ARC 6103 **Master Class** Summer 2011
Lawrence Technological University
College of Architecture and Design
210000 West Ten Mile Road Southfield, Michigan 48075-1058
http://www.ltu.edu/architecture_and_design

Document Assembly by Aaron Jones & Joel Gerber

Lawrence Technological University
College of Architecture and Design
Master Class Studio

THIRD COASTING: ECOLOGY NETWORKS IN THE GREAT LAKES

Summer 2011

STUDIO LEAD
MASON WHITE

CRITIC TEAM
PHILIP PLOWRIGHT
RALPH NELSON
CONSTANCE BODUROW
MARGARET WONG
AARON JONES
DR. BEVERLY GELTNER

Masterclass is a charrette-style studio lead by an external, exemplary critical practitioner. The studio focuses on student teams working on a common project but each team is independent and internally organized. There is a large degree of autonomy and each team takes a particular position based on the Master Practitioner's framework. Research and creativity is required as the course stresses critical thinking and team work skills while dabbling in graphic, communication, and speaking skills. The built environment and advanced design skills and methodology are stressed and encouraged.

The style of the studio places most of the responsibility on the individual student/group to push their work forward. Critique is pursued in rotating groups of critics in order to provide as much dialogue as possible and the critic team is lead, and focused, by the studio's leader, the Master Practitioner. The general focus of the course is socio-formal design, which might include architecture, interiors, landscape and urban design.

2011 Lateral Architecture / Mason White (Third Coasting - Ecology Networks in the Great Lakes)
2010 ORG / Alexander D'Hooghe (Big Boxes, Architectural Type on the verge of the Ubiquitous Singularity)
2009 el dorado (sanctioned meddling, sustainaffordability & radical pragmatism)
2008 WORKac / Dan Wood & Amale Andraos (programmatic collisions or 1+1=3)
2007 WilliamsonWilliamson (digital fabrication, computation, & tectonic expression)
2006 Veev Studio / Raveevarn Choksombatchai (merging art, architecture and environmental design)
2005 Lewis.Tsurumaki.Lewis (hysterical rationalism, or hyper-rationalism)
2004 Office dA / Monica Ponce de Leon & Nader Tehrani (tectonics and materiality)

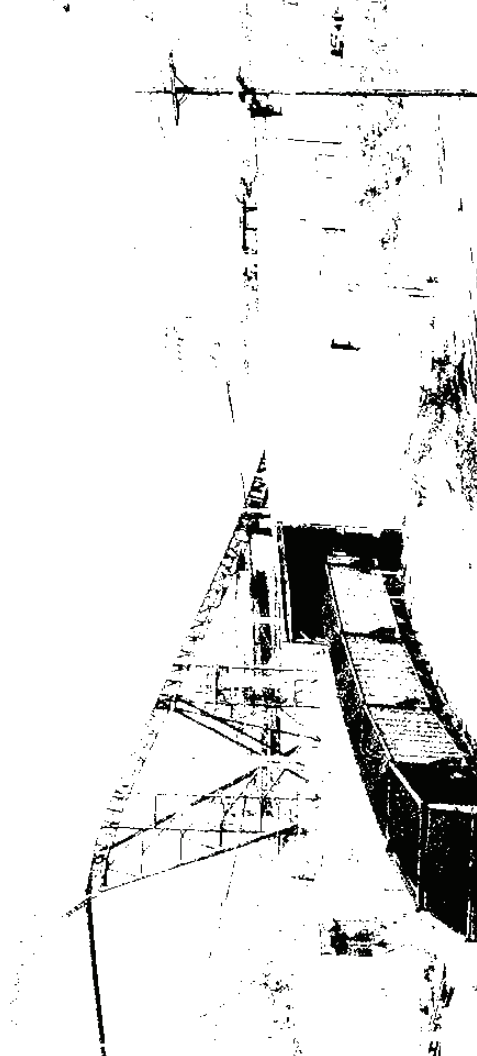
THIRD COASTING: ECOLOGY NETWORKS IN THE GREAT LAKES

Assuming more than 20% of the world's total surface freshwater, it is difficult to overstate the status of the Great Lakes as an essential and contested site in North America and globally. Formed some 10,000 years ago, the Great Lakes watershed is a result of a receding Laurentide ice sheet. The system is comprised of Lake Erie, Lake Huron, Lake MIchigan, Lake Ontario, and Lake Superior, as well as the St. Lawrence Seaway. Though the lakes reside in separate basins, they forma single, interconnected body of freshwater. The watershed facilitates access for more than 25 Cities, 8 States, and 2 Countries. The lakes have catalyzed the formation of the modern North American city with such examples as Buffalo, NY; Detroit, MI; Toronto, ON; Toledo, OH; Erie, PA; Chicago, IL; Thunder Bay, ON.

These cities have each created a direct relationship with their respective lakes, forming a very specific urban form, economy, and culture that capitalizes on lakeside living access.

The Third Coasting project will pursue an architecture that can respond to and participate in the ecology of this region and its attendant urban systems. We will use the project vehicle of wildlife habitat - though it is not confined exclusively to that type. Lets say it may exhibit properties of a zoo or an aquarium or a reserve, but it will not preclude humans or human activities. The project will use the habitat to address the idea of species, nature/ human interactions, environment, and immersive spaces. The studio will be interrogating where the city meets the lake - where humankind figures in broader conceptions of ecology.

1/ Disciplinary Expansion: Our current age presents an opportunity for the architect to acquire - at short request - a considerable depth of information on context, culture, climate from the internet. What is the status of this new architect?

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2/ Extrinsic Architecture: In distinction to sustainability mantras, an extrinsic architecture positions itself in a broader manner looking at architecture as complicit with its ecology - human and animal.

3/ Fourth Nature: Suppress your binary thinking of nature/ artifice and architecture/ ecology. Lets assume, that there is no longer such a thing as nature, or maybe rather that everything is nature, even artifice.

4/ Architecture/ Landscape and life-support: How can architecture supplement an ecology or ecosystem? Can architecture accommodate the dynamics of ever-changing ecologies and environments?

ДЯДЯ

5/ Environment / Immersion: Consider the air, and its subsequent temperature, moisture values, etc a design act of architecture as valid as any. Consider the total environment of space, not exclusively its form, as critical to the repositioning of architecture.

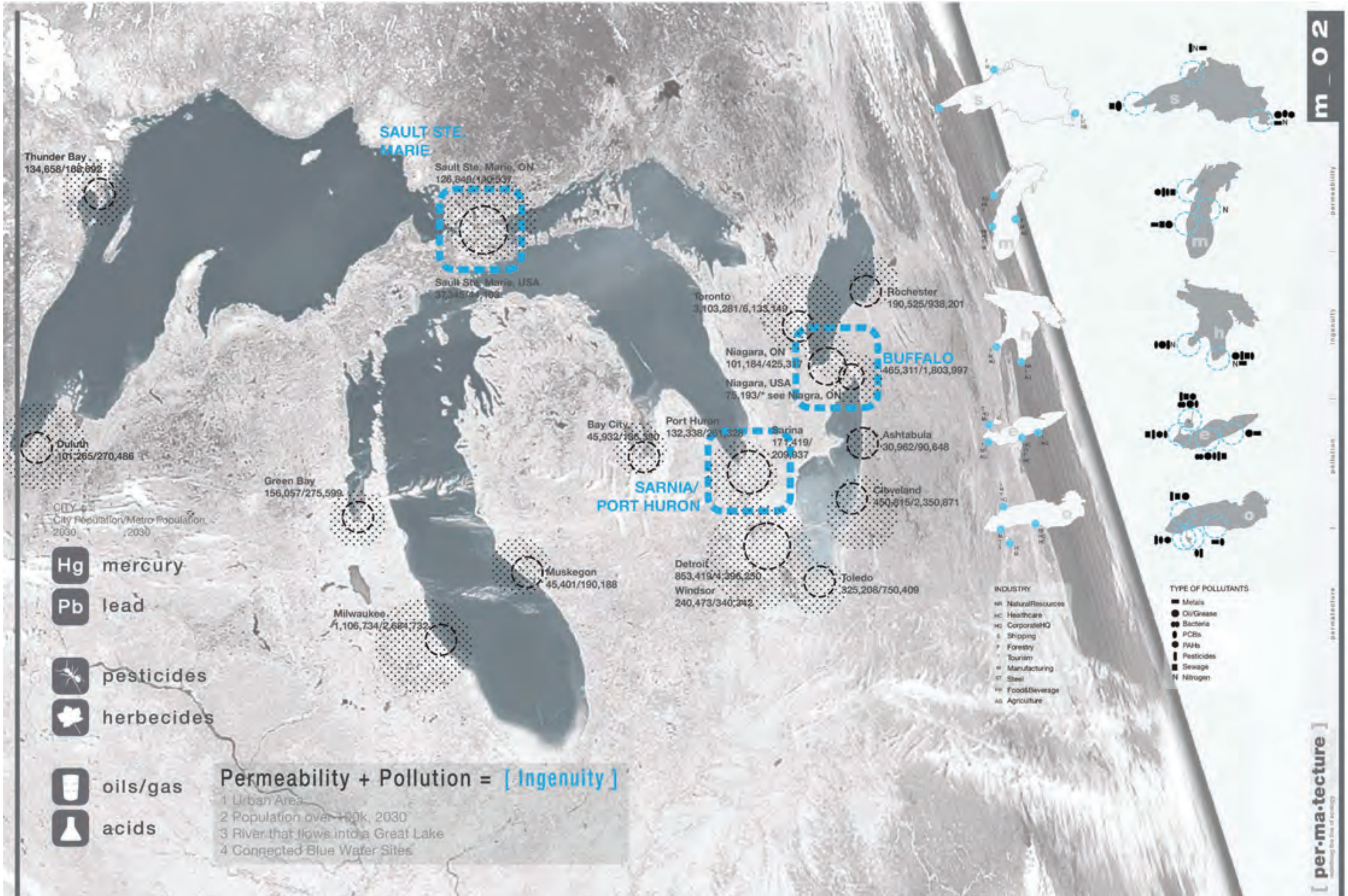
TEAM **ONE**

NICHOLAS CLARK
JONATHON JACKSON
TIM CLEMENT
CHRISTOPHER CLANTON
ANTHONY CLEMENT
MICHAEL NEUHALFEN
KYLE MCDONALD

TEAM **TWO**

CHRYSOSTOMOS KARATZIAS
JUSTEN DIPPEL
KATHLEEN DELANO
ALA BOKHARI
PAUL JAMES
JOSHUA SLITER
DAVID BARDUCA

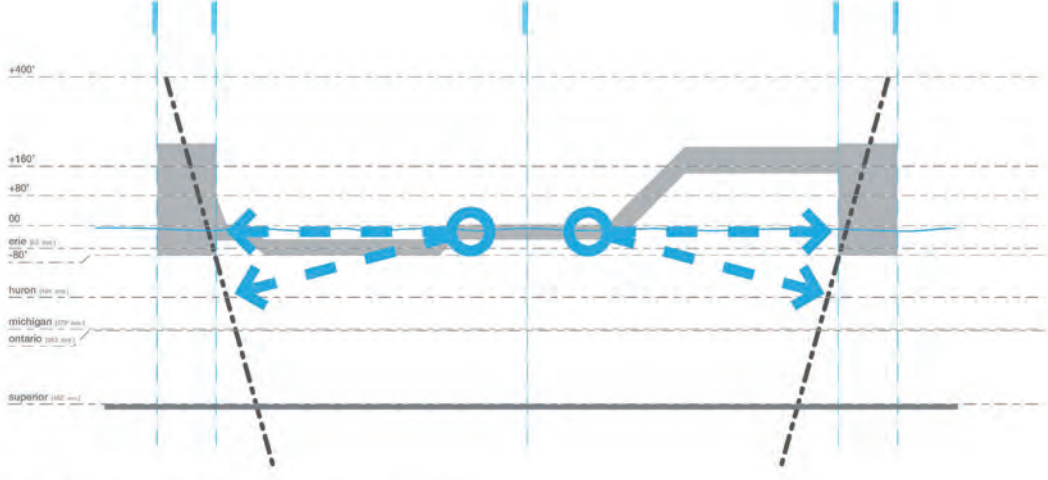

[per-ma-tecture]
| population | urbanism | river connections | areas of concern | water flow | drainage basins | international boarder corssing | Soil Types |
m_01
Soil Type
Bedrock
Till
Coarse-Textured Sediment
Fine- Textured Sediment
International Border Crossing
Average Lake Current Circulation
EPA Areas of Concern
Urban Impact
CITY
City Population/Metro Population
Drainage Basins
Lake Michigan
Lake Superior
Lake Huron
Lake Ontario
Lake Erie
River Connection to a Great Lake
Thunder Bay
109,140/122,907
Duluth
86,265/275,486
Sault Saint Marie, USA
Sault Saint Marie, On
Green Bay
104,057/282,599
Milwaukee
953,328/2,014,032
Muskegon
38,401/172,188
Bay City
34,932/107,050
Port Huron
32,338/61,026
Detroit
713,419/4,296,250
Sarina
71,419/88,793
Windsor
216,473/323,342
Toledo
287,208/651,409
Cleveland
396,815/2,250,871
Ashtabula
20,962/100,648
Buffalo
261,310/1,203,997
Niagra, On
82,184/390
Niagra, USA
50,193/* see Niagra, On
Rochester
210,565/1,098,201
Toronto
2,503,281/5,133,149
[per-ma-tecture]



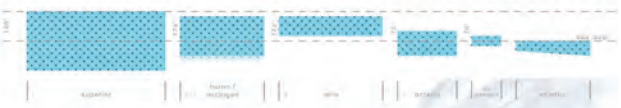
m_02
SAULT STE. MARIE
Thunder Bay
134,658/188,692
Sault Ste. Marie, ON
126,849/130,537
Sault Ste. Marie, USA
37,345/44,103
Duluth
101,265/270,486
Green Bay
156,057/275,599
CITY
City Population/Metro Population
2030 2030
Hg mercury
Pb lead
pesticides
herbecides
oils/gas
acids
Milwaukee
1,106,734/2,684,732
Muskegon
45,401/190,188
Bay City
45,932/186,390
Port Huron
132,338/261,328
Sarina
171,419/
209,937
SARNIA/
PORT HURON
Detroit
853,419/4,295,250
Windsor
240,473/340,242
Toledo
325,208/750,409
Toronto
3,103,281/6,133,149
Niagara, ON
101,184/425,317
Niagara, USA
75,193/* see Niagra, ON
BUFFALO
465,311/1,803,997
Rochester
190,525/938,201
Ashtabula
30,962/90,648
Cleveland
450,615/2,350,871
Permeability + Pollution = [Ingenuity]
1 Urban Area
2 Population over 100k, 2030
3 River that flows into a Great Lake
4 Connected Blue Water Sites
permeability
ingenuity
pollution
permatecture
INDUSTRY
NatrualResources
Healthcare
CorporateHQ
Shipping
Forestry
Tourism
Manufacturing
Steel
Food&Beverage
Agriculture
TYPE OF POLLUTANTS
Metals
Oil/Grease
Bacteria
PCBs
PAHs
Pesticides
Sewage
Nitrogen
[per·ma·tecture]

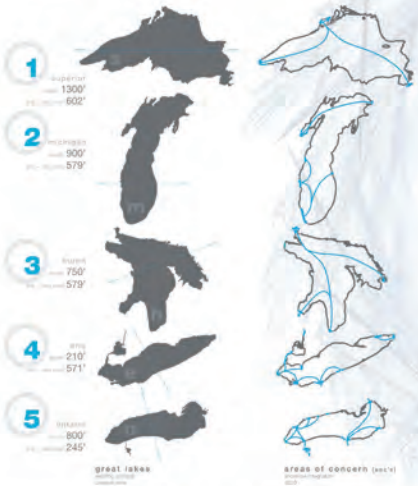
new public, spatial relationship

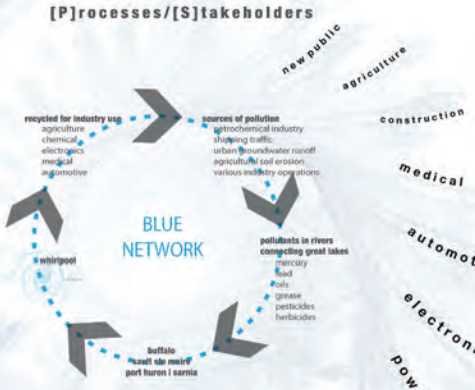
Organizations linked in an undivided system of interconnectivity creating a new opportunity for commerce and trade introducing new public and corporate entities respectful of the environment while promoting the growth and prosperity of the great lakes region.
A new public consisting of various different companies that operate in diversified fields unified in a common cause.

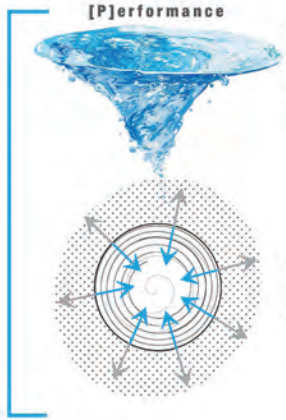


filtration - solids | liquids [particles less dense than water]









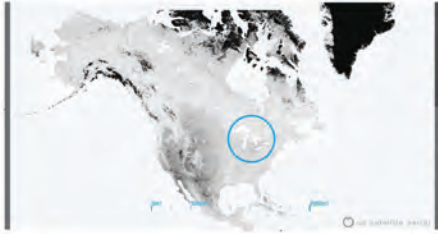
p_01

per·ma·tecture | pur-ma-tech-sure |

natural, design

Theory of permeability, science, engineering and architecture to create ecological environments that embraces functions of natural earth filtration & geology in motion.

Combines natural forces of nature and evolutionary processes by filtration, development energy, and promotes healthy economies and ecologies.



[per·ma·tecture]

redefining the line of ecology
team turbulence

team_two

TEAM THREE

VALERIE BROWN
ADRIENNE DAVIES
MICHELLE BELT
NATALIE SWARTZ
BRIAN HOMER
JOSHUA WAGENSOMER
LAUREN FREELAND

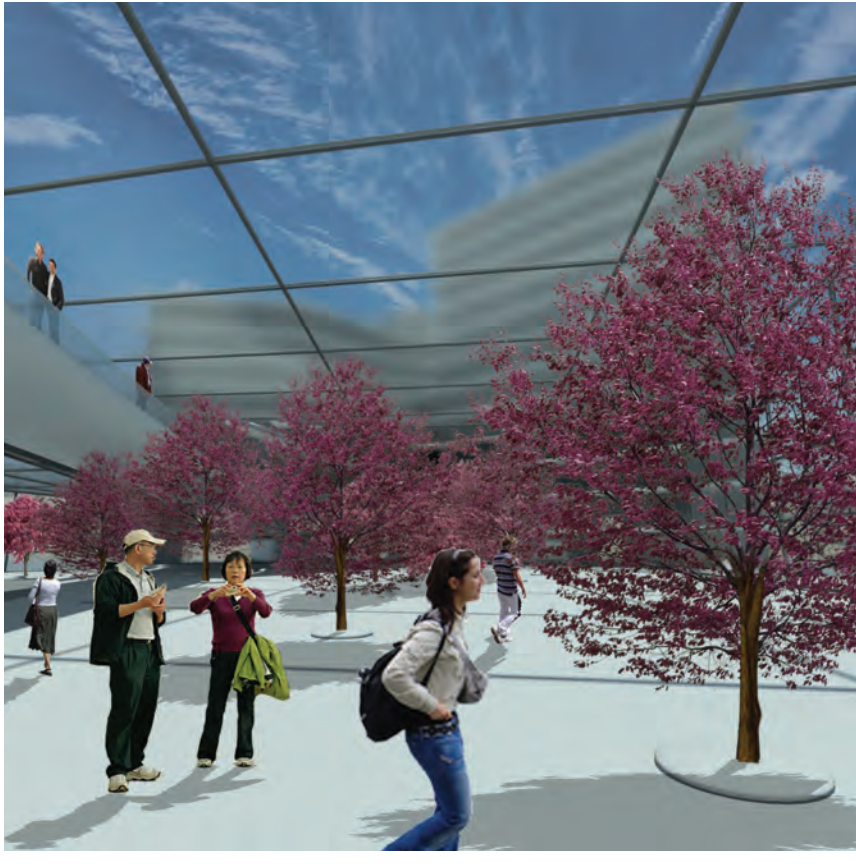


EXHIBIT A THE SNAFU

TEAM3
THIRDCOASTING

summer tourism
annual # of visitors

warm water temp
water temperature 68° F or higher

fruit belt
agricultural area

deindustrialized sites

winter tourism
annual # of visitors

ice coverage
lowest concentration

lake effect snow zones

regional
fruit harvest
calendar

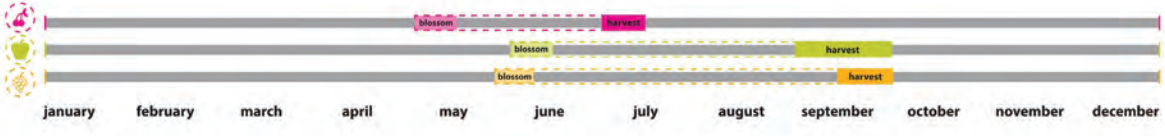


EXHIBIT B THE OPPORTUNITY

summer tourism
annual # of visitors

warm water temp
water temperature 68° F or higher

fruit belt
agricultural area

hubs

deindustrialized sites

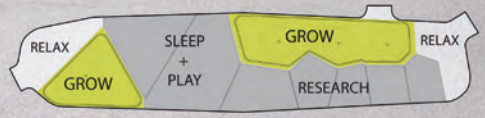
winter tourism
annual # of visitors

ice coverage
lowest concentration

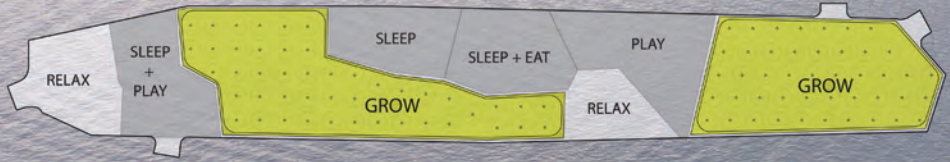
lake effect snow zones

regional
fruit harvest
calendar

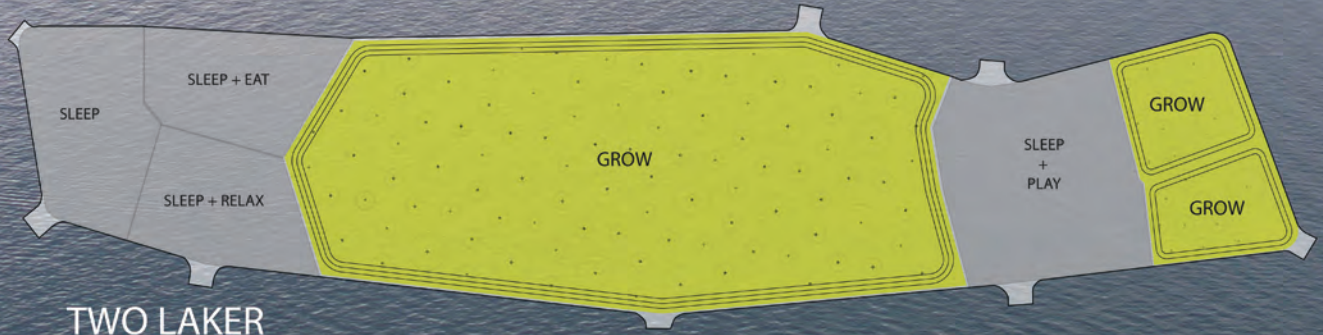
People in the region previously employed in automotive manufacturing have the opportunity to switch gears to the service industry, particularly tourism. The economic effects of the region are counterbalanced by the new agritourism on the laker vessels and will bring a new group of tourists to local shops, restaurants and pubs at the hub sites. The local government has the opportunity to recapture tax revenue from new businesses set up for lodging, feeding and entertaining these new tourists. Countering the typical economic effect that is typically seen in a region that loses manufacturing jobs where residents of the community have less money to spend have an opportunity to capitalize on the tourism industry and provide tourism services. Regional schools and post offices thrive, because residents continue to be employed and invest in their community. More people remain in the community and so the area evolves into a booming tourist destination.



FIVE LAKER



FOUR LAKER

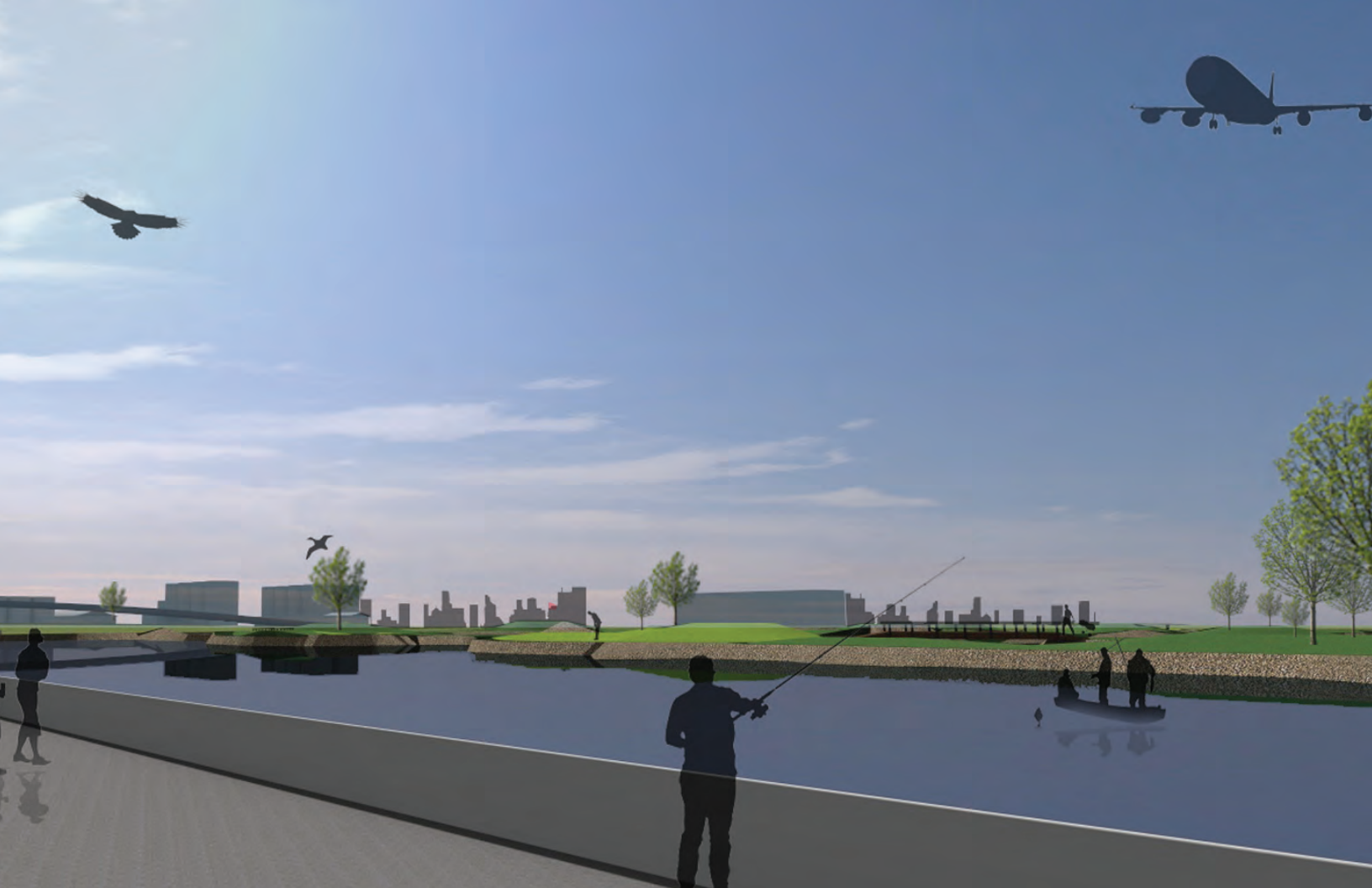


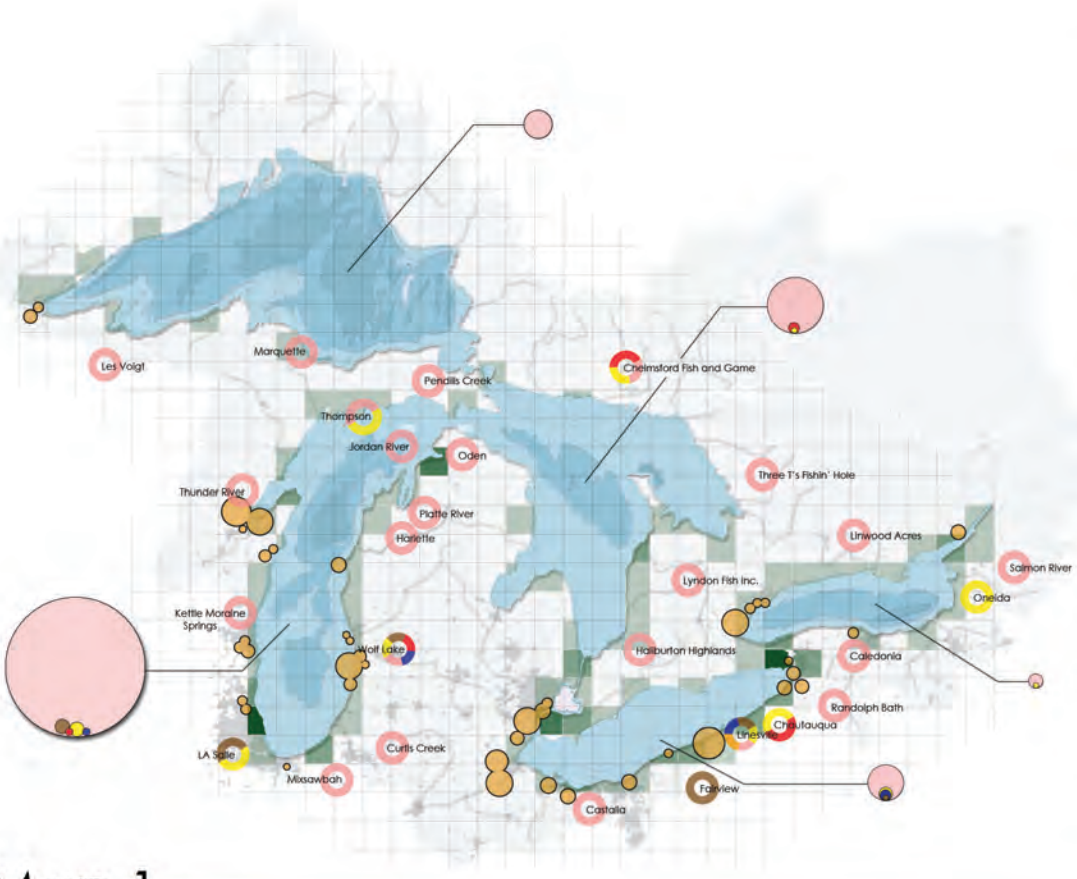
TWO LAKER

A new architectural typology grew out of the unique climatic conditions that create, seasonally, both optimal and difficult tourist destinations. In the midst of a declining economy, we introduce a new season for both agriculture and tourism, a new typology that reacts to the seasonal conditions of the lake. Floating vessels provide opportunity for combining unique agricultural production and an exciting tourist experience. We've explored several opportunities for creating a dynamic regional experience—including the introduction of extreme agriculture in the form of creative hybrids, vast blossoming orchards, and enormous oversized fruit. Intrinsically linked with the agricultural production of the vessel is the opportunity for guests to enjoy a wide range of leisure activities year-round.

TEAM **FOUR**

KYLE VANKLOMPENBERG
UNDRAM ULAMBAYAR
JAE EMDIN
JEREMY ROON
CHRISTOPHER GERRITY
RONNA FREELAND
JOHN GIROUX





Map 1

Taxonomy of Fish Hatcheries

Salmonidae
- Steelhead
- Rainbow Trout
- Brook Trout
- Lake Trout
- Brown Trout
- Coho Salmon
- Chinook Salmon

Percidae
- Walleye
- Perch
- Nothern Pike
- Sauger

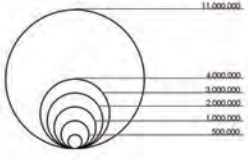
Ictaluridae
- Channel Catfish

Esocidae
- Muskellung

Centrarchidae
- Crappie
- Bluegill
- Large Mouth Bass
- Small Mouth Bass
- Rock Bass
- Sunfish

Polyodontidae
- Paddle Fish

Fish Released by Hatcheries



Brownfield Sites

Average Depth (ft)

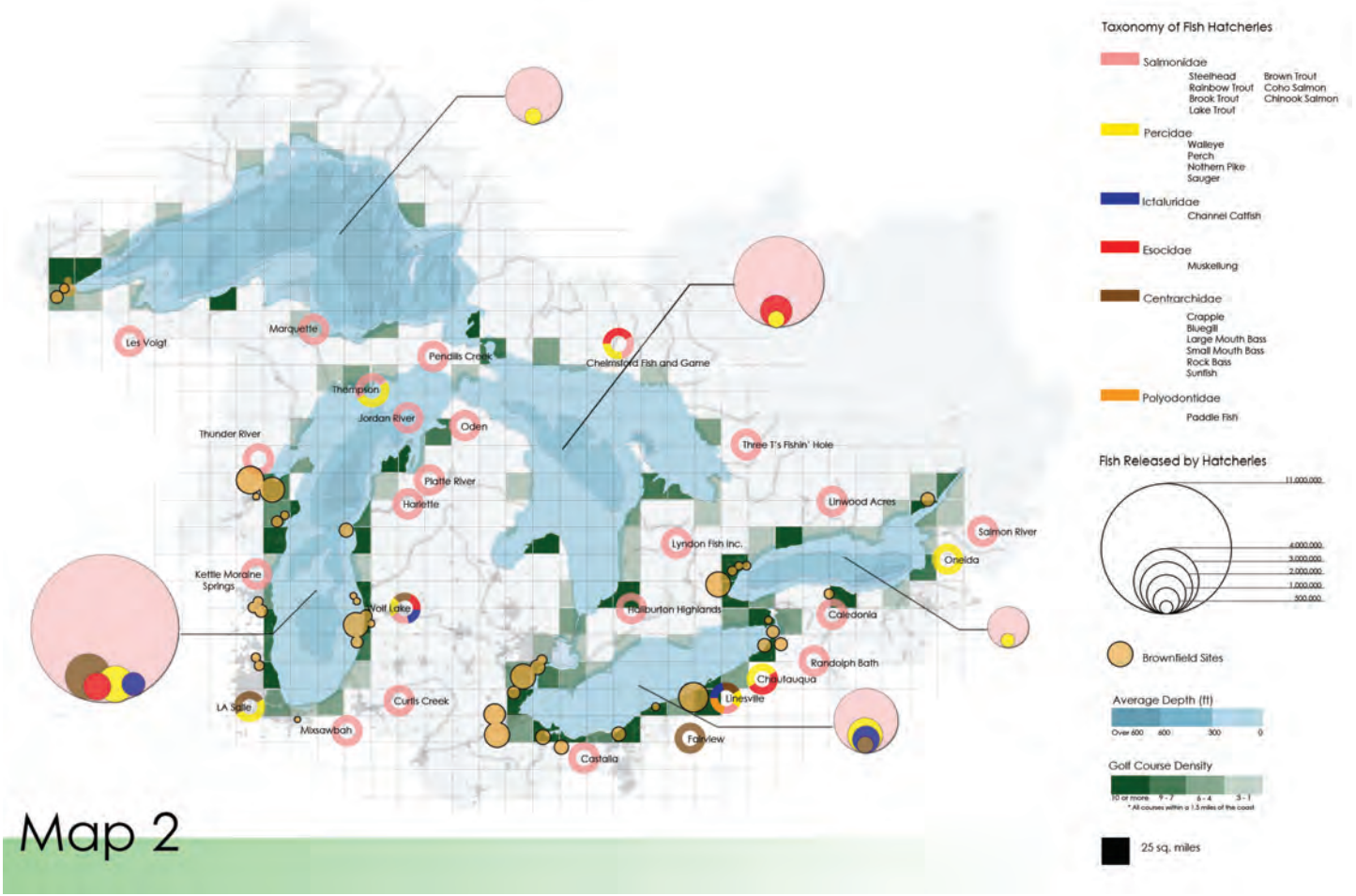
Over 600 | 600 | 300 | 0

Golf Course Density

10 or More | 4 - 6 | 1 - 3

* All courses within a 1.5 miles of the coast

25 sq. miles


Taxonomy of Fish Hatcheries
Salmonidae
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Percidae
Walleye
Perch
Nothern Pike
Sauger
Ictaluridae
Channel Catfish
Esocidae
Muskellung
Centrarchidae
Crappie
Bluegill
Large Mouth Bass
Small Mouth Bass
Rock Bass
Sunfish
Polyodontidae
Paddle Fish
Fish Released by Hatcheries
11,000,000
4,000,000
3,000,000
2,000,000
1,000,000
500,000
Brownfield Sites
Average Depth (ft)
Over 600
600
300
0
Golf Course Density
10 or more
9 - 7
6 - 4
3 - 1
* All courses within a 1.5 miles of the coast
25 sq. miles
Les Voigt
Marquette
Pendills Creek
Chelmsford Fish and Game
Thompson
Jordan River
Oden
Thunder River
Three T's Fishin' Hole
Platte River
Harlette
Linwood Acres
Salmon River
Lyndon Fish Inc.
Oneida
Kettle Moraine Springs
Wolf Lake
Haliburton Highlands
Caledonia
Randolph Bath
Chautauqua
Curtis Creek
Linesville
LA Spile
Mixsawbah
Fairview
Castalia
Map 2

Economy and Recreation System Aspects

United States golf course facilities impact the economy at an estimated $18 billion each year. Golfers spend about $26.1 billion a year on golf travel, 75 percent of which goes to the hotel, transportation and food and beverage industries. Golfers spent $19.7 billion on public and private green fees and dues in 2002, which accounted for 81 percent of all spending. They spent $4.7 billion on equipment (clubs, balls, bags, gloves, shoes). An average 9-hole course covers about two miles and an 18-hole course about four miles. In addition to benefits from exercise, research has shown that looking at a pleasant outdoor view can be healthy. Golf provides over 24.5 million Americans the opportunity to exercise outdoors.

Opportunity

Florida, South Carolina, North Carolina, California and Arizona are the most popular travel destinations for golfers, yet Michigan has the fourth largest number of golf facilities.

Ecology system aspects

Turf absorbs runoff water because its growth habitat creates many tiny spaces that trap and hold moisture. As water soaks into the grass and the soil below, it is filtered and cleansed. This process is so effective that many golf courses have become water recycling sites and their communities use treated wastewater for irrigation. Turf also improves the air we breathe. The turf growth process takes carbon dioxide from the air and releases the oxygen we need. A landscape of turf, trees, and shrubs about 2,000 square feet in size generates enough oxygen for one person for one year. Turf is an excellent choice to restore areas damaged by landfills or mining operations. Turf has a very dense root system that holds the soil and rainwater, reducing erosion. As turf grows, it adds organic matter to the soil. This allows it to absorb even more water and hold it.

Our proposal

By introducing a new typology of the well-established game of golf as a sport and pastime, we are increasing awareness of the potential for improving the environment in measurable as well as aesthetic ways. Using former industrial Brownfield sites along three unique locations in the Great Lakes Region to introduce combined golf course and fish hatchery facilities implementing the principles of IMTA. The basis for choosing the Green Bay, Wisconsin site for reintroduction of Lake Trout is based on the cold, deep waters of Lake Michigan as a suitable habitat. The Buffalo, New York site is a good match for Sauger Perch because of the warm water and large adjacent canal which will serve as a wintering pond. The Detroit, Michigan location is situated between two large rivers for a continuous flow of water and to serve the Sockeye Salmon's shallow spawning depth. Each of the sites will employ natural filtration systems and use soil balancing to obtain the landscape topogaphies. The long-term outcome will be the reintroduction of 3 former locally extinct fish species, along with increased tourism and local employment opportunities, as well as a unique form of outdoor recreation. By using brownfield sites along the Great lake megaregion as a golf landscape our team proposes to remediate sites that have previously been used for industrial purposes.

Stakeholders

GOLFERS: who visit these sites have a unique experience derived from the unusual typology consisting of water hazards used for reproduction and rearing of reintroduced fish species.

ENVIRONMENT: Nutrients created as a by-product of the fish hatchery are used as natural fertilizer for the golf course. Turf and pond plants cleanse the water.

FISH: Integrated Multitrophic Aquaculture uses complement water plants (seaweed) and species (mussels) to provide a balanced ecosystem.

COMMUNITY: Locals benefit from increased tourism and the availability of fresh, organically farmed fish as well as the jobs created by the operation of the facilities.

Systems Overview

TEAM **FIVE**

HAI BIN TAN
ABDULAZIZ ALSAYEGH
BRIAN BAUM
JASON WESTHOUSE
NEIL MISSLING
AMANDA KIGHT
CHRISTOPHER KING

Page 38


COUSIN'S
DELI

Water Pollution Areas of Concern (AOC)

Lake Superior & tributaries

Lake Michigan & tributaries

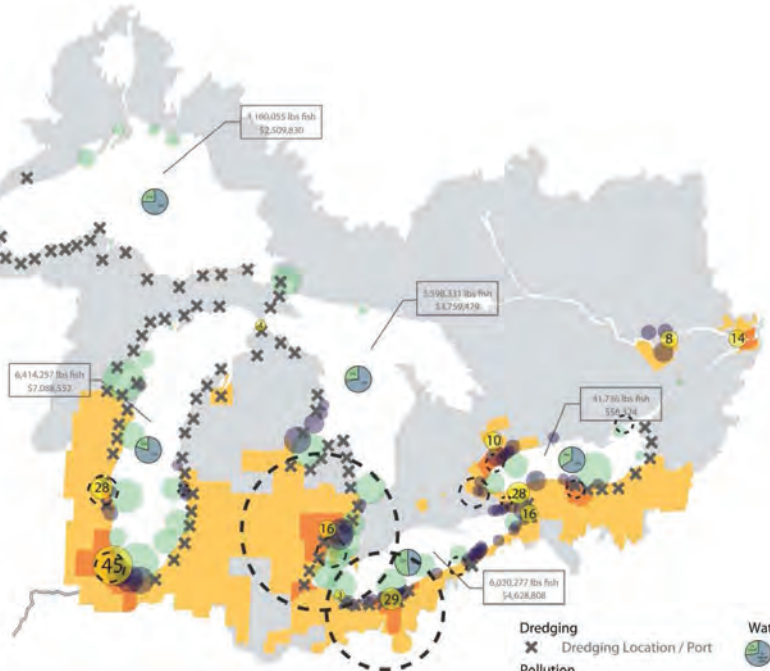
Lake Ontario & tributaries

Areas of Concern Beneficial Uses:

Lake Huron & tributaries

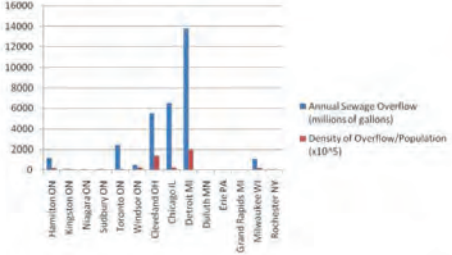
Lake Erie & tributaries

BEFORE



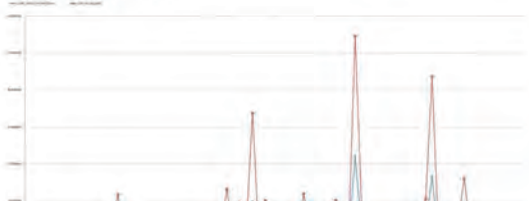
Sewage Overflow

Annual Amount / Density



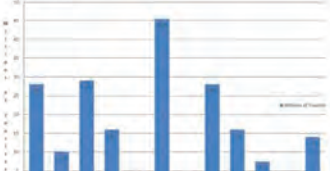
Great Lakes Dredging

Economic and Environmental Impacts



Great Lakes Tourism

Annual Average



Dredging
- Dredging Location / Port

Pollution
- Polluted Beach
- Polluted Water

Tourism
- # Million tourists per year

Commercial Fishing
- lbs of fish annually
- $ annual revenue

Population Density per Square Mile
- 0 to 100

Water Run-off
- Make-up of Lake Water

Sewage Overflow
- Density of Overflow

Hi FIVE

AFTER

Vater Pollution Areas of Concern (AOC)

reas of Concern Beneficial Uses:

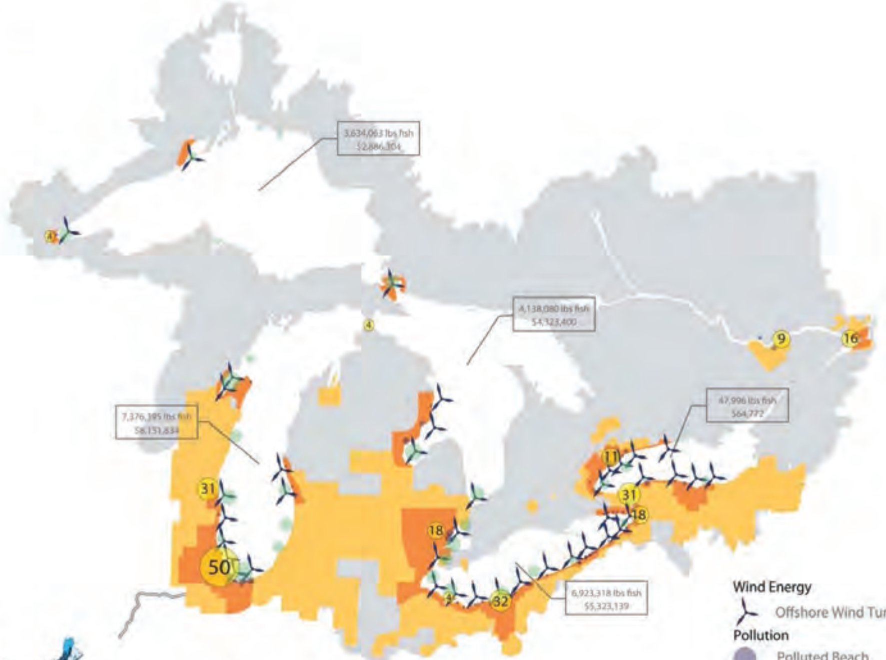
ake Superior & tributaries

ake Erie & tributaries

ake Michigan & tributaries

ake Ontario & tributaries

ake Huron & tributaries



Wind Energy

Offshore Wind Turbines

Pollution

Polluted Beach

Polluted Water

Tourism

Million tourists per year

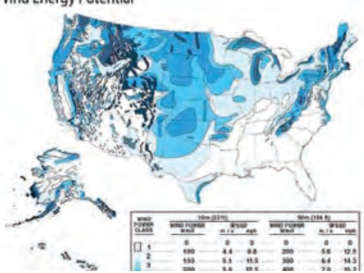
Commercial Fishing

lbs of fish annually
$ annual revenue

Population Density per Square Mile

0 to 100

Vind Energy Potential



Great Lakes Tourism

Annual Average

Hi FIVE

Systems Technologies Stakeholders
Infrastructures Ecologies Processes

Wind Energy

Water Treatment

Aquaculture

Coastal Dredging

Bio Fuel/Energy

Recreation

Wilderness


SITE PARAMETERS
DEVELOPMENT
- RESIDENTIAL
- COMMERCIAL
EMISSION OUTPUT
GREEN SPACES
OUTDOORSMAN ACTIVITIES
- AQUACULTURE
- HUNTING
TOURISM
WATER POLLUTION
STATISTICS
HOUSING TO CITY POPULATION - 43.37%
CITY UNEMPLOYMENT - 5.43%
CO2 PRODUCED - 8.98 MILLION TONNES
PARKS TO CITY POPULATION - .02%
FISHING LICENSES TO CITY POPULATION - 6.66%
HUNTING LICENSES TO CITY POPULATION - 8.92%
TOURISM POPULATION GROWTH - 1349.47%
FAILED E-COLI TESTS - 66%
COMPOSITION
RECREATION 20%
ENERGY 25%
AQUACULTURE 10%
NATURAL HARVEST 20%
DEVELOPMENT 25%
WATER TREATMENT


COMPOSITION
WATER TREATMENT
DEVELOPMENT 40%
NATURAL HARVEST 5%
AQUACULTURE 10%
ENERGY 20%
RECREATION 25%
STATISTICS
HOUSING TO CITY POPULATION - 48.58%
CITY UNEMPLOYMENT - 7.66%
CO2 PRODUCED - 3.8 MILLION TONNES
PARKS TO CITY POPULATION - .03%
FISHING LICENSES TO CITY POPULATION - 7.6%
HUNTING LICENSES TO CITY POPULATION - 9.79%
TOURISM POPULATION GROWTH - 2928.87%
FAILED E-COLI TESTS - 40%
SITE PARAMETERS
DEVELOPMENT
- RESIDENTIAL
- COMMERCIAL
EMISSION OUTPUT
GREEN SPACES
OUTDOORSMAN ACTIVITIES
- AQUACULTURE
- HUNTING
TOURISM
WATER POLLUTION

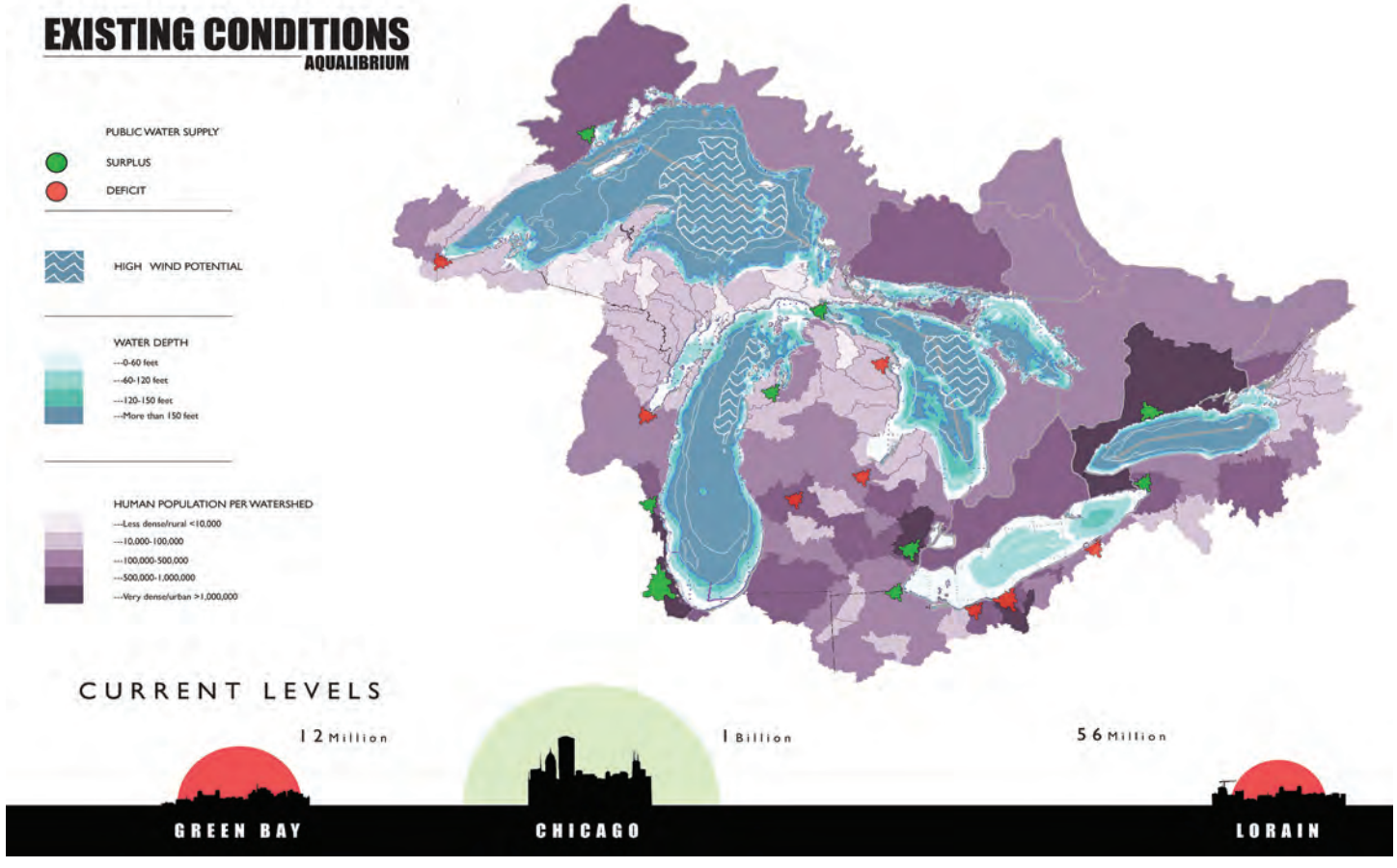

SITE PARAMETERS
DEVELOPMENT
- RESIDENTIAL
- COMMERCIAL
EMISSION OUTPUT
GREEN SPACES
OUTDOORSMAN ACTIVITIES
- AQUACULTURE
- HUNTING
TOURISM
WATER POLLUTION
STATISTICS
HOUSING TO CITY POPULATION - 46.35%
CITY UNEMPLOYMENT - 4.3%
CO2 PRODUCED - 913 THOUSAND TONNES
PARKS TO CITY POPULATION - .15%
FISHING LICENSES TO CITY POPULATION - 20.17%
HUNTING LICENSES TO CITY POPULATION - 15.53%
TOURISM POPULATION GROWTH - 3288.89%
FAILED E-COLI TESTS - 44%
COMPOSITION
RECREATION 20%
ENERGY 10%
AQUACULTURE 20%
NATURAL HARVEST 20%
DEVELOPMENT 30%
WATER TREATMENT

TEAM **SIX**

YAKE WANG
BRENTON HITE
MATTHEW ZAIA
ALI ALWAYEL
KIRSTEN LYONS
STEVEN LOISELE
CALEB MARQUARD

EXISTING CONDITIONS

AQUALIBRIUM



NETWORK SOLUTION

AQUALIBRIUM

INTERVENTION

WATER DISTRIBUTION -
Rather than create water-purificator 'singularities' that affect only a single locale, we have chosen to implement a water distribution network that balances current water deficits with current water surpluses. The distribution Pipeline acts as an artery, deep under the lake's surface, that transports vital water to cities need.

Unlike localized purification systems, this intervention not only solves the issue of potable-water shortages, but concurrently cleanses lake water by its very presence!

The Pipeline is a semi-rigid structure with a gill-like skin that purifies water surrounding it while simultaneously transporting pre-prified water throughout the Great Lakes System.

CONNECTION

THE BASIN PIPELINE -
Water surplus will be transported along the inter-lake artery to areas previously experiencing a water deficit. The distribution will be localized to ensure the maximum benefit from the closest source. The result: all Cities have access to pure potable water.

PROJECTED GROWTH

PUMPING STATION

DEFICIT

SURPLUS

AQUALIBRIUM

AQUALIBRIUM

Just Tapped! The Black and White Business of Water

AQUALIBRIUM

The **best** and **safest** tap water in the world comes from the very place we wash our dishes...Yet we justify buying "Smartwater" because it tastes better. Really?

Global demand of bottled water increased 100% from 1999 to 2004, roughly **41 billion gallons** consumed annually. Each week 1 billion bottles of water is transported in the states. That equals 37,800 semi-trucks hauling water every week. Yikes!

Feeding the bottled water industry is like feeding a sumo wrestler. It takes a lot and it does not stop. The effects are lowered lake levels and hurt wetlands. It takes three times as much water to make one bottle of water... One twenty ounce bottle of water takes sixty ounces of water to produce.

Just a Numbers Game

If tap water cost the same as the average bottle of water, monthly water bills would come to $9,000.

It is estimated that at a cost of $1.29 a water bottle, that half goes to the retailer leaving 65¢. 43¢ goes to transportation and distribution leaving 22¢. 12¢ is taken for the water, bottle, and cap. Leaving a dime for profit. But don't feel bad for Coke and Pepsi, both of which sell at least 3.36 billion bottles of water each year. Multiple all those bottles by that dime profit and each company makes at least $336,000,000 a year.

There is no health benefit to bottled water, but it still costs 4,000-10,000 times what tap does for the same amount.

Bottled water can cost as much $10 per gallon, making gasoline cost less than bottle water.

Americans spend more than $15 billion dollars annually on bottled water, buying 2.6 billion cases.

The Great Lakes provide drinking water to 40 million people as well as 56 billion gallons of water per day for municipal, agricultural and industrial use.

Bottled water can cost as much $10 per gallon, making gasoline cost less than bottle water.

PUTTING IT ALL TOGETHER

AQUALIBRIUM

1. Our proposal utilizes the existing mechanical water filtration cycle that most Great Lake cities and towns utilize. By identifying locations of deficits and surpluses (see 2.), we will expand the existing water distribution system. Locations with surpluses dump this potable water back into the lake or local rivers. We propose utilizing this surplus by pumping it into a reserve, once full, water will be sent to other locations in need. After use, it is treated and returned to the lake completing the water cycle.

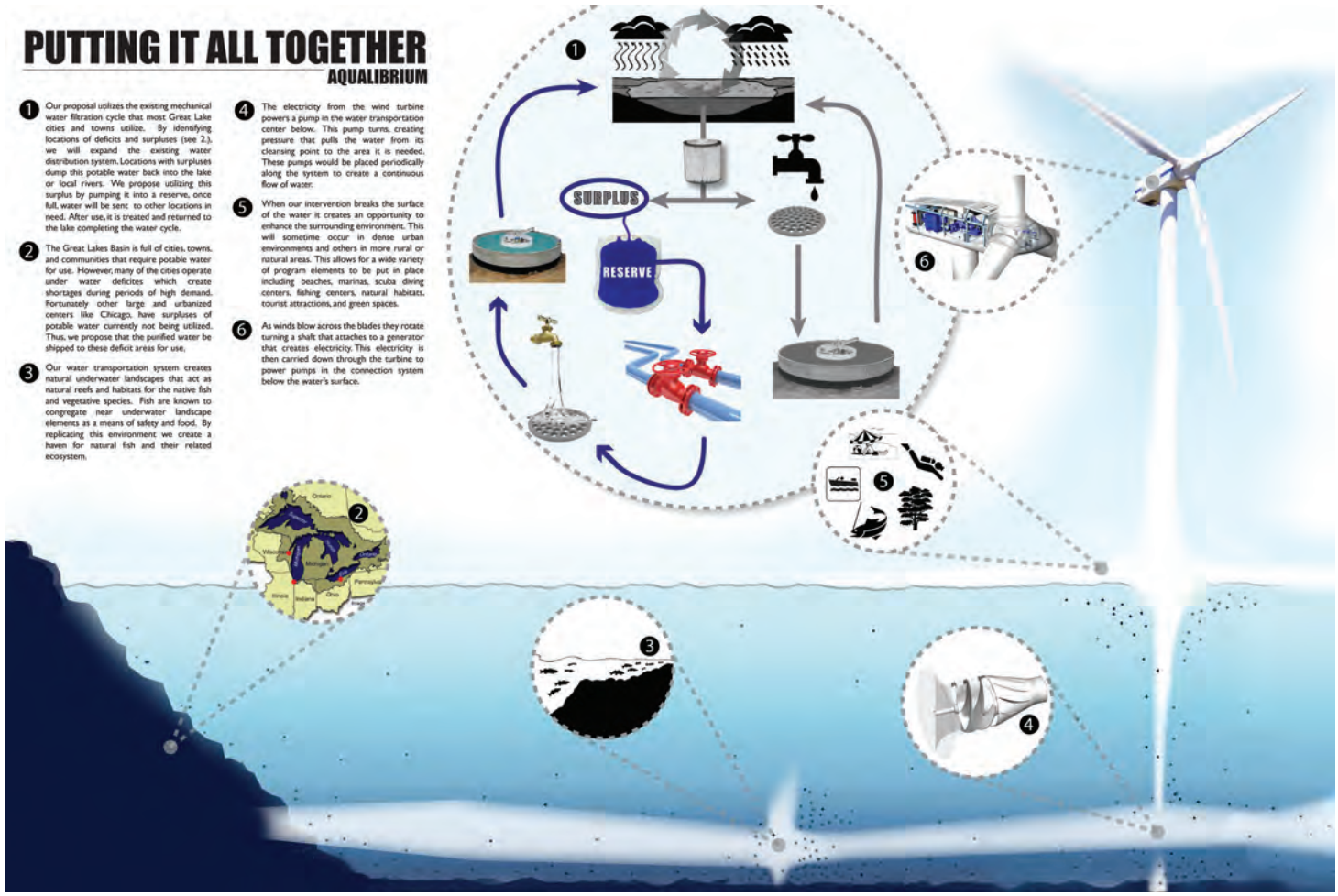
2. The Great Lakes Basin is full of cities, towns, and communities that require potable water for use. However, many of the cities operate under water deficites which create shortages during periods of high demand. Fortunately other large and urbanized centers like Chicago, have surpluses of potable water currently not being utilized. Thus, we propose that the purified water be shipped to these deficit areas for use.

3. Our water transportation system creates natural underwater landscapes that act as natural reefs and habitats for the native fish and vegetative species. Fish are known to congregate near underwater landscape elements as a means of safety and food. By replicating this environment we create a haven for natural fish and their related ecosystem.

4. The electricity from the wind turbine powers a pump in the water transportation center below. This pump turns, creating pressure that pulls the water from its cleansing point to the area it is needed. These pumps would be placed periodically along the system to create a continuous flow of water.

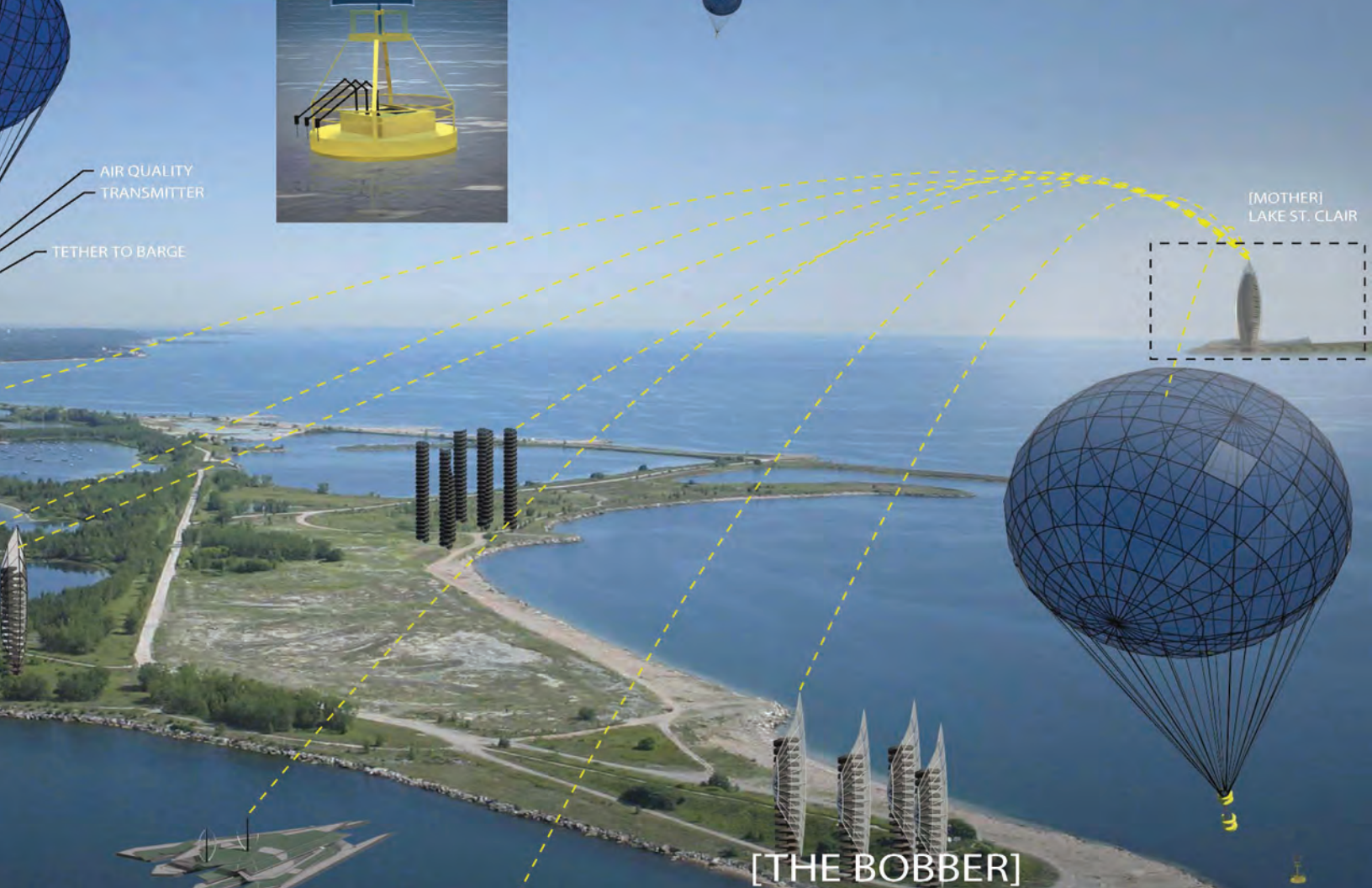
5. When our intervention breaks the surface of the water it creates an opportunity to enhance the surrounding environment. This will sometime occur in dense urban environments and others in more rural or natural areas. This allows for a wide variety of program elements to be put in place including beaches, marinas, scuba diving centers, fishing centers, natural habitats, tourist attractions, and green spaces.

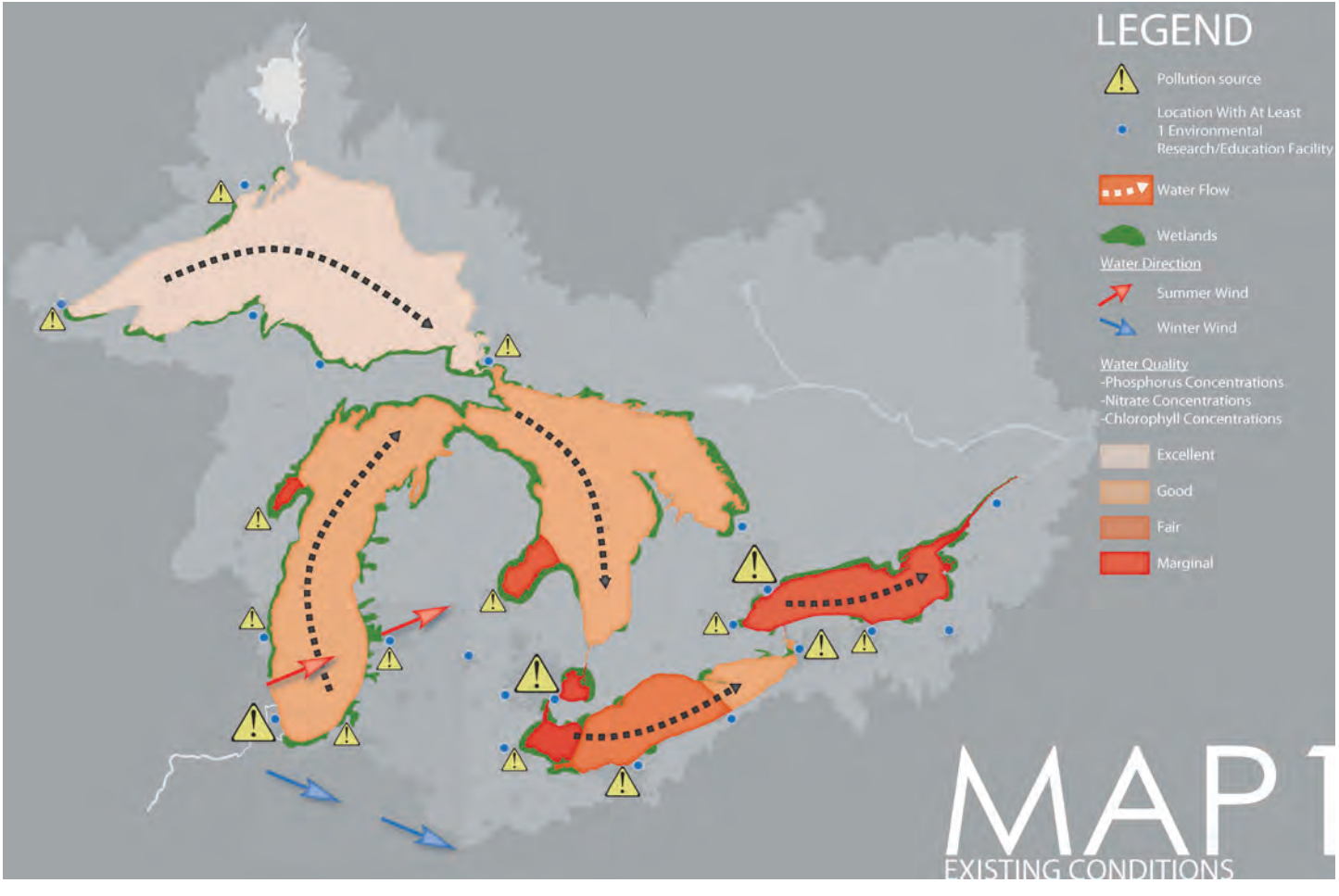
6. As winds blow across the blades they rotate turning a shaft that attaches to a generator that creates electricity. This electricity is then carried down through the turbine to power pumps in the connection system below the water's surface.

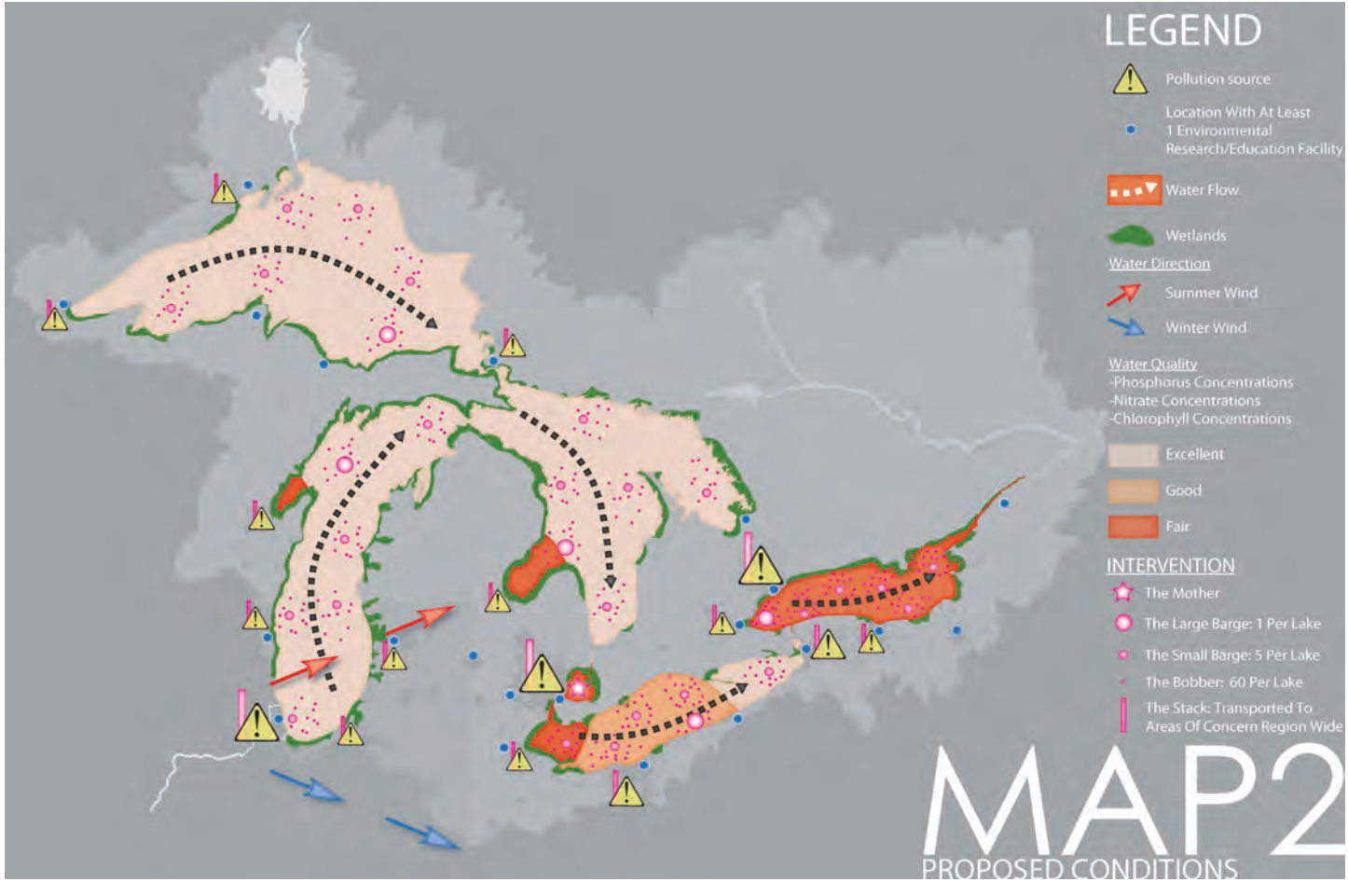


TEAM **SEVEN**

ADAM MOORE
AHMED GELAN
MOHAMAD HADLA
JOSEPH DEMSKI
AMY NONHOF
LINDSAY PEW
MARK DRIEDGER


AIR QUALITY
TRANSMITTER
TETHER TO BARGE
[MOTHER]
LAKE ST. CLAIR
[THE BOBBER]


LEGEND
Pollution source
Location With At Least
1 Environmental
Research/Education Facility
Water Flow
Wetlands
Water Direction
Summer Wind
Winter Wind
Water Quality
-Phosphorus Concentrations
-Nitrate Concentrations
-Chlorophyll Concentrations
Excellent
Good
Fair
Marginal
MAP 1
EXISTING CONDITIONS


LEGEND
Pollution source
Location With At Least 1 Environmental Research/Education Facility
Water Flow
Wetlands
Water Direction
Summer Wind
Winter Wind
Water Quality
-Phosphorus Concentrations
-Nitrate Concentrations
-Chlorophyll Concentrations
Excellent
Good
Fair
INTERVENTION
The Mother
The Large Barge: 1 Per Lake
The Small Barge: 5 Per Lake
The Bobber: 60 Per Lake
The Stack: Transported To Areas Of Concern Region Wide
MAP2
PROPOSED CONDITIONS

CHICAGO

SAULT STE MARIE

SAULT STE. MARIE

- Is located in the North-Eastern end of Michigan's Upper Peninsula, on the Canadian border
- Home of the Soo Locks which 's the world's busiest canal in terms of shipping tonnage passing through it
- People come from around the world to view up close the ships passing through the locks
- The Soo Locks are located in the St. Mary's River, which connects Lake Superior to Lake Huron
- The river is an AOC (area of concern) and part of a RAP (remedial action plan)
- Close proximity to several colleges and universities

LAKE ERIE

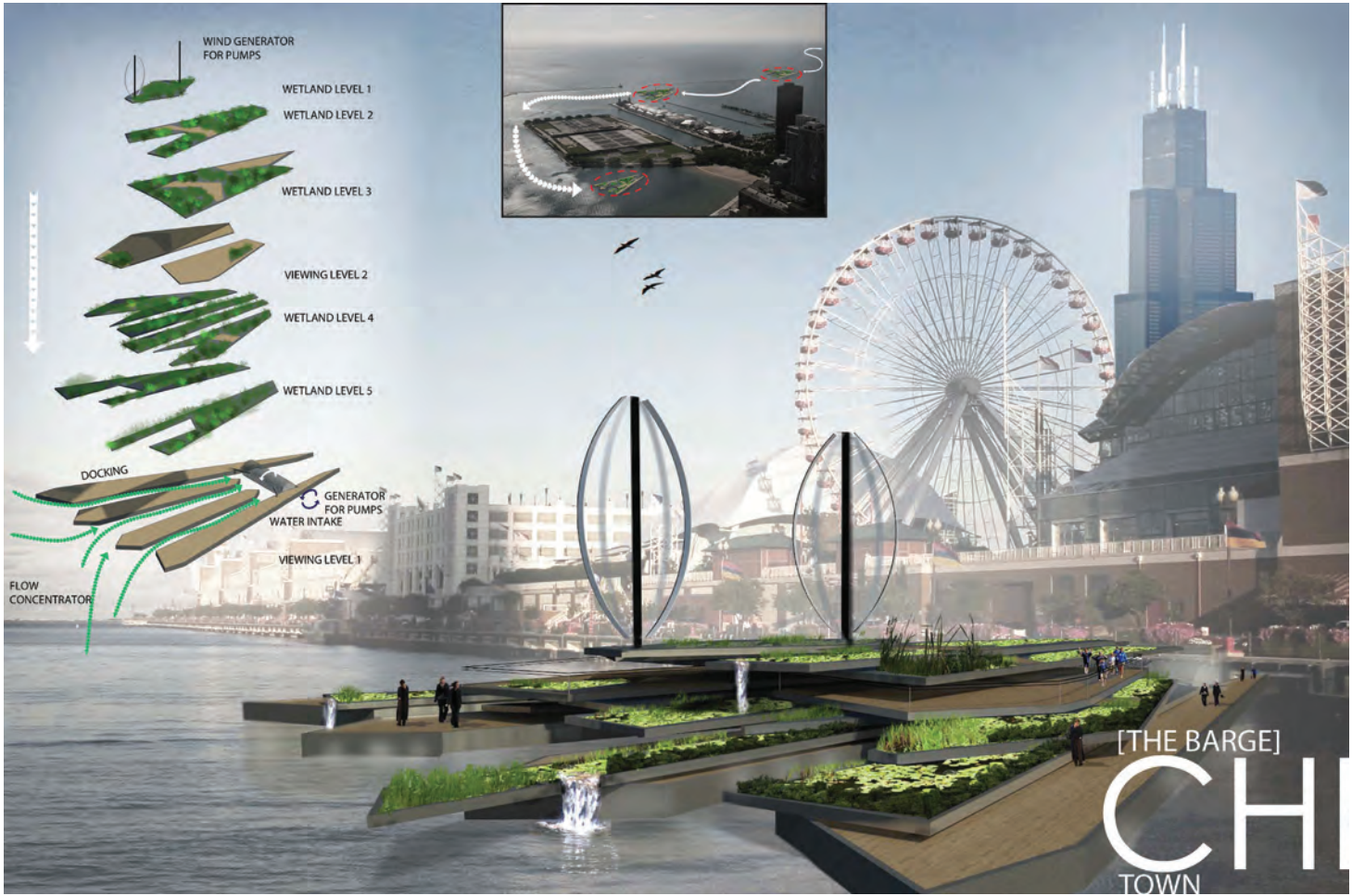
LAKE ERIE

- Is the fourth largest lake (by surface area) of the five Great Lakes in North America, and the thirteenth largest globally
- It is the southernmost, shallowest, and smallest by volume of the Great Lakes
- The average depth is 62 feet
- It is bounded on the north by the Canadian province of Ontario, on the south by the U.S. states of Ohio, Pennsylvania, and New York, and on the west by the state of Michigan
- Lake Erie infamously became very polluted in the 1960s and 1970s as a result of the quantity of heavy industry situated on its shores, with reports of "bacteria-laden" beaches and fish contaminated by industrial waste
- In the 1970s, patches of the lake were "declared dead" because of industrial waste as well as sewage from runoffs
- The water quality deteriorated partially due to increasing levels of the nutrient phosphorus in both the water and lake bottom sediments
- The resultant high nitrogen levels in the water caused eutrophication, which resulted in algal blooms and algae masses and fish kills increasingly fouled the shoreline during this period

GRAND CALUMET RIVER

- The direction of the river system has changed repeatedly
- The low gradient of the land gives the river only a very small current
- The largest extent of the river's impairment comes from the historical sediment contamination by the industrial activities already mentioned.
- Industrial development in the Calumet River area began around the 1870s
- By 1890 the West reach of the river was heavily polluted with the waste of steel mills, foundries, a meat packing plant, and glue and cornstarch factories
- Industry continued to spread along the East reach of the river between 1890 and 1910
- These decades of unrestricted pollution have left the river sediments highly contaminated to this day
- The river is an AOC (area of concern) and part of a RAP (remedial action plan)
- The area has fish consumption restrictions, beach closings, fish tumors or deformities, animal deformities or reproductive problems, and loss or degradation of fish
- The river once supported highly diverse, globally unique fish and wildlife communities
- Close proximity to several colleges and universities

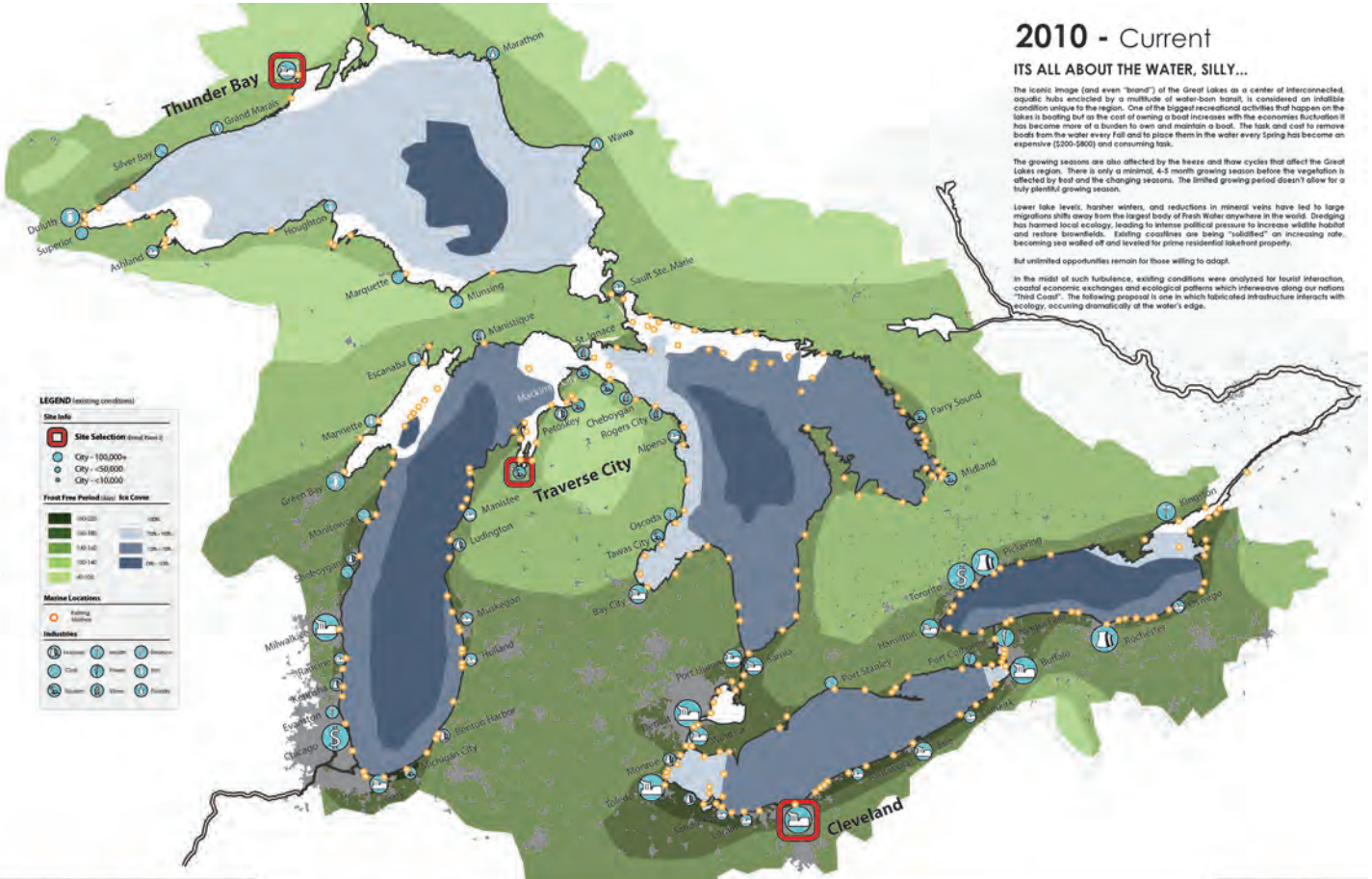
SITES


WIND GENERATOR
FOR PUMPS
WETLAND LEVEL 1
WETLAND LEVEL 2
WETLAND LEVEL 3
VIEWING LEVEL 2
WETLAND LEVEL 4
WETLAND LEVEL 5
DOCKING
GENERATOR
FOR PUMPS
WATER INTAKE
VIEWING LEVEL 1
FLOW
CONCENTRATOR
[THE BARGE]
CH
TOWN

TEAM **EIGHT**

MARK WEISGERBER
CHRISTOPHER HESS
ERIN FEGLEY
DANIEL TENOFF
MARGARET LEITHER
ELIZABETH SMITH
NICOLE SZCZEMBARA

Page 56



2010 - Current

ITS ALL ABOUT THE WATER, SILLY...

The iconic image (and even "brand") of the Great Lakes as a center of interconnected, aquatic hubs encircled by a multitude of water-born transit, is considered an infallible condition unique to the region. One of the biggest recreational activities that happen on the lakes is boating but as the cost of owning a boat increases with the economies fluctuation it has become more of a burden to own and maintain a boat. The task and cost to remove boats from the water every Fall and to place them in the water every Spring has become an expensive ($200-$800) and consuming task.

The growing seasons are also affected by the freeze and thaw cycles that affect the Great Lakes region. There is only a minimal, 4-5 month growing season before the vegetation is affected by frost and the changing seasons. The limited growing period doesn't allow for a truly plentiful growing season.

Lower lake levels, harsher winters, and reductions in mineral veins have led to large migrations shifts away from the largest body of Fresh Water anywhere in the world. Dredging has harmed local ecology, leading to intense political pressure to increase wildlife habitat and restore brownfields. Existing coastlines are being "solidified" an increasing rate, becoming sea walled off and leveled for prime residential lakefront property.

But unlimited opportunities remain for those willing to adapt.

In the midst of such turbulence, existing conditions were analyzed for tourist interaction, coastal economic exchanges and ecological patterns which interweave along our nations "Third Coast". The following proposal is one in which fabricated infrastructure interacts with ecology, occuring dramatically at the water's edge.

2010 CONDITIONS

FOCUS: Frost Free Period, Ice Cover, Marinas, Industries, Urban Densities, Major cities cities: Cleveland OH, Thunder Bay ONT, Traverse City MI

map_01:

2030 - Future

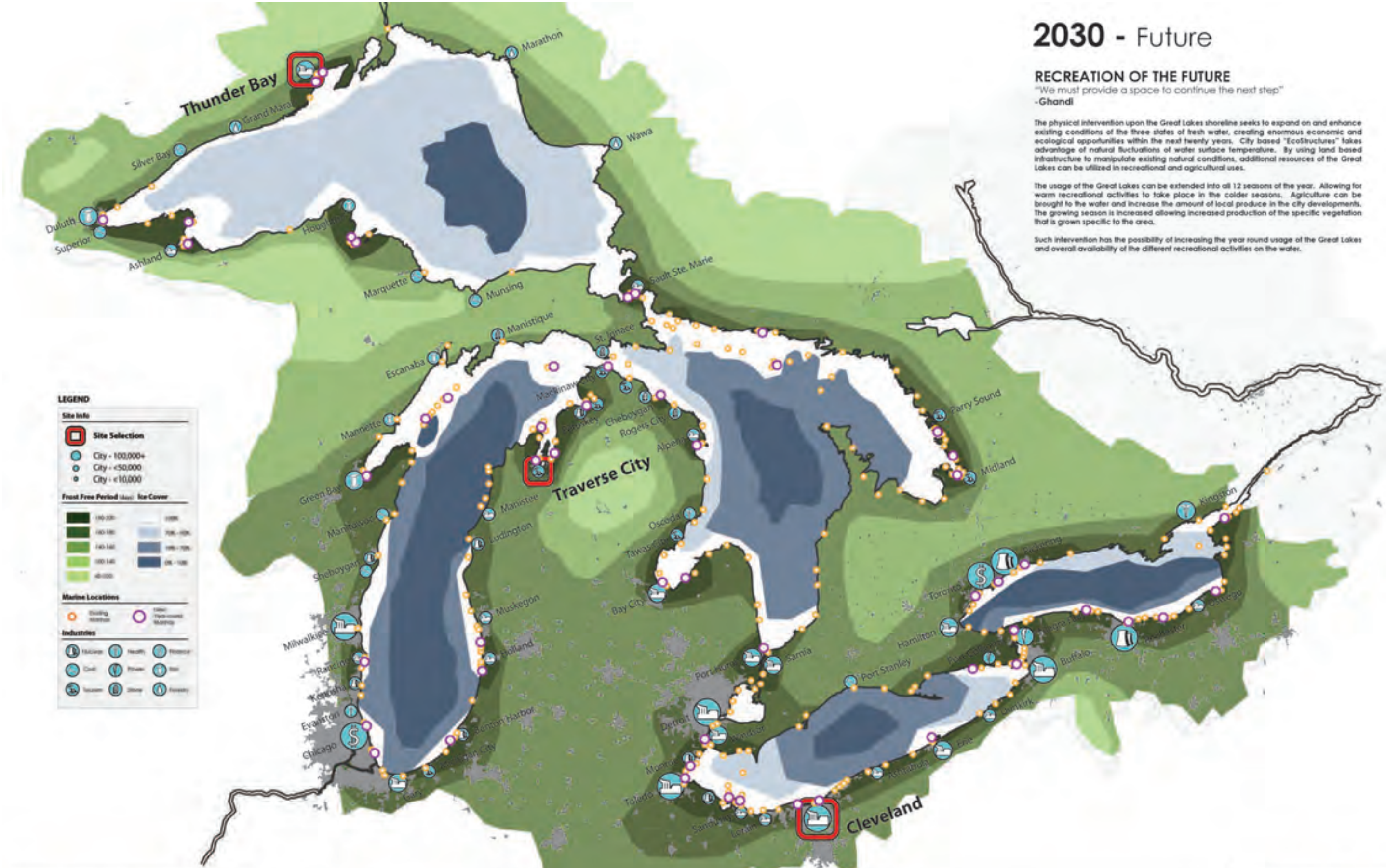
RECREATION OF THE FUTURE

"We must provide a space to continue the next step"
-Ghandi

The physical intervention upon the Great Lakes shoreline seeks to expand on and enhance existing conditions of the three states of fresh water, creating enormous economic and ecological opportunities within the next twenty years. City based "EcoStructures" takes advantage of natural fluctuations of water surface temperature. By using land based infrastructure to manipulate existing natural conditions, additional resources of the Great Lakes can be utilized in recreational and agricultural uses.

The usage of the Great Lakes can be extended into all 12 seasons of the year. Allowing for warm recreational activities to take place in the colder seasons. Agriculture can be brought to the water and increase the amount of local produce in the city developments. The growing season is increased allowing increased production of the specific vegetation that is grown specific to the area.

Such intervention has the possibility of increasing the year round usage of the Great Lakes and overall availability of the different recreational activities on the water.



2030 CONDITIONS

FOCUS: Frost Free Period, Ice Cover, Marinas, Industries, Urban Densities, Major cities   cities: Cleveland OH, Thunder Bay ONT, Traverse City MI

map_02:

average winter temp: 25.7
average summer temp: 71.9
liquid percipitation: 38.71
snow pecipitation: 61.4
hardiness zone classification:
max wave height:10-15 ft
break wall height:
wind:

THUNDER BAY SITE PLAN

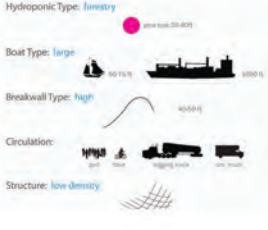
SECTION

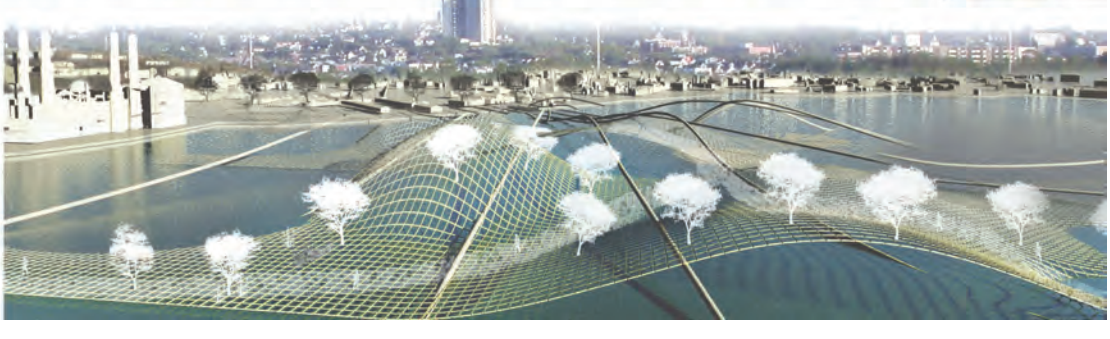
sun angle

THUNDER BAY, ONT

CITY TYPOLOGY 2: 50,000+ **population:** 99,000 **industries:** health services, forestry, manufacturing **climate:** humid continental, Koppen Dfb **heartiness zone:** Zone 3

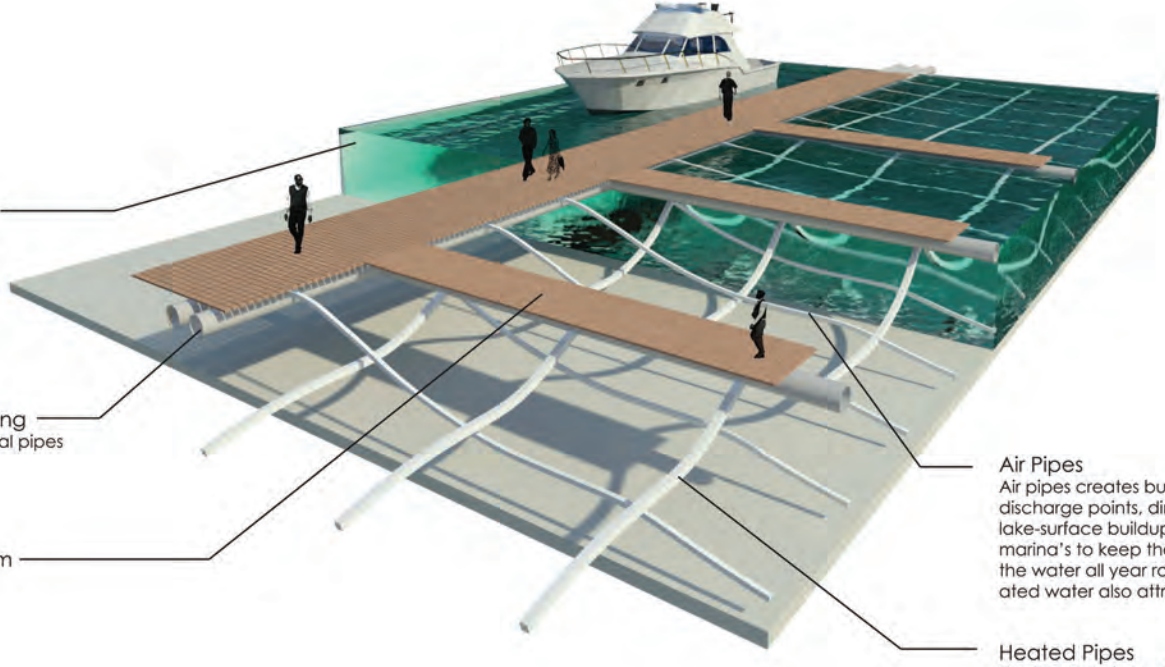
panel_05:





Systems - Marina

Perforation within select underwater pipes creates bubble discharge points, diminishing lake-surface buildup allowing marinas to keep their boats in the water all year round.



Freshwater

Primary Piping
Houses all local pipes

Dock System

Air Pipes
Air pipes creates bubble discharge points, diminishing lake-surface buildup allowing marina's to keep their boats in the water all year round. The aerated water also attracts fish.

Heated Pipes
The heated pipes allows for year round water storage of boats.

TEAM NINE

IVAN PETROVIC
MARY LANCASTER
RANDA SHAMAYA
JOSEPH CHARRON
JACOB CHIDESTER
JOEL ZINCONE
LEO BETZ

THIRD COAST RECLAMATION PROJECT

CONDITION 2011

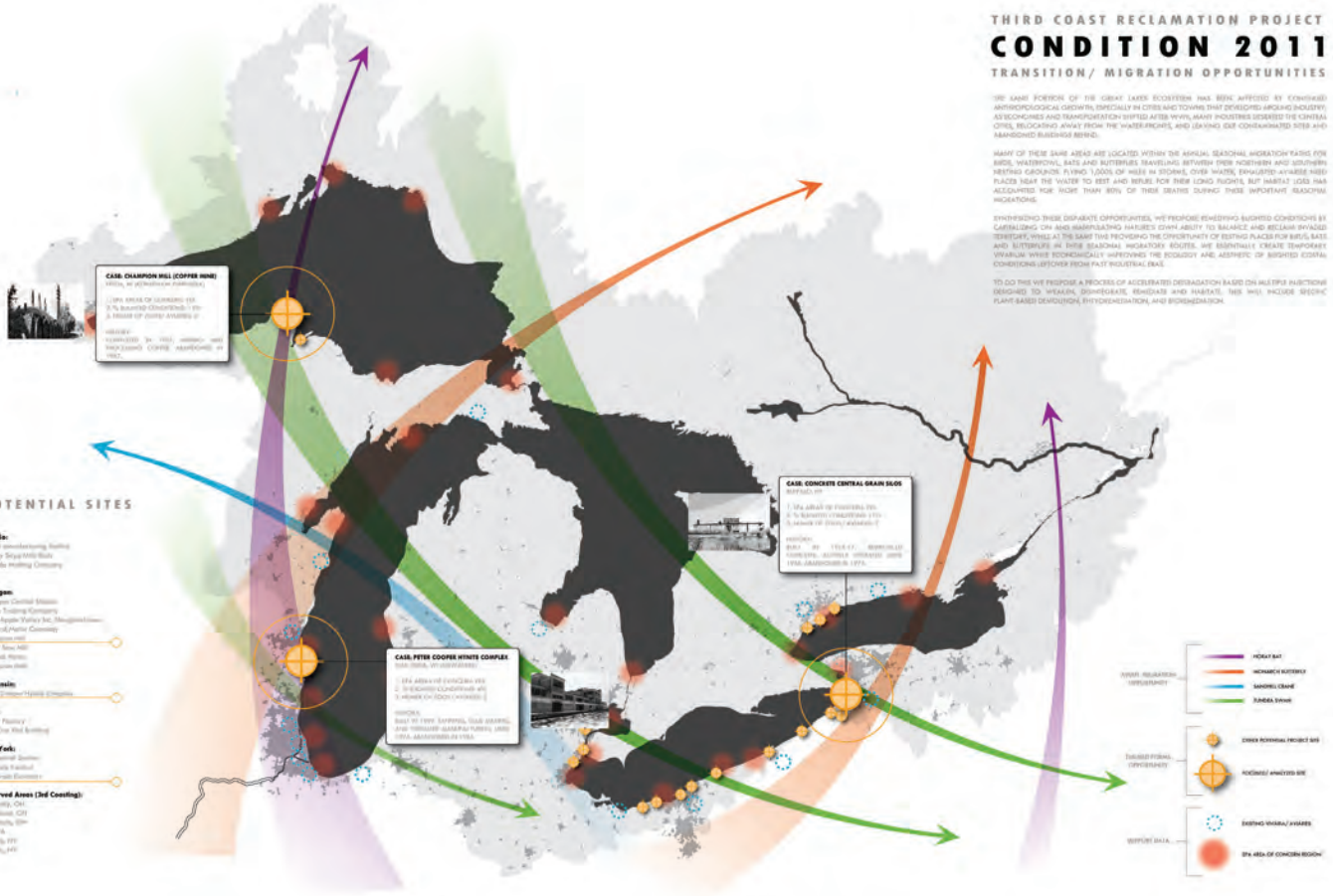
TRANSITION/ MIGRATION OPPORTUNITIES

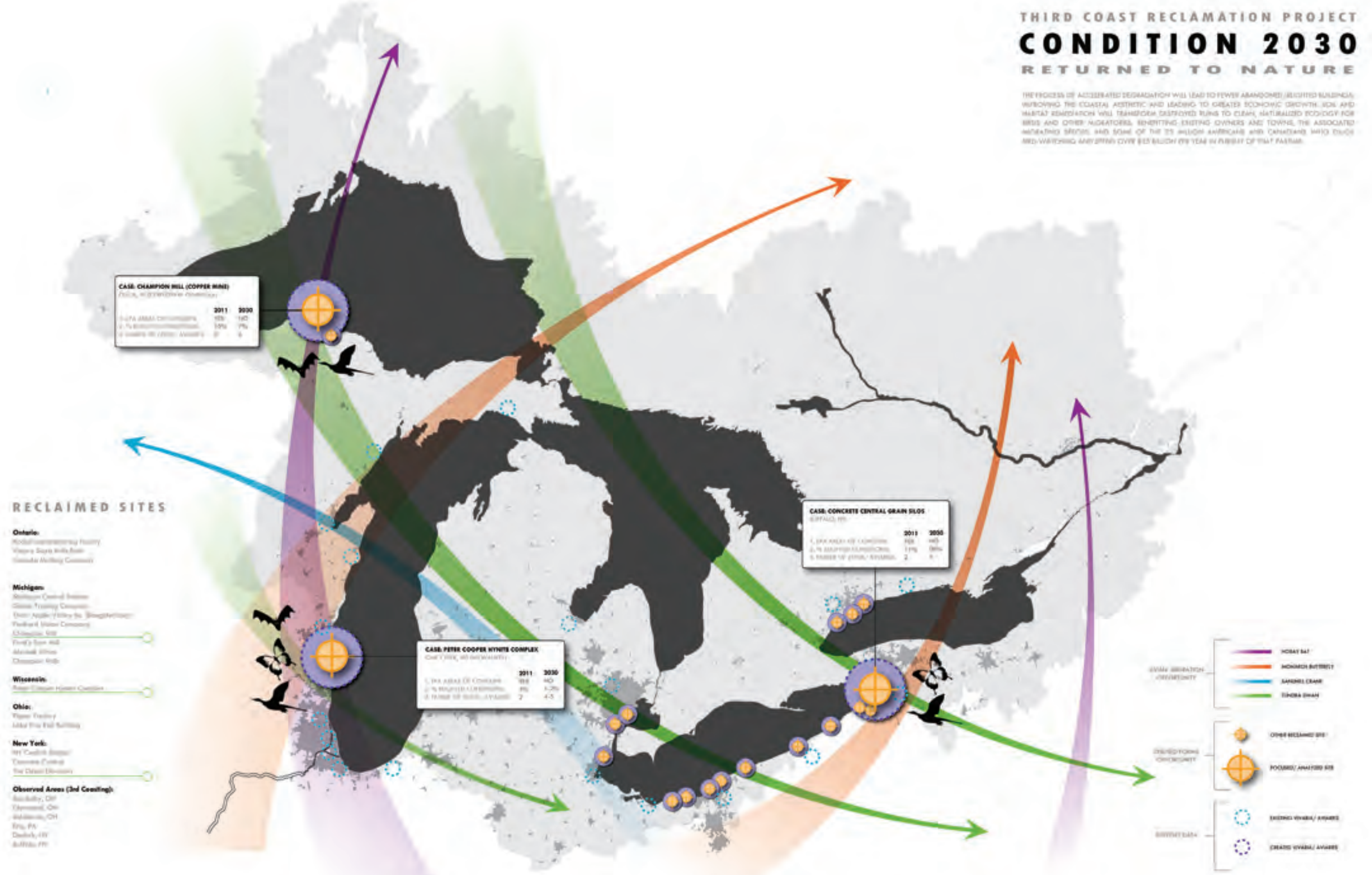
THE GREAT LAKES REGION OF THE GREAT LAKES ECOSYSTEM HAS BEEN AFFECTED BY CONTINUED ANTHROPOLOGICAL GROWTH, ESPECIALLY IN CITIES AND TOWNS THAT DEVELOPED AROUND INDUSTRY. AS ECONOMIES AND TRANSPORTATION SHIFTED AFTER WWII, MANY INDUSTRIES DESERTED THE CENTRAL CITIES, RELOCATING AWAY FROM THE WATER FRONTS, AND LEAVING OUR CONTAMINATED SITES AND MANSIONED BUILDINGS BEHIND.

MANY OF THESE SAME AREAS ARE LOCATED WITHIN THE ANNUAL SEASONAL MIGRATION PATHS FOR BIRDS, WATERFOWL, BATS AND BUTTERFLIES TRAVELLING BETWEEN THEIR NORTHERN AND SOUTHERN NESTING GROUNDS. FLYING 1,000S OF MILES IN STORMS, OVER WATER, EXHAUSTED AVIARIES NEED PLACES NEAR THE WATER TO REST AND REFUEL FOR THEIR LONG FLIGHTS, BUT HABITAT LOSS HAS ACCOUNTED FOR MORE THAN 80% OF THESE STATES DURING THESE IMPORTANT SEASONAL MIGRATIONS.

SYNTHESIZING THESE DISPARATE OPPORTUNITIES, WE PROPOSE REMEDYING BLIGHTED CONDITIONS BY CAPITALIZING ON AND MANIPULATING NATURES OWN ABILITY TO BALANCE AND RECLAIM INVADED TERRITORY, WHILE AT THE SAME TIME PROVIDING THE OPPORTUNITY OF RESTING PLACES FOR BIRDS, BATS AND BUTTERFLIES IN THEIR SEASONAL MIGRATORY ROUTES. WE ESSENTIALLY CREATE TEMPORARY VIVARIUM WHILE ECONOMICALLY IMPROVING THE ECOLOGY AND AESTHETIC OF BLIGHTED COASTAL CONDITIONS LEFTOVER FROM PAST INDUSTRIAL ERAS.

TO DO THIS WE PROPOSE A PROCESS OF ACCELERATED DEGRADATION BASED ON MILDEW INJECTIONS DESIGNED TO WEAKEN, DISINTEGRATE, REMEDIATE AND HABITATE. THIS WILL INCLUDE SPECIFIC PLANT-BASED DEMOLITION, PHYTOREMEDIATION, AND BIOREMEDIATION.




THIRD COAST RECLAMATION PROJECT
CONDITION 2030
RETURNED TO NATURE
CASE: CHAMPION MILL (COPPER MINE)
2011
2030
CASE: PETER COOPER HYNITE COMPLEX
2011
2030
CASE: CONCRETE CENTRAL GRAIN SILOS
2011
2030
RECLAIMED SITES
Ontario:
Michigan:
Wisconsin:
Ohio:
New York:
Observed Areas (3rd Coasting):
MONARCH BUTTERFLY

CYCLE PROCESS FLOW

THIRD COAST RECLAMATION PROJECT

SITE SELECTION

THE THIRD COAST RECLAMATION AUTHORITY, WITH AN EYE TOWARDS BOTH THE REGIONAL ECONOMIC GROWTH AND IMPROVED COASTAL AESTHETIC, CONSIDERS SITE FOR INCLUSION IN THIS PROGRAM. REQUIRED CRITERIA INCLUDE 1) THAT THE BUILDING SITE BE ON GREAT LAKES COAST 2) THE BUILDING SITE IS AMONG HIGH DENSITY OF BLIGHTED STRUCTURES AND 3) THE BUILDING SITE BE WITHIN RANGE OF MIGRATORY BIRD/ BAT/ BUTTERFLY CORRIDOR.

INJECTIVE CARTRIDGE SELECTION

BASED ON DETERMINED SITE CONDITIONS, FUNCTION-SPECIFIC CARTRIDGES ARE SELECTED TO CREATE THE TEMPORARY VIVARIUM AND ACCELERATE THE "RETURNING OF THE STRUCTURE TO NATURE". FUNCTIONS OF INJECTIVE CARTRIDGES RANGE FROM MATERIAL DECOMPOSITION TO HEAVY METAL AND PETROLEUM DISSOLVING SYSTEMS TO PROVIDING SPECIFIC HABITATS FOR TARGETED SPECIES.

CARTRIDGE ALLOCATION

UTILIZING EXISTING SHIPPING INFRASTRUCTURE, THE SELECTED CARTRIDGES ARE TRANSPORTED TO THE DETERMINED PROJECT SITE. CARTRIDGES MAY EITHER BE NEW, OR RE-DISTRIBUTED FROM PREVIOUS THIRD COAST RECLAMATION PROJECT CASES.

SITE PREPARATION

A CREW OF LOCAL UNEMPLOYED FACTORY/ CONSTRUCTION WORKERS, AS SELECTED BY THE RECLAMATION AUTHORITY, PREPARES THE SITE FOR CARTRIDGE INJECTION. PREPARATION MAY INCLUDE, BUT IS NOT LIMITED TO, REMOVAL OF SOME WALLS/ ROOFS TO KICK-START THE PROCESS, PREPARING THE SITE FOR THE ARRIVAL AND UNLOADING OF CARTRIDGES, AND AFFIXING THE CARTRIDGES TO THE STRUCTURE.

INJECTED STRUCTURE / TEMPORARY VIVARIUM

THE PROCESS OF ACCELERATED STRUCTURAL BREAKDOWN, SITE REMEDIATION, AND THE 'RETURN TO NATURE' HAS BEGUN. AS FORMS BEGIN TO DETERIORATE, TARGETED WILDLIFE BEGINS TO POPULATE THE SPACE, AN A SEMI-REGULATED VIVARIUM IS CREATED, BASED ON THE SITE LOCATION WITHIN AVIAN MIGRATORY ROUTES.

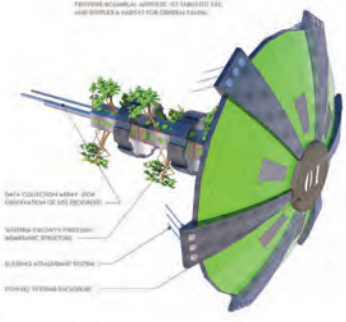
RETURN TO NATURE

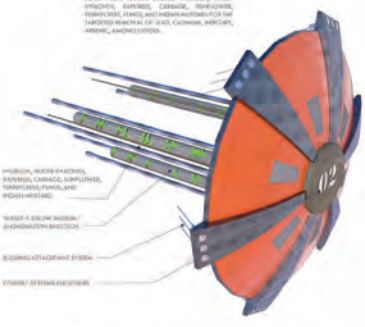
AS THE PROCESS FINALIZES, THE VIVARIUM AS A MAN-MADE, DEFINED SPACE DISSOLVES COMPLETELY, AS DOES THE HOST STRUCTURE ITSELF. THE REMEDIATION OF THE SITE IS COMPLETE, AND THE BLIGHTED FORM HAS 'RETURNED TO NATURE'.

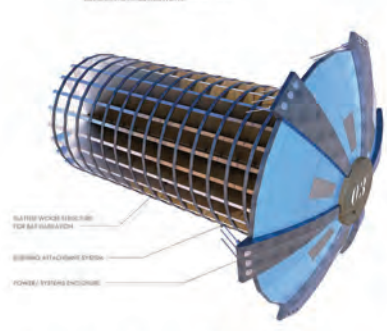
MATRIX OF CARTRIDGES TYPOLOGIES

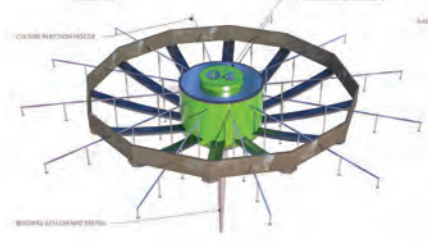
THIS MULTIFACETED PROCESS OF RECURRING SUCCESSIVE STRUCTURES TO MATURE REQUIRES MULTIPLE MODES OF INJECTION TO FACILITATE STRUCTURAL BREAKDOWN, CHEMICAL AND HEAVY METAL REMEDIATION, AND DEVELOPMENT OF HABITAT FOR TARGETED MIGRATORY SPECIES.

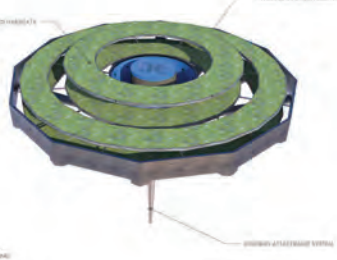
	STRUCTURAL BREAKDOWN	SITE REMEDIATION	TARGETED HABITAT
INJECTIVE MODE	01- WISTERIA GROWTH	02- PHYTOREMEDIATION MIX	03- CHIROPTERA VIVARIUM
PLATFORM MODE	04- HALOMONAS CULTURES	05- MICROBIAL REMEDIATION	06- AVIAN VIVARIUM











TEAM TEN

ERIN CURLEY
THOMAS NEWMAN
JOEL KUZICH
ROENA ARAPI
JULIA DUTTON
NICHOLAS CUOZZO
BETTY SHREVE

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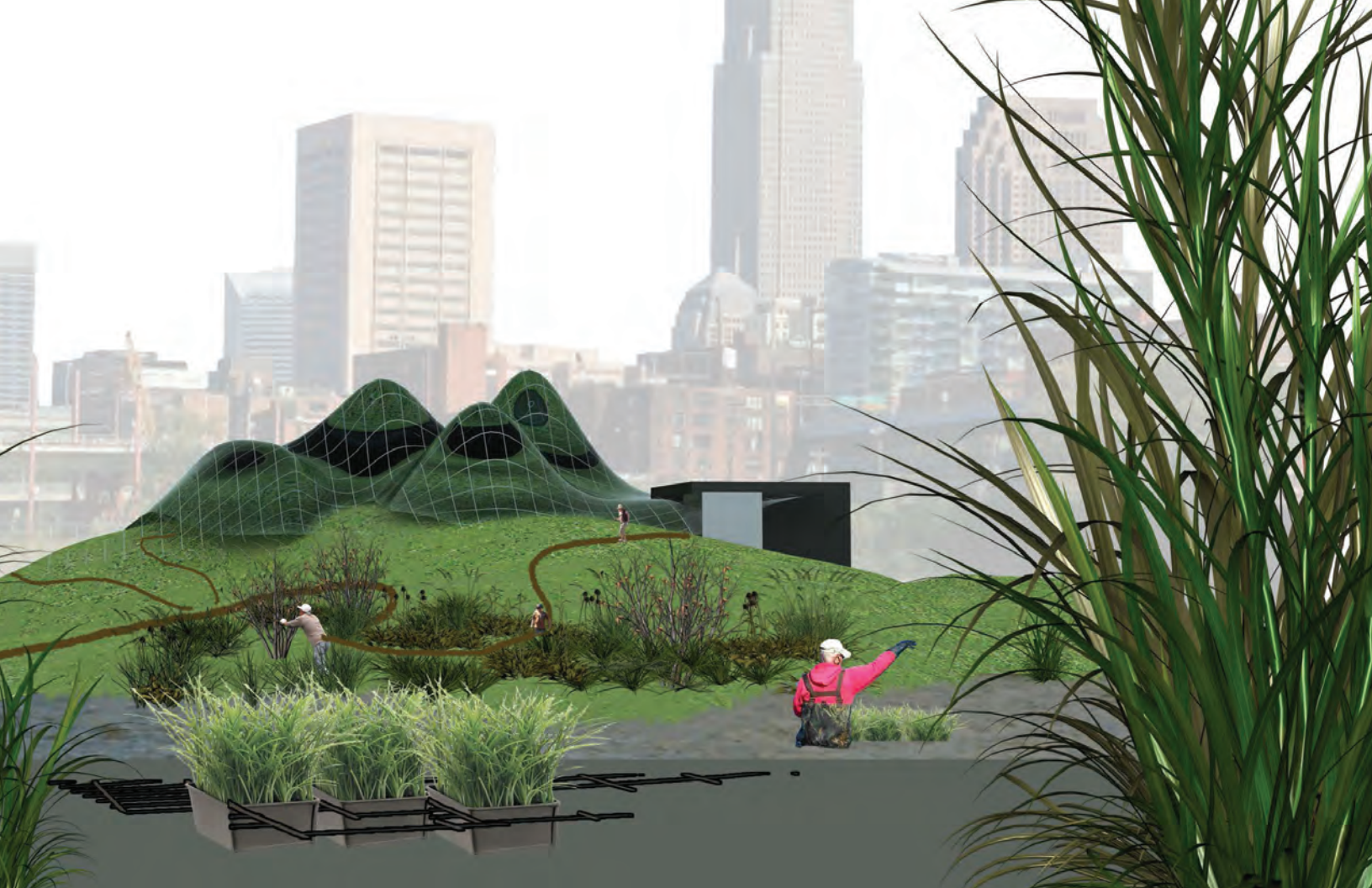
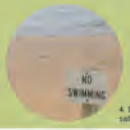


INVOLVEMENT OPPORTUNITIES

1. River and wetland construction/restoration

2. Explosive zebra mussel growth

3. Attention paid to local water quality



4. Demand for safe recreation

5. Developed port cities and industry

6. Visible cleanup opportunities

7. Loyal and hopeful coastal culture

The Great Lakes basin does not need to be told to heal itself.

There is today a loud demand voiced by residents to preserve the Third Coast culture, and an awareness of the environmental issues facing the region. At times, it is hard to ignore. The zebra mussel, for example, has colonized most of the basin and is notoriously known as the ubiquitous invasive species that everyone loathes. The loss of the historic wetlands lurks in the motivation behind US-government-funded 'wetland restoration' projects and ordinances that require any construction that develops over any wetland area to replace them by constructing new areas. The demand is conscious.

The area is driven by those desires and industry which are tied to the water - the resources the Lakes provide. Long stretches of the shoreline are developed with human construction or habitation while others are left - sometimes intentionally - as the region might have been before human construction. Both are critical to the econimic flow of the area. However, that appealing clean water and busy industry often are thought of as occupying mutually exclusive locations.

There is immense opportunity to utilize the ecologic history and current momentum of the Great Lakes to guide the area into a new growth of industrial, ecological, and cultural opportunity with an inventive approach.

LEGEND

- Port
- Area of Concern (water quality)
- AoC influenced by a port
- Wetlands Restoration Project Sites
- Zebra Mussel + Invasive Species Sightings

Shoreline Transitions (% modified)

- 70-100%
- 40-70%
- 15-40%
- < 15%
- Non-structural modifications

OUTFLOW OF INFLUENCE

1. Sales to wetland construction projects

2. Exploited zebra mussel growth

3. Attention paid to local water quality

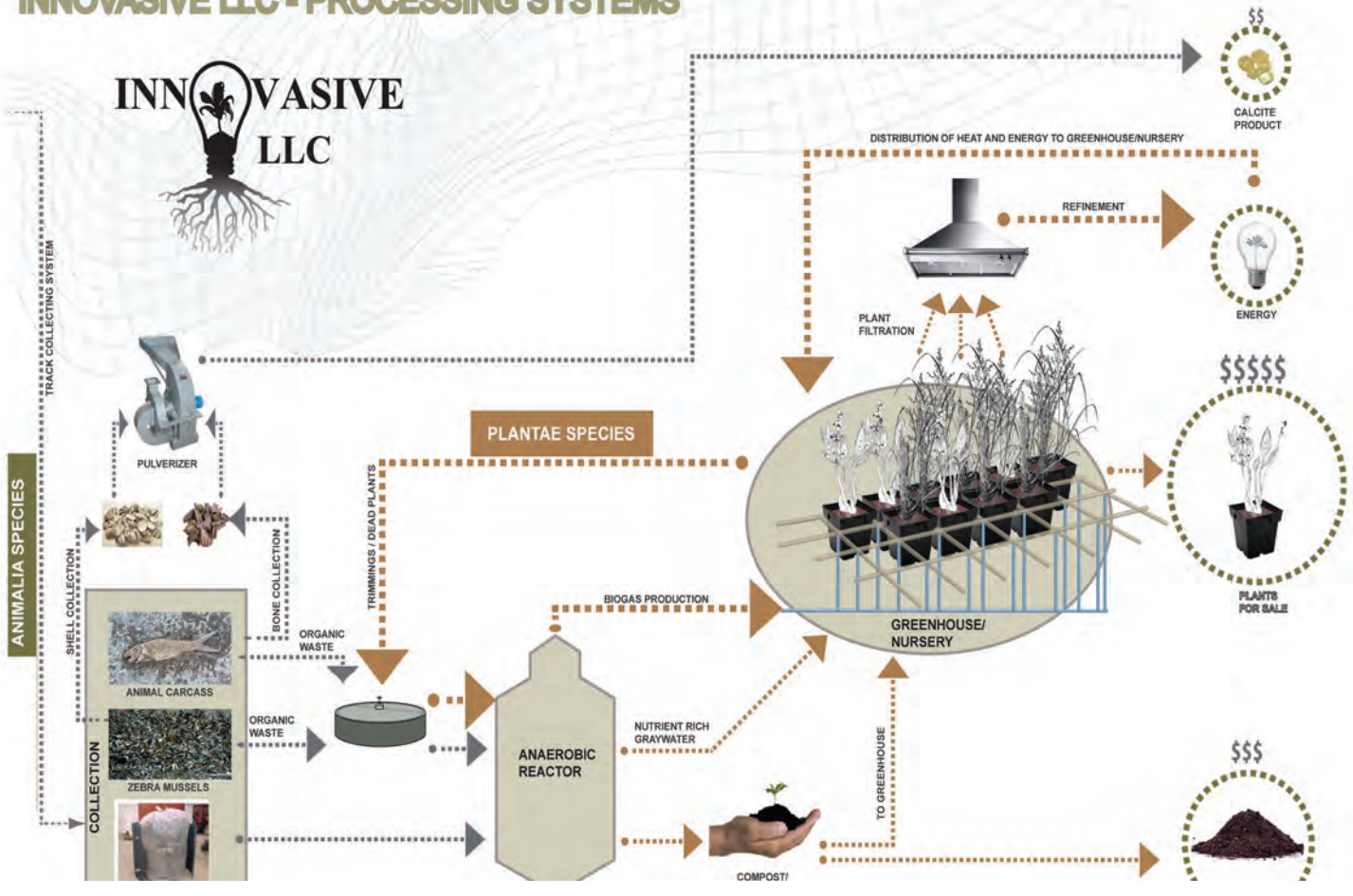
4. Supply for safe recreation

5. Adding to greenhouse and construction industry

6. Data contribution to cleanup efforts

7. Loyal and hopeful coastal culture

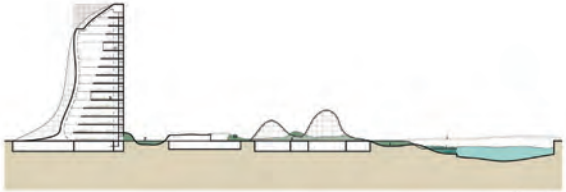
INNOVASIVE LLC - PROCESSING SYSTEMS



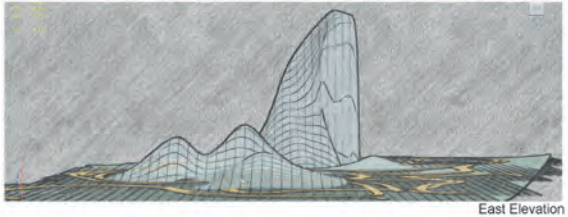
SITE SELECTION: CHICAGO, IL



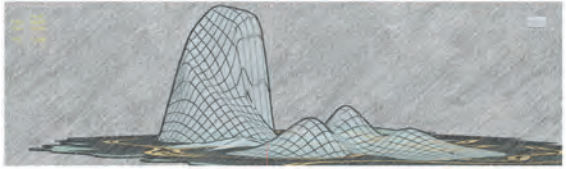

The Chicago River is also known for its old nickname, the Stinking River. Chicago still doesn't disinfect the wastewater it dumps in there. You wouldn't know it now, but Chicago was once an enormous swamp. If you'd begun at Lake Michigan and walked west, you would have crossed some dunes before finding yourself in seemingly endless wetland. Chicago found itself in the late 1800s with a huge problem. The city's residential and industrial sewage, which wasn't treated at the time, flowed into the river and then the lake. At the same time, Chicago was drawing its drinking water from the lake. A canal was created between Chicago and the Mississippi river to divert the sewage. The canal was originally far too polluted by Chicago's sewage to allow any life, but treatment has now improved. The canal also allows aquatic species to move from the Great Lakes to the Mississippi, and vice versa raising concern about invasive species spreads.



Section

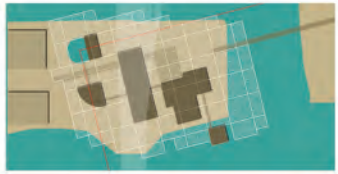


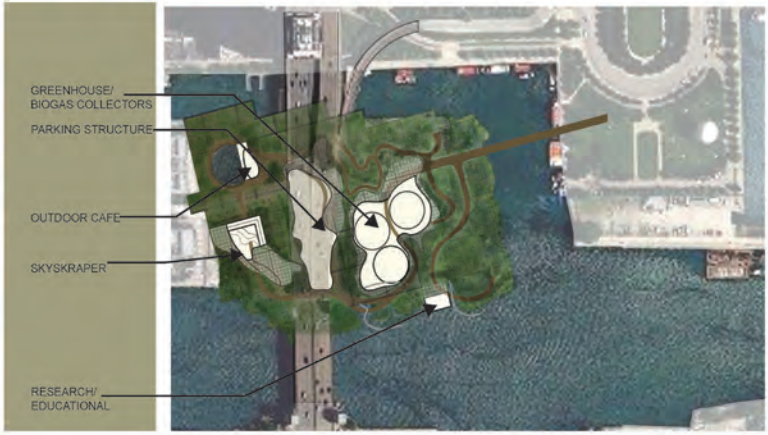
East Elevation



Southeast Elevation



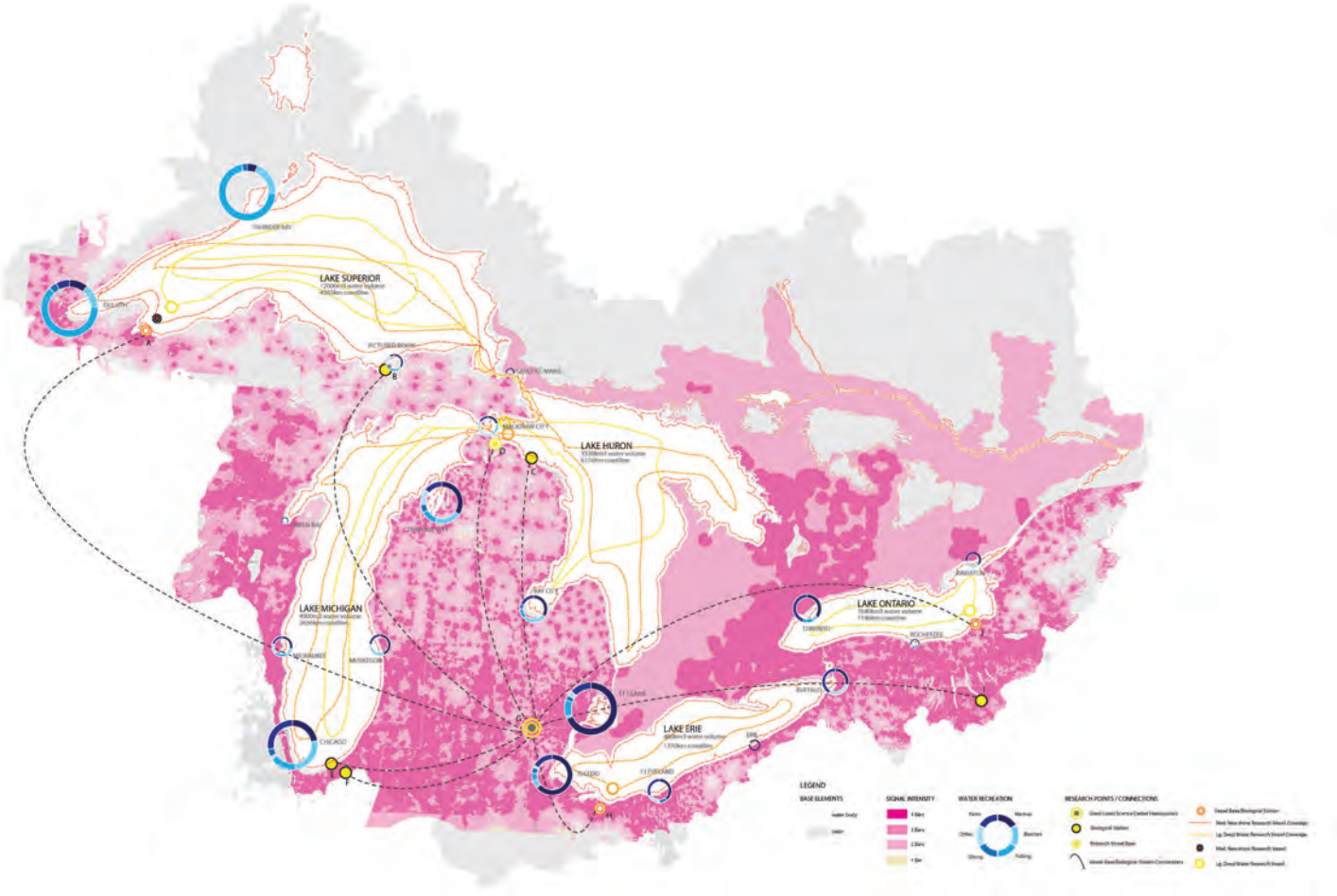


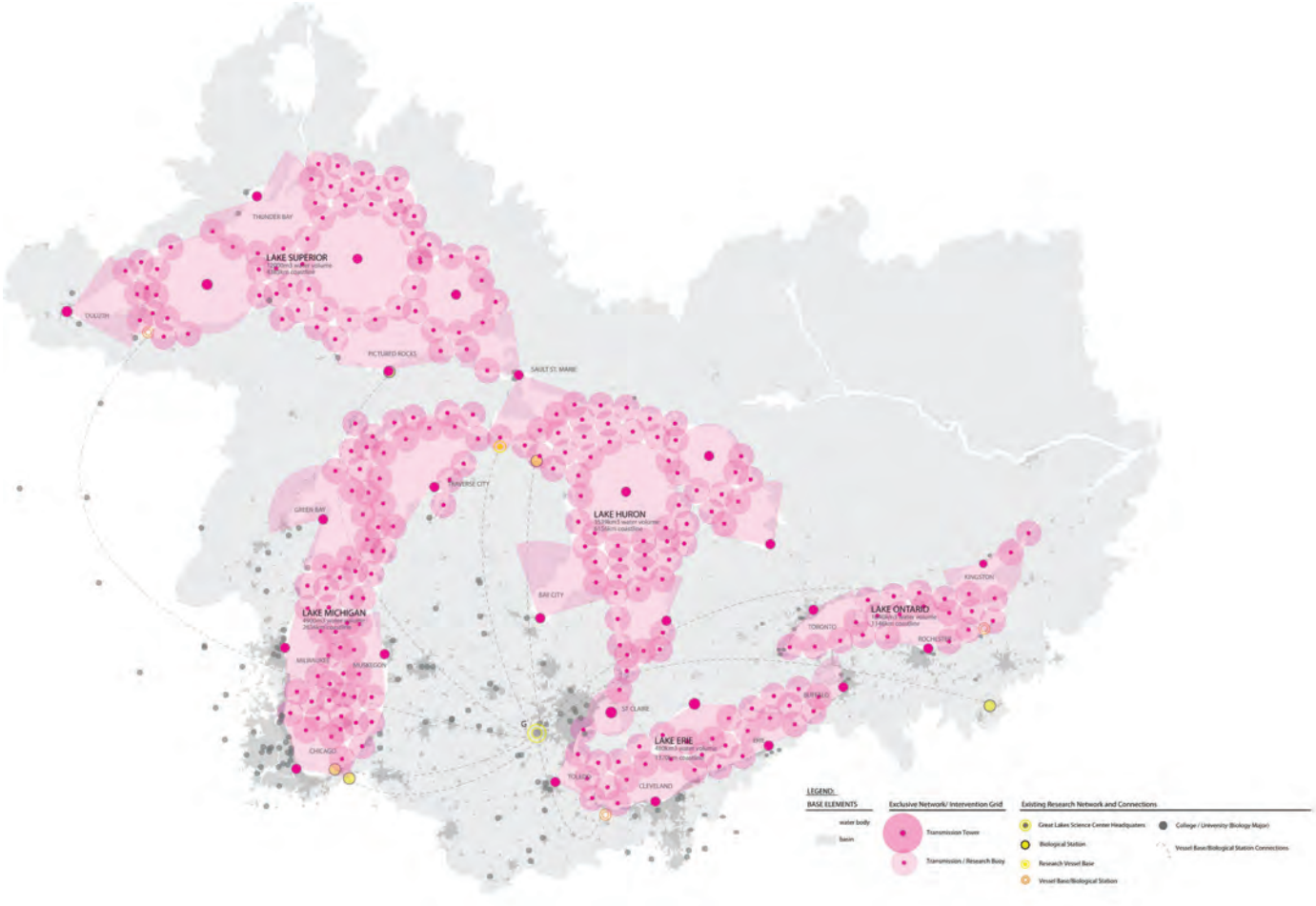


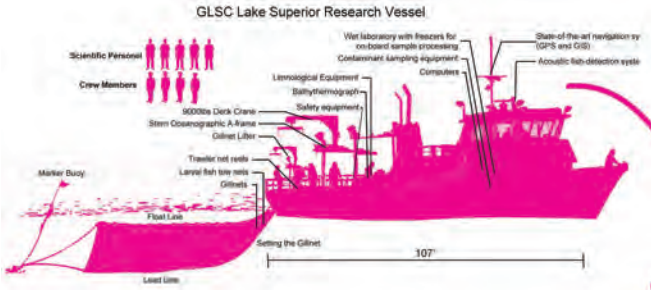
SITE PLAN

TEAM ELEVEN

ERICA MULDOON
ERIC KLOOSTER
SUSAN KARCZAG
KEVIN KIRK
ASHLEY PHILLIPS
DOMINIC ATISHA
JOHN COUTURE

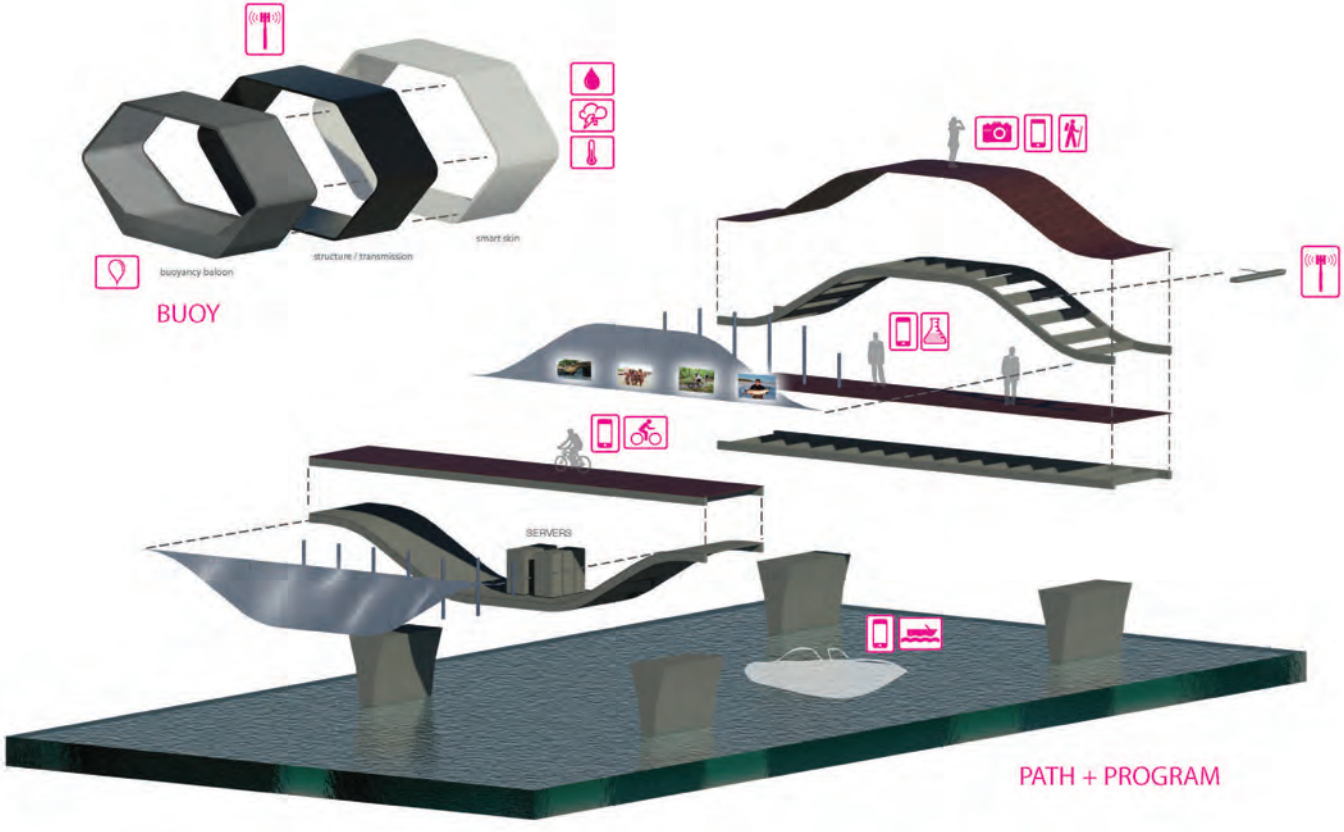

LAKE SUPERIOR
LAKE HURON
LAKE MICHIGAN
LAKE ONTARIO
LAKE ERIE
LEGEND
BASE ELEMENTS
SIGNAL INTENSITY
WATER RECREATION
RESEARCH POINTS / CONNECTIONS


THUNDER BAY
LAKE SUPERIOR
DULUTH
PICTURED ROCKS
SAULT ST. MARIE
TRAVERSE CITY
GREEN BAY
LAKE HURON
BAY CITY
KINGSTON
LAKE ONTARIO
TORONTO
ROCHESTER
LAKE MICHIGAN
MILWAUKEE
MUSKEGON
BUFFALO
ST. CLAIRE
CHICAGO
LAKE ERIE
TOLEDO
CLEVELAND
LEGEND:
BASE ELEMENTS
water body
basin
Exclusive Network/ Intervention Grid
Transmission Tower
Transmission / Research Buoy
Existing Research Network and Connections
Great Lakes Science Center Headquaters
Biological Station
Research Vessel Base
Vessel Base/Biological Station
College / University (Biology Major)
Vessel Base/Biological Station Connections



leafsnap

DUCKS UNLIMITED


smart skin
structure / transmission
buoyancy baloon
BUOY
SERVERS
PATH + PROGRAM

TEAM TWELVE

JESSICA WARRILOW
JOEL GERBER
SHERIN MICHAIL
JUSTON ROBERTS
JENNA HORRIGAN
LEAH MUELLER
RACHEL BRECKLE

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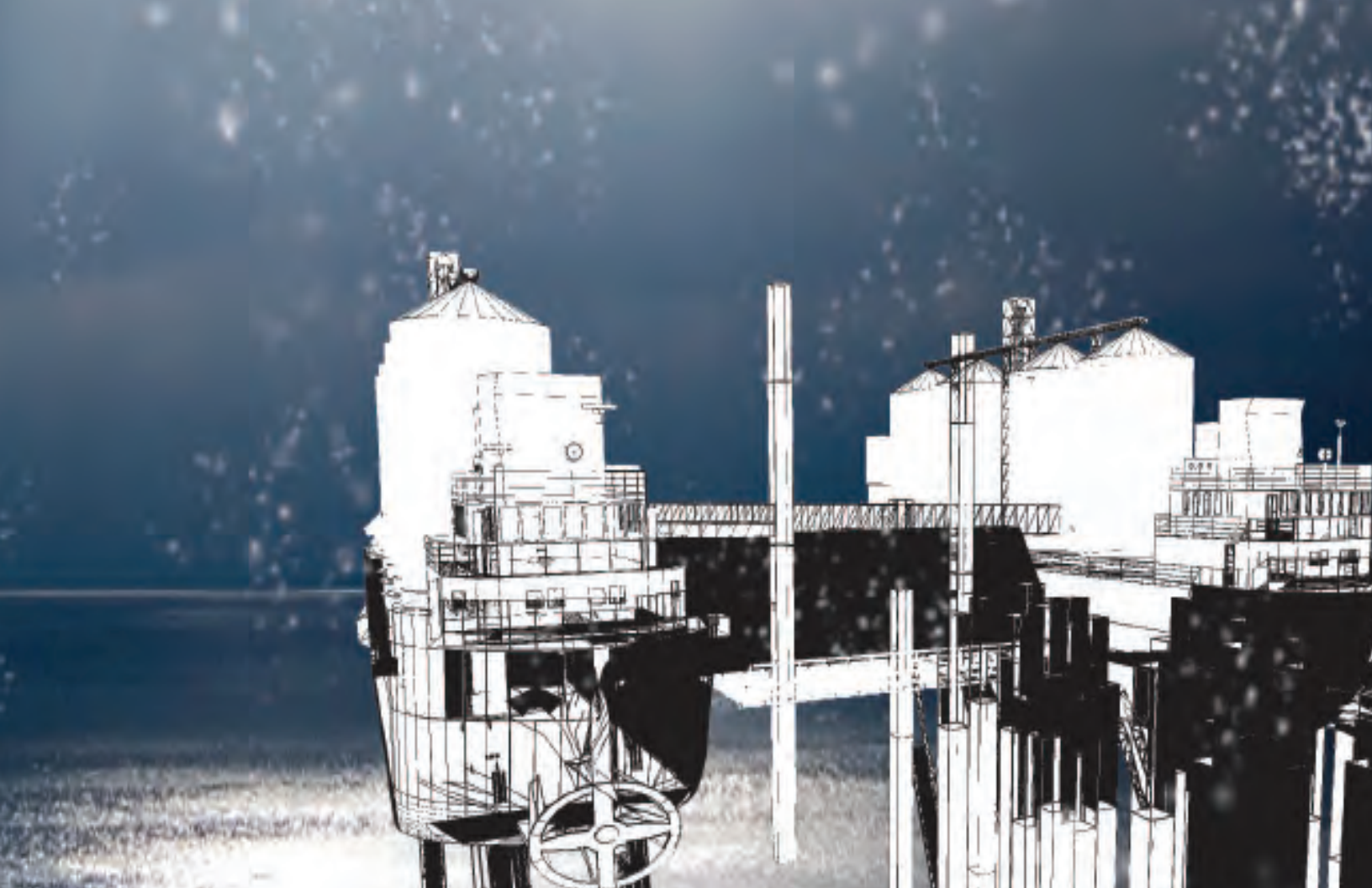
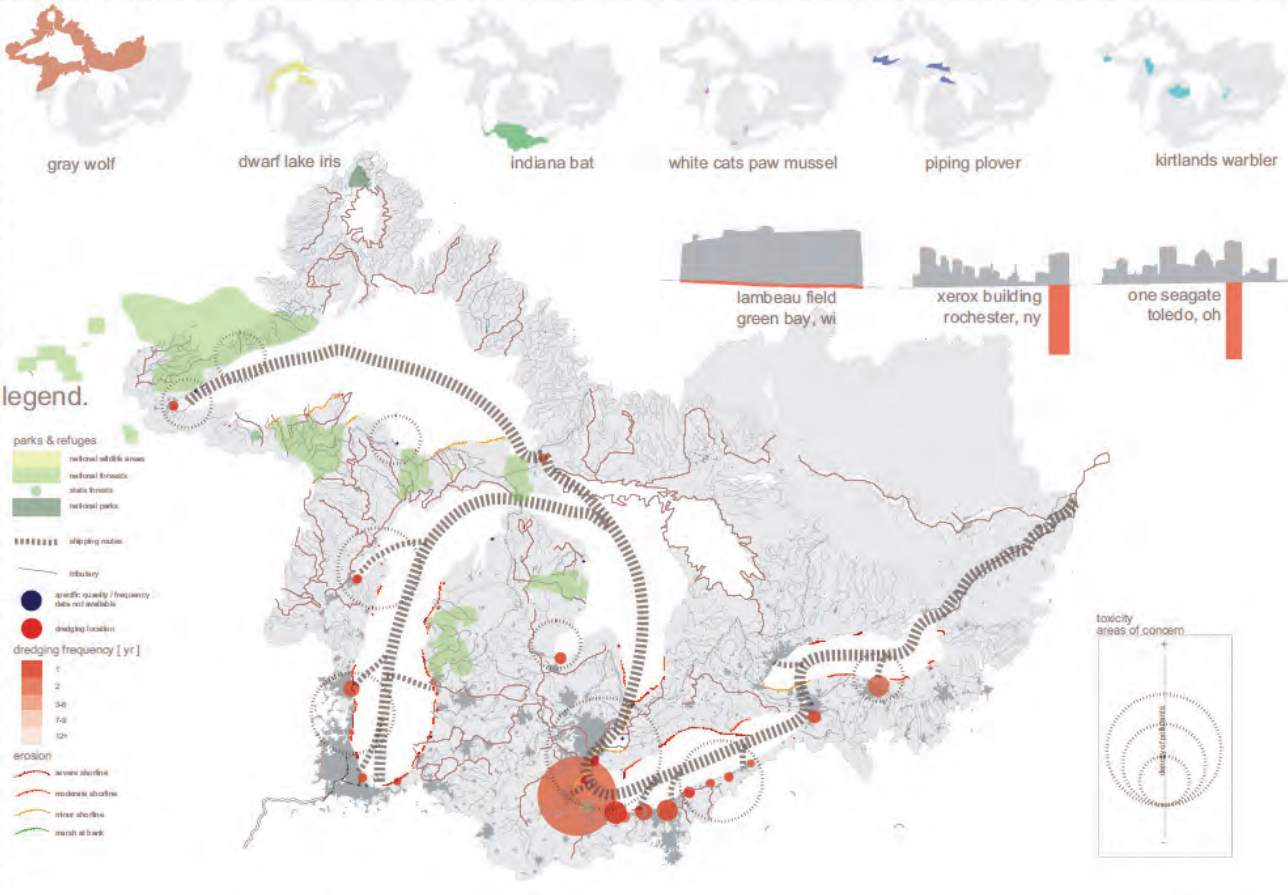


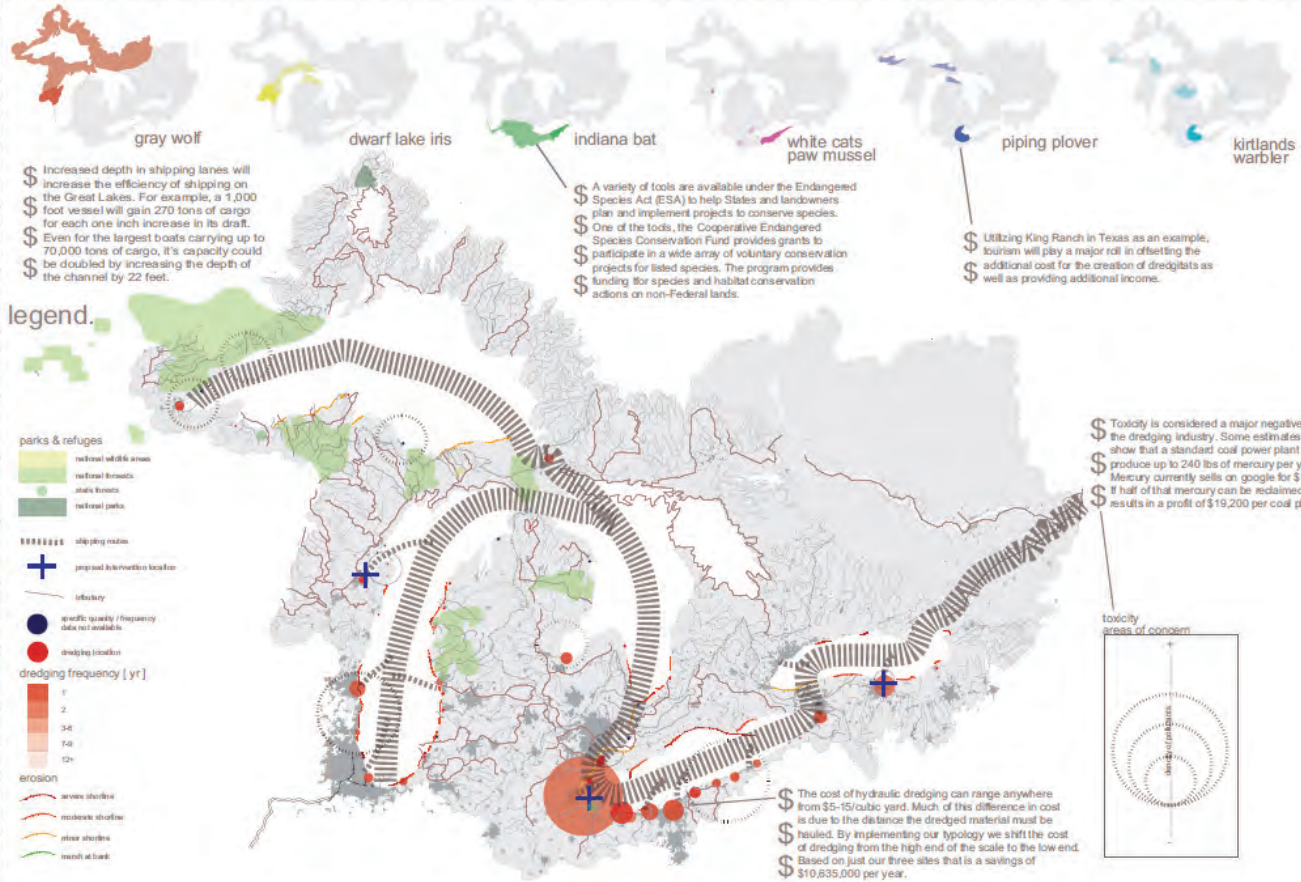
mapping data.



MAP ONE

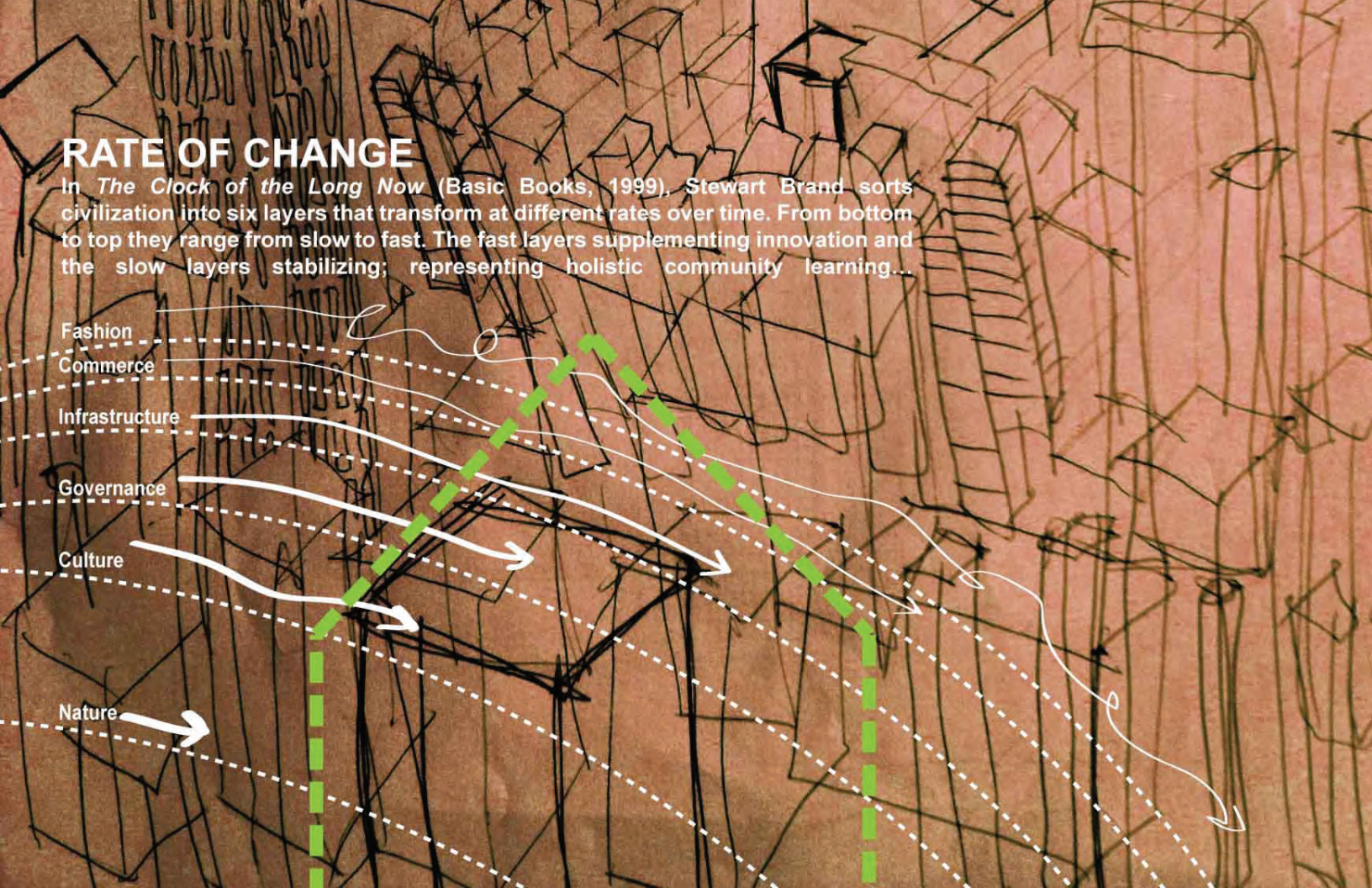
GROUP 12

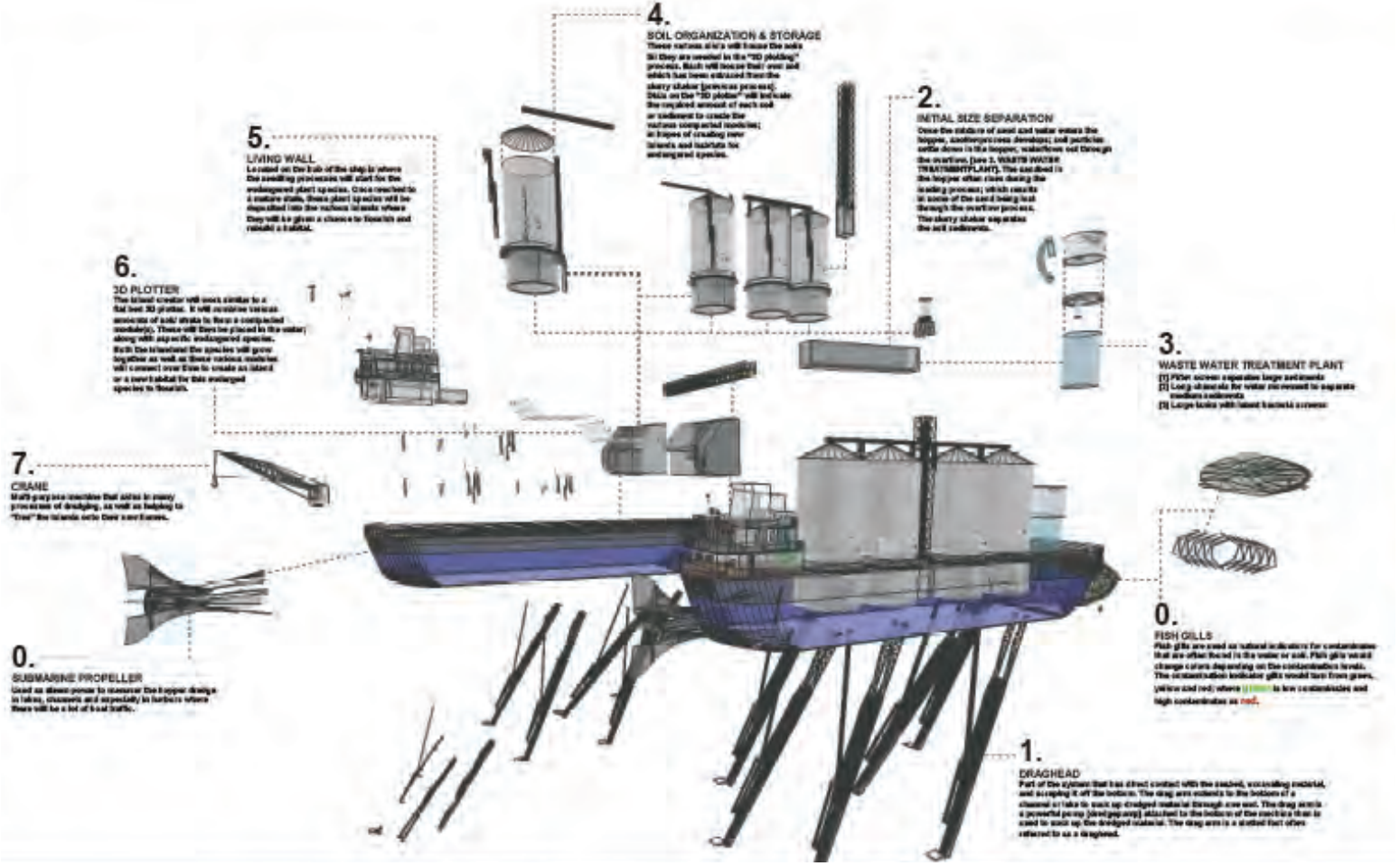
DREDGING SHIPPING WILDLIFE HABITAT EROSION TRIBUTARIES


gray wolf
dwarf lake iris
indiana bat
white cats paw mussel
piping plover
kirtlands warbler
$ Increased depth in shipping lanes will increase the efficiency of shipping on the Great Lakes. For example, a 1,000 foot vessel will gain 270 tons of cargo for each one inch increase in its draft.
$ Even for the largest boats carrying up to 70,000 tons of cargo, it's capacity could be doubled by increasing the depth of the channel by 22 feet.
$ A variety of tools are available under the Endangered Species Act (ESA) to help States and landowners plan and implement projects to conserve species.
$ One of the tools, the Cooperative Endangered Species Conservation Fund provides grants to participate in a wide array of voluntary conservation projects for listed species. The program provides funding for species and habitat conservation actions on non-Federal lands.
$ Utilizing King Ranch in Texas as an example, tourism will play a major roll in offsetting the additional cost for the creation of dredgitats as well as providing additional income.
legend.
parks & refuges
national wildlife areas
national forests
state forests
national parks
shipping routes
proposed intervention location
tributary
specific quantity / frequency data not available
dredging location
dredging frequency [yr]
1
2
3-6
7-9
12+
erosion
severe shoreline
moderate shoreline
minor shoreline
marsh at bank
$ Toxicity is considered a major negative of the dredging industry. Some estimates show that a standard coal power plant produce up to 240 lbs of mercury per year. Mercury currently sells on google for $160/lb. If half of that mercury can be reclaimed it results in a profit of $19,200 per coal plant.
toxicity
areas of concern
density of pollutants
$ The cost of hydraulic dredging can range anywhere from $5-15/cubic yard. Much of this difference in cost is due to the distance the dredged material must be hauled. By implementing our typology we shift the cost of dredging from the high end of the scale to the low end.
$ Based on just our three sites that is a savings of $10,635,000 per year.
MAP TWO
GROUP 12
WILDLIFE HABITAT
ECONOMICS
SHIPPING
DREDGING

RATE OF CHANGE

In *The Clock of the Long Now* (Basic Books, 1999), Stewart Brand sorts civilization into six layers that transform at different rates over time. From bottom to top they range from slow to fast. The fast layers supplementing innovation and the slow layers stabilizing; representing holistic community learning...





4.
SOIL ORGANIZATION & STORAGE
These various silo's will house the soils so they are seeded in the "3D plotting" process. Each will house their own soil which has been extracted from the slurry shaker (previous process). Data on the "3D plotter" will indicate the required amount of each soil or sediment to create the various corresponding locations; in hopes of creating new islands and habitats for endangered species.

5.
LIVING WALL
Located on the hull of the ship is where the seeding processes will start for the endangered plant species. Once reached to a mature state, these plant species will be degraded into the various islands where they will be given a chance to flourish and rebuild a habitat.

6.
3D PLOTTER
The island creator will work similar to a flat bed 3D printer. It will combine various amounts of soil strata to form a composited module(s). These will then be placed in the water along with aquatic endangered species. Both the introduced the species will grow together as well as these various modules will connect over time to create an island or a new habitat for this endanged species to flourish.

7.
CRANE
Multi-purpose machine that aides in many processes of dredging, as well as helping to "float" the islands onto their new homes.

0.
SUBMARINE PROPELLER
Used as diesel power to maneuver the hopper dredge in lakes, channels and especially in harbors where there will be a lot of boat traffic.

2.
INITIAL SIZE SEPARATION
Once the mixture of sand and water enters the hopper, sedimentation process develops; soil particles settle down in the hopper, waterflows out through the overflow. [see 3. WASTE WATER TREATMENT PLANT]. The sediment in the hopper often rises during the loading process; which results in some of the sand being lost through the overflow process. The slurry shaker separates the soil sediments.

3.
WASTE WATER TREATMENT PLANT
[1] Filter screen separates large sediments
[2] Long channels for water movement to separate medium sediments
[3] Large tanks with latest bacteria screens

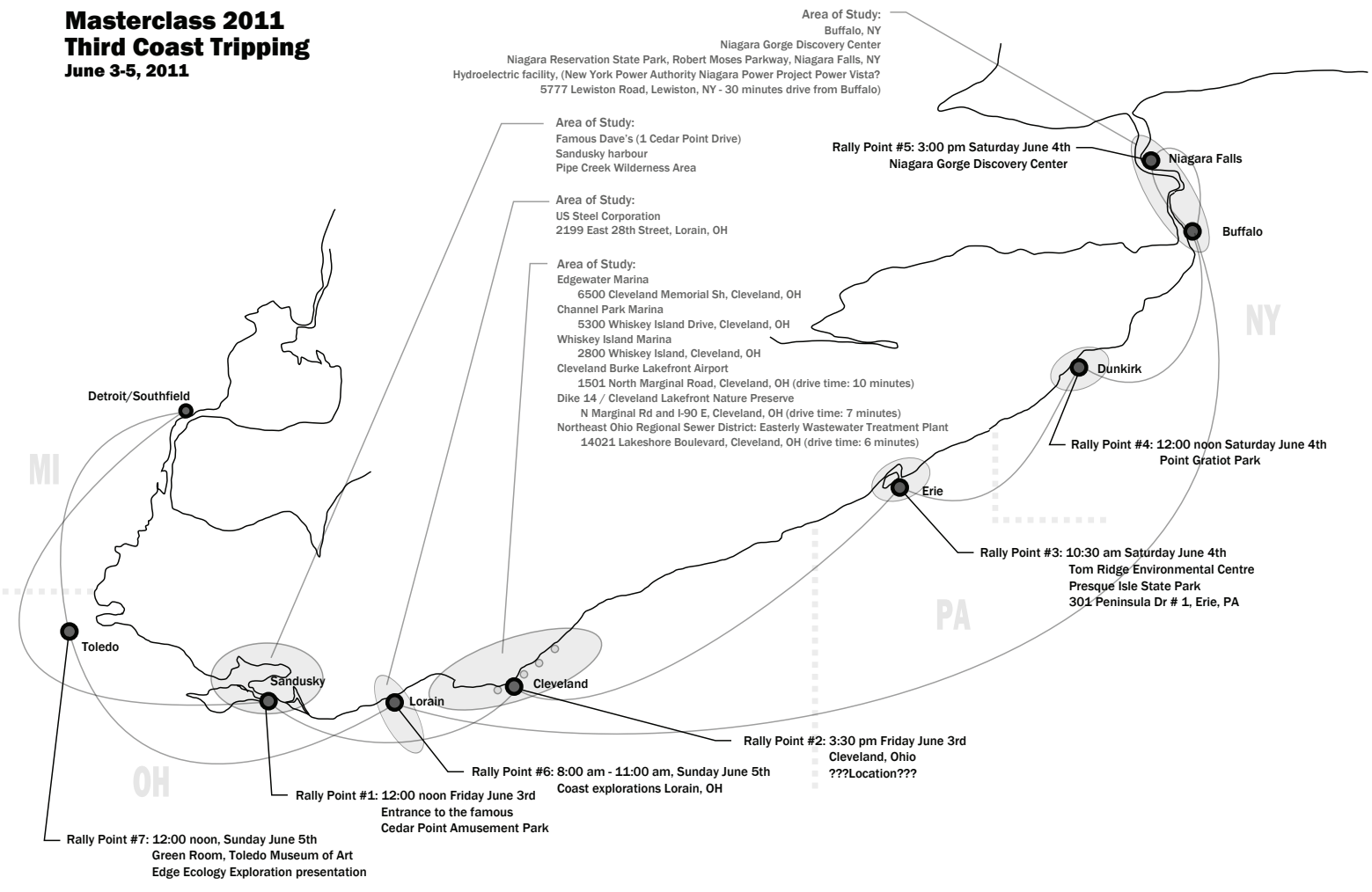
0.
FISH GILLS
Fish gills are used as natural indicators for contaminates that are often found in the water or soil. Fish gills would change colors depending on the contaminates levels. The colorcontamination indicator gills would turn from green, yellow and red; where green is low contaminates and high contaminates as red.

1.
DRAGHEAD
Part of the system that has direct contact with the seabed, excavating material, and scooping it off the bottom. The drag arm extends to the bottom of a channel or lake to suck up dredged material through a vacuum. The drag arm is a powerful pump [dredgepump] attached to the bottom of the machine that is used to suck up the dredged material. The drag arm is a slotted tool often referred to as a dragshead.


A


RESERVED
PARKING
ROW
20

Masterclass 2011
Third Coast Tripping
June 3-5, 2011



MASON WHITE
Master Class Studio Lead 2011

Mason's work and research privileges architecture as a mutable territory that is formed out of and responsive to its environment and history. His work, research and teaching invites readings of Architecture as a byproduct of complex networks within ecology and culture. Design is conceived more as a system for open patterns of use and active engagement rather than merely arranged objects. Recent research pursues questions of the role of infrastructure and networks within contemporary spatial practice. His design research exists at the intersection of architecture, landscape, and urbanism. It is often situated within sites where the systems and codes that determine these environments must be uncovered and rethought.

He founded Lateral Office in 2002 in partnership with Lola Sheppard. Mason is also a founding Director of InfraNet Lab, an exploratory initiative launched in 2008. InfraNet Lab is a non-profit research collective probing the spatial byproducts of contemporary resource logistics. InfraNet Lab is an editor of the journal Bracket: Architecture, Environment, Digital Culture (www.brkt.org).