC	Community Assisted Contact
CAV	Community Assistance Visit
CBRS	Coastal Barrier Resources System
CHL	Coastal and Hydraulics Laboratory
CID	Community Identification Number
CIS	Community Information System
C-MAN	Coastal Marine Automated Network
CNMS	Coordinated Needs Management Strategy
CO-OPS	Center for Operational Oceanographic Products and Services
CRS	Community Rating System
CSLF	Changes Since Last FIRM
DEM	Digital Elevation Model
DNR	Department of Natural Resources
DTM	Digital Terrain Model
ECID	Enterprise Coastal Inventory Database
ERDC	Engineer Research and Development Center
ESRI	Environmental Systems Research Institute
FEMA	Federal Emergency Management Agency
FIPS	Federal Information Processing Standards
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
GIS	Geographic Information System
GLCFS	Great Lakes Coastal Flood Study
Hazus-MH	Multi-Hazard Risk Assessment and Loss Estimation Software Program
HUC8	Hydrologic Unit Code 8
HWM	High Water Mark
LiDAR	Light Detection and Ranging
LiMWA	Limit of Moderate Wave Action
LOMA	Letter of Map Amendment
LOMC	Letter of Map Change
LOMR	Letter of Map Revision
LOMR-F	Letter of Map Revision based on Fill

MIP	Mapping Information Platform
MLI	Midterm Levee Inventory
MNUSS	Mapping Needs Update Support System
MPTA	Mitigation Planning Technical Assistance
MSC	Map Service Center
NDBC	National Data Buoy Center
NFIP	National Flood Insurance Program
NID	National Inventory of Dams
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
Risk MAP	Risk Mapping, Assessment, and Planning
RL	Repetitive Loss
RLTG	Repetitive Loss Target Group
RMSE	Root-Mean-Square-Error
SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
STARR	Strategic Alliance for Risk Reduction
TIGER	Topologically Integrated Encoding and Referencing
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

I. Coastal Scoping 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 Coastal Scoping 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 Coastal Scoping Map(s) and a Coastal Scoping Report that summarize and display the Coastal Scoping findings



The Coastal Scoping process involves coordination with Great Lakes stakeholders, data collection and analysis, community interviews, a Coastal Scoping 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 Coastal Scoping

The Great Lakes Coastal Scoping 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, discuss local priorities and data, discuss coastal issues, and move towards a project that will successfully identify the risks associated with Great Lakes flooding.

This Coastal Scoping Report discusses the communities potentially affected by coastal flooding in Iosco and Arenac Counties, Michigan. This Coastal Scoping process helped FEMA to better identify the types of data sets 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 Flood Insurance Studies (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 future congressional funding, but also on the type of data sets, local and national, that are available.

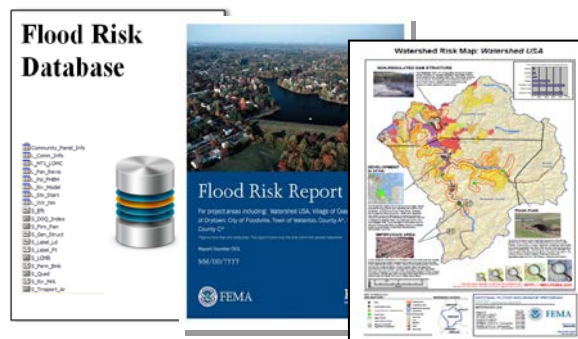
The following section describes the coastal flood risk products that a community may receive, as well as some products that are under development for the Great Lakes study areas.

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

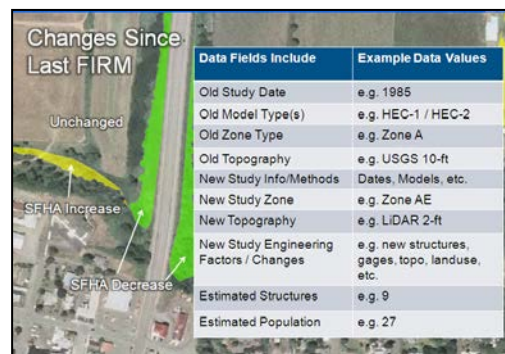


These products will summarize information captured in flood risk data sets that may be generated during a Risk MAP, or flood risk, study. The flood risk data sets could include regular and enhanced products. Standard flood risk data sets, also termed products, are listed below.

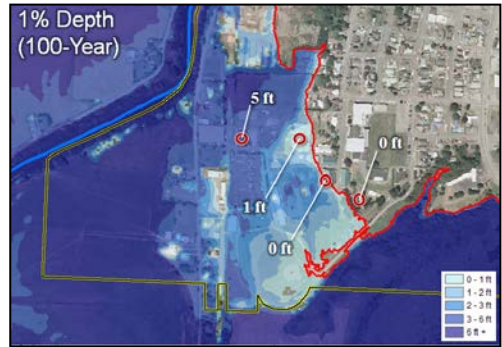
- **Changes Since Last FIRM (CSLF)**

The CSLFs serve the following purposes:

- Identify Areas and Types of Flood Zone Change:
 - Compares current effective (previous) with proposed (new) flood hazard mapping.
 - Flood zone changes are categorized and quantified.



- Provide Study/Reach Level Rationale for Changes, Including:
 - Methodology and assumptions.
 - 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 (Hazus-MH)**
 - Hazus-MH combines science, engineering and mathematical modeling with geographic information systems (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, hurricanes, winds, and floods.
 - Coastal flood risk assessments will be similar to riverine, but will use coastal depth grids as input for refined analysis.
 - Hazus-MH analysis and data can support adoption of high regulatory standards for structures in high loss areas.
 - Hazus-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 Hazus 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 data sets that have recently been collected or will be collected as part of the GLCFS:

- Storm Response Erosion Data: Data set is expected to contain the results from erosion analysis in response to the 1-percent-annual chance flood event.
- Shoreline Feature Data: Data set was developed by USACE in 2012 and contains primary and secondary land use tables, as well as coastline type, materials, and vegetation. The current data set contains data at 1-mile spacing. The data set 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 data sets 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 Coastal Scoping 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 Huron Coastal Scoping Stakeholder Coordination

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

To kick-off this Coastal Scoping process, FEMA formed a group of core stakeholders, which included representatives from FEMA Region V, STARR (mapping partner to FEMA), USACE, National Oceanic and Atmospheric Administration (NOAA), ASFPM, the State NFIP Coordinator, the State Hazard Mitigation Officer (SHMO), and state engineers. The core stakeholders reviewed the Coastal Scoping plan, objectives, and key outcomes for Lake Huron Coastal Scoping with FEMA, provided suggestions for outreach and communication, and raised any concerns as it related to Lake Huron and the coastal flood study process. Following this kick-off process, outreach, communication, and coordination with local stakeholders was initiated.

Coastal Scoping Meeting letter invitations were sent to local community and county stakeholders within the Iosco and Arenac Counties portions of the Lake Huron 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, Great Lakes associations, and technical stakeholders. Representatives from the local governments, including counties, cities, and townships 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 Coastal Scoping 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:

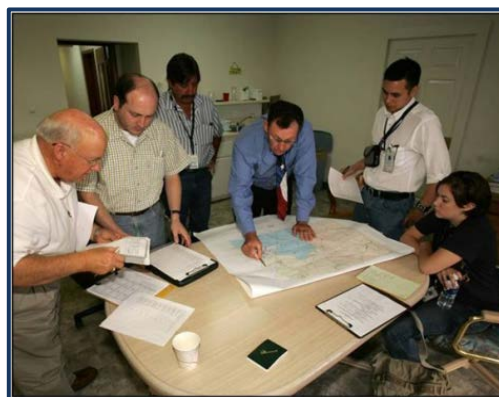
- Base Map Data
- Coastal Data
- Historic Flood Data
- Risk Assessment
- Other comments/concerns based on local knowledge

A summary of the responses to the Coastal Data Request Form can be found in Section IV, Summary of Data Analysis, of this report.

The core stakeholder documents, stakeholder contact list, and Coastal Scoping Meeting invitations can be found in Attachment B, Iosco and Arenac Counties Pre-Meeting Correspondence.

III. Coastal Scoping Meeting

The Coastal Scoping Meeting for Iosco and Arenac Counties will be held on May 6, 2014 in East Tawas, MI. Communities and stakeholders affected by coastal flooding in Iosco and Arenac Counties were invited to the Coastal Scoping Meeting. The purpose of this meeting was to facilitate discussion about study needs, desired compliance support, and local flood risk awareness efforts.



The objectives of the Coastal Scoping 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 data sets
- NFIP regulatory updates
- Coastal Scoping schedule and deliverables

The Coastal Scoping Meeting presentations included the following information:

- An overview of the GLCFS and schedule
- Review of the Coastal Scoping 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
- Encouragement and facilitated discussion regarding coastal study needs, desired compliance support, and local flood risk awareness efforts

Draft Coastal Scoping Maps for Iosco and Arenac Counties (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 Coastal Scoping 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
- U.S. Geological Survey (USGS) Gages
- Watershed Boundaries

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.

Tabular Data:

- Declared Disasters
- Flood Insurance Data
- Summary of Shoreline Data (Type and Coverage)

Participants at the Coastal Scoping Meeting were asked to cooperatively identify areas of flooding concern using the draft Coastal Scoping Maps and through general discussion during the meeting.

In addition to the draft Coastal Scoping Maps, figures showing the location of initially proposed draft transects around Iosco and Arenac Counties were available for review and comment immediately following the meetings. 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 Coastal Scoping Meeting for Iosco and Arenac Counties can be found in Attachment D. A sample map is shown as Figure 1:



Figure 1: Sample Proposed Draft Transect Panel

All comments that will be provided by stakeholders at the upcoming Iosco and Arenac Counties Coastal Scoping Meeting will be assessed and compiled into geospatial layers and associated tables. The GIS layers will be titled “Stakeholder General Comments” and

“Stakeholder Transect Comments”. These will be shown on the Final Coastal Scoping Map in Appendix R of the basin-wide Lake Huron Coastal Scoping Report (Federal Emergency Management Agency, 2014). Each comment collected for Iosco and Arenac Counties will be shown in Attachment E, Stakeholder Comments from Coastal Scoping Meeting, of this report. Each comment will have a unique map identification number (if one exists) that correlates to its location on the Final Coastal Scoping Map. The identification of a comment (ID) categorized as a “Stakeholder General Comment” will be represented by using the first three letters of the county name followed by a unique number (i.e. ARE – 1, ARE – 2). The identification of a comment (ID) categorized as a “Stakeholder Transect Comment” will be represented by using the first three letters of the county name, followed by “TR”, followed by a unique number (i.e. ARE-TR-1, ARE-TR-2).

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

Coastal Scoping meeting minutes, sign in sheets, PowerPoint presentation, marked up draft Coastal Scoping Maps, and correspondence documentation have been included in Attachment F, Iosco and Arenac Coastal Scoping Meeting Documents.

IV. Summary of Data Analysis

During this Coastal Scoping portion of the Lake Huron 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, the Coastal Scoping Meeting, and the Coastal Scoping Coastal Data Request Forms sent to each coastal community. This section lists the types of data and their sources that were collected for the Iosco and Arenac Counties study area, including information collected during and after the Coastal Scoping 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 Iosco and Arenac Counties Lake Huron Project Area prior to moving forward with the coastal flood study.

Table 1. Data Collected for Iosco and Arenac Counties

Data Types	Deliverable/ Product	Source	Date of Data Collection	Level
AAL	Coastal Scoping Map	FEMA		Nationwide
Bathymetry and Topography	Coastal Scoping Report	USACE		Lakewide
CBRS	Coastal Scoping Map	U.S. Fish and Wildlife Service		Nationwide
Census Blocks	Coastal Scoping Map	U.S. Census Bureau		Countywide
CNMS	Coastal Scoping Map	FEMA		Countywide
Coastal Data Request Form	Coastal Scoping Report	Community and County Stakeholders		Countywide
Contacts	Coastal Scoping Report	Local Community Websites, State/FEMA updates		Countywide
Community Assistance Visits (CAVs)	Coastal Scoping Report	FEMA Community Information System (CIS)		Countywide
Community Rating System (CRS)	Coastal Scoping Report	FEMA's "CRS Communities and Their Classes"		Nationwide
Coastal Structures	Coastal Scoping Map/Tabular Data	USACE		Nationwide
Critically Eroded Beach Areas	Coastal Scoping Report	Local Stakeholders		Statewide
Dams	Coastal Scoping Map	USACE, National Inventory of Dams, FIRM Database		Countywide
Declared Disasters	Coastal Scoping Report	FEMA's "Disaster Declarations Summary"		Nationwide
Demographics, Industry	Coastal Scoping Report	U.S. Census Bureau		Countywide
Effective Floodplains	Coastal Scoping Map	FEMA Map Service Center and Mapping Information Platform		Countywide
Flood Insurance Policies	Coastal Scoping Report	FEMA CIS		Nationwide
High Water Marks	Coastal Scoping Report	Effective FIS		Countywide
Historical Flooding	Coastal Scoping Report	Effective FIS		Countywide
Historical Storm Events	Coastal Scoping Report	Effective FIS		Countywide
Local Data	Coastal Scoping Report	Coastal Data Request Form completed by communities		Countywide

Table 1. Data Collected for Iosco and Arenac Counties

Data Types	Deliverable/ Product	Source	Date of Data Collection	Level
LOMCs	Coastal Scoping Map	FEMA’s Mapping Information Platform		Countywide
Meteorological Gages	Coastal Scoping Report	NOAA Great Lakes Environmental Research Laboratory		Regionwide
Oblique Imagery	Coastal Scoping Report	USACE		Lakewide
Ordinance Level	Coastal Scoping Report	FEMA CIS		Countywide
Proposed Draft Transects	Coastal Scoping Map	FEMA		Lakewide
Repetitive Loss	Coastal Scoping Report	FEMA CIS		Countywide
Shoreline Classification	Coastal Scoping Map	USACE		Regionwide
Stream Gages	Coastal Scoping Map	USGS		Countywide
Water Level Gages	Coastal Scoping Report	NOAA Department of Fisheries and Oceans		Regionwide
Wave Gages	Coastal Scoping Report	NOAA		Regionwide

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

During the Coastal Scoping 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 GIS websites can provide some of the pertinent data, but local knowledge of flooding 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 Data

AAL data provides a general understanding of the dollar losses associated with a certain frequency of flood events within a county and are 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-MH, a free risk assessment software application from FEMA, is the most widely used flood risk assessment tool available. Hazus-MH can run different scenario floods (riverine and coastal) to determine how much damage might occur as a result. Hazus-MH 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 data sets that can be supplemented with local data. If local detailed data sets are available, users may consider using these 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 data sets. 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 Coastal Scoping Maps (Attachment C).

Table 2. Hazus AAL Data for Iosco and Arenac Counties

FIPS Code	County	Total Losses for Building and Content (in thousands of \$)
26069	Iosco	\$8,159
26011	Arenac	\$2,490

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 Huron. 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.

**This section will be completed after the Coastal Scoping Meeting*

I.IV.i.3 Federal Land

Federal lands data were obtained from the National Atlas at <http://nationalatlas.gov/mla/fedlanp.html>. These data are also available from the National Coastal Scoping 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.

No federal lands were found in Arenac County; however, a large area of the Lake Huron National Forest can be found in the Iosco County Project Area. The Wurtsmith Air Force Base is also located within the Iosco County project area. The Air Force base was decommissioned in 1993.

I.IV.i.4 Jurisdictional Boundaries

Iosco and Arenac Counties' jurisdictional boundaries were obtained from the Michigan Department of Technology, Management & Budget, dated June 1, 2013.

Jurisdictional boundaries can also be obtained from a derived set of Topologically Integrated Encoding and Referencing (TIGER) line files available through the U.S. Census Bureau geography division. To find out more about TIGER line files and other Census TIGER database derived data sets visit <http://www.census.gov/geo/www/tiger>.

Municipal boundaries used for Iosco County's effective Flood Insurance Rate Maps and Arenac's County-wide Preliminary Flood Insurance Rate Maps can be located at FEMA's Map Service Center website: <https://msc.fema.gov>. A fee is charged in order to download this data.

I.IV.i.5 Local Data

As part of this Coastal Scoping 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, and risk assessment information.

**Information on what each community provided to the Coastal Scoping project will be completed in this section after the Coastal Scoping Meeting*

The data sets noted above may not all be provided or collected as part of this Coastal Scoping process. Those that will be provided shall be included on FEMA's Mapping

Information Platform (MIP) Coastal Scoping Data Repository at J:\FEMA\COASTAL SCOPING_DATA_REPOSITORY\R05_DATA\ and can be accessed by FEMA authorized users. The MIP can be accessed from <https://hazards.fema.gov/>.

I.IV.i.6 Publicly Owned Land

Publicly Owned Land is found in the Iosco and Arenac study areas. Tawas Point State Park and state forests in the northeast and southeast portions of the county can be found in Iosco County. State forests were also found in the northeastern portion of Arenac County. More information about publicly owned lands can be found on Michigan's Department of Natural Resource's Website at: http://www.mich.gov/dnr/0,4570,7-153-31154_64433---.00.html.

No statewide geospatial coverage data set for publicly owned lands was identified during this Coastal Scoping process.

I.IV.i.7 Shoreline Information

A shoreline feature data set 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 data set captures shoreline types, land uses, coverage, and vegetation types along the entire Great Lakes shoreline, including Lake Huron. The data set includes identification of "artificial" shoreline, which may be indicative of local coastal flood protection structures. This data set 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 data set contains data at 1-mile spacing. The data set does not include field-based reconnaissance or sediment/subsurface soil collection. The data set can be downloaded from <http://www.greatlakescoast.org/> under the "Technical Resources" section.

From the USACE shoreline feature data set, the approximate shoreline along Iosco and Arenac Counties that is covered by this study totals 108.1 miles. The shoreline classification information for Iosco and Arenac Counties is summarized in Tables 3 through 6, including shoreline types, land uses, coverage, and vegetation types, respectively.

Table 3. 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)
Iosco County	40.1	16.9	0	0	23.2	0
Arenac County	52.0	20.3	0	0	31.7	0

Source: USACE 2012, Lake Michigan Shoreline Classification

Table 4. Summary of Shoreline by Land Use

County	Total Shoreline (mile)	Commercial/Industrial (mile)	Farm Land (mile)	Forested (mile)	High Density Residential (mile)	Low Density Residential (mile)	Moderate Density Residential (mile)	Park Land (mile)
Iosco County	40.1	7.5	0	1.2	3.3	1.9	22.5	3.73
Arenac County	52.0	0.6	0	0	4.9	8.7	19.8	18.0

Source: USACE 2012, Lake Michigan Shoreline Classification

Table 5. 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)
Iosco County	40.1	2.5	3.7	2.0	31.8	0	0
Arenac County	52.0	1.2	36.0	4.2	10.6	0	0

Source: USACE 2012, Lake Michigan Shoreline Classification

Table 6. 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)
Iosco County	40.1	.6	0	29.3	2.6	3.1	4.4
Arenac County	52.0	0	.6	14.2	0	.6	36.7

Source: USACE 2012, Lake Michigan Shoreline Classification

I.IV.i.8 Stream Lines/Hydrography

Stream lines and water areas for Iosco and Arenac Counties were acquired from the Michigan Department of Technology, Management & Budget. These data sets were published on June 1, 2013. Both the stream lines and water areas are digital vector data sets used by GIS. They contain features such as lakes, ponds, streams, and rivers. The data sets are designed to be used in general mapping and in the analysis of surface-water systems. Data can be downloaded from <http://www.mcgi.state.mi.us/mgdl/>.

Hydrography data used for Iosco and Arenac Counties' effective Flood Insurance Rate Maps can be located at FEMA's Map Service Center website: <https://msc.fema.gov>. A fee is charged in order to download these data.

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 Huron 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 are digital models 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 data sets 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 data set. 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 (RMSE) in hilly terrain. Horizontal positions will be accurate to +/- 1.5m (RMSE). Data will be processed to 2ft contours.

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.

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 sometime next month 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 data set 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 Huron shoreline. The oblique imagery is current available via a web-based browser at <http://greatlakes.usace.army.mil/>.

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 World Topo Map service has been used as a basemap layer on the Coastal Scoping Map, and includes a transportation layer. For more information on Environmental Systems Research Institute (ESRI) Map services and how they can be used in GIS, please visit http://goto.arcgisonline.com/maps/World_Topo_Map.

In addition, transportation data for Iosco and Arenac Counties was obtained from the United States Census Bureau 2013 TIGER/Line Shapefiles. These data can be attained on the web at: <http://www.census.gov/geo/maps-data/data/tiger-line.html>.

I.IV.i.11 Watershed Boundaries

USGS Hydrologic Unit Code 8 (HUC8) watershed boundaries were obtained from the National Atlas 2011 “Raw Data Download” (<http://nationalatlas.gov/atlasftp.html>).

Iosco County contains portions of three HUC-8 watersheds: One Lake-Ocqueoc (04070003), Au Sable (04070007), and Au Gres-Rifle (04080101).

Arenac County contains portions of three HUC-8 watersheds: Kawkawlin-Pine (04080102) and Au Gres-Rifle (04080101).

ii. Other Data and Information

Arenac County is located in the northern portion of Michigan's Lower Peninsula. It has a total land area of approximately 370 square miles. Arenac County is approximately 110 miles north of Detroit. It is bordered by Iosco County and Ogemaw County on the north, Gladwin County on the west, Bay County on the south, and Lake Huron on the east. Arenac County had a population of 15,899 (U.S. Census Bureau, 2010). Three (3) cities are located in Arenac County. These cities are Omer, Standish, and Au Gres. The only city that is within the Coastal Scoping project area is Au Gres, which has a population of 889 (2010). The county seat of Arenac County is Standish.

Iosco County is also located in the northern portion of Michigan's Lower Peninsula. It has a total land area of approximately 550 square miles. Iosco County borders Alcona County on the north, Ogemaw County on the west, Arenac County on the south, and Lake Huron on the east. The county had a population of 25,887 according to the 2010 Census. Three (3) cities are located Iosco County. These are Tawas City, East Tawas, and Whittemore. The county seat of Iosco County is Tawas City, and it has a population of 1,827 (U.S. Census Bureau, 2010). Both Tawas City and East Tawas are located within the coastal scoping project area. East Tawas has a population of 2,808 (2010).

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. A coastal barrier resource 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.

Iosco County has no designated units of coastal barriers along the Lake Huron shoreline and/or within this study area. Arenac County does have one (1) CBRS area that is located on Charity Island. Charity Island is a part of Whitney Township.

I.IV.ii.2 Coastal Flood Protection Measures

Any coastal structures found Iosco and Arenac Counties during the Coastal Scoping process will be reviewed in more detail during the engineering analysis portion of the Lake

Huron study and were not analyzed as part of this Coastal Scoping 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 Coastal Scoping process, the November 2011 MLI Status Report published by FEMA was reviewed. The MLI Levee database shows no levee segments Iosco or Arenac County study areas that provide protection from the 1- percent-annual-chance flood; however, as discussed below, other flood protection measures do exist.

According to the Federal Emergency Management Agency's (2013) Preliminary Flood Insurance Study of Arenac County, both Standish and Sims Township have coastal structures to protect from flooding. These structures include revetment, vertical concrete, and sheetpile seawalls. Despite these protection measures, it has been determined that none of the structures would protect against a 1-percent-annual-chance flood. Whitney Township also has coastal structures along the shoreline to prevent erosion. Most of these structures were set up by local property owners. These structures include groins, bulkheads, and riprap. (Federal Emergency Management Agency, 2013).

Flood protection measures from coastal flooding have been put in place in many parts of Iosco County. The City of East Tawas is lined with either rock or concrete to protect erosion, and some breakwaters and seawalls have been found in the city (Federal Emergency Management Agency, 2012). Tawas City and Baldwin Township also have structures in place to protect from coastal flooding. It was found that none of the structures in the county could protect from a 1-percent-annual-chance flood. (Federal Emergency Management Agency, 2012).

The USACE Coastal and Hydraulics Laboratory (CHL), a member of the Engineer Research and 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.erd.c.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, bridges, and other structures or infrastructure. These structures include seawalls, bulkheads, revetments, dikes and levees, breakwaters, groins, sills/perched beaches, and jetties and piers.

The USACE coastal structures along Lake Huron found within Iosco and Arenac Counties are compiled in Table 7. It is important to note that these coastal structures do not necessarily protect areas from the 1-percent-annual-chance flood event. Many of these USACE coastal structures were built between 1860 and 1940. Low lake levels since the 1990's have accelerated deterioration of these navigation structures and USACE Detroit District launched an investigation to assess the effects of changes in Lake Michigan water levels on the performance and stability of these structures. An inventory of critical infrastructure protected by federally maintained navigation structures was conducted along with a condition assessment of the structures, including an estimation of the risk associated with structure failure. Structures were rated on the following scale:

- A – Failure Unlikely
- B – Low Risk of Failure
- C – Medium Risk of Failure
- D – High Risk of Failure
- F – Failed

Table 7 also provides the condition assessment for each of the structures listed.

Table 7. USACE Coastal Structure Inventory

State	Location	Coastal Structure	USACE Condition Assessment	Structure Length (feet)
MI	Point Lookout Harbor	East Breakwater	B	3,999
		West Breakwater		3,799
MI	Tawas Bay Harbor	Breakwater	B	1564
MI	Au Sable Harbor	North Jetty	B	1371
		South Jetty		1200

I.IV.ii.3 Community Assisted Visits

Statewide Community Assisted 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 CIS at <https://portal.fema.gov> in March 2014. Table 8 shows the most recent CAV date by community or jurisdiction. Not all communities within the project area were identified as having a CAV; therefore, those communities are not included in the table.

Table 8. Summary of Community Assisted Visits in Iosco and Arenac Counties

County	Community	CAV Date	FIRM Date
Iosco County	East Tawas, City of	4/5/2000	1/6/2012
Iosco County	Tawas City, City of	4/12/2000	1/6/2012
Iosco County	Au Sable, Township of	8/24/2001	1/6/2012
Iosco County	Baldwin, Township of	8/22/2001	1/6/2012
Iosco County	Oscoda, Township of	9/7/2001	1/6/2012
Arenac County	Arenac, Township of	8/31/1999	7/3/1986
Arenac County	Au Gres, Township of	8/31/1999	8/31/1999
Arenac County	Standish Township of	4/11/2001	4/2/1993

CAV = Community Assisted Visit

I.IV.ii.4 Community Rating System

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 March 2014.

No coastal communities in Iosco or Arenac Counties participate in the CRS program.

I.IV.ii.5 Coordinated Needs Management Strategy 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 September 2013. CNMS only captures riverine studies at this time.

Table 9. CNMS Status for Iosco and Arenac Counties

County	FIPS	Unknown (stream miles)	Unverified (stream miles)	Valid (stream miles)	Total (stream miles)
Iosco	26069	0	5	49	54
Arenac	26011	0	0	230	230

FIPS = Federal Information Processing Standard

I.IV.ii.6 Critically Eroded Beaches and Beach Nourishment/Dune Replacement Projects

Critically eroded beaches and beach nourishment/dune replacement projects were not identified in Iosco or Arenac County at the time this report was issued, although it should be noted that all counties experience shore erosion.

I.IV.ii.7 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 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 at <https://nid.usace.army.mil/>.

At the time this report was compiled, no NIDs were identified in either Iosco or Arenac County.

The Michigan Department of Natural Resources (DNR) may also be consulted when developing future information on dam. Information pertaining to dam management, dam removal, and dam funding can be found at: https://www.michigan.gov/dnr/0,4570,7-153-10364_52259_27415---,00.html.

I.IV.ii.8 Declared Disasters

The FEMA Disaster Declarations Summary is a summarized data set 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 data set 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 data set).

The list of FEMA's disaster declarations is available on the FEMA Website at <http://www.fema.gov/data-feeds> . Table 10 lists the major disaster declarations that have been declared in Iosco and Arenac Counties.

Table 10. Declared Disasters in Iosco and Arenac Counties

Declared County/Area	Disaster Number	Declaration Date	Incident Type	Description
Iosco (County)	363	12/1/1972	Flood	Severe Storms and Flooding
Iosco (County)	371	4/12/1973	Flood	Severe Storms and Flooding
Iosco (County)	744	9/18/1985	Flood	Severe Storms and Flooding
Iosco (County)	3035	3/2/1977	Drought	Drought
Iosco (County)	3057	1/27/1978	Snow	Blizzards and Snowstorms

Table 10. Declared Disasters in Iosco and Arenac Counties

Declared County/Area	Disaster Number	Declaration Date	Incident Type	Description
Iosco (County)	3137	1/27/1999	Snow	MI –Severe Weather 1/2/99
Iosco (County)	3225	9/7/2005	Hurricane	Hurricane Katrina Evacuation
Arenac (County)	363	12/1/1972	Flood	Severe Storms and Flooding
Arenac (County)	371	4/12/1973	Flood	Severe Storms and Flooding
Arenac (County)	774	9/18/1986	Flood	Severe Storms and Flooding
Arenac (County)	1527	6/30/2004	Severe Storm(s)	Severe Storms, Tornadoes, and Flooding
Arenac (County)	3035	3/2/1977	Drought	Drought
Arenac (County)	3057	1/27/1978	Snow	Blizzards and Snowstorms
Arenac (County)	3137	1/27/1999	Snow	MI –Severe Weather 1/2/99
Arenac (County)	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.9 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 Coastal Scoping 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 Iosco and Arenac Counties. The data are based on Community Summary Reports that were extracted from FEMA’s CIS website (<https://portal.fema.gov/famsVuWeb/home>) in March 2014.

Table 11. Summary of Flood Insurance Policies and Claims for Iosco and Arenac Counties

County	Community	CID	No. Policies	Total Premium	Total Coverage	Number of claims since 1978	Dollar (\$) paid for claims since 1978
Iosco	Au Sable, Township of	260098	23	\$14,512	\$3,806,100	2	\$12,885
Iosco	Baldwin, Township of	260099	31	\$22,909	\$4,673,400	6	10,141
Iosco	East Tawas, City of	260100	84	\$42,113	\$7,757,200	11	\$16,882
Iosco	Oscoda, Township of	260101	55	\$32,603	\$8,826,200	11	\$7,977
Iosco	Tawas City, City of	260102	39	\$19,954	3,768,400	5	\$2,076

Table 11. Summary of Flood Insurance Policies and Claims for Iosco and Arenac Counties

County	Community	CID	No. Policies	Total Premium	Total Coverage	Number of claims since 1978	Dollar (\$) paid for claims since 1978
Iosco	Alabaster, Township of	260249	1	\$1,183	\$111,500	1	0
Iosco	Tawas, Township of	261255	0	0	0	0	0
Iosco	Wilber, Township of	260547	0	0	0	0	0
Arenac	Au Gres, City of	260012	38	\$20,187	\$4,640,200	7	\$9,454
Arenac	Au Gres, Township of	260013	39	\$33,047	\$4,470,600	8	\$20,109
Arenac	Sims, Township of	260015	28	\$28,298	\$4,086,700	2	\$3,681
Arenac	Standish, Township of	260017	58	\$47,639	\$5,628,600	27	\$89,752
Arenac	Whitney, Township of	260018	5	\$2,934	\$350,200	4	\$3,161
Arenac	Arenac, Township of	260251	16	\$12,594	\$1,973,600	14	\$31,617

*Community not currently participating in the NFIP
 CID = Community Identification
 Source: FEMA’s CIS Summary Report “Insurance Reports”

I.IV.ii.10 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 Huron’s Iosco and Arenac Counties project areas.

Table 12. NOAA Meteorological Stations on Lake Huron near Iosco and Arenac Counties

County	Station ID	Location	Owner	Data	Years of Historical Data
Iosco	TAWM4	Tawas City, MI	NWS	Meteorological Observation	2010-Present
Arenac	GSLM4	Gravelly Shoals Light, MI	NWS	Meteorological Observation	2005-Present

In addition, the Great Lakes Environmental Research Laboratory is a part of NOAA focused on the Great Lakes. It maintains multiple data sets, including a collection of meteorological data for both the United States and Canada. The data sets 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> (accessed January 2014) provides real-time data for any given stream gage location. No USGS stream gages were found within the Iosco and Arenac Counties study Area.

Water Level Station:

NOAA's Center for Operational Oceanographic Products and Services (CO-OPS) maintains several water level stations along Lake Huron. 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/stations.html#LakeHuron>. The monthly high and low water level data from the year 1918 to 2011 at Lake Huron are available at the USACE Website: <http://www.lre.usace.army.mil/Missions/GreatLakesInformation/GreatLakesWaterLevels/HistoricalData.aspx>

Figure 2 depicts Historic Great Lakes Water Levels from 1918 to 2012 (U.S. Army Corps of Engineers, 2013).

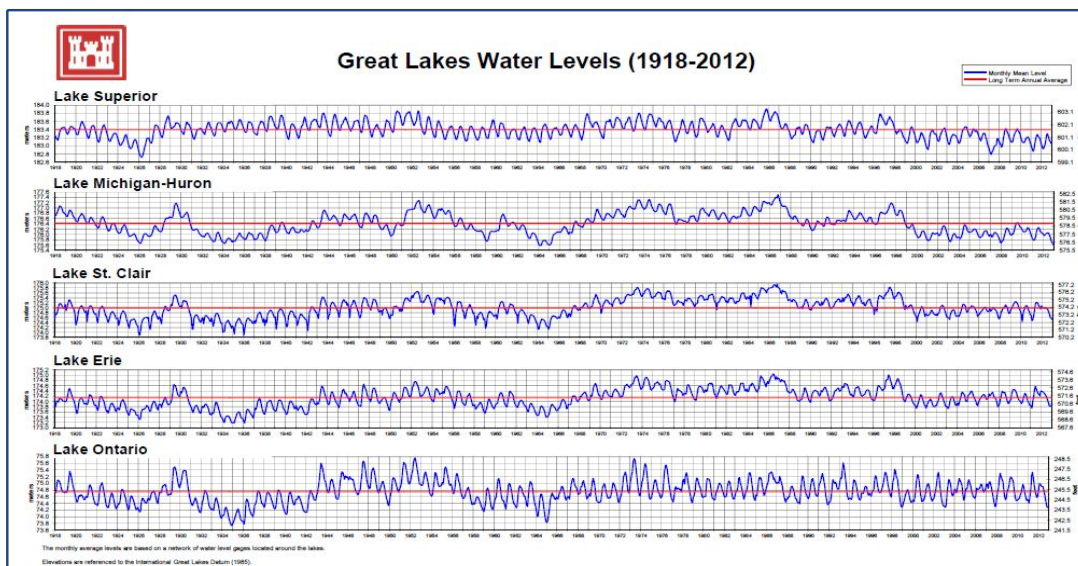


Figure 2: USACE Historic Great Lakes Water Level Data (1918 to 2012)

The Great Lakes Water Levels Report provides daily mean water levels of Lake Huron for the past three months. The data are available at the USACE website:

<http://www.lre.usace.army.mil/Missions/GreatLakesInformation/GreatLakesWaterLevels/CurrentConditions.aspx>.

Wave Gage/Buoy Stations

The NDBC is a part of the NOAA 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.11 Historical Flooding and High Water Marks

As part of this Coastal Scoping process, the latest FISs were reviewed for information on historical flooding and high water mark (HWM) data. Record High waters levels were recorded in the mid-1980s – these water levels resulted in consistent flooding along the Township of Arenac’s Shoreline (Federal Emergency Management Agency, 2013). Record high water levels were also identified in Iosco County in the mid- 1980s. No notable damage from these high water levels was identified in the Iosco County FIS (Federal Emergency Management Agency, 2012).

If local stakeholders have additional available HWM data, historical flooding information, or historic flooding photographs they are encouraged to submit them to FEMA Region V Mitigation Division.

I.IV.ii.12 Letters of Map Change

A 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 March 2014.

Table 13 lists the number of LOMCs per county. No Conditional LOMAs or Conditional LOMR-Fs were included. The LOMCs are shown on the Coastal Scoping Maps. Clusters of LOMCs indicate a need for updated maps.

Table 13. Summary of LOMC cases in Iosco and Arenac Counties

County	Number of Letters of Map Amendments	Number of Letters of Map Revisions – Based on Fill	Number of Letters of Map Revisions – Floodway Removal	Number of Letters of Map Revisions
Iosco	211	8	4	0
Arenac	86	1	1	1

I.IV.ii.13 Ordinance Level

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 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 following table:

<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

Table 14. Program Status and Ordinance Level

County	Community	CID	Program Status	Ordinance Level
Iosco	Au Sable, Township of	260098	Participating	D
Iosco	Baldwin, Township of	260099	Participating	D
Iosco	East Tawas, City of	260100	Participating	D
Iosco	Oscoda, Township of	260101	Participating	D
Iosco	Tawas City, City of	260102	Participating	D

County	Community	CID	Program Status	Ordinance Level
Iosco	Alabaster, Township of	260249	Participating	C
Iosco	Tawas, Township of	261255	Not Participating	N/A
Iosco	Wilber, Township of	260547	Not Participating	N/A
Arenac	Au Gres, City of	260012	Participating	Pending*
Arenac	Au Gres, Township of	260013	Participating	Pending*
Arenac	Sims, Township of	260015	Participating	Pending*
Arenac	Standish, Township of	260017	Participating	Pending*
Arenac	Whitney, Township of	260018	Participating	Pending*
Arenac	Arenac, Township of	260251	Participating	Pending*

CID = community identification

*Ordinance Levels for Arenac Communities will be determined once new county wide maps for Arenac County are complete.

I.IV.ii.14 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 Huron shoreline.

The originally proposed draft transect layout is shown on the draft Coastal Scoping Map for Iosco and Arenac Counties (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 Coastal Scoping Meeting. Input from local officials is encouraged regarding the placement and the number of transects. The detailed comments collected will be found in Attachment E, Stakeholder Comments from Coastal Scoping Meeting. The ID numbers in this table will correspond to the location of the comment, which will be shown on the Final Coastal Scoping Maps in Appendix R of the basin-wide Lake Huron Coastal Scoping Report.

Below will be a summary of the comments received during the Coastal Scoping Meeting and their impact on revisions to the proposed draft transects along the Lake Huron

shoreline in Iosco and Arenac Counties When the Coastal Scoping Report will be finalized:

- Iosco County:
- Arenac County:

All comments will be reviewed and incorporated where possible and a revised proposed draft transect layout will be created. This revised transect layout will be found on the Final Coastal Scoping Map in Appendix R of the Lake Huron basin-wide report. It should be noted that these transects remain subject to change pending future coastal analysis.

I.IV.ii.15 Regulatory Mapping

The effective mapping status for communities in the Iosco and Arenac Counties project area is listed in Table 15.

Table 15. Effective Mapping Status

County	Community	CID	FIRM Date	Program Status
Iosco	Au Sable, Township of	260098	1/6/2012	Participating
Iosco	Baldwin, Township of	260099	1/6/2012	Participating
Iosco	East Tawas, City of	260100	1/6/2012	Participating
Iosco	Oscoda, Township of	260101	1/6/2012	Participating
Iosco	Tawas City, City of	260102	1/6/2012	Participating
Iosco	Alabaster, Township of	260249	1/6/2012	Participating
Iosco	Tawas, Township of	261255	1/6/2012	Not Participating
Iosco	Wilber, Township of	260547	1/6/2012	Not Participating
Arenac	Au Gres, City of	260012	05/17/1989	Participating
Arenac	Au Gres, Township of	260013	05/17/1989	Participating
Arenac	Sims, Township of	260015	02/03/1993	Participating
Arenac	Standish, Township of	260017	04/02/1993	Participating
Arenac	Whitney, Township of	260018	11/04/1992	Participating
Arenac	Arenac, Township of	260251	07/03/1986	Participating

CID = community identification
 FIRM = Flood Insurance Rate Map

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

I.IV.ii.16 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 10-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.

Repetitive losses were reviewed in FEMA’s CIS “Community Disaster Detail – Flood Insurance” report. Table 16 details the total number of repetitive loss structures and total amount of repetitive loss payments in Iosco and Arenac project area communities.

Table 16. Repetitive Loss

County	Community	CID	Total Repetitive Loss Structures	Total Repetitive Loss Payment
Iosco	Au Sable, Township of	260098	0	\$0
Iosco	Baldwin, Township of	260099	0	\$0
Iosco	East Tawas, City of	260100	0	\$0
Iosco	Oscoda, Township of	260101	0	\$0
Iosco	Tawas City, City of	260102	0	\$0
Iosco	Alabaster, Township of	260249	0	\$0
Iosco	Tawas, Township of	261255	0	\$0
Iosco	Wilber, Township of	260547	0	\$0
Arenac	Au Gres, City of	260012	0	\$0
Arenac	Au Gres, Township of	260013	0	\$0

County	Community	CID	Total Repetitive Loss Structures	Total Repetitive Loss Payment
Arenac	Sims, Township of	260015	0	\$0
Arenac	Standish, Township of	260017	8	\$30,179.83
Arenac	Whitney, Township of	260018	0	\$0
Arenac	Arenac, Township of	260251	7	\$41,963.85

CID = community identification

I.IV.ii.17 State-level Data sets, Programs, and Information

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

**This section will be completed after the Coastal Scoping Meeting*

V. Risk MAP Projects and Needs

This section provides information about the planned next steps for the Lake Huron 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 Coastal Scoping effort and provided in this report will be utilized in the upcoming coastal flood study for Lake Huron.

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.

**Additional information about potential Flood Risk Product that could be developed for Iosco and Arenac Counties will be provided after the Coastal Scoping Meeting*

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 are 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 data sets and products into potential and effective community legislation, guidance, regulations, and procedures
- Assistance with the creation, acquisition and incorporation of GIS data into potential and effective maps, planning mechanisms, and emergency management procedures
- Facilitating the identification of data gaps and interpreting technical data to identify risk reduction deficiencies that should be corrected

Additional discussions will occur between FEMA and local stakeholders as this coastal flood study moves forward to see if MPTA would be an appropriate and beneficial option.

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), CAVs, 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 Coastal Scoping 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 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 upcoming basin-wide Lake Huron Coastal Scoping Report. The basin-wide Lake Huron Coastal Scoping report will be developed after the Coastal Scoping Meeting.

iv. Communication

Throughout this Coastal Scoping process, community representatives and local stakeholders indicated the need to be kept informed about the results of Coastal Scoping, 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 up-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

**This section will be completed after the Coastal Scoping Meeting*

VI. Close

**This section will be completed after the Coastal Scoping Meeting*

VII. References

Federal Emergency Management Agency. (2013). *Preliminary Flood Insurance Study, Arenac County, Michigan*. Washington D.C.

Federal Emergency Management Agency. (2012). *Flood Insurance Study, Ioscoa County, Michigan*. Washington D.C.

Federal Emergency Management Agency. (2011). *HAZUS Flood Average Annualized Loss Usability Analysis*.

Federal Emergency Management Agency. (2010). *Coordinated Needs Management Strategy*. Retrieved September 2013, from Coordinated Needs Management Strategy: <http://cnms.riskmapcds.com/HelpCNMS.html>

U.S. Army Corps of Engineers. (2012). Shoreline Feature Data set. Detroit District, MI.

U.S. Army Corps of Engineers. (2013). *Great Lakes Water Levels (1918 - 2012)*

U.S. Census Bureau. (2010). *State and County Quick Facts*. Retrieved March, 2014, from <http://quickfacts.census.gov>

VIII. Attachments

Coastal Scoping data and information, as well as this report and appendices, have been stored digitally on FEMA's Mapping Information Platform (MIP) Coastal Scoping Data Repository at J:\FEMA\COASTAL SCOPING_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 Coastal Scoping Report and appendices are also available for download from <http://www.greatlakescoast.org/>.

Attachments in this report include: (Will be compiled after the Coastal Scoping Meeting)

Attachment A: Coastal Data Request Form

Attachment B: Iosco and Arenac Counties Pre-Meeting Correspondence

Attachment C: Draft Coastal Scoping Maps

Attachment D: Proposed Draft Transect Figures

Attachment E: Stakeholder Comments from Coastal Scoping Meeting

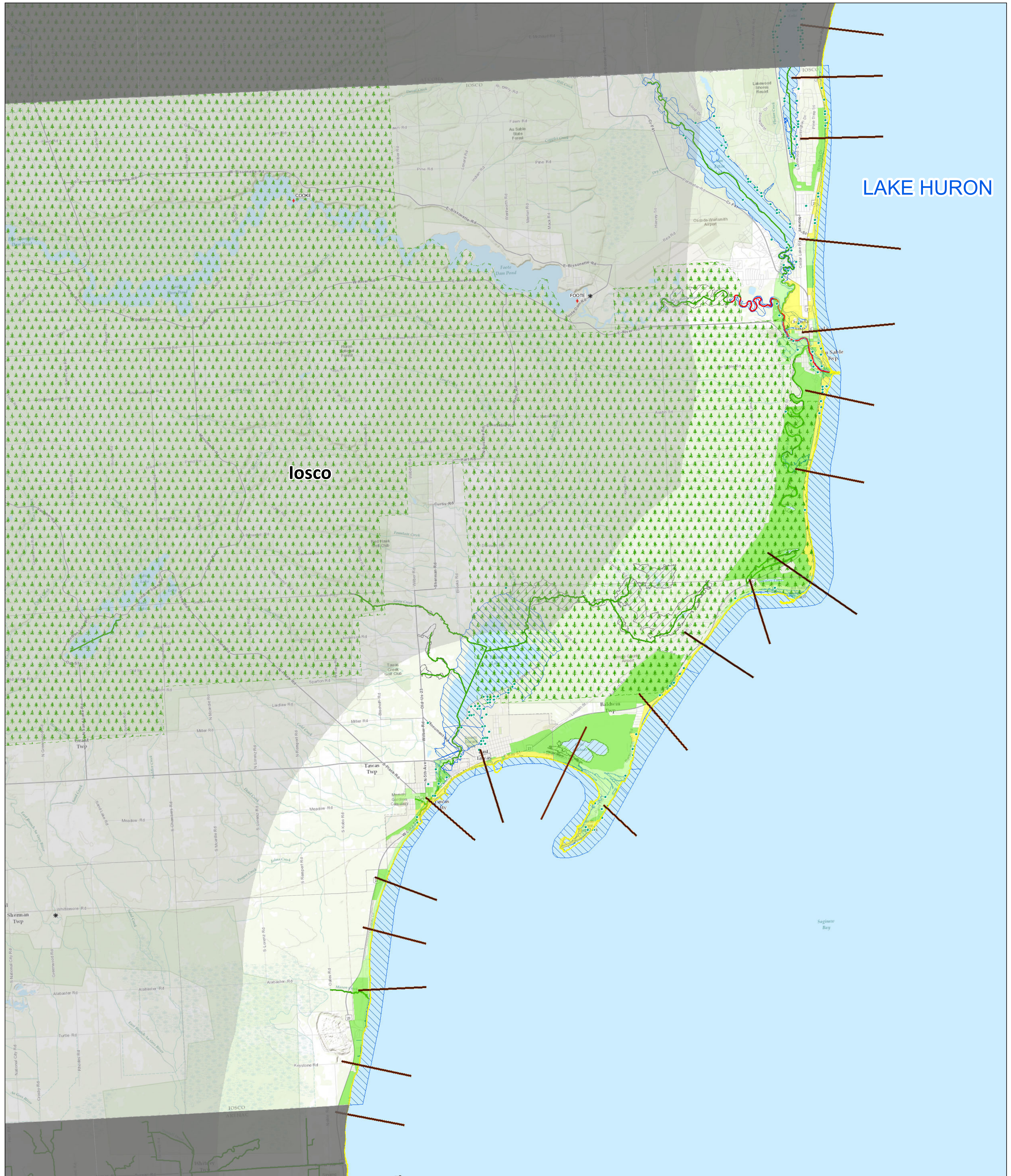
Attachment F: Iosco and Arenac Counties Coastal Scoping Meeting Documents

Attachment G: Coastal Data Request Form Compilation



Additional materials that will be presented at the Coastal Scoping Meeting are on the following pages. These products include, in order:

- 1) Draft Coastal Scoping Maps
- 2) Draft Transect Maps
- 3) Community Fact Sheets



LAKE HURON

Iosco

MAP SYMBOLOGY

Transects	Effective Flooding Hazards A	Coordinated Needs Management Strategy Unverified
Shoreline	Effective Flooding Hazards AE	Coordinated Needs Management Strategy Valid
Dams	0.2% PCT ANNUAL CHANCE FLOOD	
USGS Gages	AAL Data	
Letters of Map Change	Less than \$10,000	
Coastal Barrier Resource System	\$10,001 - \$100,000	
National Forest Boundary	\$100,001 - \$1,000,000	
	\$1,000,001 - \$5,000,000	
	Greater than \$5,000,000	

COASTAL STUDY LOCATOR



NATIONAL FLOOD INSURANCE PROGRAM
Draft Coastal Scoping Map

LAKE HURON COASTAL STUDY
IOSCO COUNTY, MICHIGAN COASTAL STUDY COMMUNITIES

Alabaster, Township of
AuSable, Township of
Baldwin, Township of
East Tawas, City of
Oscoda, Township of
Tawas, City of
Tawas, Township of
Wilber, Township of



LAKE HURON

ARENAC

MAP SYBOLOGY

LEGEND		
Transects	Effective Flooding Hazards A	Coordinated Needs Management Strategy Unverified
Shoreline	Effective Flooding Hazards AE	Unknown
Dams	0.2% PCT ANNUAL CHANCE FLOOD	Valid
USGS Gages	AAL Data	
Letters of Map Change	Less than \$10,000	
Coastal Barrier Resource System	\$10,001 - \$100,000	
National Forest Boundary	\$100,001 - \$1,000,000	
	\$1,000,001 - \$5,000,000	
	Greater than \$5,000,000	

COASTAL STUDY LOCATOR

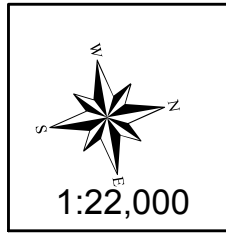


NATIONAL FLOOD INSURANCE PROGRAM
Draft Coastal Scoping Map

LAKE MICHIGAN COASTAL STUDY
ARENAC COUNTY, MICHIGAN COASTAL STUDY COMMUNITIES

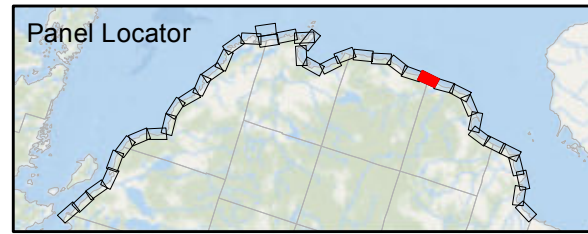
Au Ges, City of
Arenac, Township of
Au Gres, Township of
Sims, Township of
Standish, Township of
Whitney, Township of







- Project Transect
 - Adjoining Panel Edge
 - Political Boundary
- Basemap Source: ESRI

Coastal Scoping Meeting
 Location: East Tawas, MI
 Date: May 6, 2014
 Time: 8:30 - 11:00am

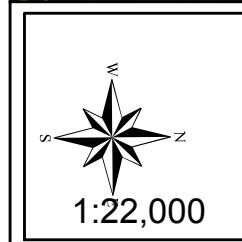


COUNTIES
 IOSCO COUNTY
 ALCONA COUNTY

COMMUNITIES
 TOWNSHIP OF OSCODA
 TOWNSHIP OF GREENBRUSH

Lake Huron DRAFT TRANSECTS



- Project Transect
 - Adjoining Panel Edge
 - Political Boundary
- Basemap Source: ESRI

Coastal Scoping Meeting
 Location: East Tawas, MI
 Date: May 6, 2014
 Time: 8:30 - 11:00am

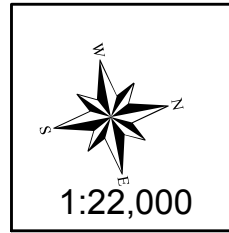
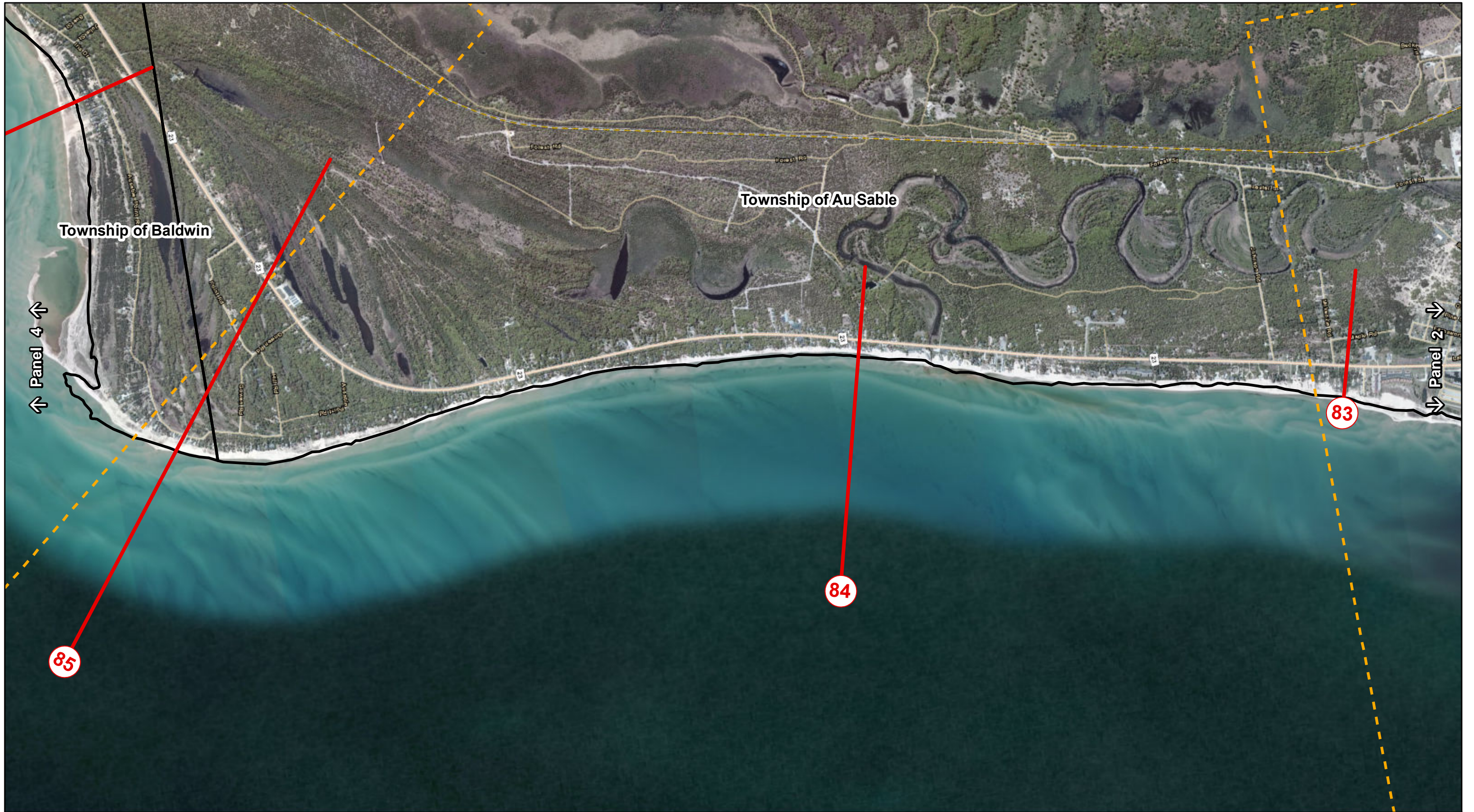


COUNTIES
 IOSCO COUNTY

COMMUNITIES
 TOWNSHIP OF AU SABLE
 TOWNSHIP OF OSCODA



Lake Huron DRAFT TRANSECTS



- Project Transect
 - Adjoining Panel Edge
 - Political Boundary
- Basemap Source: ESRI

Coastal Scoping Meeting
 Location: East Tawas, MI
 Date: May 6, 2014
 Time: 8:30 - 11:00am

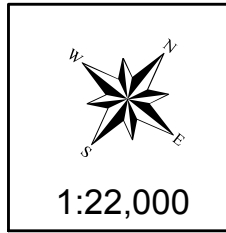


COUNTIES
 IOSCO COUNTY

COMMUNITIES
 TOWNSHIP OF AU SABLE
 TOWNSHIP OF BALDWIN



Lake Huron DRAFT TRANSECTS



- Project Transect
 - Adjoining Panel Edge
 - Political Boundary
- Basemap Source: ESRI

Coastal Scoping Meeting
 Location: East Tawas, MI
 Date: May 6, 2014
 Time: 8:30 - 11:00am

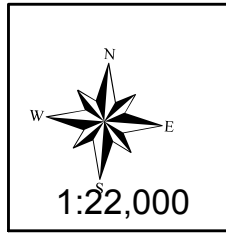


COUNTIES
 IOSCO COUNTY

COMMUNITIES
 TOWNSHIP OF BALDWIN
 TOWNSHIP OF AU SABLE

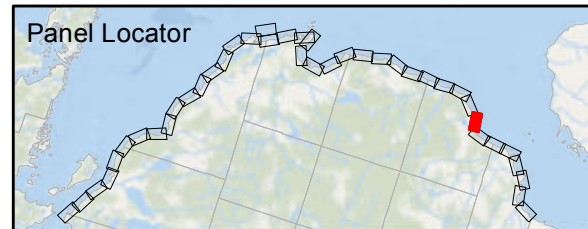


Lake Huron DRAFT TRANSECTS



- Project Transect
 - Adjoining Panel Edge
 - Political Boundary
- Basemap Source: ESRI

Coastal Scoping Meeting
 Location: East Tawas, MI
 Date: May 6, 2014
 Time: 8:30 - 11:00am

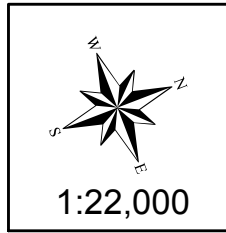
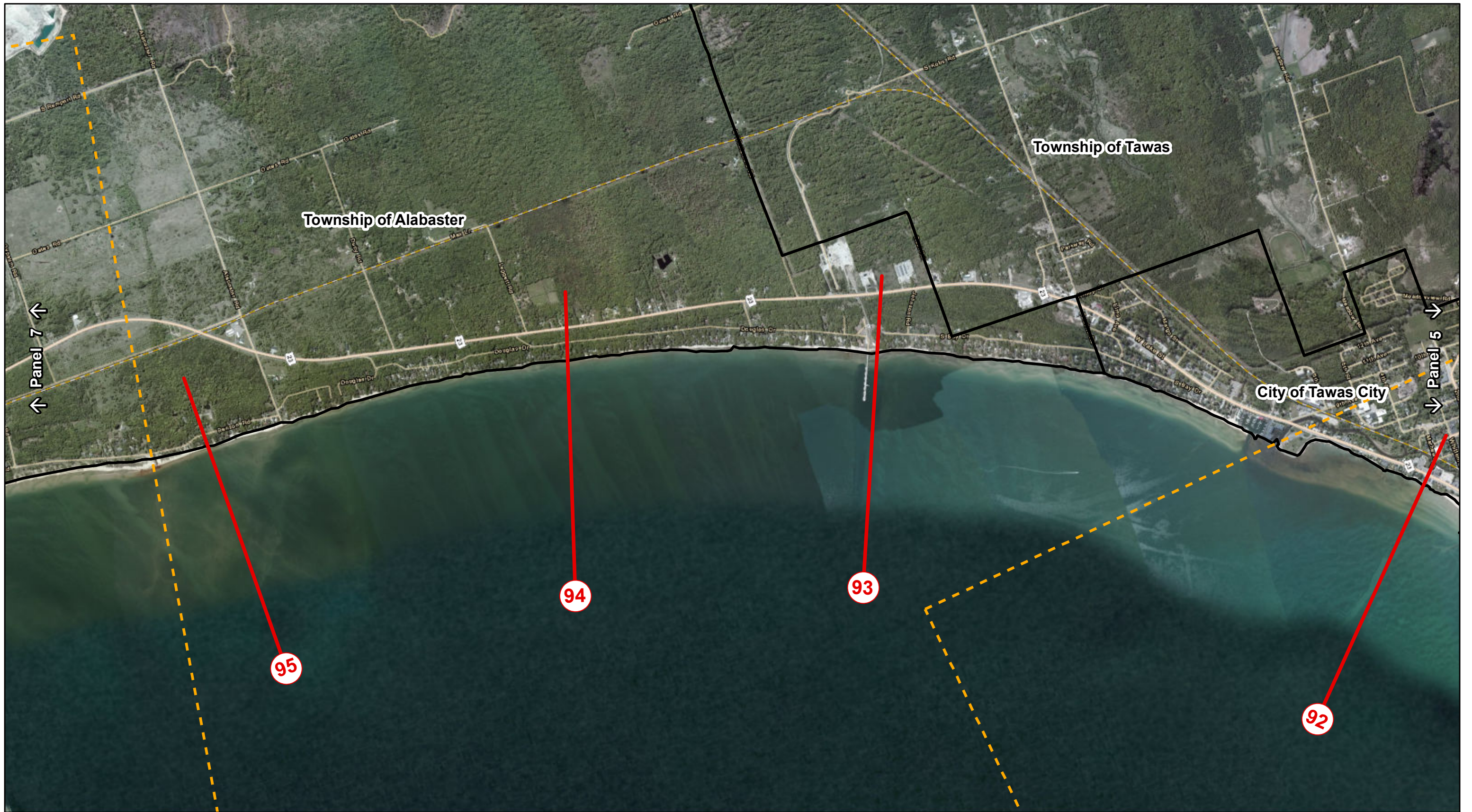





COUNTIES
 IOSCO COUNTY

COMMUNITIES
 CITY OF TAWAS CITY
 CITY OF EAST TAWAS
 TOWNSHIP OF BALDWIN

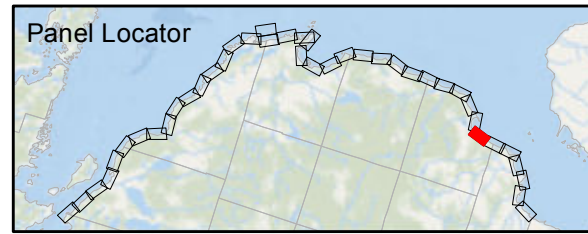


Lake Huron DRAFT TRANSECTS




-  Project Transect
 -  Adjoining Panel Edge
 -  Political Boundary
- Basemap Source: ESRI

Coastal Scoping Meeting
 Location: East Tawas, MI
 Date: May 6, 2014
 Time: 8:30 - 11:00am



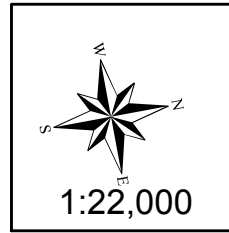
COUNTIES
 IOSCO COUNTY




COMMUNITIES
 TOWNSHIP OF ALABASTER
 TOWNSHIP OF TAWAS
 CITY OF TAWAS CITY




**Lake Huron
 DRAFT TRANSECTS**

Panel 6 of 12



-  Project Transect
 -  Adjoining Panel Edge
 -  Political Boundary
- Basemap Source: ESRI

Coastal Scoping Meeting
 Location: East Tawas, MI
 Date: May 6, 2014
 Time: 8:30 - 11:00am

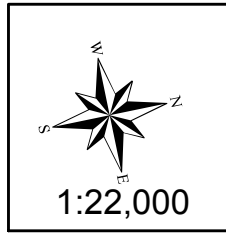


COUNTIES
 ARENAC COUNTY
 IOSCO COUNTY

COMMUNITIES
 TOWNSHIP OF WHITNEY
 TOWNSHIP OF ALABASTER



Lake Huron DRAFT TRANSECTS



- Project Transect
 - Adjoining Panel Edge
 - Political Boundary
- Basemap Source: ESRI

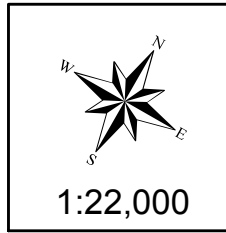
Coastal Scoping Meeting
 Location: East Tawas, MI
 Date: May 6, 2014
 Time: 8:30 - 11:00am



COUNTIES
ARENAC COUNTY

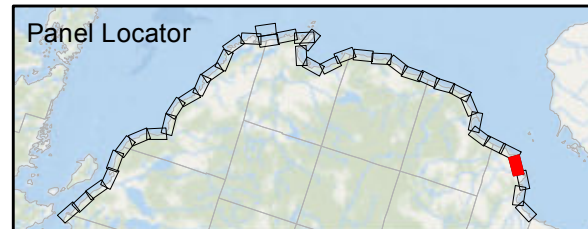
COMMUNITIES
TOWNSHIP OF SIMS
TOWNSHIP OF WHITNEY

Lake Huron DRAFT TRANSECTS



- Project Transect
 - Adjoining Panel Edge
 - Political Boundary
- Basemap Source: ESRI

Coastal Scoping Meeting
 Location: East Tawas, MI
 Date: May 6, 2014
 Time: 8:30 - 11:00am

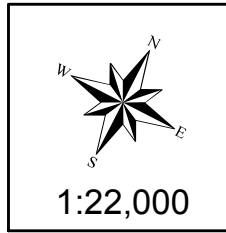


COUNTIES
ARENAC COUNTY

COMMUNITIES
CITY OF AU GRES
TOWNSHIP OF AU GRES
TOWNSHIP OF SIMS

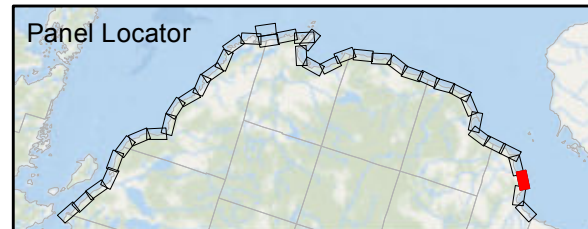
**Lake Huron
DRAFT TRANSECTS**

Panel 9 of 12





- Project Transect
 - Adjoining Panel Edge
 - Political Boundary
- Basemap Source: ESRI

Coastal Scoping Meeting
 Location: East Tawas, MI
 Date: May 6, 2014
 Time: 8:30 - 11:00am

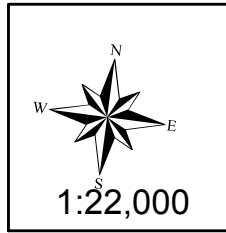
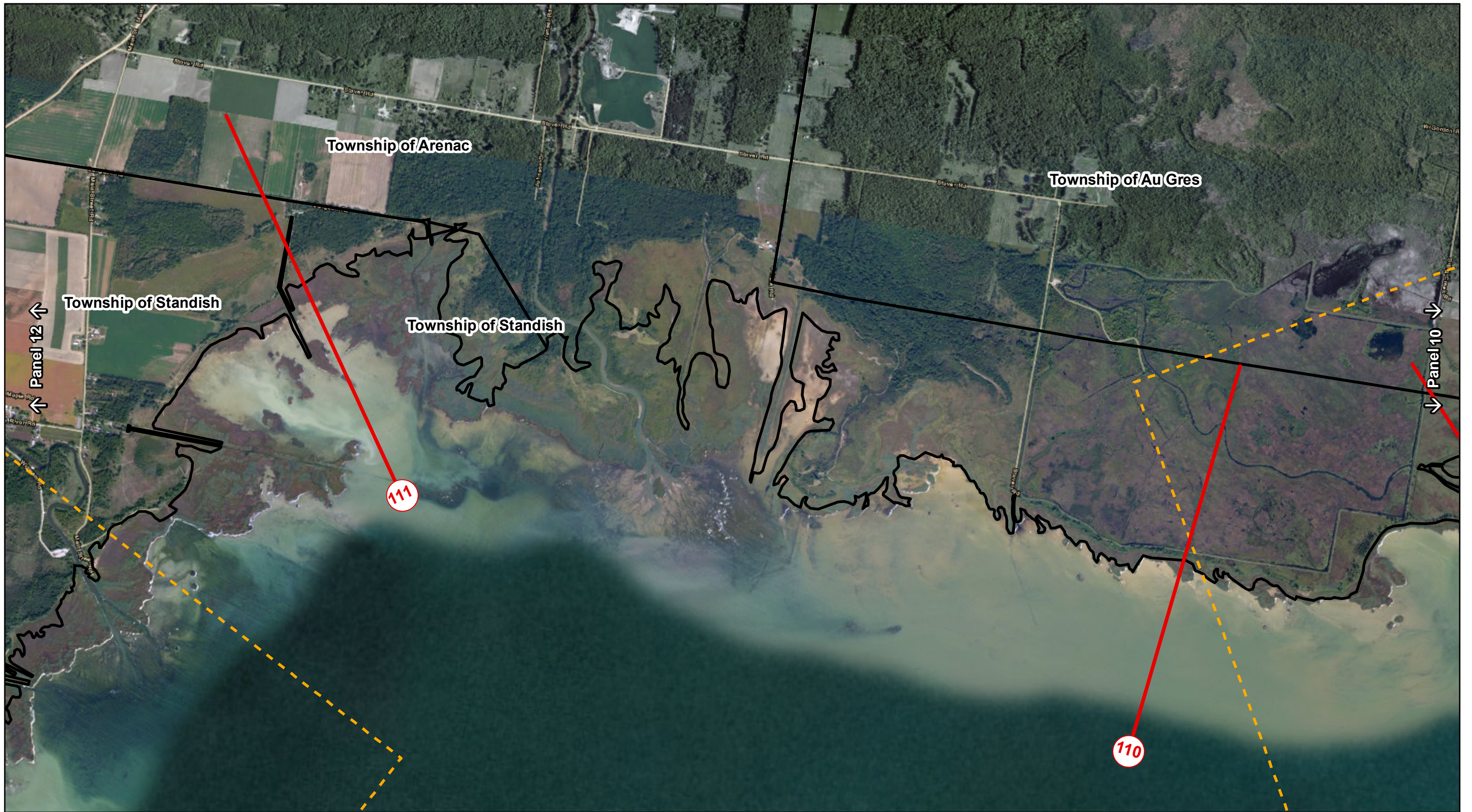


COUNTIES
ARENAC COUNTY

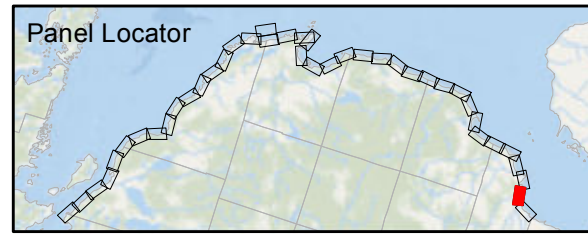
COMMUNITIES
 TOWNSHIP OF ARENAC
 TOWNSHIP OF AU GRES
 TOWNSHIP OF SIMS
 CITY OF AU GRES

Lake Huron DRAFT TRANSECTS



- Project Transect
 - Adjoining Panel Edge
 - Political Boundary
- Basemap Source: ESRI

Coastal Scoping Meeting
 Location: East Tawas, MI
 Date: May 6, 2014
 Time: 8:30 - 11:00am



COUNTIES
ARENAC COUNTY

COMMUNITIES
TOWNSHIP OF STANDISH
TOWNSHIP OF ARENAC
TOWNSHIP OF AU GRES

**Lake Huron
DRAFT TRANSECTS**

Panel 11 of 12



↓ Panel 11 ↓

Township of Standish

114

113

112



- Project Transect
 - Adjoining Panel Edge
 - Political Boundary
- Basemap Source: ESRI

Coastal Scoping Meeting
 Location: East Tawas, MI
 Date: May 6, 2014
 Time: 8:30 - 11:00am



COUNTIES
ARENAC COUNTY

COMMUNITIES
TOWNSHIP OF STANDISH



Lake Huron DRAFT TRANSECTS



FEMA

FEMA REGION V COMMUNITY FACTSHEET

STATE: Michigan
STATE FIPS #: 26

COUNTY: Iosco
COUNTY FIPS # 069

Iosco Communities within the Lake Huron Discovery Project Area

City of East Tawas, City of Tawas City, Township of Alabaster, Township of Au Sable, Township of Baldwin, Township of Oscoda, Township of Tawas, Township of Wilber

DEMOGRAPHICS (County-Wide)

2010 Census

Total Population: 25,887
Total Population Under 18: 4,554
Total Population 18 & Over: 21,333
Total Population 65 & Over: 6,755

U.S. Census Bureau - American Fact Finder

Latest Population Estimates: 25,357
Median Age: 51.1
Median Household Income: \$35,396
Individuals below the poverty line: 19.6%

2010 Housing Status (In housing units)

Total: 20,443
Occupied: 11,757
Vacant: 8,686
Vacant (for rent): 311
Vacant (for sale): 490

NFIP Facts for Iosco County

Community Status in Project Area*: All are Participating Except:
Township of Tawas & Township of Wilber
County Wide Effective FIRM Data: 1/6/2012
Total Identified LOMCs: 223 (March 2014)

Total Number of Policies: 233
Total Premiums: \$133,274
Total Coverage: \$28,942,800
Total Claims Since 1978: 36
Dollar Amount Paid for claims since 1978: \$49,961

Latest Community Action Visits (CAV)

(Project Area Communities Only)
City of East Tawas: 4/5/2000
City of Tawas City: 4/12/2000
Township of Alabaster: None
Township of Au Sable: 8/24/2001
Township of Baldwin: 8/22/2001
Township of Oscoda: 9/7/2201
Township of Tawas: N/A
Township of Wilber: N/A

Source: FEMA Community Information Systems

*Project Area for this study is defined as all land area within three miles of Lake Huron



FEMA

FEMA REGION V COMMUNITY FACTSHEET

STATE: Michigan
STATE FIPS #: 26

COUNTY: Arenac
COUNTY FIPS # 011

Arenac Communities within the Lake Huron Discovery Project Area

City of Au Gres, Township of Arenac, Township of Au Gres, Township of Sims, Township of Standish,
Township of Whitney

DEMOGRAPHICS (County-Wide)

2010 Census

Total Population: 15,899
Total Population Under 18: 3,195
Total Population 18 & Over: 12,704
Total Population 65 & Over: 3,227

U.S. Census Bureau - American Fact Finder

Latest Population Estimates: 15,477
Median Age: 46.7
Median Household Income: \$36,937
Individuals below the poverty line: 18.0%

2010 Housing Status (In housing units)

Total: 9,803
Occupied: 6,701
Vacant: 3,102
Vacant (for rent): 86
Vacant (for sale): 194

NFIP Facts for Arenac County

Community Status: All Communities Participating
County Wide Effective FIRM Data: Pending (Prelim Date: 4/13)
Total Identified LOMCs: 89 (March 2014)

Total Number of Policies: 184
Total Premiums: \$144,699
Total Coverage: \$21,149,900
Total Claims Since 1978: 62
Dollar Amount Paid for claims since 1978: \$157,774

Latest Community Action Visits (CAV)

(Project Area Communities Only)

City of Au Gres: None
Township of Arenac: 8/31/1999
Township of Au Gres: 8/31/1999
Township of Sims: None
Township of Standish: 4/11/2001
Township of Whitney: None

Source: FEMA Community Information Systems

*Project Area for this study is defined as all land area within three miles of Lake Huron