Lakeshore Boulevard: Planning, Challenges, Funding and the Future

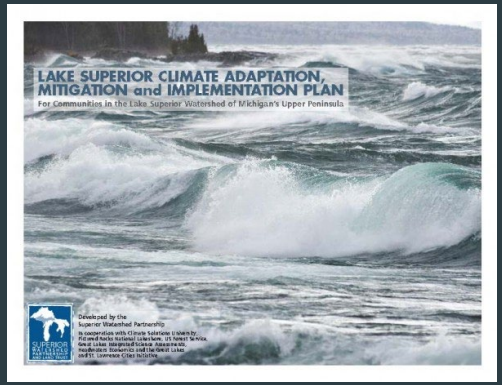
City Commission Work Session – January 2020

Presenters

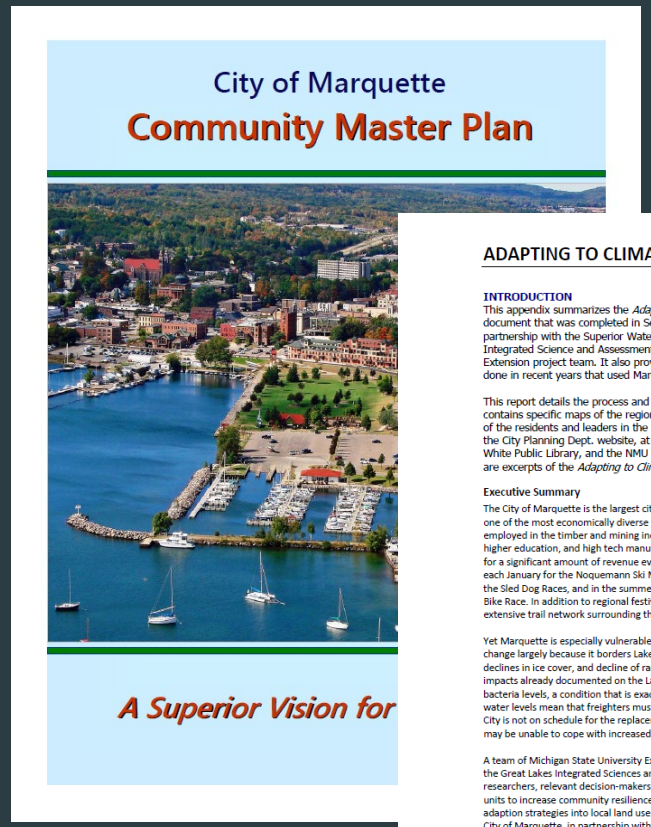
- Dennis Stachewicz – Community Development Director
- Scott Cambensy – Public Works Director
- Curt Goodman – Municipal Utilities Director
- Ian Davis – Fire Chief
- Geri Grant– Superior Watershed Partnership
- Jon Swenson – Community Services Director
- Mike Angeli – City Manager

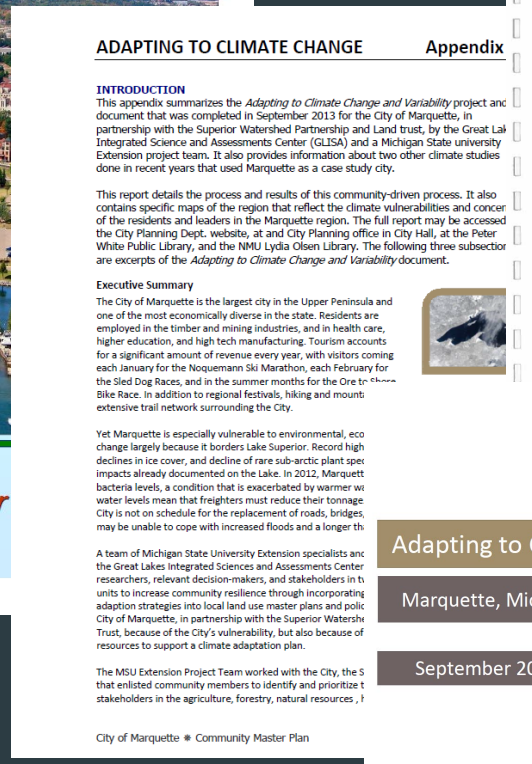
Historical Planning and Community Engagement

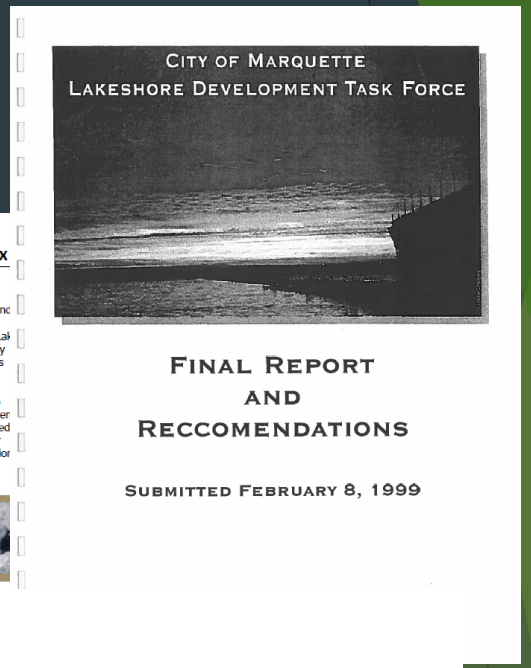
Dennis Stachewicz – Community Development Director


LAKE SUPERIOR CLIMATE ADAPTATION, MITIGATION and IMPLEMENTATION PLAN
For Communities in the Lake Superior Watershed of Michigan's Upper Peninsula

Marquette Area Climate and Health Adaptation Guidebook
Volume I: Stakeholder Engagement and Visual Design Imaging
Marquette County, MI
Michigan State University
December 2018
MICHIGAN STATE UNIVERSITY


City of Marquette
Community Master Plan
A Superior Vision for


ADAPTING TO CLIMATE CHANGE Appendix
INTRODUCTION
This appendix summarizes the Adapting to Climate Change and Variability project and document that was completed in September 2013 for the City of Marquette, in partnership with the Superior Watershed Partnership and Land trust, by the Great Lak Integrated Science and Assessments Center (GLISA) and a Michigan State university Extension project team. It also provides information about two other climate studies done in recent years that used Marquette as a case study city.
This report details the process and results of this community-driven process. It also contains specific maps of the region that reflect the climate vulnerabilities and concer of the residents and leaders in the Marquette region. The full report may be accessed the City Planning Dept. website, at and City Planning office in City Hall, at the Peter White Public Library, and the NMU Lydia Olsen Library. The following three subsectior are excerpts of the Adapting to Climate Change and Variability document.
Executive Summary
The City of Marquette is the largest city in the Upper Peninsula and one of the most economically diverse in the state. Residents are employed in the timber and mining industries, and in health care, higher education, and high tech manufacturing. Tourism accounts for a significant amount of revenue every year, with visitors coming each January for the Noquemann Ski Marathon, each February for the Sled Dog Races, and in the summer months for the Ore to Shore Bike Race. In addition to regional festivals, hiking and mount extensive trail network surrounding the City.
Yet Marquette is especially vulnerable to environmental, eco change largely because it borders Lake Superior. Record high declines in ice cover, and decline of rare sub-arctic plant spec impacts already documented on the Lake. In 2012, Marquett bacteria levels, a condition that is exacerbated by warmer wa water levels mean that freighters must reduce their tonnage City is not on schedule for the replacement of roads, bridges, may be unable to cope with increased floods and a longer th
A team of Michigan State University Extension specialists and the Great Lakes Integrated Sciences and Assessments Center researchers, relevant decision-makers, and stakeholders in tw units to increase community resilience through incorporating adaption strategies into local land use master plans and polic City of Marquette, in partnership with the Superior Watersh Trust, because of the City's vulnerability, but also because of resources to support a climate adaptation plan.
The MSU Extension Project Team worked with the City, the S that enlisted community members to identify and prioritize t stakeholders in the agriculture, forestry, natural resources ,
City of Marquette ✱ Community Master Plan


CITY OF MARQUETTE
LAKESHORE DEVELOPMENT TASK FORCE
FINAL REPORT AND RECCOMENDATIONS
SUBMITTED FEBRUARY 8, 1999
Adapting to Climate Change and Variability
Marquette, Michigan
September 2013
MICHIGAN STATE UNIVERSITY Extension
MICHIGAN STATE UNIVERSITY School of Planning, Design and Construction

Adopted Plans

- Lakeshore Boulevard Task Force Report and Recommendation (City of Marquette)
- Coastal Zone Management Grant Phase I and II Workshops (SWP and City of Marquette)
- Lake Superior Climate Adaptation, Mitigation, and Adaptation Plan (SWP and partners)
- Marquette County Climate and Health Adaptation Guidebook (MSUE and County Partners, including City of Marquette)
- Adapting to Climate Change and Variability (MSUE and City of Marquette)
- Marquette County Community Resiliency Workshop (Climate Adaptation Task Force)
- Marquette Community Master Plan (City of Marquette)

Example of Specific Recommendation for Climate Task Force

MARQUETTE COUNTY COMMUNITY RESILIENCE WORKSHOP
October 20-22, 2015
Northern Michigan University

EXECUTIVE SUMMARY

The *Marquette County Community Resilience Workshop* brought together more than 30 elected officials, managers and planners to discuss and develop proactive strategies for becoming more resilient and effective when dealing with the negative consequences of unusual and extreme weather events. This was a training-style workshop designed to introduce participants to the U.S. Climate Resilience Toolkit (https://toolkit.climate.gov/) created by an interagency task force. Members of the website's national development team, including David Herring (NOAA), Jim Fox (National Environmental Modeling & Analysis Center), Nancy Beller-Sims (NOAA), and Daniel Brown (UMich-GLISA) traveled to Marquette to lead the workshop. The workshop focused on specific adaptation planning and hazard mitigation concerns related to 1) municipal water supply, 2) municipal water infrastructure and 3) Lake Superior shoreline erosion.

THE U.S. CLIMATE RESILIENCE TOOLKIT

The web-based toolkit provides scientific tools, information and expertise to help people understand climate-related risks and opportunities for building resilience to extreme events. The site was designed to serve interested citizens, communities, businesses, resource managers, planners, and policy leaders at all levels of government. The workshop facilitators introduced the Toolkit's five-step process designed to help communities initiate, plan and implement projects to become more resilient. The Toolkit includes several additional resources, including (CRT, 2015):

- **Taking Action Stories** - Case studies describing climate-related risks and opportunities that communities and businesses face, steps they're taking to plan and respond, and tools and techniques they're using to improve resilience
- **A Catalog of Freely Available Tools** for accessing and analyzing climate data, generating visualizations, exploring climate projections, estimating hazards, and engaging stakeholders in resilience-building efforts
- **Climate Explorer** - A visualization tool that offers maps of climate stressors and impacts as well as interactive graphs showing daily observations and long-term averages from thousands of weather stations
- **Topic Narratives** that explain how climate variability and change can impact particular regions of the country and sectors of society
- **Free, Federally Developed Training Courses** that can build skills for using climate tools and data
- **Maps** highlighting the locations of centers where federal and state agencies can provide regional climate information
- **Advanced Search Engine.** Search the entire federal government's climate science domain and filter results according to your interests

Table 2. Options for Increased Resilience

Options for Assets	Ability to Increase Resilience	Economic Feasibility	Low Environmental Impact	Able to Implement in our County
Implement plan to move road and restore natural features (e.g., green infrastructure) ≈ $10 million	🟢	🟢 🟡	🟢 🟡	🔴
Form a multi-jurisdictional water authority (e.g., address interconnectivity and Lake water vs. pumped water)	🟢	🟢	🟢 🟡	🟡 🔴
Mine water in terms of developing alternative sources of water (e.g., drill more wells, pump from Lake).	🟢	🟢	🟡	🟡
Funding for mapping of the mains (e.g. using GIS)	🟡	🟡	🟢	🟢
Map the mains for improved emergency response (e.g., utility crews responding during freeze events)	🟢	🟢	🟢	🟢

Coastal Zone Management Grant Phase I and II

- SWP and City of Marquette were project partners
- Goal – Protect infrastructure while blending in natural shoreline attributes based upon previous community planning efforts
- Project spanned two years
- Community Engagement
  - Multiple Community Forums
  - Written Comments
  - Community Survey
- Outcome was a preferred alternative in “shovel ready” form

Phase I

- Grant Funded Project – MDEQ Coastal Zone Management
- Coastal Engineering Firm (BAIRD)
  - Analyze erosion
  - Draft alternatives based on Community Master Plan and natural science
- Five alternatives presented to the community at a public meeting on March 27, 2013

NORTH

0 75 150 300ft.

GRAPHIC SCALE — FEET

SHORELINE RESTORATION - EXISTING CONDITIONS
MARQUETTE, MICHIGAN

MARQUETTE SHORELINE RESTORATION	
Figure Number: 12035-CD-01	Project Number: 12035.100
Description: EXISTING CONDITIONS - LAYOUT	Date: 02/04/2013

Baird

Date Plotted: 2/13/2013 9:53:03 AM

NORTH

0 75 150 300ft.

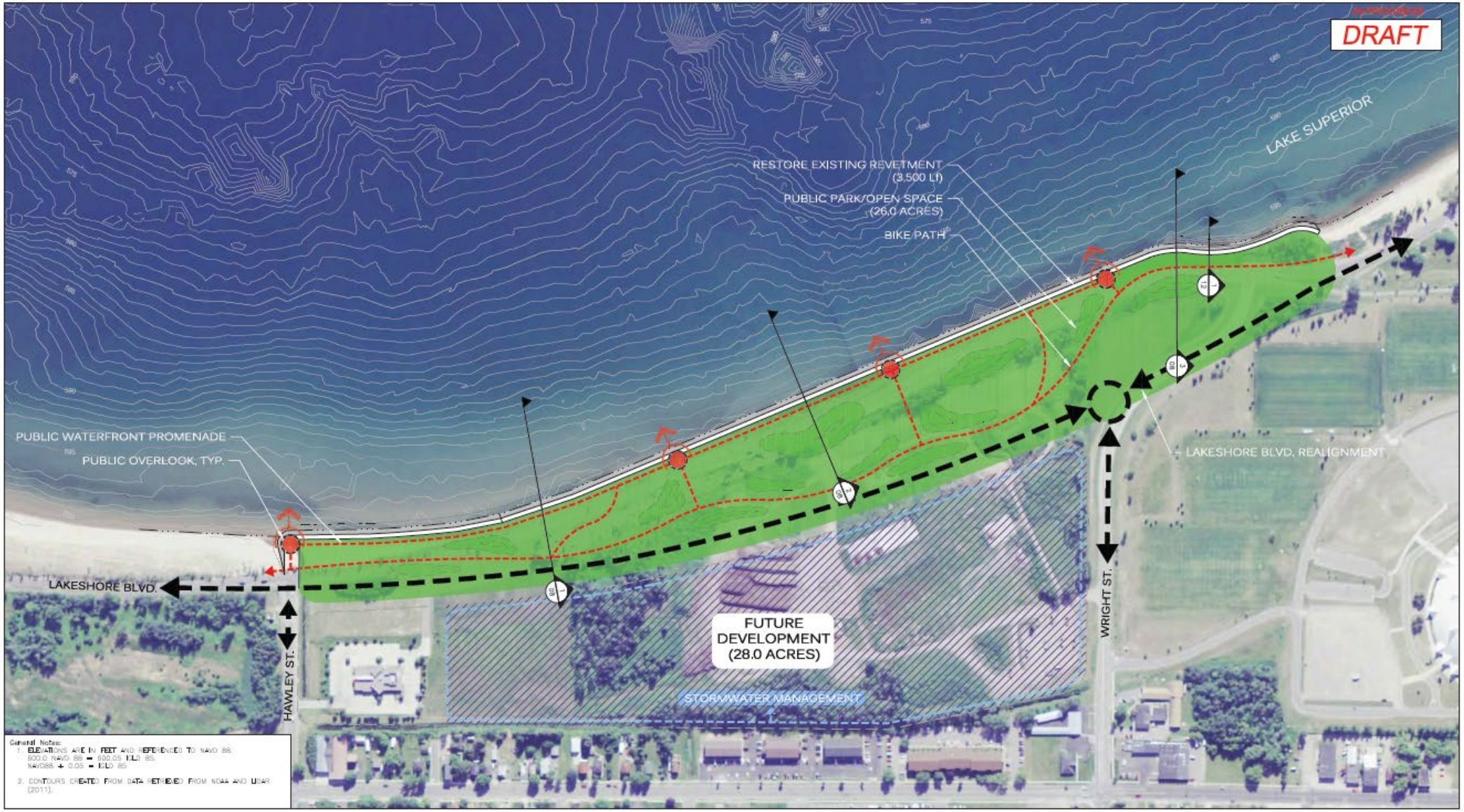
GRAPHIC SCALE — FEET

SHORELINE RESTORATION - ALTERNATIVE 1
REMOVE EXISTING REVETMENT

MARQUETTE SHORELINE RESTORATION

Figure Number:	Project Number:
12035-CD-03	12035.100
Description: ALTERNATIVE 1 - LAYOUT	Date: 02/04/2013

Baird



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GRAPHIC SCALE — FEET

SHORELINE RESTORATION - ALTERNATIVE 2
RESTORE EXISTING REVETMENT

MARQUETTE SHORELINE RESTORATION	
Figure Number: 12035-CD-04	Project Number: 12035.100
Description: ALTERNATIVE 2 - LAYOUT	Date: 02/04/2013

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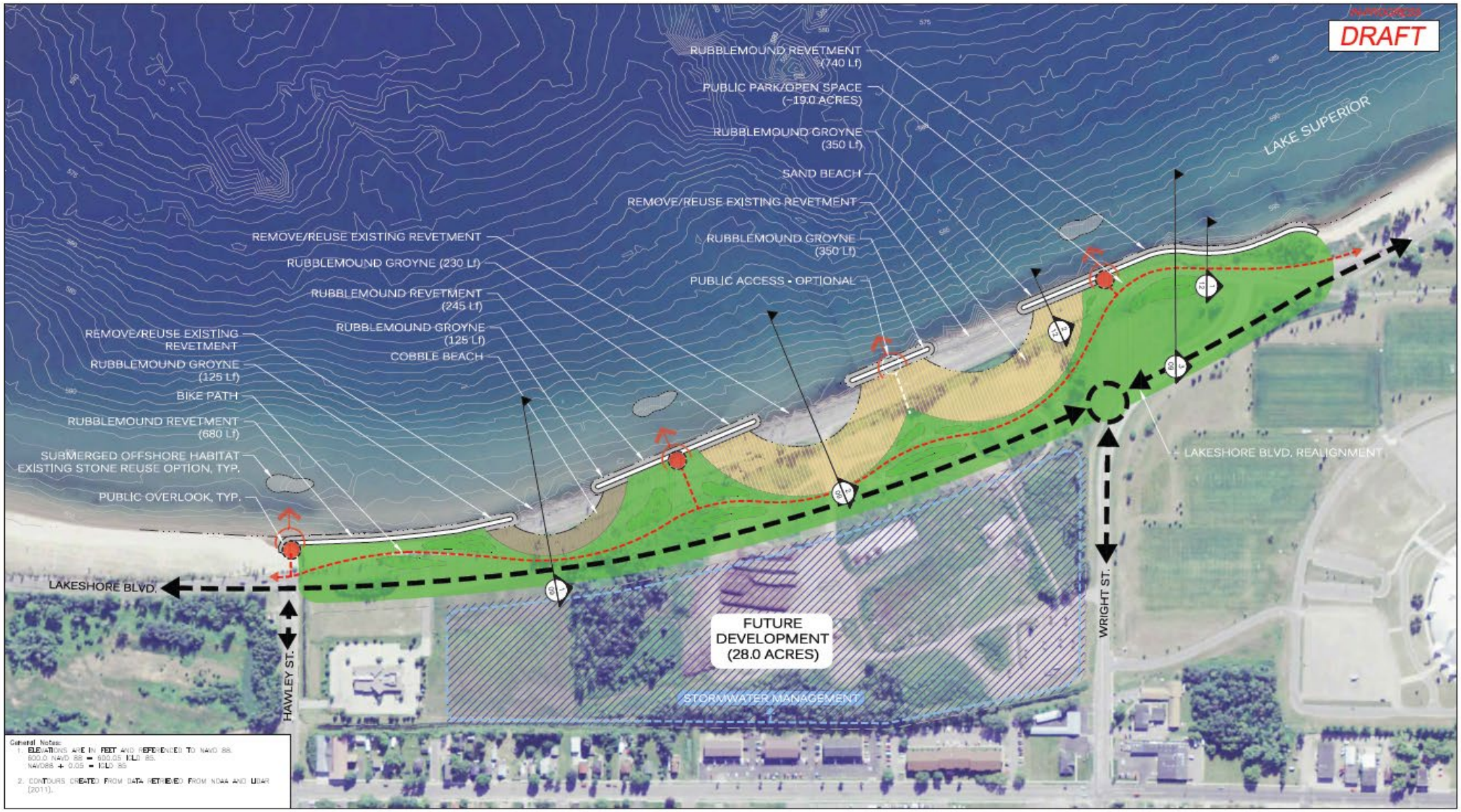
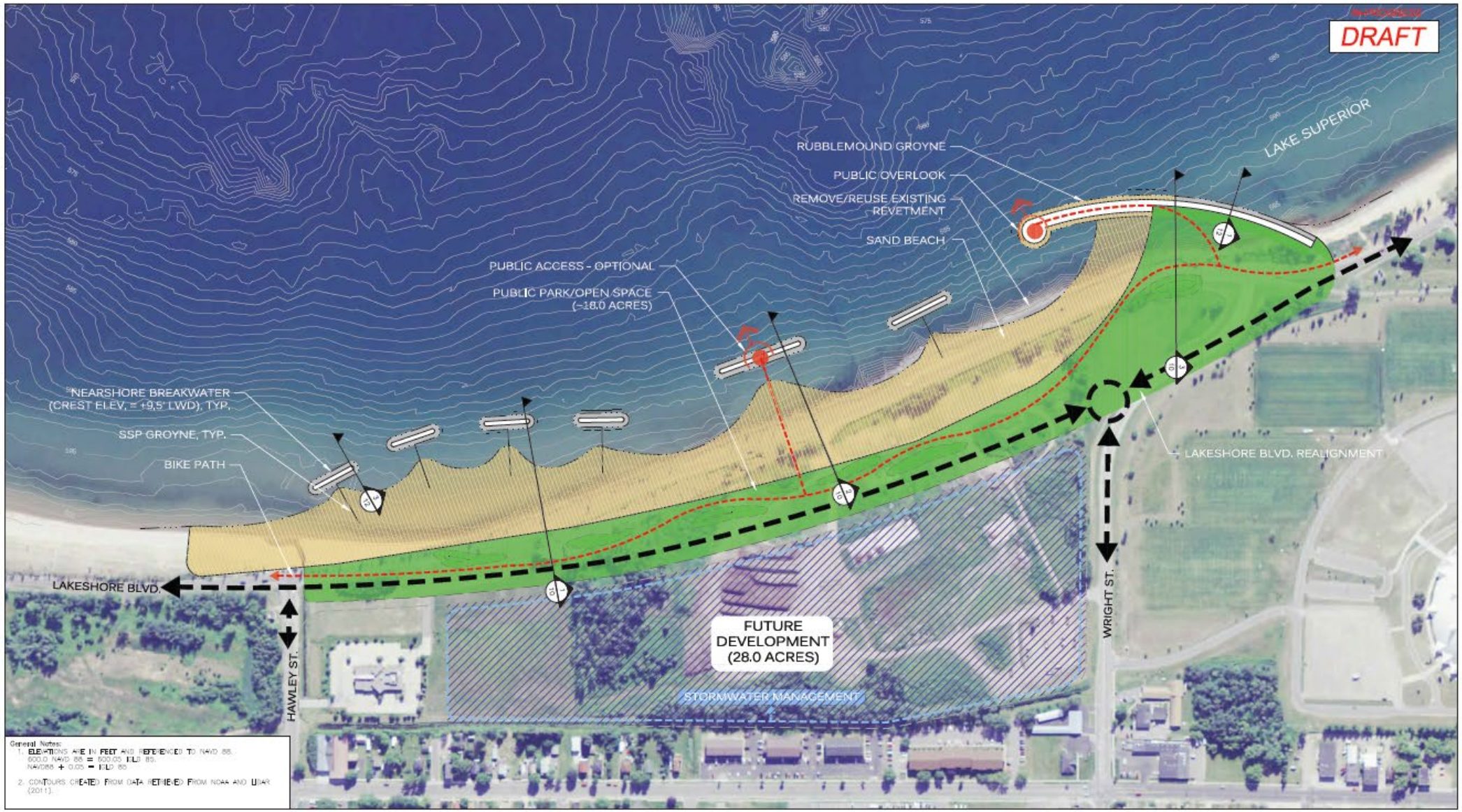


SHORELINE RESTORATION - ALTERNATIVE 3
LANDWARD BEACH DEVELOPMENT

MARQUETTE SHORELINE RESTORATION		
Figure Number: 12035-CD-05	Project Number: 12035.100	Baird
Description: ALTERNATIVE 3 - LAYOUT	Date: 02/04/2013	



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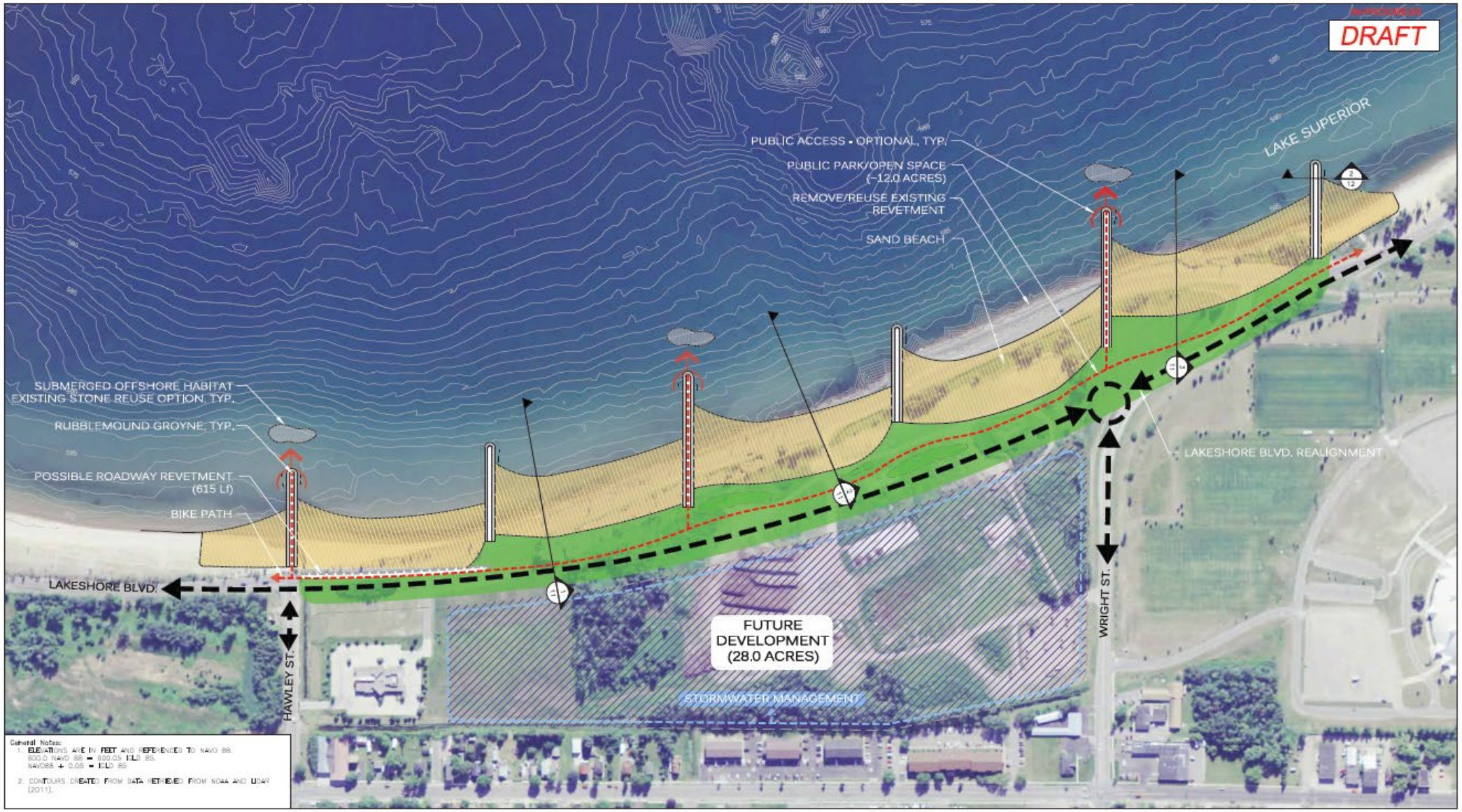
GRAPHIC SCALE – FEET

SHORELINE RESTORATION - ALTERNATIVE 4
OFFSHORE BREAKWATER BEACH DEVELOPMENT

MARQUETTE SHORELINE RESTORATION	
Figure Number: 12035-CD-06	Project Number: 12035.100
Description: ALTERNATIVE 4 - LAYOUT	Date: 02/04/2013

Baird



NORTH

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GRAPHIC SCALE – FEET

SHORELINE RESTORATION - ALTERNATIVE 5
RUBBLEMOUND GROYNES BEACH DEVELOPMENT

MARQUETTE SHORELINE RESTORATION

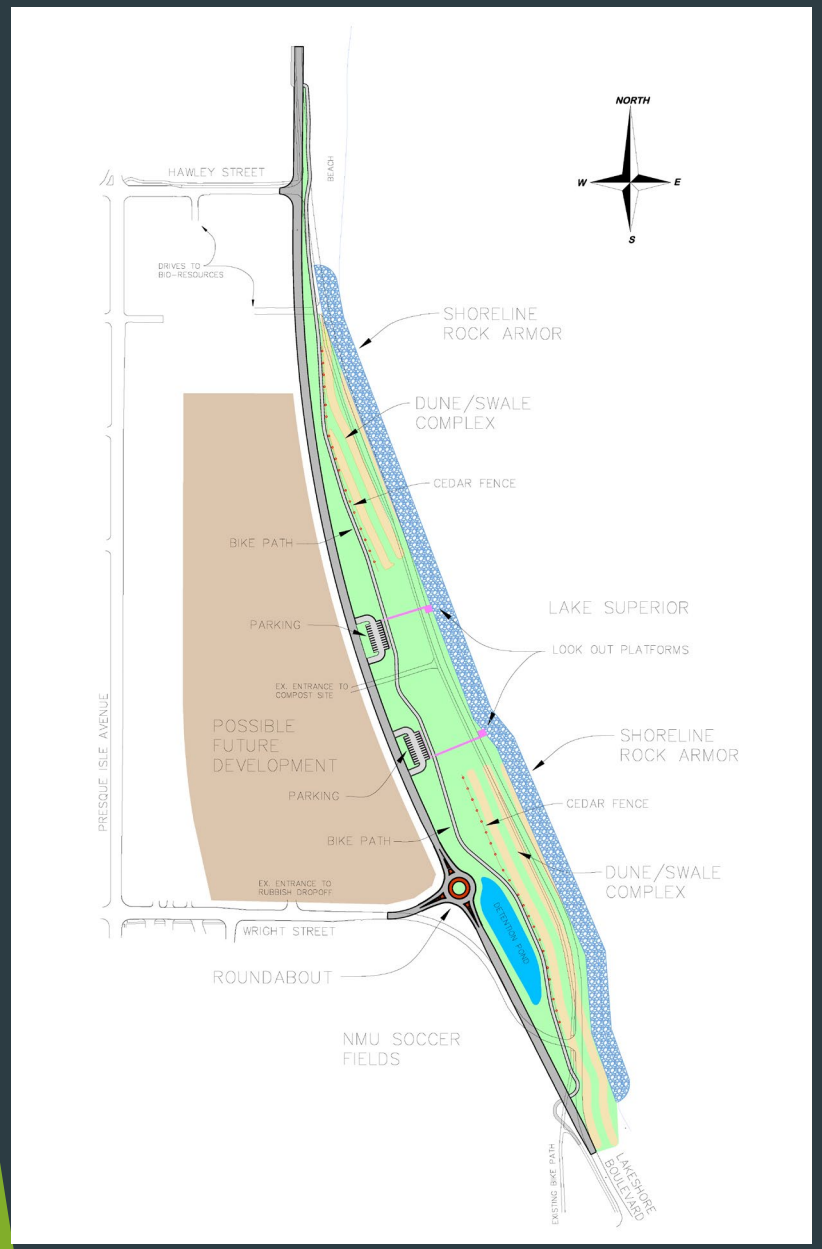
Figure Number:	Project Number:
12035-CD-07	12035.100
Description: ALTERNATIVE 5 - LAYOUT	Date: 02/04/2013

Baird

Lakeshore Boulevard Relocation and Shoreline Restoration Project – Phase II

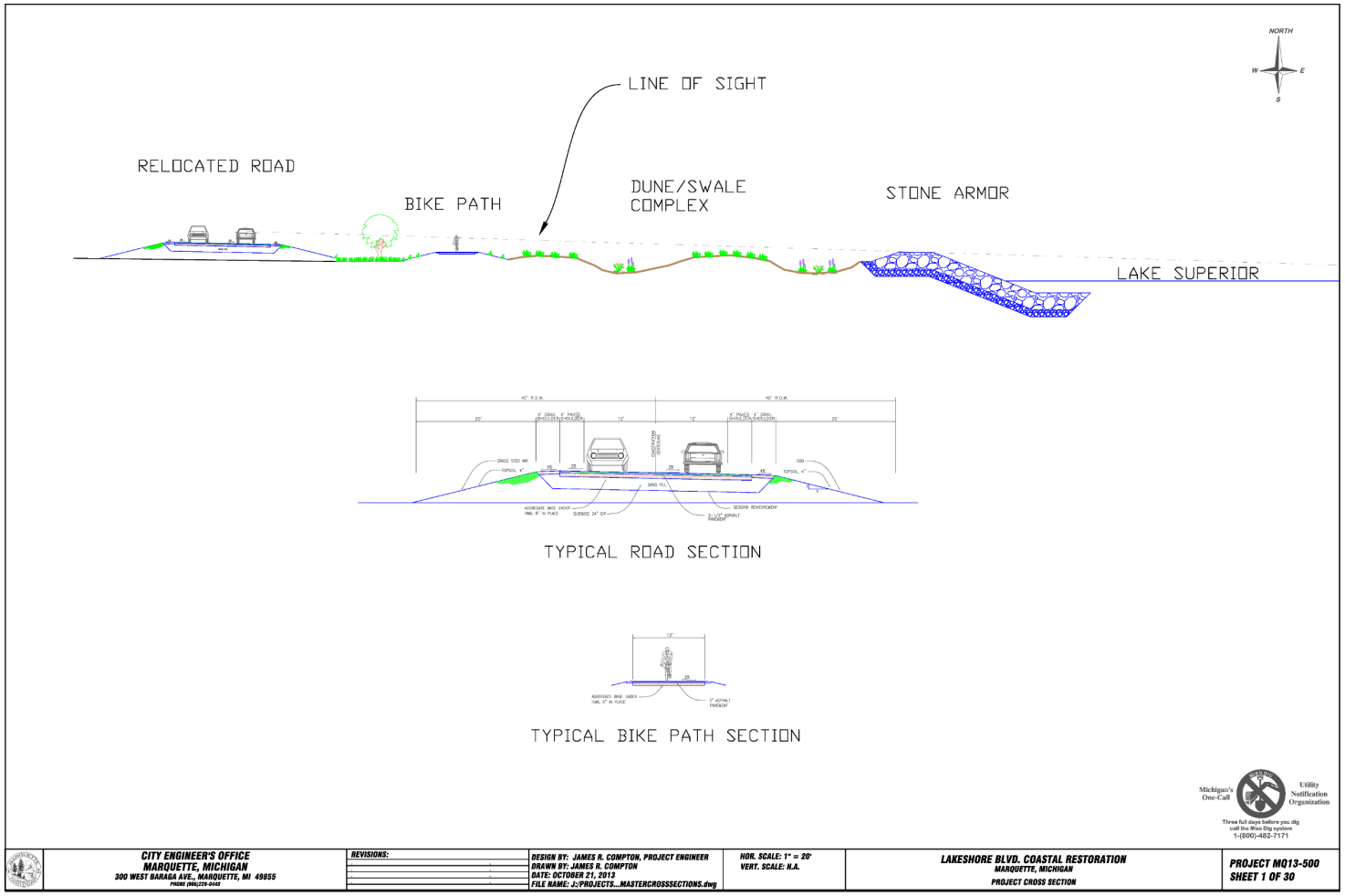
- MDEQ Coastal Zone Management Grant - $34,500 grant for a $69,250 project
- Conduct public engagement and develop a design for construction (shovel ready) based upon previous work by BAIRD
- Incorporate coastal restoration into man-made defense system (Dune and Swale complexes)
- Surveys and Public Meetings
- City Commission approved plans

City Commission Approved Design



- Shoreward Erosion Control – Stone Armor
- Shoreline Restoration – Dune/Swale Complex
- Multi-use pathway
- Two designated parking areas
- Two viewing platforms
- Asphalt street structure
- Roundabout at terminating vista

City Commission Approved Design



- Stone Armor per U.S. Corps of Engineers design
- Street and multi-use pathway provide direct line of sight to lake
- Dune/Swale Complex – dune grass and native plants
- Street structure to incorporate geogrid reinforcement

City Commission Approved Design - Cost Estimate

Description	Cost
Shoreline Rock Armor	$5,100,000
Road Relocation + Utilities	$2,800,000
Multi-use Pathway	$1,015,000
Parking Lots/ADA Public Access	$282,000
Dune Restoration/Coastal Wetland	$513,000
Contingency (15%)	$1,456,500
Total	$11,166,500

Outcome

- City Commission endorsement of final plans after lengthy public process described here
- Received approval from State of Michigan
- Seek funding multiple funding opportunities with “shovel ready” design
  - USACE
  - NFWF
  - FEMA

Challenges

Scott Cambensy – Public Works Superintendent

Challenges

- Lakeshore Boulevard – Wright to Hawley
  - Plans in Place
  - Funding awarded
  - Interim Maintenance
- Lakeshore Boulevard – Fair to Pine Street
  - Future Planning (CZM Grant Application)
  - Possible NMU partnership
  - Interim Maintenance
- Other Shoreline Areas
  - Shiras Park
  - US-41 South
  - Presque Isle Park
  - North Breakwall and Beaches

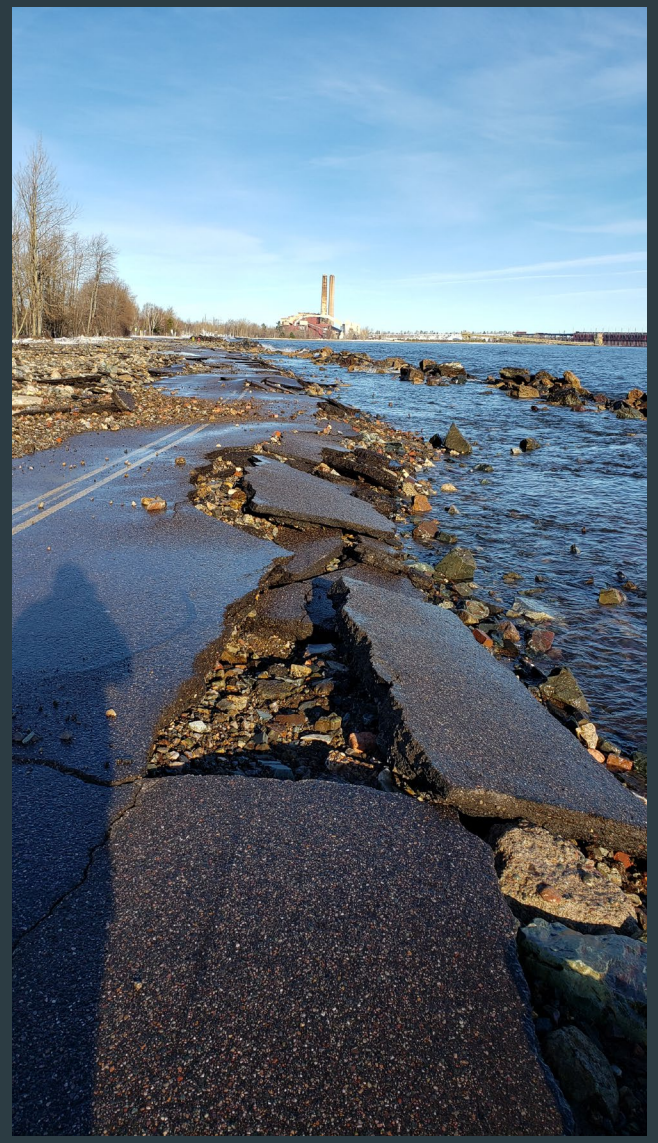
Lakeshore Blvd. Damage

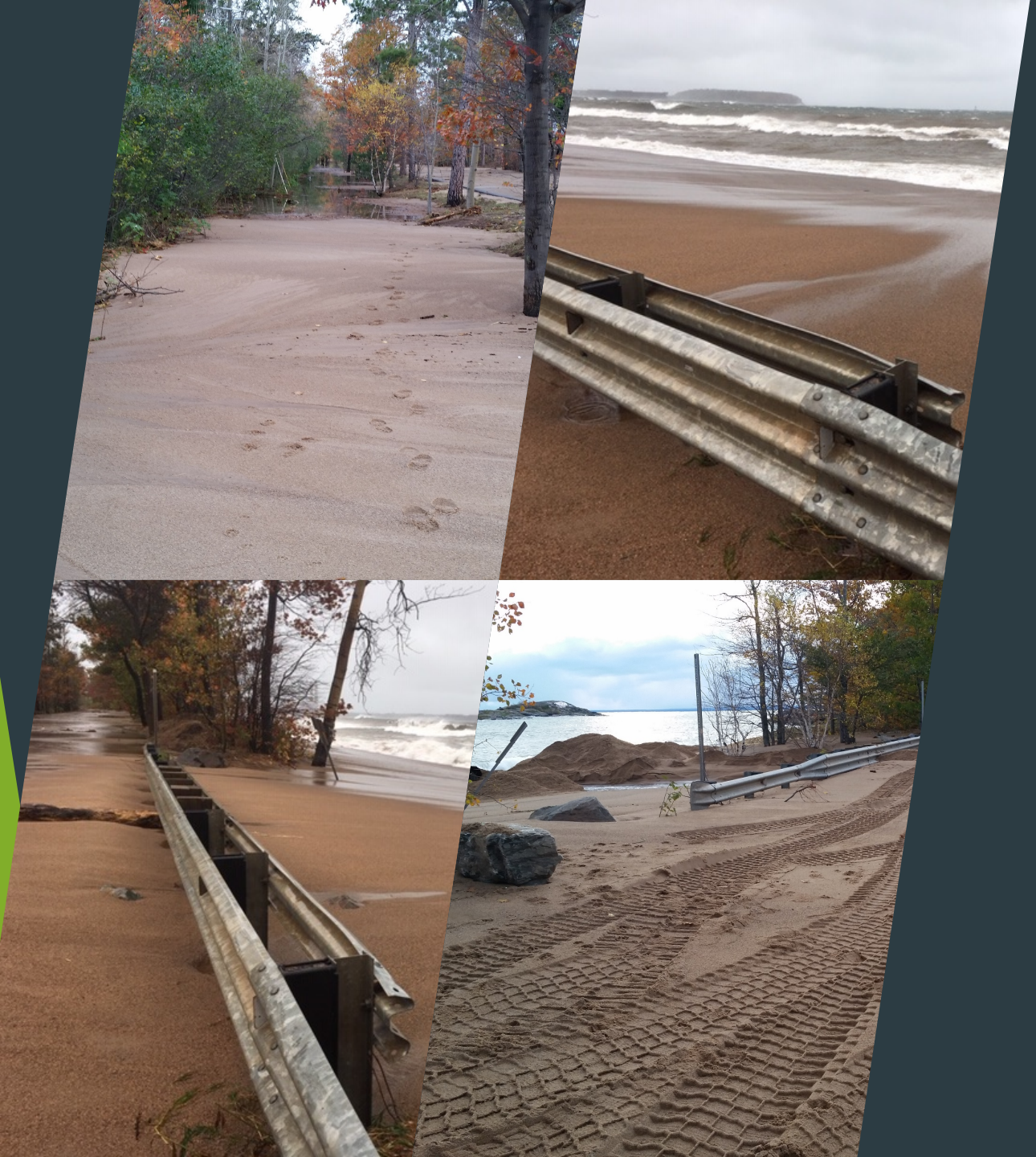
October 2017

January 2019

Damage to Lakeshore Blvd. – Pine St. to Hawley St.

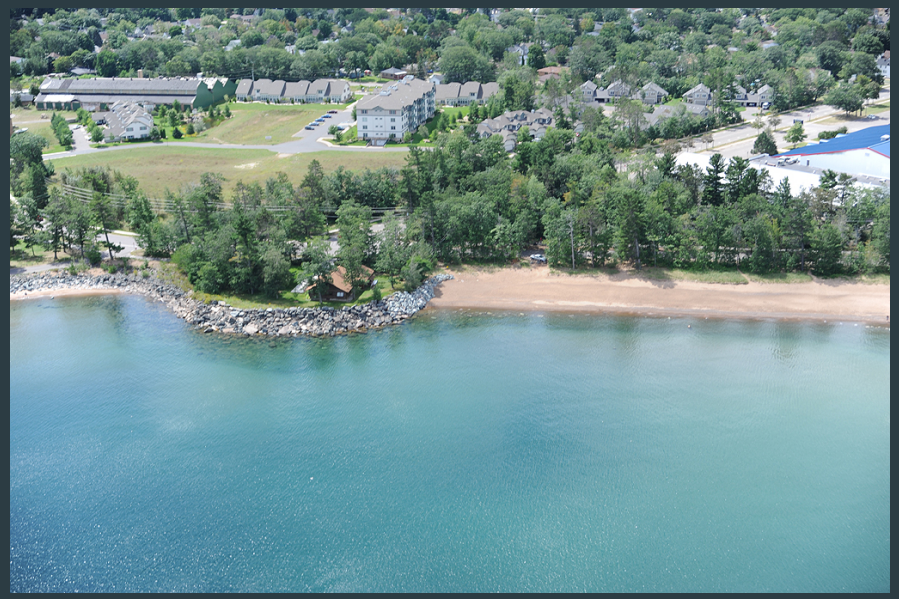
Catastrophic Damage from Fall 2019





Lakeshore Blvd. between Fair Ave. and Pine St.

Lakeshore Boulevard – Fair Ave. to Pine St.



2011

Lakeshore Boulevard – Fair Ave. to Pine St.

- Through erosion and rising lake levels the shoreline was disappearing. This area a shown in the previous 2011-12 photos averaged 20 to 40 feet of forested dune and over 100 feet of beach.

2019

- A Superior Watershed Partnership employee inspecting the bank post storm. This was typical to over 1,400 feet of shoreline.

Lakeview Arena Storm Outfall

2019

- The Con-Span bridge across the drainage outlet behind Lakeview Arena has been compromised by high seas and required repairs on multiple occasions in 2019. Prior to 2019 the maintenance centered on clearing sand from the outlet.

Armoring Lakeshore Boulevard - Fair Ave. to Pine St.

- In danger of losing Lakeshore Boulevard from Fair Ave. to Pine St. the City began the process of armoring the shoreline. Roughly 1,400 feet of shoreline was armored with rock at a cost of $220,400.

- A temporary breakwall was constructed in order to slow the erosion while the shoreline was being armored.

2019

Additional Shoreline Erosion Areas Affecting the Bike Path

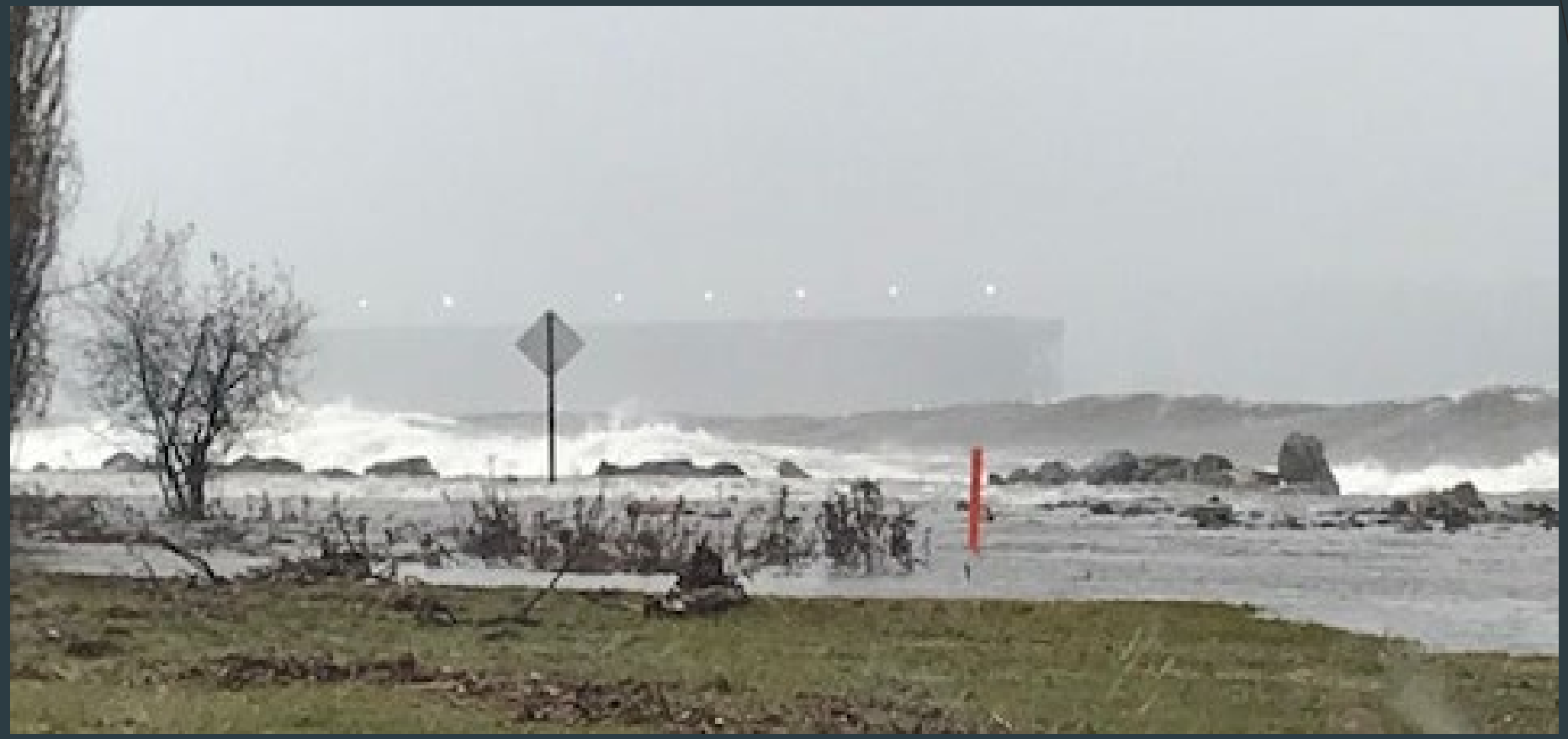
2019

- Additional erosion adjacent to the Hampton Inn located at Founders Landing is encroaching on the bike path.

- The bike path adjacent South Lake St. Portions of the shoreline are owned by the City and portions are owned by the State of Michigan.

2017 Shiras Park Damage

2011



Shoreline Stabilization

Coastal Events (2009-2019)

Year	Events	Total
2010	Lakeshore Blvd. Overlay	$74,938
2013	Lakeshore Coastal Restoration	$20,000
2015	May 2015 Storm Cleanup	$17,143
2017	October 2017 Storm Cleanup	$110,000
2018	Carp River Restoration	$10,825
2019	Lakeshore Armoring (Pine to Fair)	$220,400
2019	Breakwall Gate	$5,000
2019	Bike path (Hampton Inn)	$5,000
--	--	$463,306

*These are one-time events separate from annual maintenance.

Public Works Annual Coastal Maintenance (2009-2019)

Description	Annual Maintenance Cost
Close, Clean/Repair and Open Lakeshore Blvd.	$20,000
Marina Dock Repairs	$7,500
Dredging Stormwater Outlets	$11,000
Bulkhead/Sinkhole Repair	$15,000
Annual Average Maintenance	$53,500

Public Works Ten Year Coastal Maintenance (2009-2019)

Description	Costs
10 Year Total Maintenance	$535,000
Coastal Events Repair/Cleanup	$463,306
Total with Coastal Events	$998,306

Historical Funding Opportunities Realized

Curt Goodman and Geri Grant

1AB
2015 Great Lakes Restoration Initiative
Reducing Runoff/Tree Planting
2,500 trees planted (Approx. 737,500 gallons of stormwater captured)
$169,996 grant /$17,204 match = 187,200 (SWP/City)

2
Coastal Wetland Mitigation
Restored Approximately 2 acres
City/Funded, SWP Planning Assistance

3AB
2016 Great Lakes Restoration Initiative
Coastal Wetland Restoration
9.5 acres wetland habitat enhanced
2.5 acres coastal wetland restored
15 acres in conservation easement
2 acres beach restoration, 1000 trees planted
$199,451 grant /$36,100 match = $235,551 (SWP/City)

4
2017 Great Lakes Restoration Initiative
Hawley Storm Drain Relocation
Approx. 9.0 M gallons stormwater per year disconnected from Lake Superior
$288,500 grant /$112,500 match = $401,000 (SWP/City)

5
2012 Michigan Coastal Management Program
Public Engagement and Coastal Planning:
$58,000 grant/$59,990 match = $117,990 (SWP/City)

6
2014 Michigan Coastal Management Program
Coastal Engineering Design Review and Public Engagement:
$34,500 grant/$36,381 match= $70,881 (City/SWP)

7
2018 National Fish and Wildlife Foundation
Coastal Resiliency, Shoreline Stabilization and Habitat Restoration
$2,500,000 grant/$3,050,000 match= $5,550,000 (SWP/City)

8
2018 FEMA Pre-Disaster Mitigation Program
Lakeshore Boulevard Relocation
$2,700,000 grant /$675,000 match
= $3,375,000 – (**Pending** : City)

9
2020 Michigan Coastal Management Program
9 acres of coastal habitat restored
Improved resiliency 1,200 linear feet of shoreline
$200,000 grant/$202,851 match = $402,851
(**Pending** - City/SWP)

10
2014 Great Lakes Restoration Initiative
Lakeview Storm Drain Improvements
0.7 acres wetlands created (Lakeview storm drain)
70% reduction in bacteria and pollutants
$179,700 grant funds/$12,508 matching funds
= $192,208 (City/SWP)

11
Great Lakes Conservation Corps and Community Volunteers
Beach grass planting, invasive plant removal, beach clean-ups, etc.
Annually: City funded and SWP match

12
2017 U.S. Army Corps of Engineers
Preliminary Coastal Study: Funded
Note: First step to additional coastal implementation funding
$100,000 grant/$0 match (City/SWP)

* Picnic Rocks to Dead River

Specific Projects

- NOAA Shoreline Viewer
- NOAA U.S. Climate Toolkit
- CZM Form-Based Codes
- M.A.P. Resiliency Grant for Land Development Code
- MI Sea Grant Shoreline Restoration
- Coastal Wetland Mitigation
- GLRI Stormwater Management

Funding Opportunities Realized for Lakeshore Boulevard – Wright Street to Hawley

Curt Goodman and Geri Grant

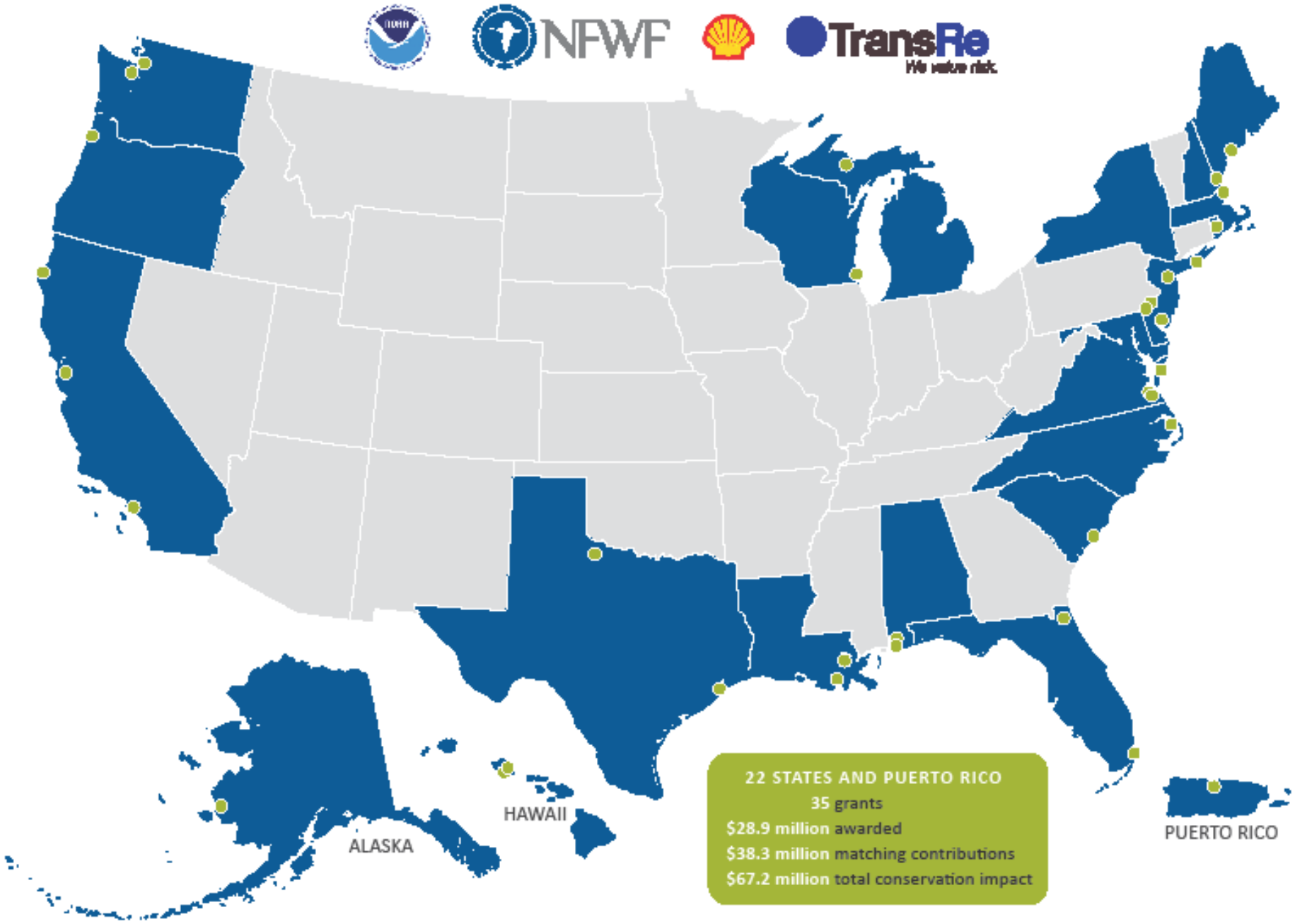
Awarded Funding

- National Fish and Wildlife Foundation – National Coastal Resilience Fund
  - Grant Amount: $2,500,000
  - Local Match: $3,050,000 (includes $50,000 in match from SWP)
  - Timeline: November 2018 – October 2021
  - Submitted By: Superior Watershed Partnership
  - Status: Awarded

Lakeshore Boulevard Project Supporters

- NOAA Climate Program Office
- Great Lakes & St. Lawrence Cities
- American Society of Adaptation Professionals
- Michigan Sea Grant
- Michigan Department of Natural Resources
- Michigan State University Extension
- United States Senator Debbie Stabenow
- United States Congressman Jack Bergman
- Climate Adaptation Task Force
- Marquette County
- Keweenaw Bay Indian Community
- Lakehead University, Thunder Bay, Ontario

NATIONAL COASTAL RESILIENCE FUND 2018 GRANTS



Pending Funding

- **FEMA – Pre-Disaster Mitigation Fund/Coastal Resilient Infrastructure (2 Proposals)**
  - Grant Amount: $2,700,000
  - Local Match: $675,000
  - Tentative Timeline: December 2019 – April 2023
  - Submitted by: City of Marquette
  - Status: Pending

- **USACE – Section 111 Shoreline Damage Attributable to a Federal Navigation Project**
  - Grant Amount: Maximum Federal Limit $10,000,000
  - Local Match: Cost share up to 35%
  - Tentative Timeline: If awarded, funding is anticipated in 2022-2023 or later
  - Submitted By: City of Marquette
  - Status: Pending

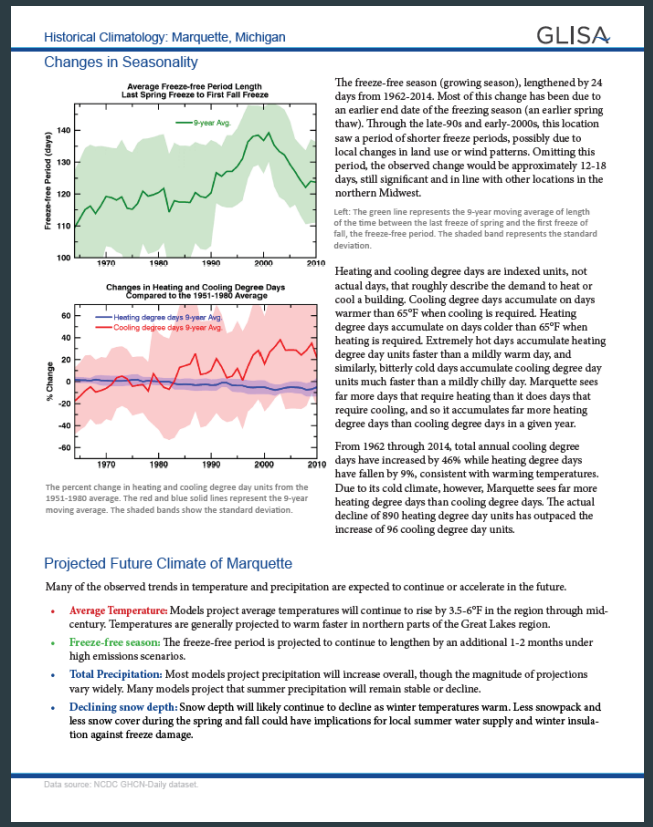
Former Cliffs-Dow Site Funding Opportunities

- RFQ – Development Interest
- Brownfield Funding Opportunities
  - Public Infrastructure cost recovery
  - Environmental Remediation (if necessary)

Recent Design Modifications to Match Funding Opportunities

- Changes to shoreline treatment
  - Addition of a beach into coastal restoration
- Road design remains the same
- Cost impacts
- Impacts from adjacent property
- Coastal engineering considerations
- Timeline for construction

Example of Coastal Engineering Considerations



Historical Climatology: Marquette, Michigan

GLISA

Changes in Seasonality

The percent change in heating and cooling degree day units from the 1951-1980 average. The red and blue solid lines represent the 9-year moving average. The shaded bands show the standard deviation.

The freeze-free season (growing season), lengthened by 24 days from 1962-2014. Most of this change has been due to an earlier end date of the freezing season (an earlier spring thaw). Through the late-90s and early-2000s, this location saw a period of shorter freeze periods, possibly due to local changes in land use or wind patterns. Omitting this period, the observed change would be approximately 12-18 days, still significant and in line with other locations in the northern Midwest.

Left: The green line represents the 9-year moving average of length of the time between the last freeze of spring and the first freeze of fall, the freeze-free period. The shaded band represents the standard deviation.

Heating and cooling degree days are indexed units, not actual days, that roughly describe the demand to heat or cool a building. Cooling degree days accumulate on days warmer than 65°F when cooling is required. Heating degree days accumulate on days colder than 65°F when heating is required. Extremely hot days accumulate heating degree day units faster than a mildly warm day, and similarly, bitterly cold days accumulate cooling degree day units much faster than a mildly chilly day. Marquette sees far more days that require heating than it does days that require cooling, and so it accumulates far more heating degree days than cooling degree days in a given year.

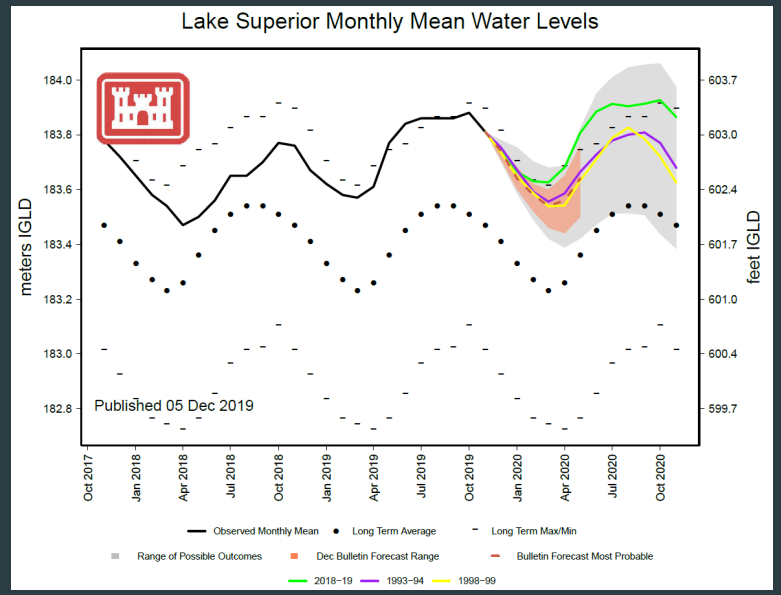
From 1962 through 2014, total annual cooling degree days have increased by 46% while heating degree days have fallen by 9%, consistent with warming temperatures. Due to its cold climate, however, Marquette sees far more heating degree days than cooling degree days. The actual decline of 890 heating degree day units has outpaced the increase of 96 cooling degree day units.

Projected Future Climate of Marquette

Many of the observed trends in temperature and precipitation are expected to continue or accelerate in the future.

- **Average Temperature:** Models project average temperatures will continue to rise by 3.5–6°F in the region through mid-century. Temperatures are generally projected to warm faster in northern parts of the Great Lakes region.
- **Freeze-free season:** The freeze-free period is projected to continue to lengthen by an additional 1-2 months under high emissions scenarios.
- **Total Precipitation:** Most models project precipitation will increase overall, though the magnitude of projections vary widely. Many models project that summer precipitation will remain stable or decline.
- **Declining snow depth:** Snow depth will likely continue to decline as winter temperatures warm. Less snowpack and less snow cover during the spring and fall could have implications for local summer water supply and winter insulation against freeze damage.

Data source: NCDC GHCN-Daily dataset.



Modified Design

- Maintains Commission Adopted Plans
  - Same road alignment
  - Same number of parking areas
  - Same Access to waterfront from parking areas
  - Same multiple use pathway
  - Same Dune and Swale concepts
- Enhances Commission Adopted Plans
  - Addition of a sand or cobble beach
  - Underwater erosion protection

Modified Design Cost Estimates

Description	Cost
Shoreline Rock Armor	$5,100,000
Road Relocation	$2,800,000
Beach Restoration	$600,000
Underwater Habitat	$350,000
Multi-use Pathway	$1,015,000
Parking Lots/ADA Public Access	$282,000
Dune Restoration	$513,000
Contingency (15%)	$1,559,000
Total	$12,259,000

*Does not include potential cost for site remediation (if necessary)

Modified Design Cost Estimates – Phased Approach - Phase I

Description	Cost
Shoreline Repair	$1,000,000
Road Relocation	$2,800,000
Contingency (15%)	$570,000
Total	$4,370,000

Modified Design Cost Estimates – Phased Approach - Phase – Phase II

Description	Cost
Shoreline Rock Armor	$4,500,000
Multi-use Pathway	$1,015,000
Parking Lots/ADA Public Access	$282,000
Dune Restoration	$513,000
Beach Restoration	$600,000
Underwater Habitat	$350,000
Contingency (15%)	$1,089,000
Total	$8,349,000

Lakeshore Boulevard – Wright Street to Hawley Construction

- Project has been budgeted in the FY2020 Capital Outlay Budget
- Requests for Bids have been prepared for distribution
- Construction in 2020 (May – Oct)

Future Funding Opportunities

Curt Goodman, Jon Swenson, Ian Davis, Geri Grant and Mike Angeli

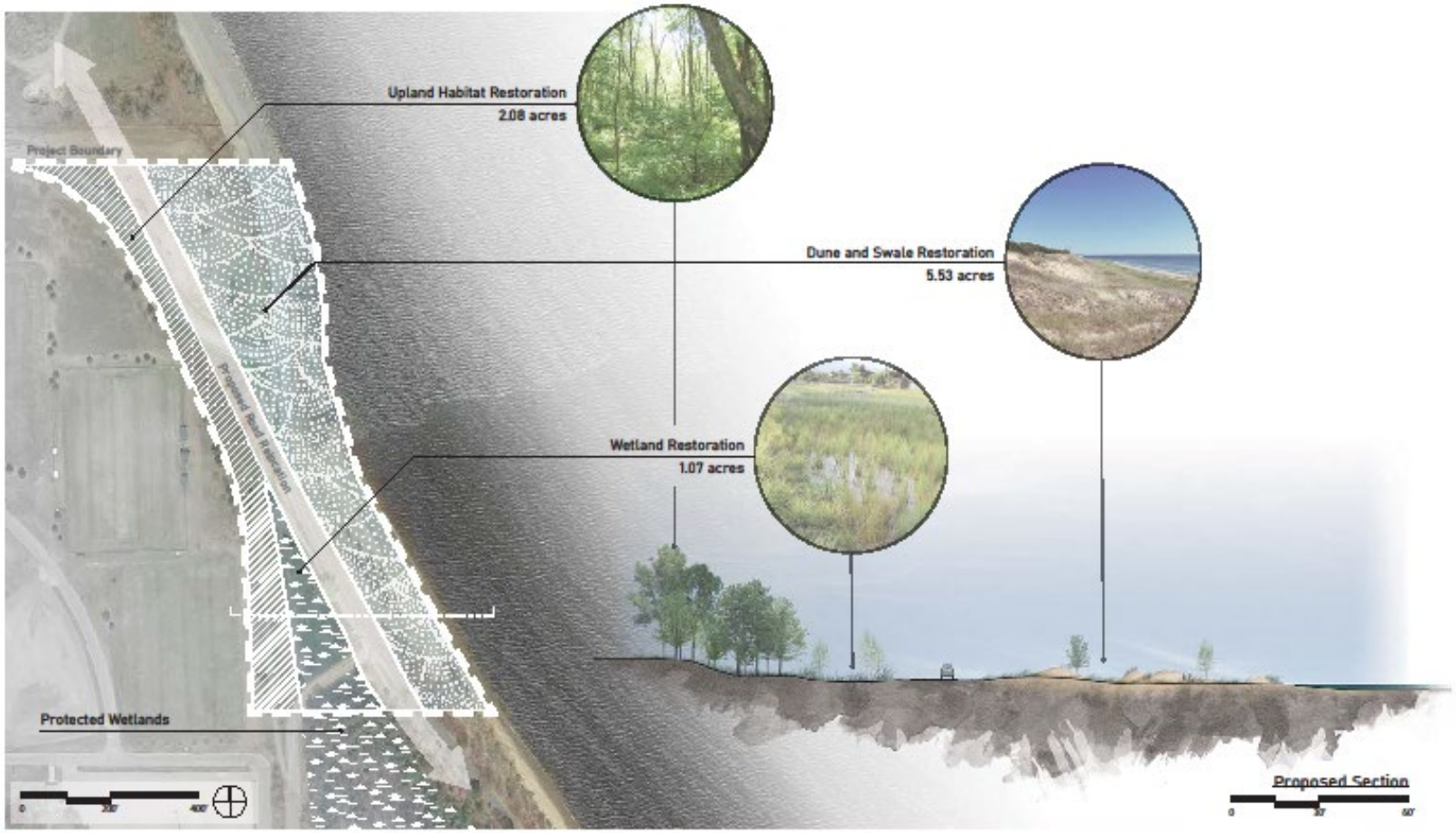
Lakeshore Boulevard – Fair Avenue to Pine Street

- Coastal Zone Management Grant Application?
- Interim Maintenance Plans
  - Stormwater Outlet
- NMU Partnership?
- Planning Process for future options?
  - Do nothing
  - Close that section of Lakeshore Boulevard permanently and re-route along Fair to Pine Street
  - Modify and Strengthen the shoreline (funding dependent)

PROPOSED COASTAL RESTORATION | MARQUETTE, MI

OHM Advisors

12/19/2019

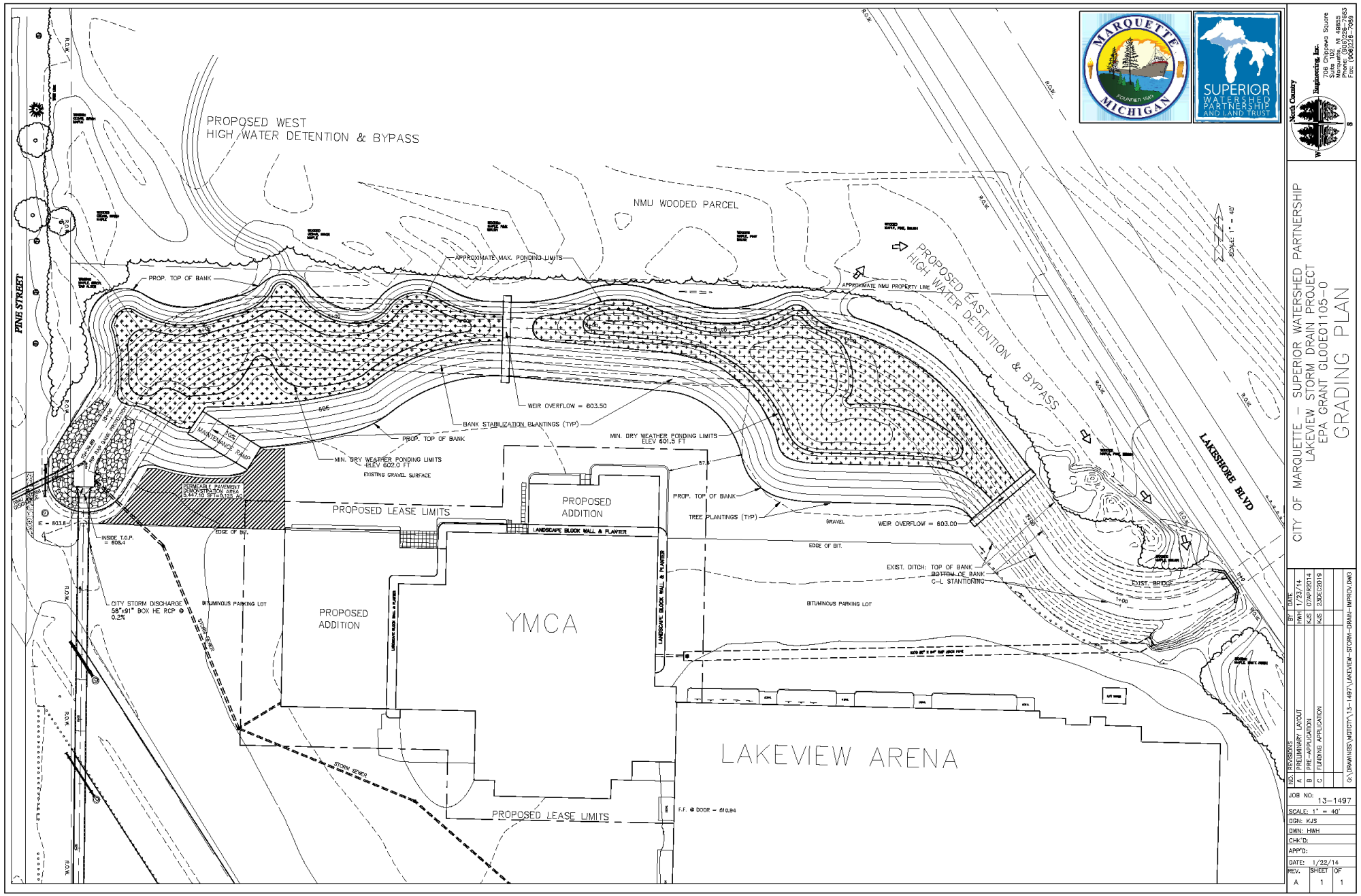


PROPOSED COASTAL RESTORATION | MARQUETTE, MI

OHM

12/19/2019

Lakeview Storm Drain Culvert


PROPOSED WEST
HIGH WATER DETENTION & BYPASS
NMU WOODED PARCEL
PROPOSED EAST
HIGH WATER DETENTION & BYPASS
APPROXIMATE MAX. PONDING LIMITS
PROP. TOP OF BANK
APPROXIMATE NMU PROPERTY LINE
WEIR OVERFLOW = 603.50
BANK STABILIZATION PLANTINGS (TYP)
MIN. DRY WEATHER PONDING LIMITS
ELEV 601.5 FT
MIN. DRY WEATHER PONDING LIMITS
ELEV 602.0 FT
EXISTING GRAVEL SURFACE
MAINTENANCE RAMP
PERMEABLE PAVEMENT
DEMONSTRATION AREA
PROPOSED LEASE LIMITS
PROPOSED
ADDITION
LANDSCAPE BLOCK WALL & PLANTER
TREE PLANTINGS (TYP)
GRAVEL
WEIR OVERFLOW = 603.00
EDGE OF BIT.
EXIST. DITCH: TOP OF BANK
BOTTOM OF BANK
C-L STANTIORING
EXIST. BRIDGE
BITUMINOUS PARKING LOT
INSIDE T.O.P.
= 603.4
CITY STORM DISCHARGE
58"x91" BOX HE RCP @
0.2%
YMCA
LAKEVIEW ARENA
STORM SEWER
F.F. @ DOOR = 610.94
PINE STREET
LAKESHORE BLVD
SCALE: 1" = 40'
MARQUETTE
MICHIGAN
FOUNDED 1849
SUPERIOR
WATERSHED
PARTNERSHIP
AND LAND TRUST
North Country
Engineering, Inc.
208 Ridge Square
Suite 102
Marquette, MI 49855
Phone: (906)228-7583
Fax: (906)228-7069
CITY OF MARQUETTE – SUPERIOR WATERSHED PARTNERSHIP
LAKEVIEW STORM DRAIN PROJECT
EPA GRANT GL00E01105-0
GRADING PLAN
NO. REVISIONS BY DATE
A PRELIMINARY LAYOUT HWH 1/23/14
B PRE-APPLICATION KJS 07APR2014
C FUNDING APPLICATION KJS 23DEC2019
G:\DRAWINGS\MQTCTY\13-1497\LAKEVIEW-STORM-DRAIN-IMPROV.DWG
JOB NO: 13-1497
SCALE: 1" = 40'
DGN: KJS
DWN: HWH
CHK'D:
APP'D:
DATE: 1/22/14
REV. A
SHEET 1
OF 1

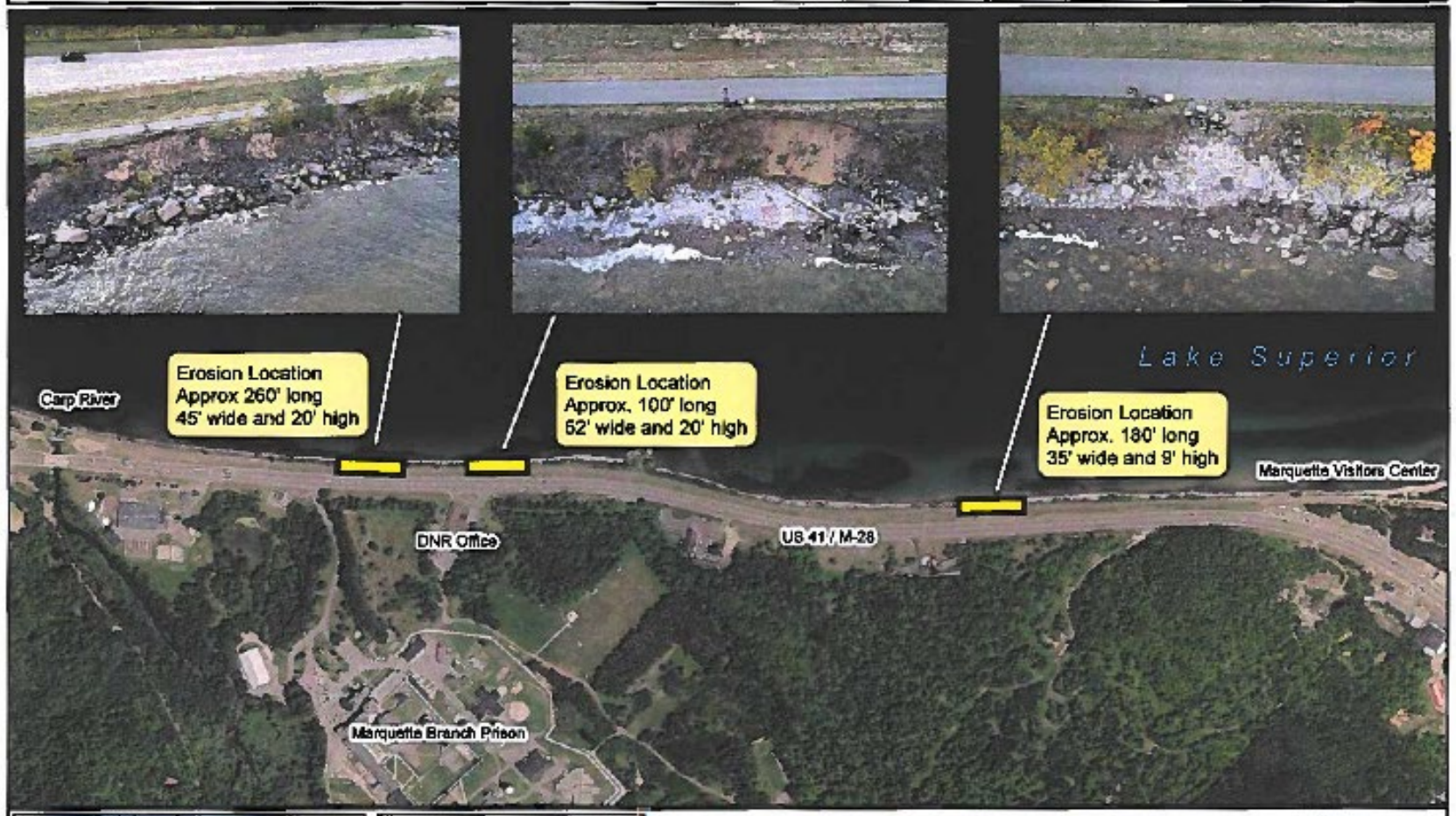
Transportation Alternatives Program

- Project Description: Shoreline stabilization to protect the multi-use trail and US 41/M-28
- Amount: $837,500
- Local Match:

MDNR	$160,000
City of Marquette	$5,000
Superior Watershed Partnership	$2,000

- Tentative Award: February 2020
- Submitted By: City of Marquette
- Status: Pending

CRITICAL EROSION: Iron Belle/Iron Ore Heritage Trail/US HWY 41; Marquette, Michigan



Erosion Locations

0 500 1,000 2,000 Feet

0 0.125 0.25 0.5 Miles

SUPERIOR WATERSHED PARTNERSHIP

Shiras Park

- USACE Section 111 Study
- $300,000 set aside for grant matches and/or maintenance
- Outcome dependent on Commission decision regarding three options for Lakeshore Boulevard to the north
  - Destination vs. pass-by park

Presque Isle Park

- Pathway relocations
- Sunset Point

Public Safety

- Breakwall Access
- Lifeguard Stands
- Lifesaving Stations