

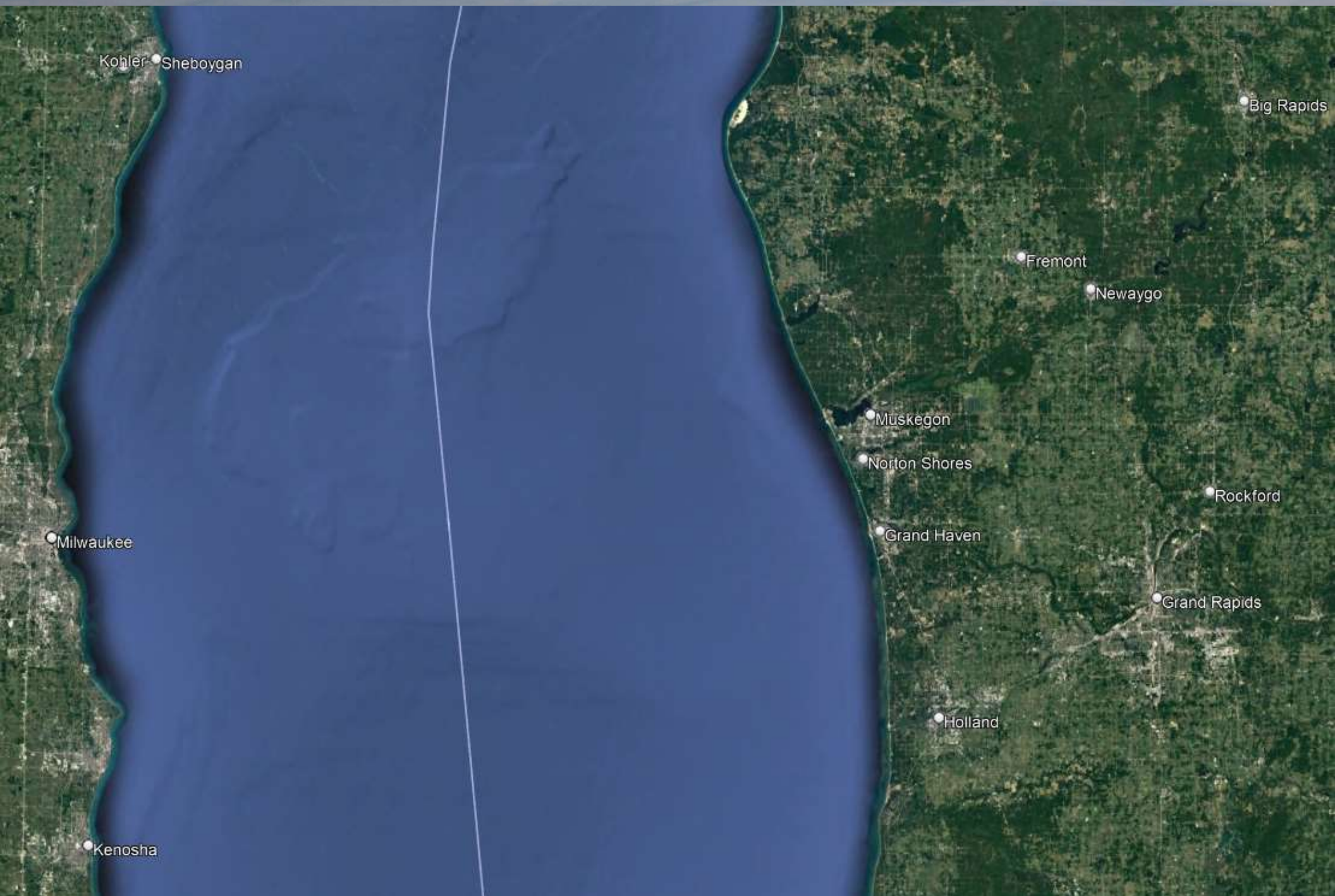
Edgewater Resources

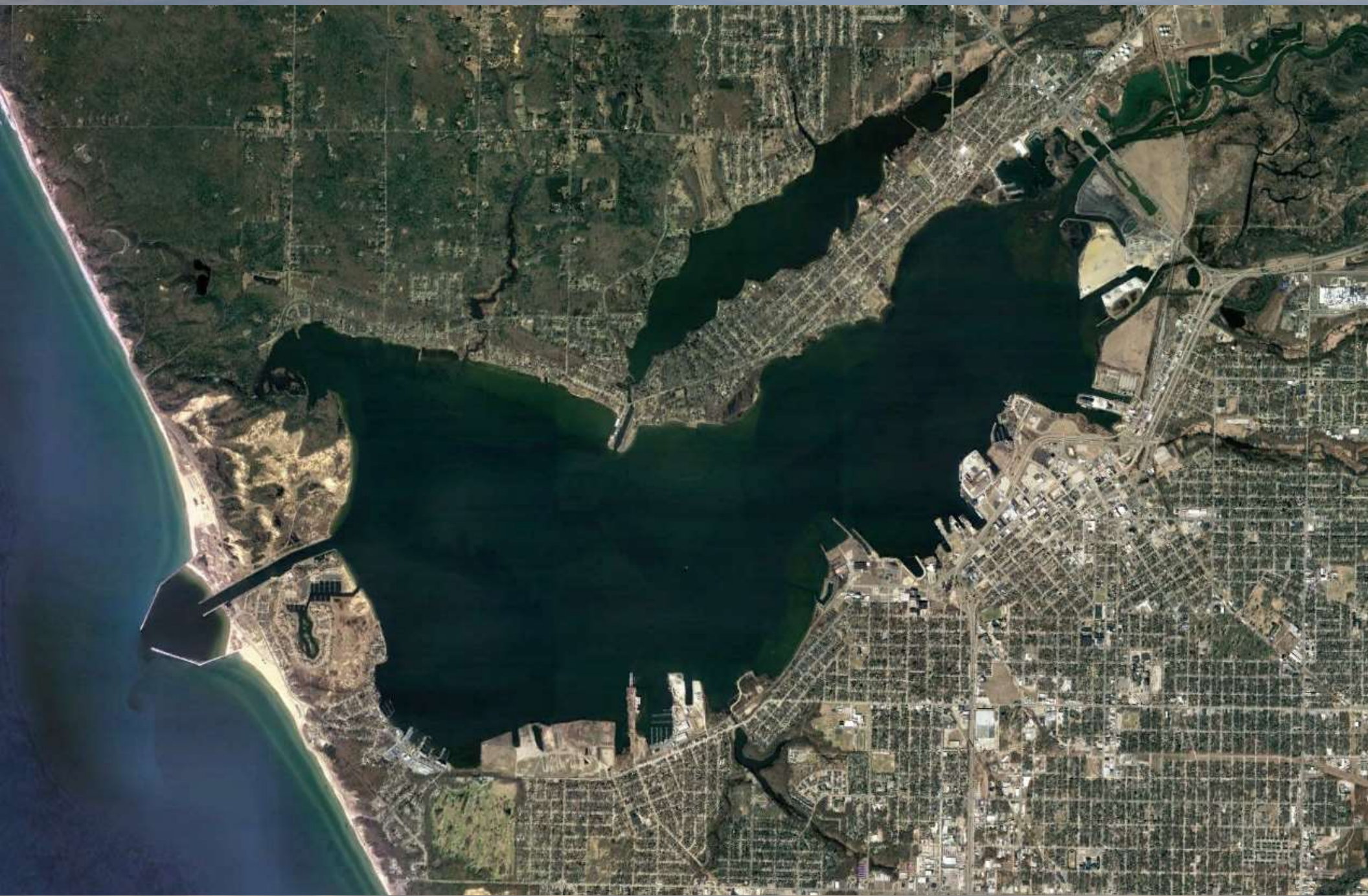
Sustainable Marina Design

Sustainable Design Benefits

- Save Money / Increase Profits
- Reduce Energy Costs
- Reduce Maintenance Costs
- Market Differentiation
- Expand Habitat
- Grant Funding
- Speed Up Entitlements
- Future Proof Your Facility
- Good for the Environment

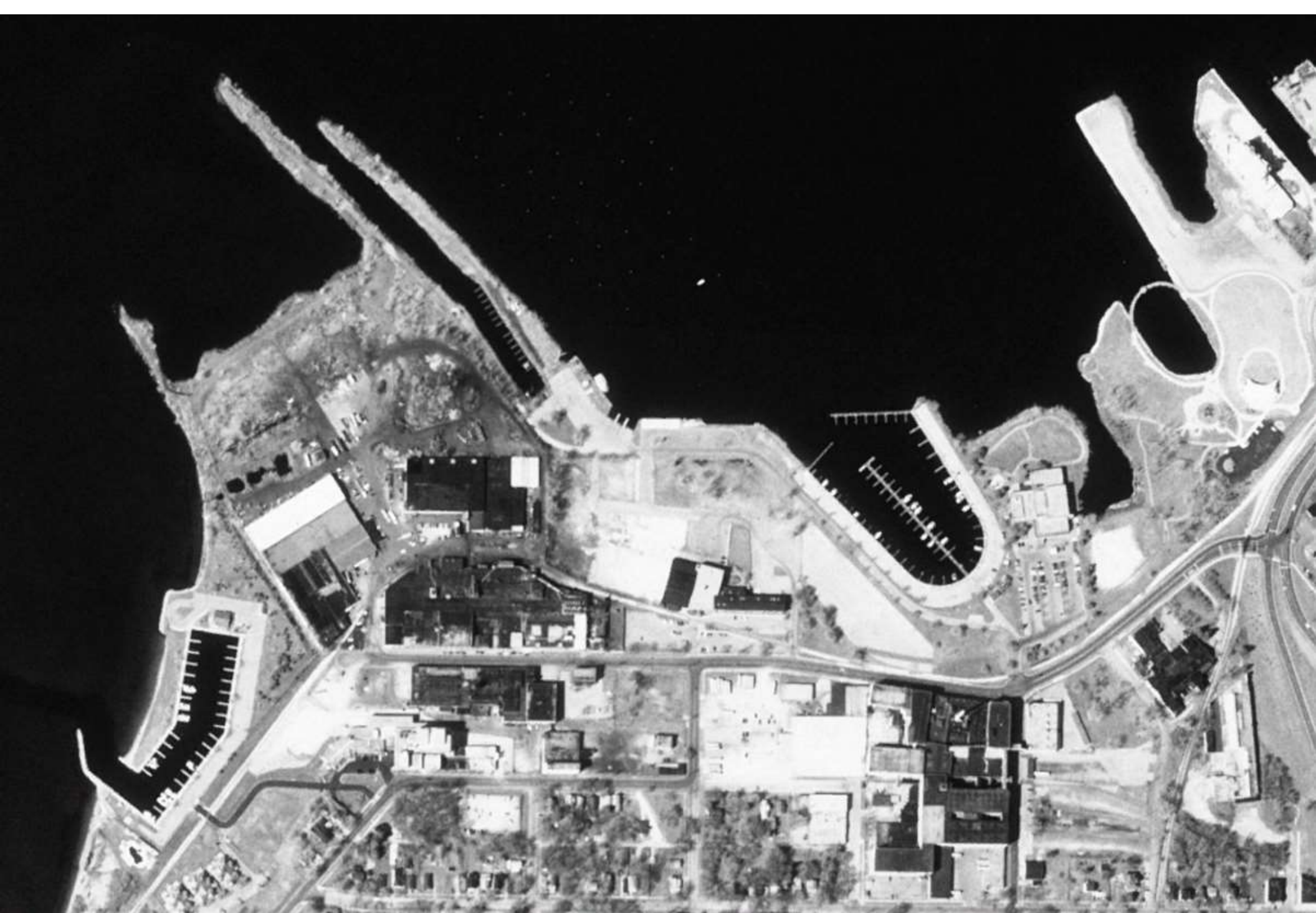






Edgewater Resources

Sustainable Marina Design

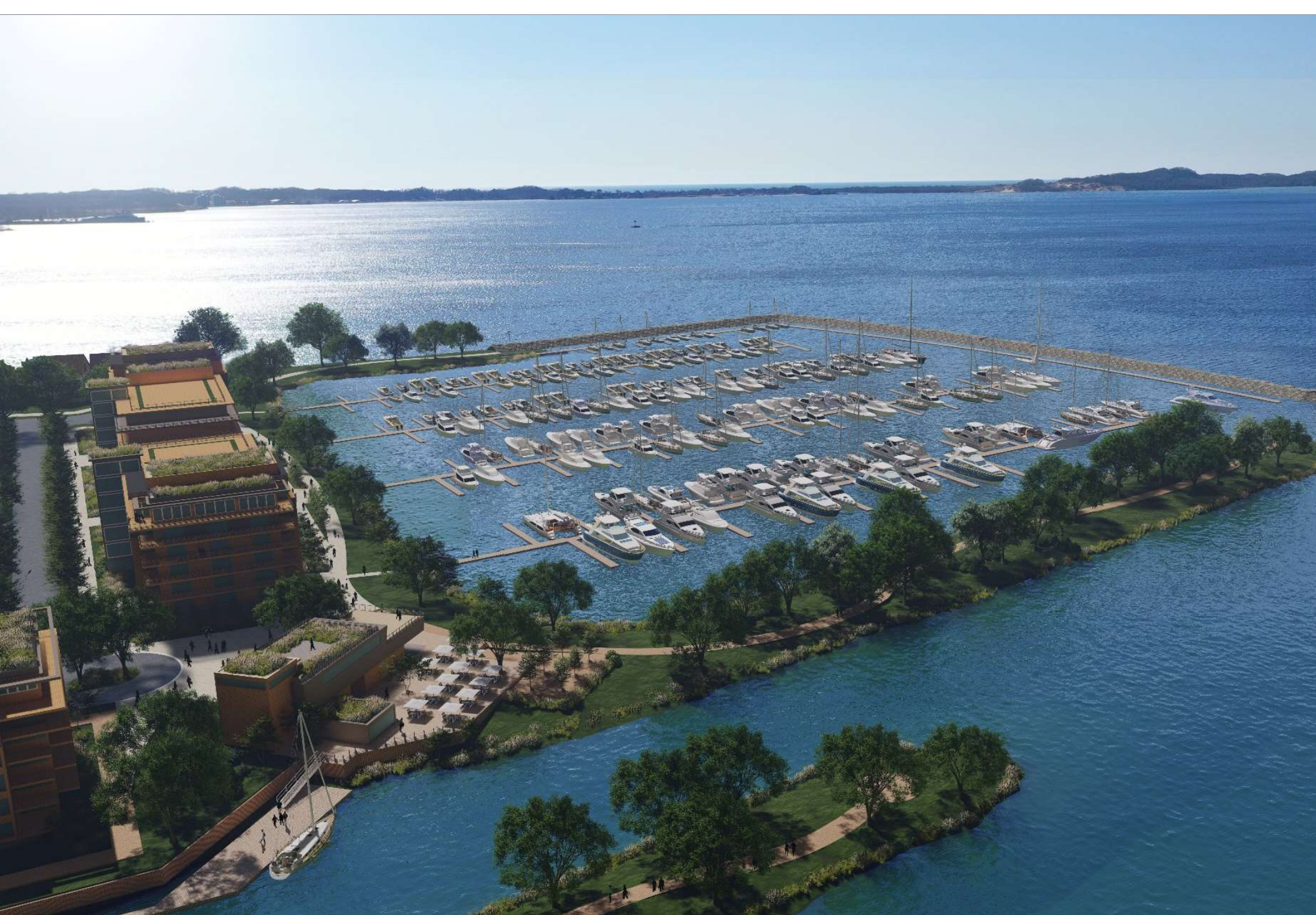




MUSKEGON, MICHIGAN, SHOWING HARBOR AND S. S. ALABAMA.







Vision Overview – Project Program

- The Next Step in the Transformation of the Muskegon Waterfront
- Expanding Public Access to the Lake and Waterfront
- Brownfield Cleanup
- Most Sustainable Waterfront Development
- Mass Timber Structures Tell the Story of Muskegon





Brownfield Services

- Phase I and II site assessments
- Asbestos, lead, and mold surveys
- Baseline environmental assessments
- Due care planning
- Demolition
- Soil and groundwater cleanup
- Brownfield planning
- Incentives

Fishbeck staff have supported hundreds of brownfield projects across Michigan, securing millions of dollars in redevelopment incentives for communities and developers and restoring underutilized properties through blight elimination and environmental cleanup.



Brownfield Site Conditions

- **Former Industrial Uses**

- **Slag**
- **Debris**
- **Asbestos**
- **Lead Based Paint**
- **Demolition**
- **Obsolete Uses**



Brownfield Incentives Plan

- An estimated \$250 million investment
- Working on a Brownfield Plan Amendment with the City of Muskegon
 - Baseline environmental assessment activities
 - Due care activities
 - Asbestos/lead paint/mold abatement
 - Demolition
 - Site preparation
 - Infrastructure
- Pursuing state grants and loans



History of Site

- 1870s Lumber Mill
 - Peninsulas are Former Lumber Piers
 - Recovered Logs from 18th Century to Custom Furniture
- Westran Foundry
 - Proud History of Patents and Technology
 - Fifth Wheel Hitch
 - Fill Sand from Steel Casting Operations Created Northern Half of Site





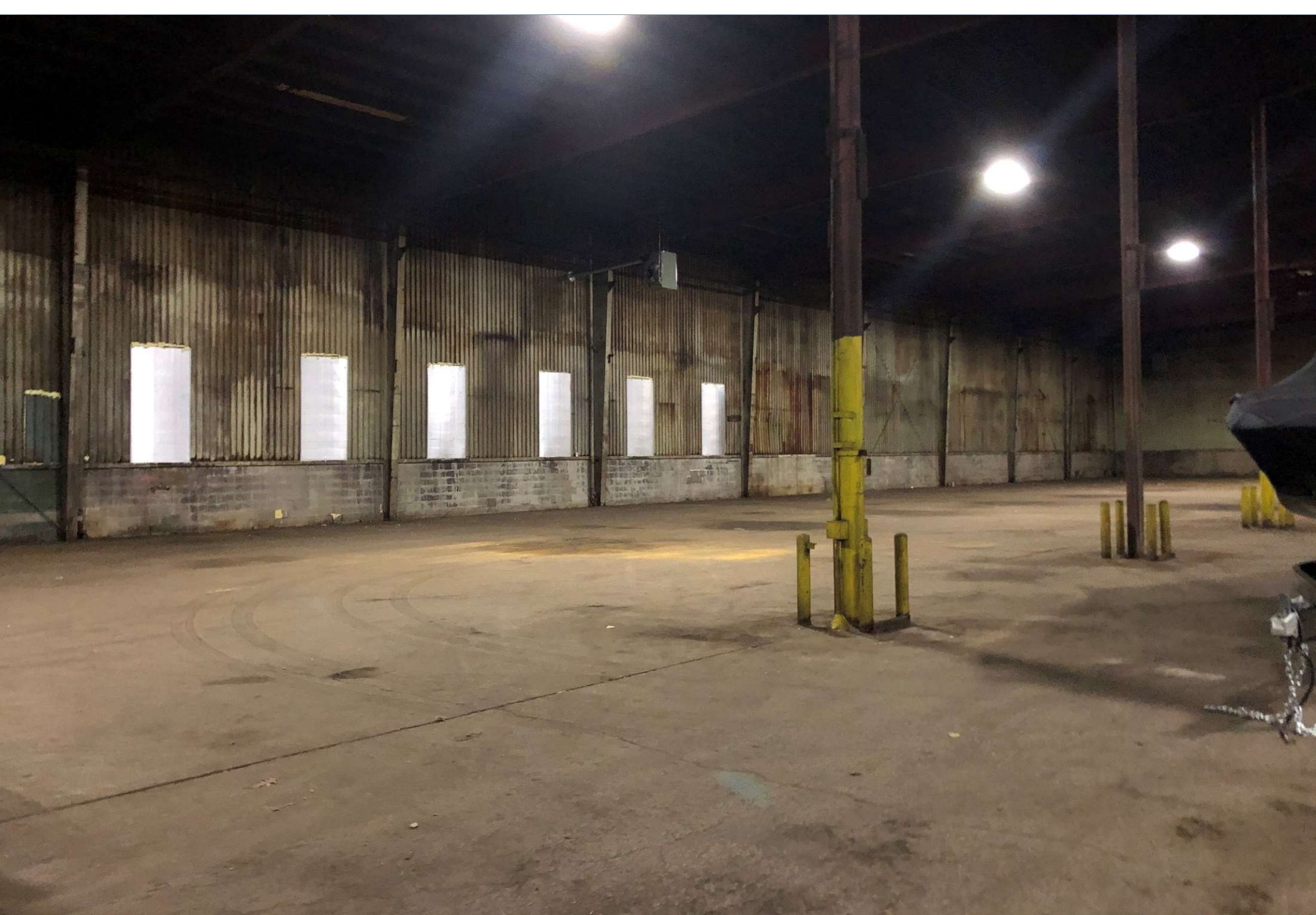






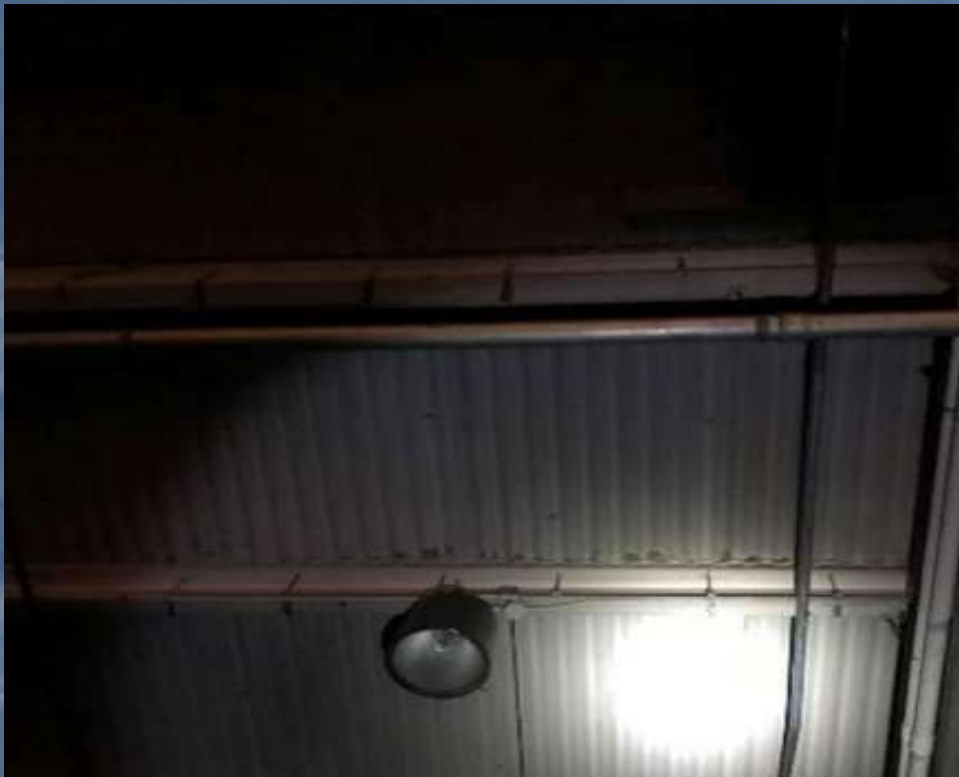






Brownfield Building Conditions

- Mold
- Asbestos
- Lead Paint



All Public Waterfront

- Every inch of the waterfront is open to the public via improved ADA compliant waterfront trail system linking lake to downtown
- All three peninsulas cleaned up, improved, and opened to the public for fishing, walking, and accessing the lake
- Soft green habitat edges protected, enhanced, and expanded wherever feasible
- Expanded ADA compliant fishing access, including new breakwater

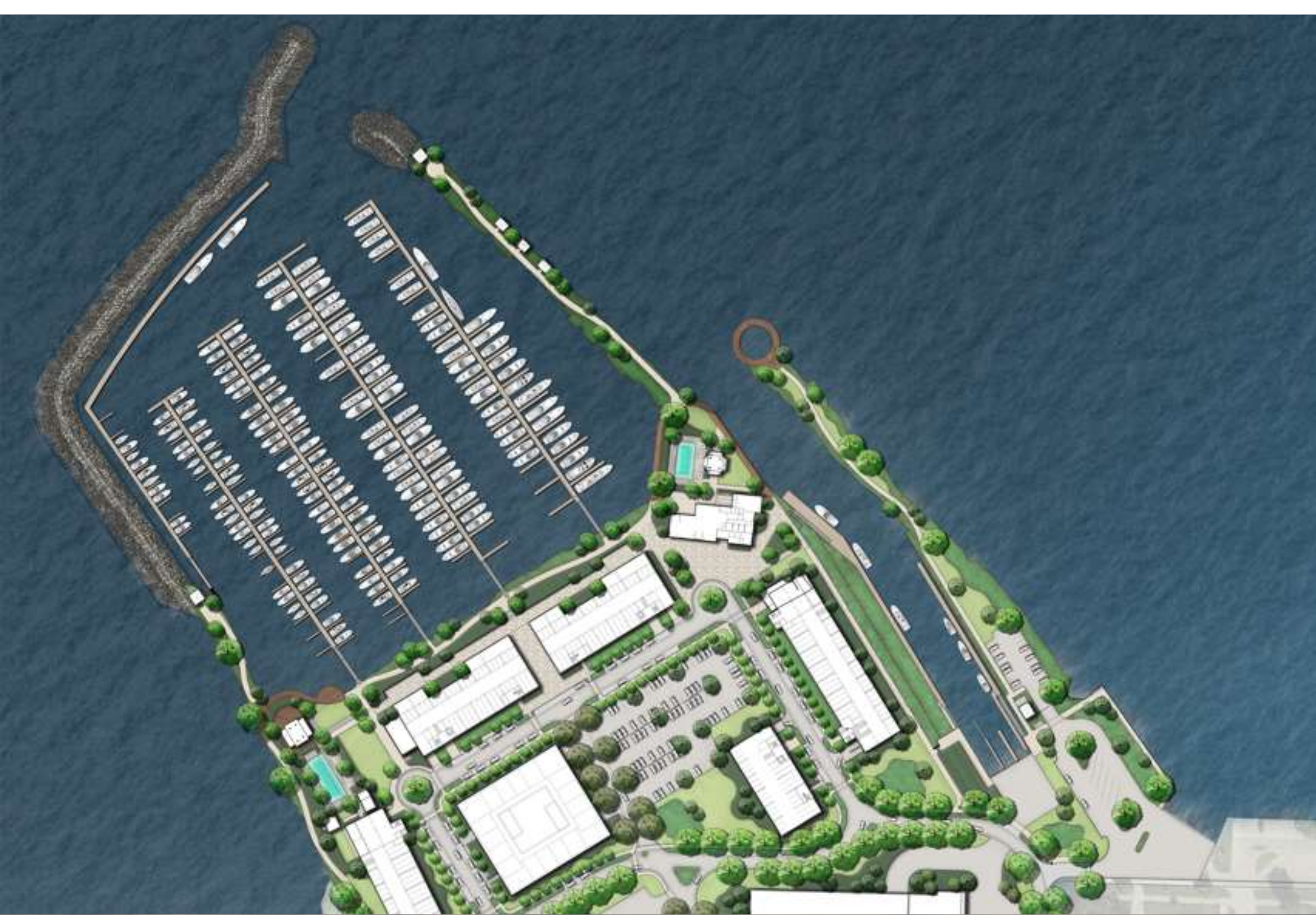


Environmental Sustainability

- Brownfield Cleanup
- Solar Power Generation
- Wind Power Generation
- Green Roofs
- Dark Sky Lighting
- Native Plant Palette
- Soft Shoreline Habitat
- Michigan Clean Marina Certification







Expanding Access to Muskegon Lake

- 270 slips, dry rack, and expanded winter storage – fully ADA, ESD, and Clean Marina compliant
- Currently closed Hartshorn small boat basin slips replaced with modern ADA and ESD compliant floating slips
- Old restroom building replaced with modern restrooms, showers, and boater services amenities
- 72 transient slips greatly increase transient boating opportunities while improving operational flexibility at Hartshorn large boat basin

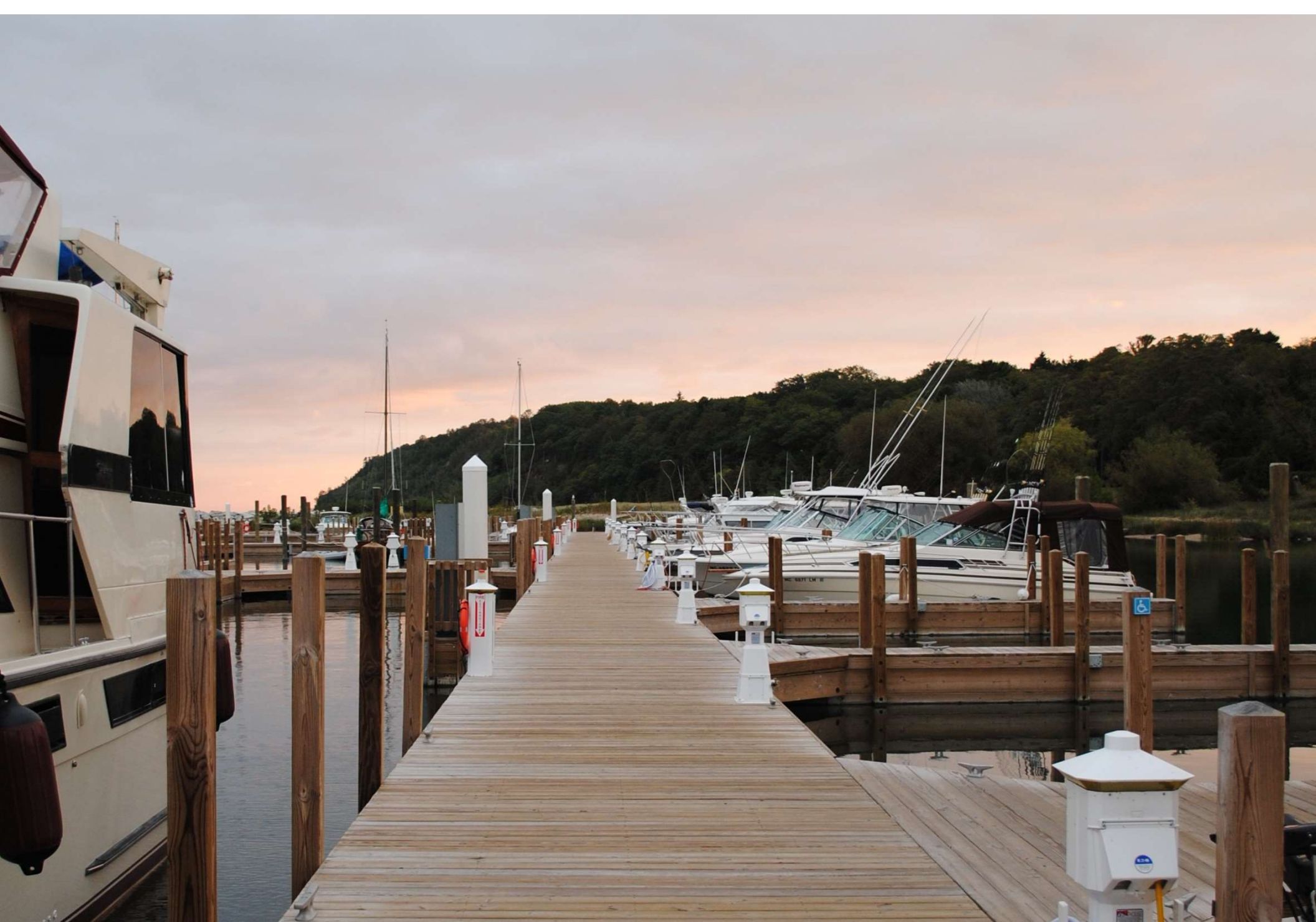


Expanding Access to Muskegon Lake

- Short term transient shopper docks create waterfront destination for local area boaters
- ADA compliant kayak and paddlecraft launch, and affordable rental opportunities make boating accessible to everyone regardless of age, income, or ability
- Affordable boat rental/boat club opportunities lower the cost of entry to boating for all residents of Muskegon
- Affordable dry rack slip facilities greatly expand access to Muskegon Lake for the smaller boat market
- Modern fuel and pump-out facilities reduce pollution
- Michigan Clean Marina Standards







Edgewater Resources

Sustainable Marina Design



Edgewater Resources

Sustainable Marina Design

Program

- Boat Clubs / Boat Sharing
- Dry Rack
- Paddlecraft Rental
- Public Access





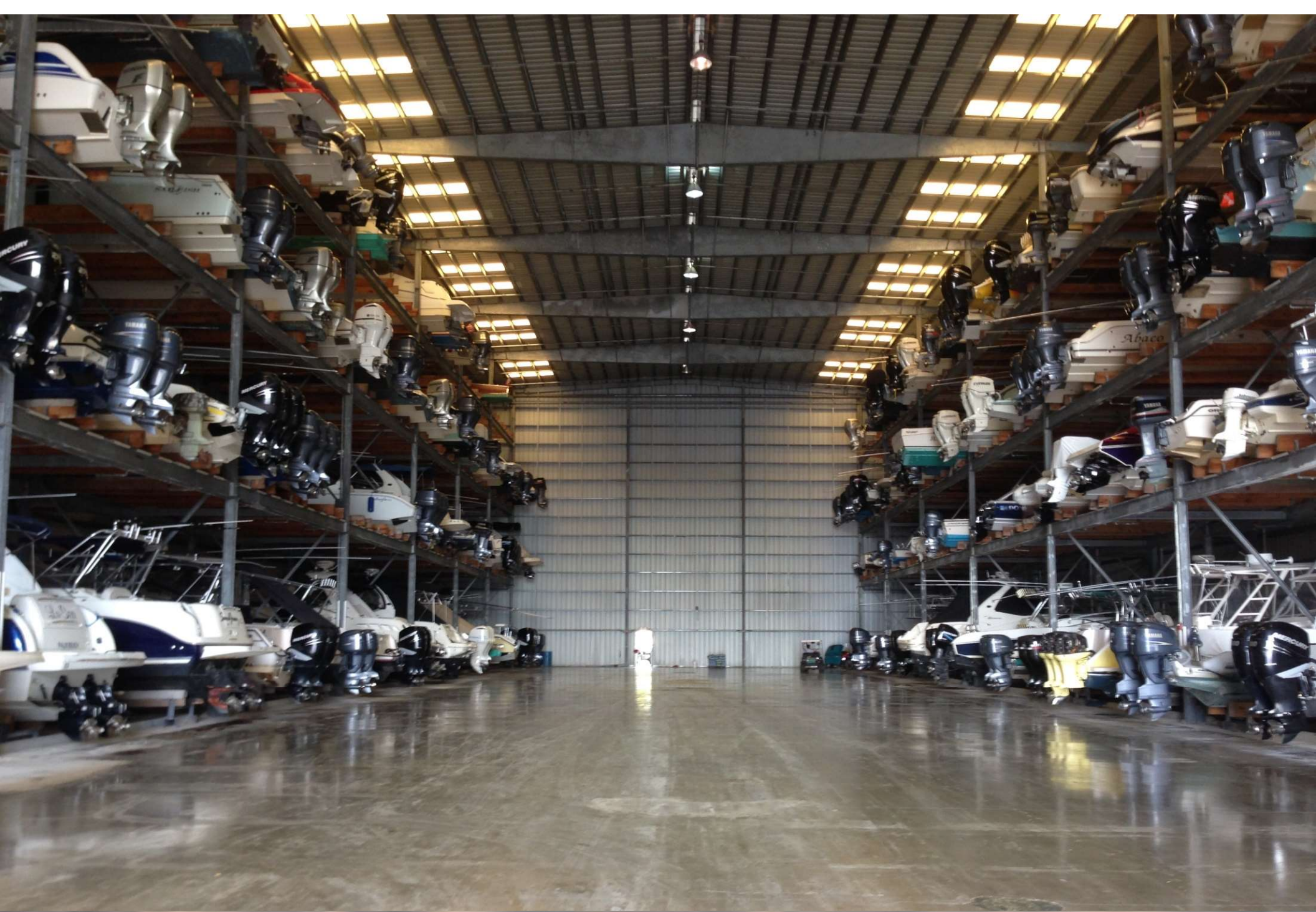
Edgewater Resources

Sustainable Marina Design



Edgewater Resources

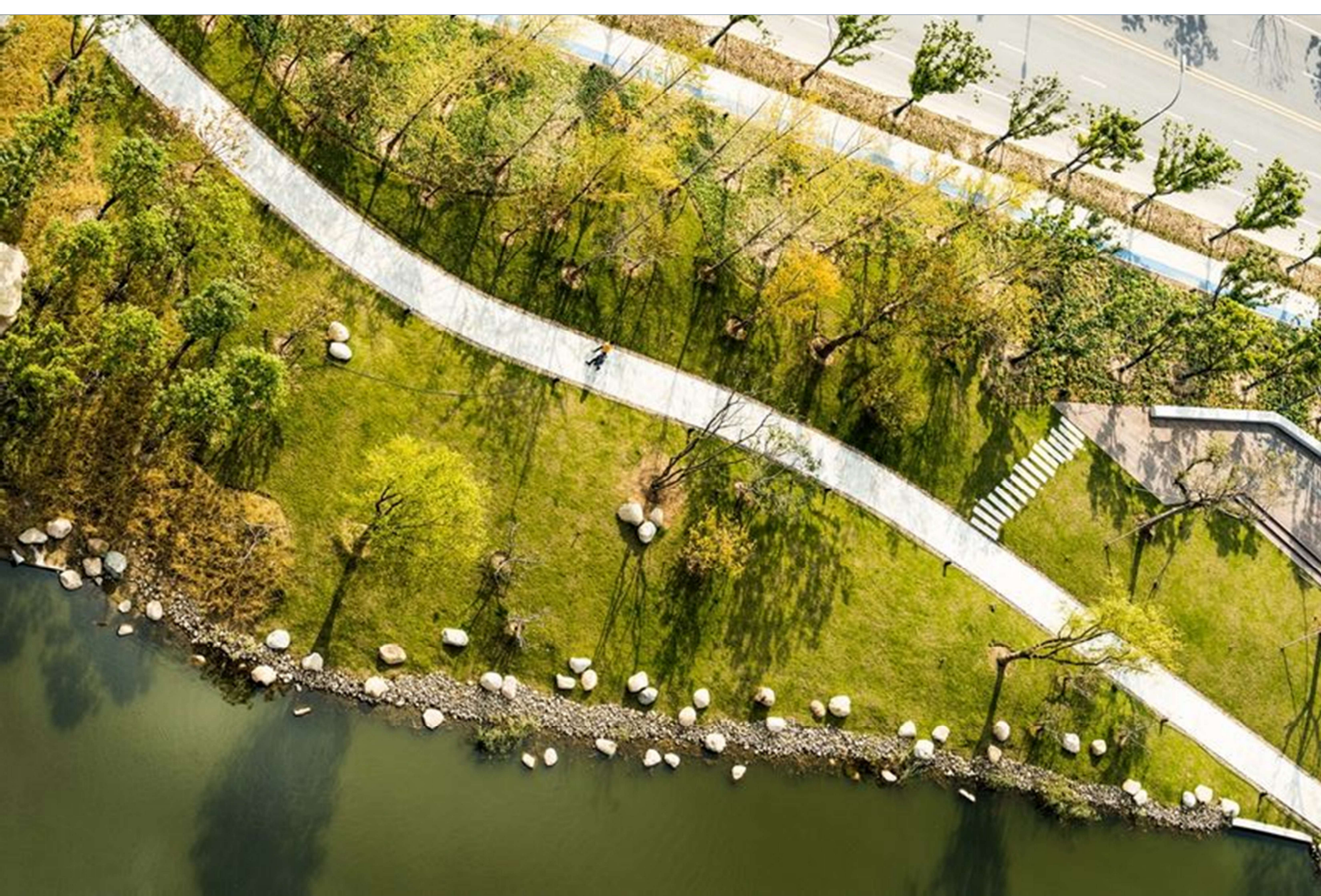
Sustainable Marina Design



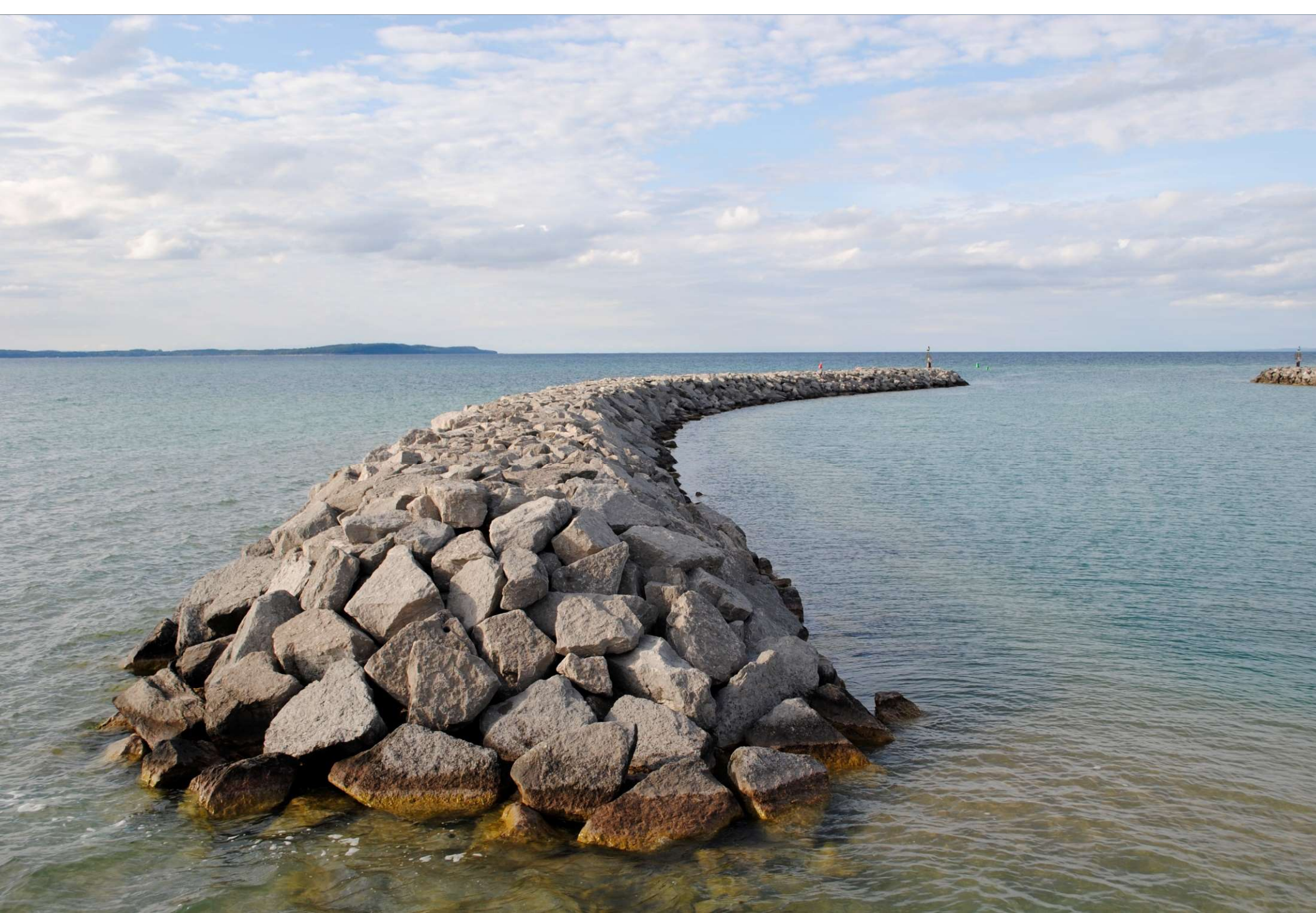














TOTTENVILLE, STATEN ISLAND

A mix of exposed, intertidal, and sub-tidal breakwaters reduces risk to shoreline neighborhoods while creating calmer, slower water that can be safely occupied by people for a greater diversity of activities and programs. In Tottenville, the introduction of the breakwater system and the Water Hub enable local community partners, such as Kayak Staten Island and Conference House Park, to more fully enjoy the protected shoreline and calmer water.





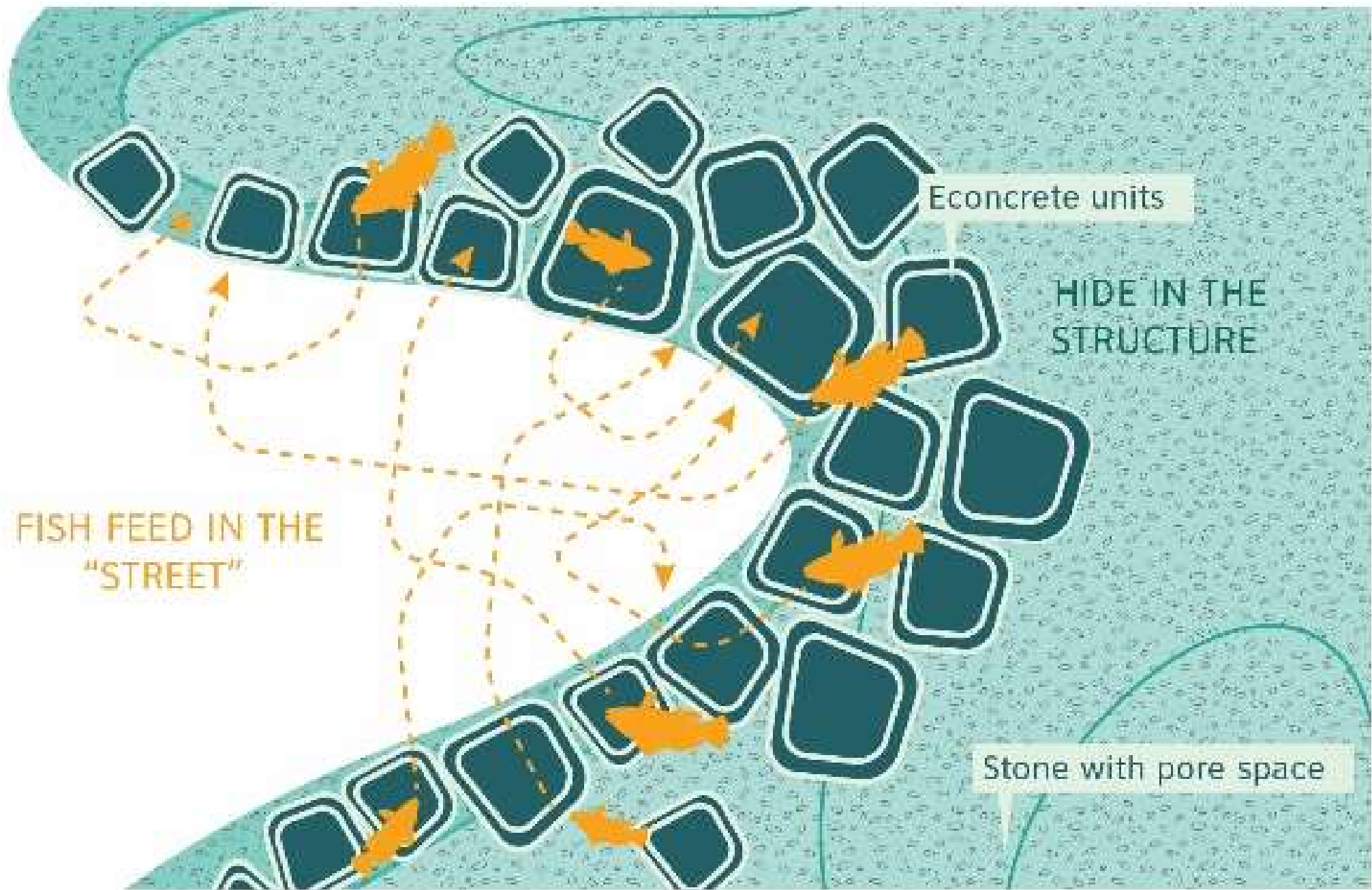
REEF "STREET" ↔

REEF "STREET" ↔

SEDIMENTATION ZONE
HARD CLAMS, EELGRASS, SALT MARSH
DEPENDANT ON RATE OF SEDIMENTATION

ECONCRETE UNITS
CONCENTRATE AT "STREETS" AND IN
INTERTIDAL AND SUBTIDAL ZONES





Completed Shore/Marina Protection

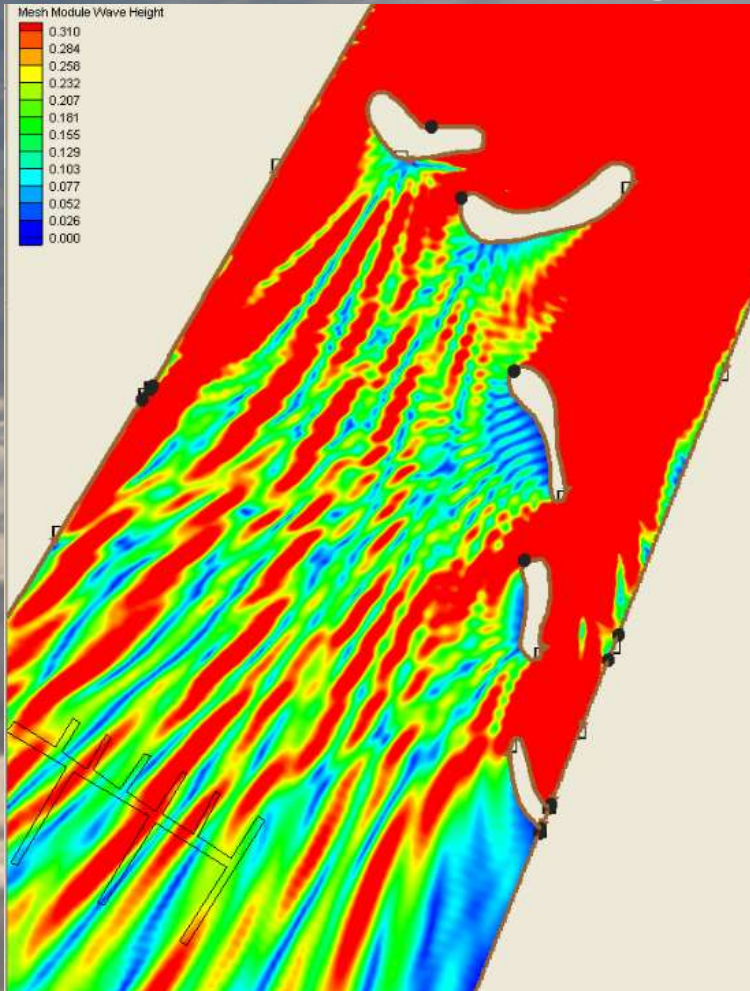


- Habitat Islands
- Pocket Beaches
- Sacrificial Sand Dunes
- Sediment Diverting Shapes



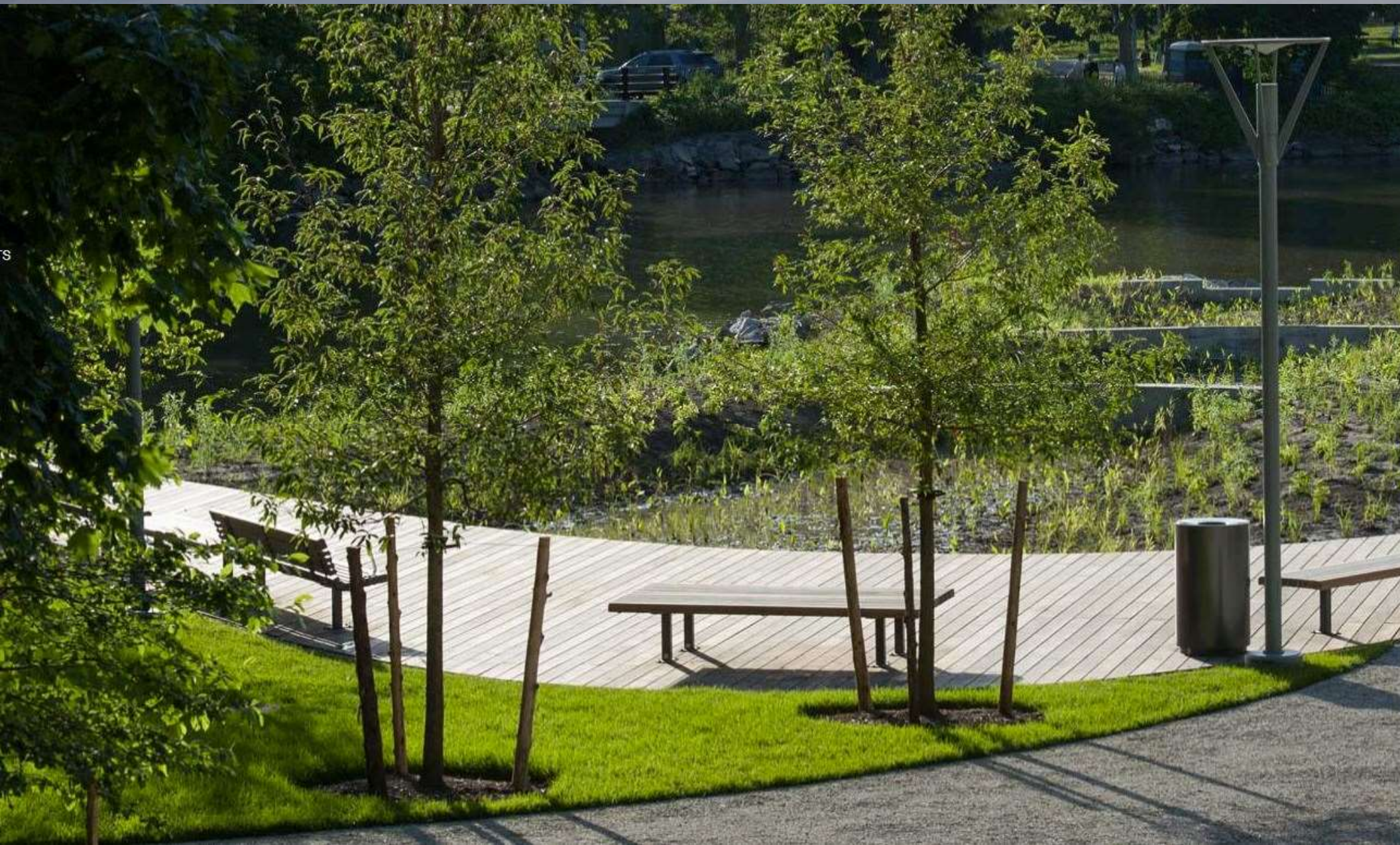
Designed as System Rather than Solid Structure

Physical/Numerical Modeling



Habitat Creation

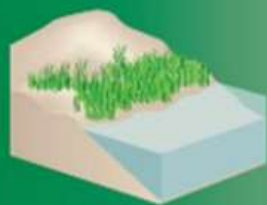




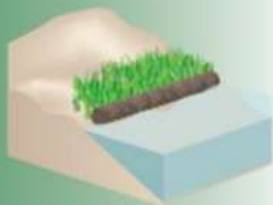
GREEN - SOFTER TECHNIQUES

GRAY - HARDER TECHNIQUES

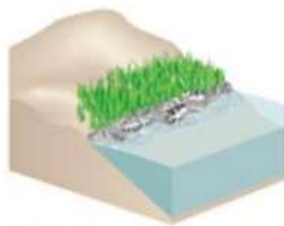
Living Shorelines



VEGETATION ONLY -
Provides a buffer to upland areas and breaks small waves. Suitable for low wave energy environments.



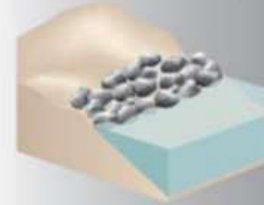
EDGING -
Added structure holds the toe of existing or vegetated slope in place. Suitable for most areas except high wave energy environments.



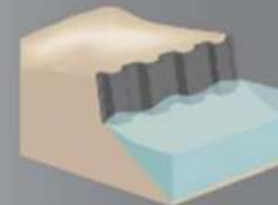
SILLS -
Parallel to vegetated shoreline, reduces wave energy, and prevents erosion. Suitable for most areas except high wave energy environments.



BREAKWATER -
(vegetation optional) - Offshore structures intended to break waves, reducing the force of wave action, and encourage sediment accretion. Suitable for most areas.



REVETMENT -
Lays over the slope of the shoreline and protects it from erosion and waves. Suitable for sites with existing hardened shoreline structures.



BULKHEAD -
Vertical wall parallel to the shoreline intended to hold soil in place. Suitable for high energy settings and sites with existing hard shoreline structures.

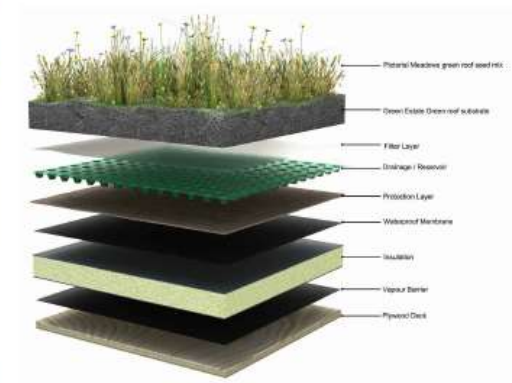




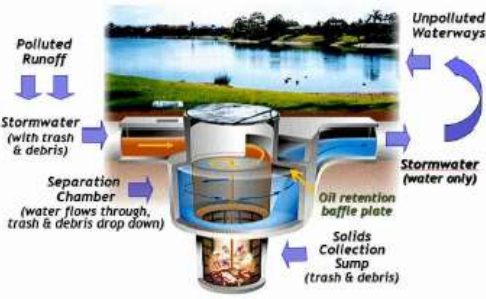
2 NATURALIZED SHORELINE
SCALE: NTS



3 BIOSWALE
SCALE: NTS



4 GREEN ROOF
SCALE: NTS





LEGEND

- STORM SEWER
- SANITARY SEWER
- GAS LINE
- WATER LINE
- ELECTRIC
- TRANSFORMER
- WATER VAULT
- FIRE HYDRANT
- STORM WATER QUALITY UNIT

Sustainable Design Elements

- Materials
- Energy Use Reduction
- Energy Generation and Storage
- Architecture
- Program



Sustainable Materials

- Use Natural Materials Wherever Possible (Wood, Stone, Metal)
- Wood Has Lowest Embodied Carbon
 - Consider Modified Woods Like Kebony
- Consider Stone Over Concrete
- Steel and Aluminum Highly Recyclable
- Concrete is Responsible for 8% of Global Carbon Emissions
 - Consider EConcrete





Bio-enhancing
admix



Texture agents

Science-based molds

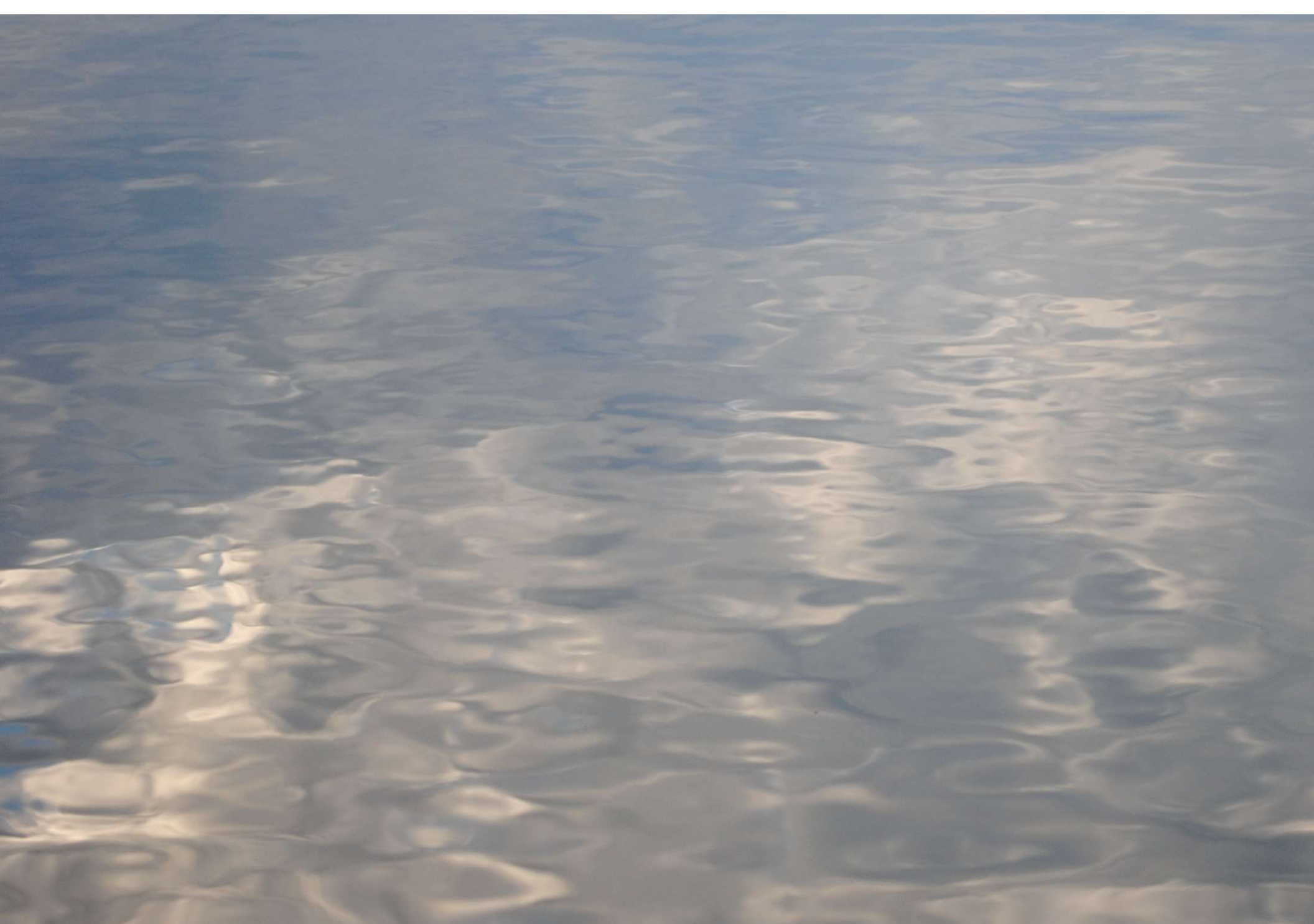
The macro design of our molds and mold-inserts, enables the creation of ecological niches. These support the ecological uplift of infrastructure and provide added bioprotection, delivering increased strength and durability to the structure.





Edgewater Resources

Sustainable Marina Design



Energy Generation & Storage

- Solar
- Wind
- Batteries







Electric Vehicles

- Lower Fuel Costs
- 30% Lower Maintenance Costs
- More Durable Drivetrain











★ DONOR HONOR ROLL ★

\$500,000 - \$1,000,000

COMMUNITY FOUNDATION FOR MUSKEGON COUNTY
J & S DAVIS FUND OF THE COMMUNITY FOUNDATION FOR MUSKEGON COUNTY
JACOB A. REIDING UNRESTRICTED FUND
OF THE COMMUNITY FOUNDATION FOR MUSKEGON COUNTY
PAUL C. JOHNSON FOUNDATION • MUSKEGON STRATEGIC FUND
MUSKEGON LAKESHORE CHAMBER OF COMMERCE

\$200,000 - \$499,999

ALCOA FOUNDATION • FREY FOUNDATION

\$50,000 - \$199,999

ALCO AUTOMOTIVE • CONSUMERS ENERGY FOUNDATION
DTE ENERGY FOUNDATION • LINDS E. & ANN J. ERLAND • MCL FOUNDATION
HINES CORPORATION • CHARLES E. JOHNSON II • MILLER • NICHOLS
PATRICK J. O'LEARY • SPA

\$25,000 - \$49,999

BETTER BIKES CHEVROLET CYCLES INC. • BURT & DORRIS BROS. • BELL & LOWELL DASH
LARRY ALLEY, INC. • FAYE THOMAS BROS. • JIMMY & DAN KESLER
LEAH & MARIE BROS. • JIMMY HENRY OF THE FUTURE • JIMMY & STEVE BLAIR
LINDS & MARY FARMER FOUNDATION • STANT CORPORATION
JANSON TRUCK CO. • SHEN & MARVIN NITRAM



BUILT IN 2014 WITH
DONATIONS FROM MANY
CONTRIBUTORS AND GIFTED
TO THE CITY OF MUSKEGON
TO SERVE AS THE NEW HOME
OF THE FORMER YUBA
STREET MARKET AND AS A
DOWNTOWN CENTER OF
COMMERCE AND COMMUNITY









› Deep Blue i 900 rpm

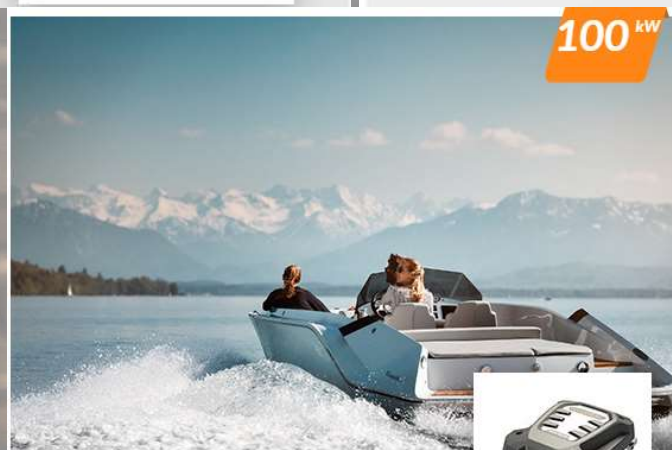


› Deep Blue



› Deep Blue i 1800 rpm

for planing with fast boats



› Deep Blue i 2500 rpm

for planing with fast boats

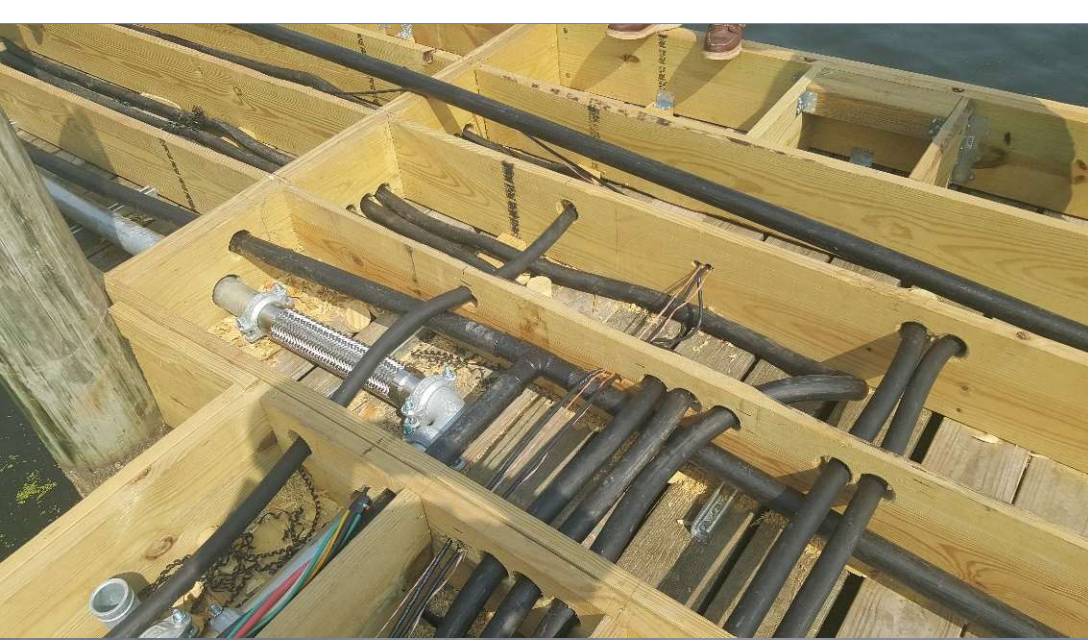


› Deep Blue 25 Saildrive

For Sailing Yachts and Catamarans







Edgewater Resources

Sustainable Marina Design

Energy Savings

- Energy Star Appliances
- Heat Pump
- Geothermal
- Insulation
- Windows
- Dark Sky Lighting



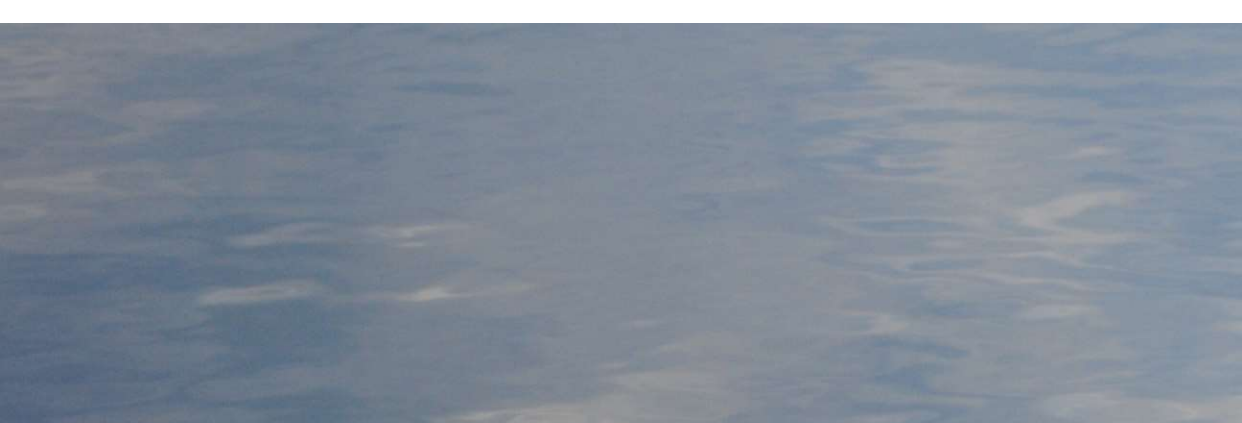


Architecture

- Design for Passive Solar
- Green Roofs
- Walkable / Accessible Design
- Construction Methodology











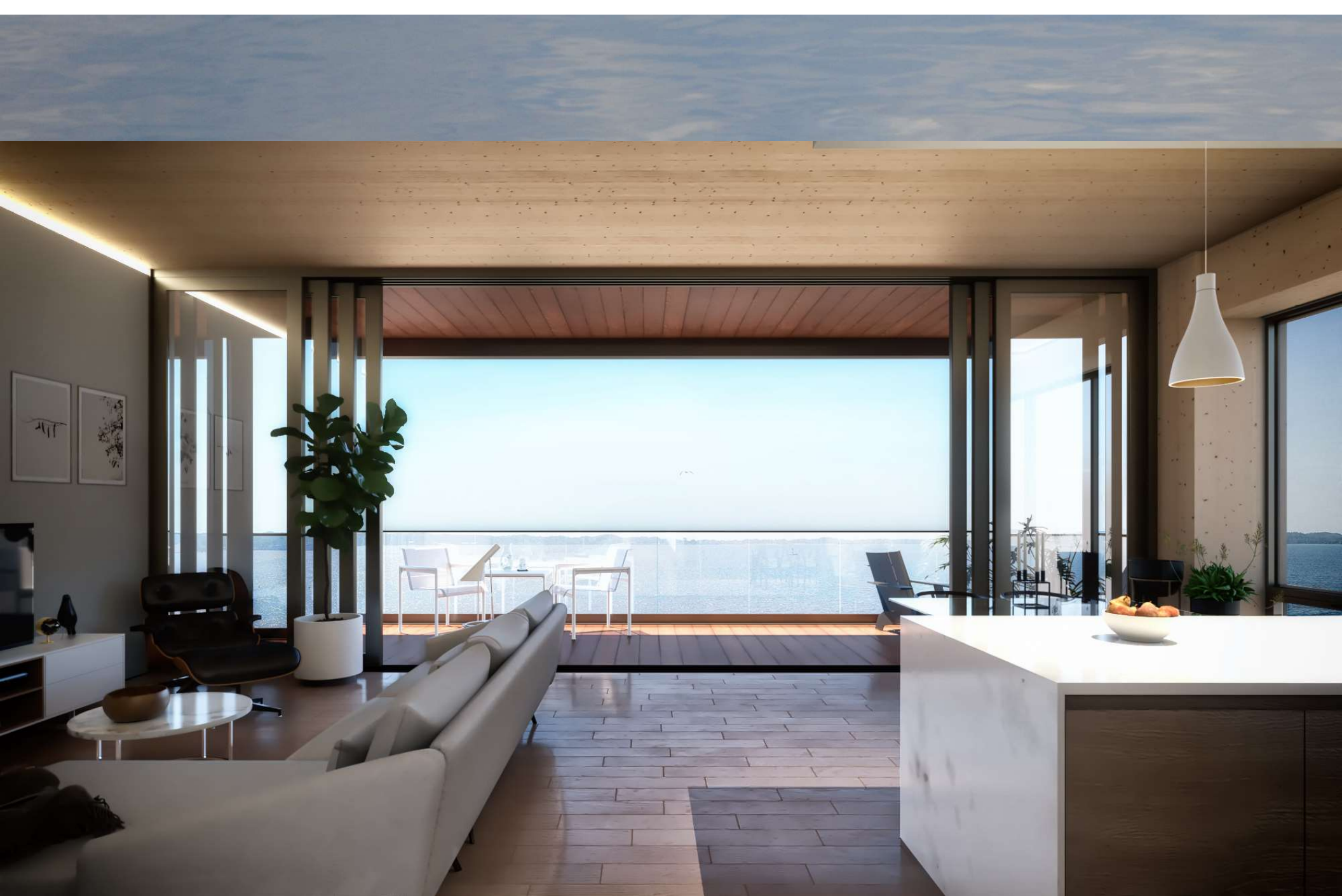


Edgewater Resources

Sustainable Marina Design













Edgewater Resources

Sustainable Marina Design



Sustainable Design Benefits

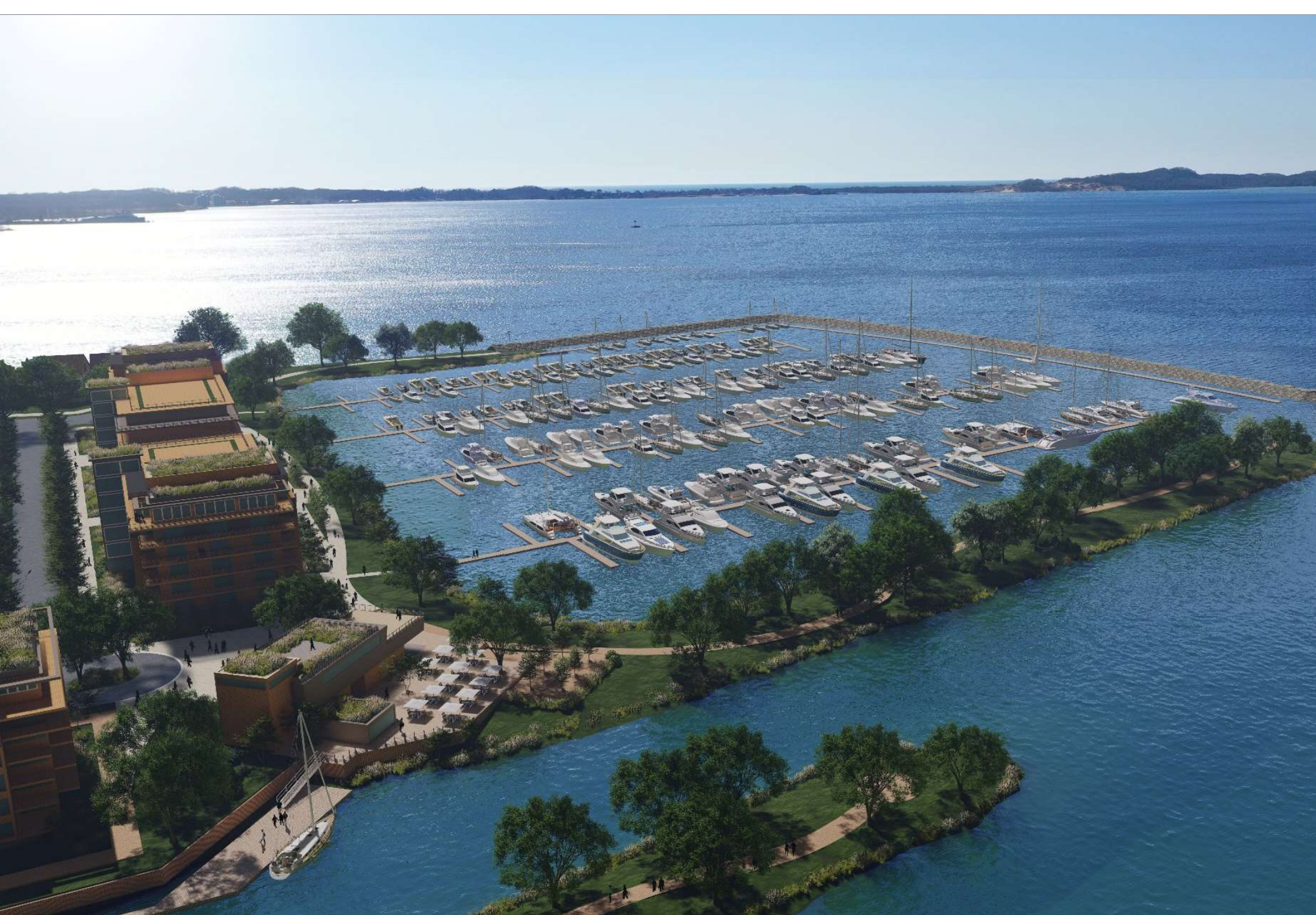
- Save Money / Increase Profits
- Reduce Energy Costs
- Reduce Maintenance Costs
- Market Differentiation
- Expand Habitat
- Grant Funding
- Speed Up Entitlements
- Future Proof Your Facility
- Good for the Environment





Michigan Department of Natural Resources

Mustangville, Michigan



Edgewater Resources

Sustainable Marina Design

Questions and Answers

Greg Weykamp, ASLA, LEED AP BD+C

269 408 6562

gweykamp@edgewaterresources.com

