

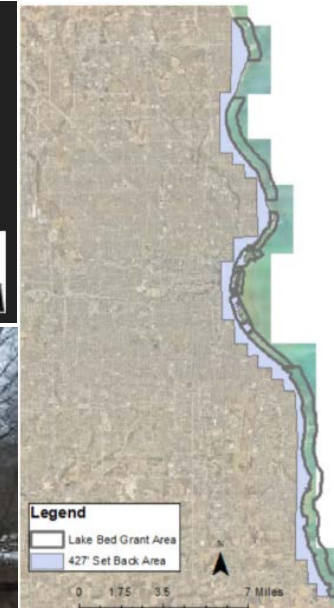
Milwaukee County Parks

- Coastal Asset Inventory
- Coastline Management Guidelines

December 2020



Bay View Park, 2020



Grant Funding - WI Coastal Management Program Grant

- File 19-342 authorized grant funding
 - Coastal Asset Inventory
 - Coastal Management Guidelines

- *Protect Milwaukee County's financial investment in County-owned assets within the Lake Michigan Coastline Management Zone.*
- *Protect the ecology, resources, and natural character of County-owned lands within the Lake Michigan Coastline Management Zone.*
- *Provide efficiency and consistency when reviewing proposals for a scope of work to be completed within the Lake Michigan Coastline Management Zone.*

Asset Inventory

- 477 Assets inventoried.
 - 13% of assets identified were classified as being in poor condition.
 - 22% assets were deemed highly vulnerable.
 - The assets with the highest risk were the beaches, groins, and parking lots.
 - Different infiltration basins, revetments, and parking lots in the vicinity of McKinley Marina all appeared in the top 40 most at risk.
- The total Milwaukee County coastal asset valuation is estimated at \$2,927,425,276 with approximately 50% of the cost attributed to bluff stabilization needs.

FINAL

Milwaukee County Coastal Resources Inventory



Prepared by

Milwaukee County, Environmental Services Unit

In Partnership with Wisconsin Coastal Management Program
and
GZA Environmental, Inc.

Milwaukee County Project 5741-19805

Coastal Resilience Grant No. 017.CR08



OCTOBER 7, 2020

Asset Inventory Evaluations

Asset Type	Sub Asset Type	Number of Assets	Value Type	Value Cost	Value Source	Sub Asset Valuation Total
Athletic Courts	Stand-alone volleyball courts	1	Replacement	\$5,000/each	Capital Planning	\$5,000
	Tennis Courts	1	Replacement	\$115k/each		
	Track	1	Replacement	\$100k/each		
Athletic Fields	Soccer	4	Replacement	\$1,800/each		
	Multi-Use	2	Replacement	\$1,800/each		
	Archery	1	Replacement	\$1,800/each		

Bluffs:

Vulnerability Assessment:

Metric	High	Medium	Low	Weight
Distance from Shore	<100 ft	100-350 ft	>350 ft	25%
Shoreline Protection	Rated Poor or None	Rated Fair	Rated Good	25%
Recession Sum (5 years) ⁴	> 1 ft	0.5-1 ft	< 0.5ft	30%
Change in Soil Volume	>7,500 ft ³	0 – 7,500 ft ³	<0 ft ³	20%

Table 8. Vulnerability Metrics for Bluffs.

(A) Condition Value x (B) Vulnerability Value = Resiliency Rating

Where (A) and (B) are the weighting factors with high and poor scoring a 1, medium or fair scoring a 2, and low and good scoring a 3. NA conditions were considered a 3 for resiliency calculations.

Assets were grouped into three levels of priority, based on risk score:

- High Priority: Risk score below 4.5
- Medium Priority: Risk score between 4.5 and 6.74
- Lower Priority: Risk score 6.75 and above.

Shoreline Recession & Bluff Failure	High
Coastal Flooding	Moderate
Shore Protection Damage	Moderate
Beach Loss	Moderate
Beach Impairment	High
Port, Harbor, & Marina Damage	Moderate
Port, Harbor, & Marina Navigation Impairment	Moderate

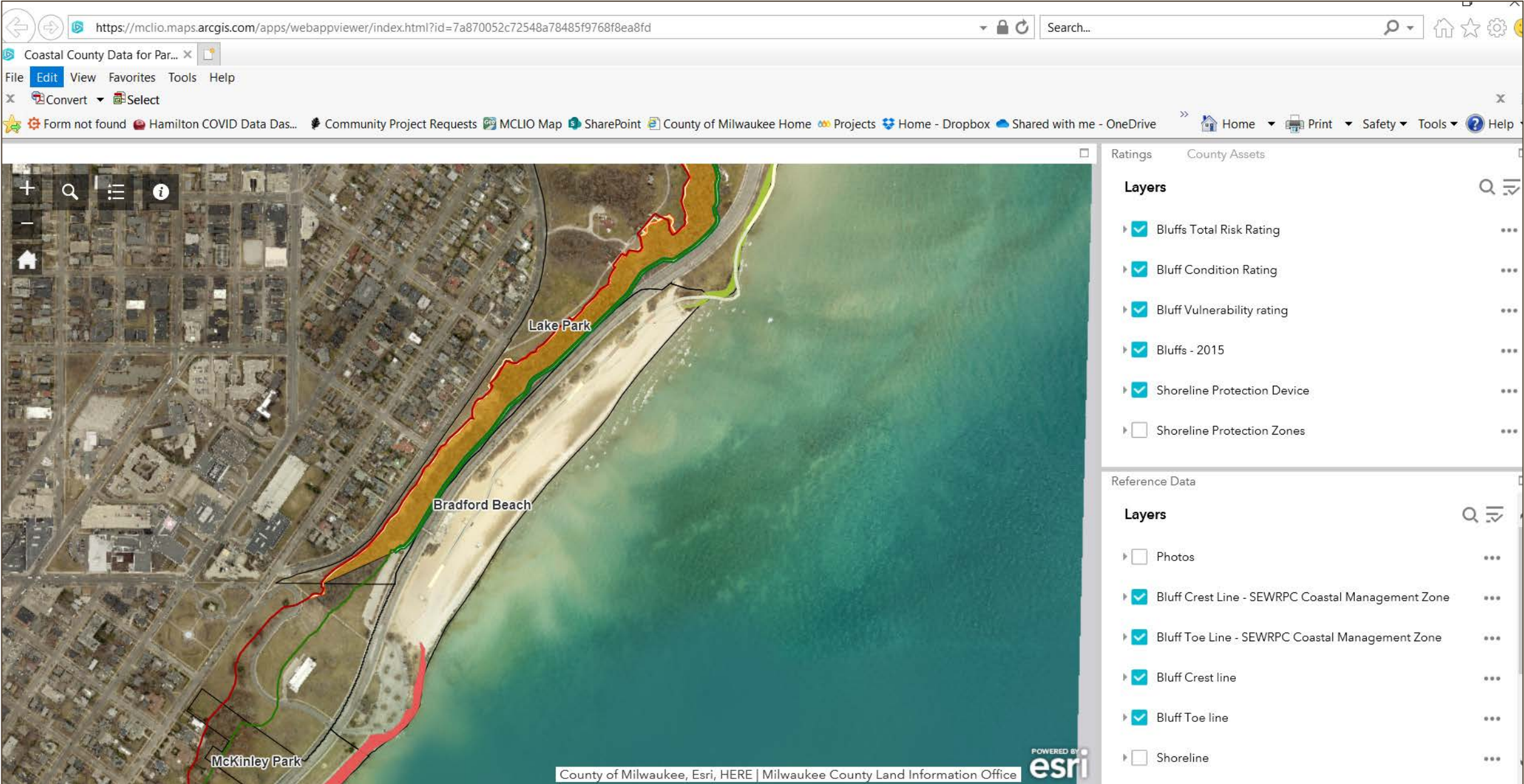
Asset Inventory Evaluation

Milwaukee County Coastal Resources Inventory - October 2020

APPENDIX IV – ASSET LIST BY RISK

	Type	Location	Condition	Condition	VulnerabilityScore	Vulnerability	Risk	Risk	2020Cost
1	Beach	Big Bay	1	Poor	1	High	1	High	\$ 1,121,285
2	Groin	Warnimont Park	1	Poor	1	High	1	High	\$ 454,883
3	Groin	Warnimont Park	1	Poor	1	High	1	High	\$ 343,651
4	Revetment	McKinley Marina	1	Poor	1	High	1	High	\$ 175,375
5	Parking Lot	Bradford Beach	1	Poor	1.25	High	1.25	High	\$ 6,185,435
6	Breakwater	South Shore Park	1	Poor	1.5	High	1.5	High	\$ 2,990,000
7	Groin	Sheridan Park	1	Poor	1.5	High	1.5	High	\$ 55,000
8	Groin	Sheridan Park	1	Poor	1.5	High	1.5	High	\$ 55,000
9	Groin	Sheridan Park	1	Poor	1.5	High	1.5	High	\$ 55,000
10	Groin	Sheridan Park	1	Poor	1.5	High	1.5	High	\$ 55,000
11	Groin	Sheridan Park	1	Poor	1.5	High	1.5	High	\$ 55,000
12	Groin	Sheridan Park	1	Poor	1.5	High	1.5	High	\$ 55,000
13	Groin	Sheridan Park	1	Poor	1.5	High	1.5	High	\$ 55,000
14	Groin	Sheridan Park	1	Poor	1.5	High	1.5	High	\$ 55,000
15	Groin	Sheridan Park	1	Poor	1.5	High	1.5	High	\$ 55,000
16	Groin	Sheridan Park	1	Poor	1.5	High	1.5	High	\$ 55,000
17	Groin	Sheridan Park	1	Poor	1.5	High	1.5	High	\$ 55,000
18	Groin	Sheridan Park	1	Poor	1.5	High	1.5	High	\$ 55,000
19	Revetment	War Memorial and Art Center	1	Poor	1.5	High	1.5	High	\$ 83,000

GIS Web App Data Tool



Coastline Management Guidelines Applicability

- Reference tool as the County considers conducting work or evaluates proposals for work that could impact bluff slope stability:
 - *Construction of infrastructure, occupiable buildings, and other facilities*
 - *Landscape management, such as landscape restoration, removal and/or pruning of vegetation, including invasive species*
 - *Maintenance of existing infrastructure*
 - *Shore protection modifications and structures*

History of Coastline Damages

- Past declared storm disasters in 2008, 2010, and 2020.
- Continuous coastline impacts cause degradation to bluffs.

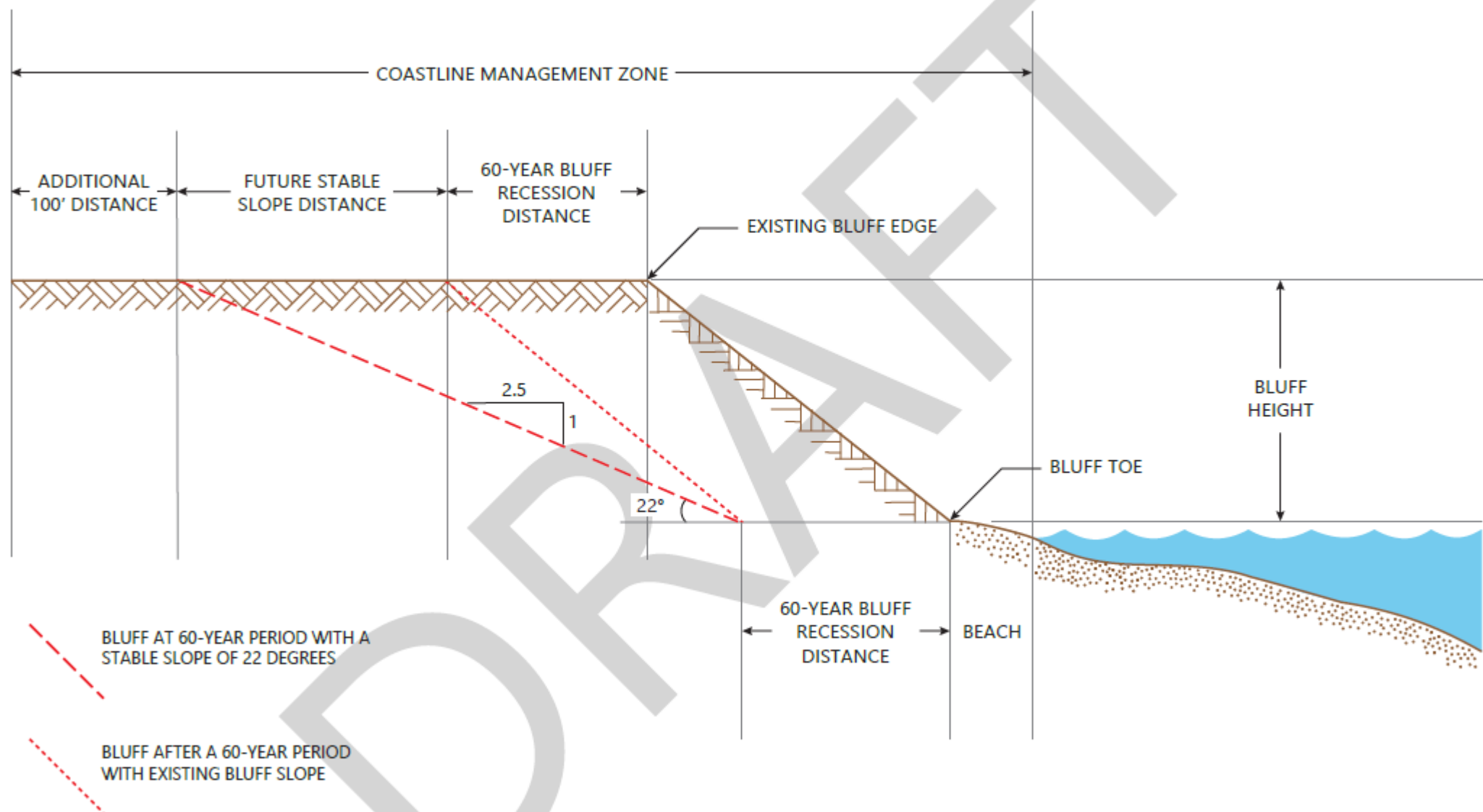




Coastline Management Zone (CMZ)

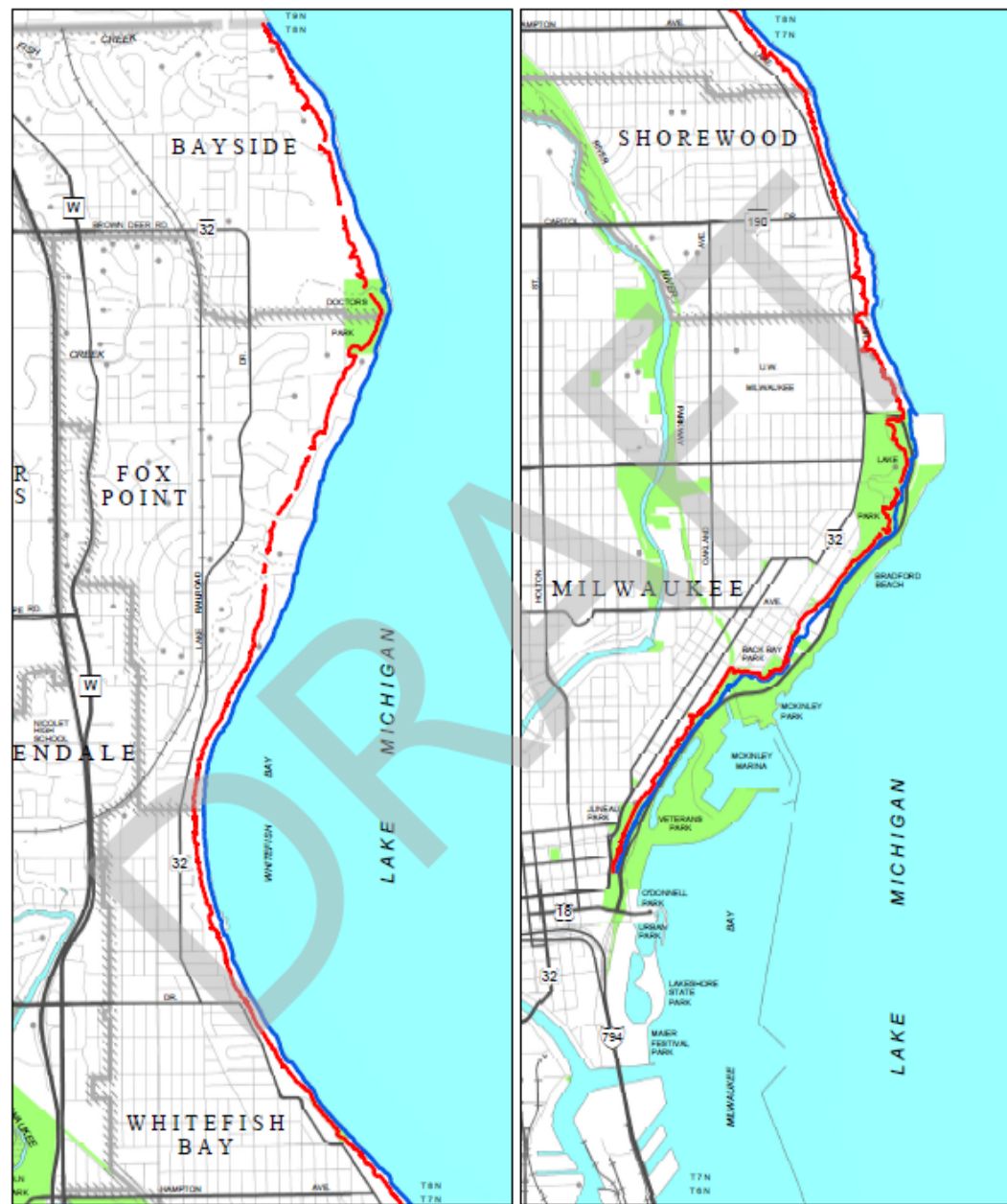
- Based on recommendations for bluff setbacks published by the University of Wisconsin Sea Grant Institute in 2008.
- **Projected 60-year bluff recession distance from the current bluff toe** (*calculated using a minimum recession rate of one foot per year — unless information revealed during the site analysis necessitates using a greater recession rate per year*)
- **Future stable slope distance** (*calculated from the existing bluff toe to the future stable bluff crest using the ratio of a one-foot vertical rise to a 2.5-foot horizontal run*)
- **Setback distance of 100** (*provides for uncertainties related to future recession rates, stable slope angles, the effect of nearby shore protection structures, fluctuations in Lake Michigan water levels, and other factors*)

Figure 3.1
Coastline Management Zone: 2020



Map 2.x
Bluff Crest and Bluff Toe Along the Milwaukee County Coastline

DRAFT



— BLUFF CREST
— BLUFF TOE
■ MILWAUKEE COUNTY OWNED PROPERTY

Note: (Based on 2015 Lidar Topo but aligned in various locations to data provided to SEWRPC by Wisconsin Coastal Management Program)

Source: Wisconsin Coastal Management Program and SEWRPC

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Review by Project Type

Submittals to be prepared by third parties (and their consultants) for County staff review.

Infrastructure & Buildings

- A proposal prepared by a Professional Engineer (P.E.) or Registered Architect (R.A.)
- Stormwater management
 - Direct away from the bluff
 - Low-impact development (LID)
 - Maintain existing stormwater drainage patterns and protect tributary ravines.

Landscape Management

- A proposal prepared by a Landscape Architect, and stability analysis performed by a Professional Engineer (P.E.)
 - Vegetation Inventory
 - Describe the vegetation to be removed and the means of removal
 - Identify replacement vegetation
 - Proposals related to viewshed management should account for the need to retain and maintain bluff vegetation in a variety of heights to promote bluff stability.

Shore Protection & Structures

- A proposal prepared by a Professional Engineer (P.E.)
 - A site investigation of slope stability, lakeshore erosion, and near-shore bathymetry
 - A plan for ensuring adequate quality control of materials used in the designed structure; and
 - Adequate monitoring and maintenance plans, as determined by Milwaukee County.

Bluff or Shoreline Modification

- A proposal prepared by a Professional Engineer (P.E.)
 - A slope stability analysis
 - A no adverse impacts (NAI) analysis stamped by a PE
 - A landscape management plan
 - Adequate monitoring and maintenance plans
 - A statement from the P.E. establishing that the proposed scope of work will not decrease the stability of the bluff area.

Questions

Final Guideline Documents Planned for January 2021



Cupertino Pier – Image Captured May 2018, Source: MCLIO



South Shore Breakwater – Image Captured May 2018, Source: MCLIO



Cupertino Pier Debris – Image Captured January 2020, Source: MCOEM



South Shore Breakwater Damage – Image Captured January 2020, Source: MCOEM