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# Ultra-Urban Ecosystem Restoration Northerly Island - Chicago



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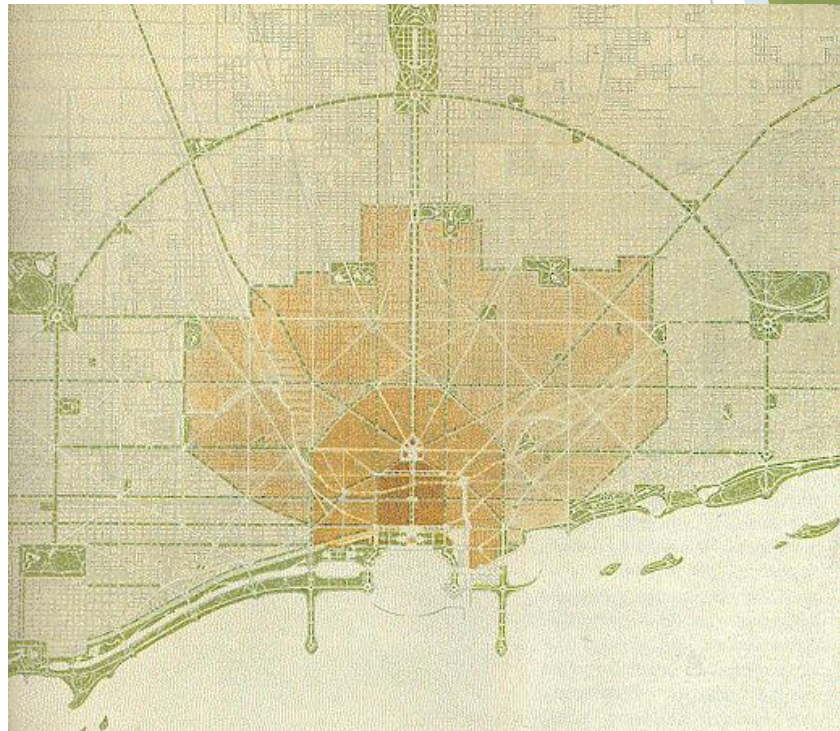


# Overview

- ▶ History of Northerly Island
- ▶ Concept Plan and Lakefront Framework
- ▶ Project Funding
- ▶ Project Specifications and Final Plans
  - ▶ Native Plant Communities
  - ▶ Development of Planting Plans
- ▶ Construction
  - ▶ Surprises
  - ▶ Challenges
- ▶ The Future

# Northerly Island History

- ▶ Part of the 1909 Burnham Plan
- ▶ Planned as Airport Following Wright Brothers Flight
- ▶ Constructed in 1920s
- ▶ Expanded as a primary feature of the 1933-34 "Century of Progress" World's Fair





# Northerly Island History

- ▶ After WWII Meigs Airfield was constructed on Northerly Island
- ▶ Private Lease for Airport Operations
- ▶ Lease “Expiration” Midnight March 30<sup>th</sup> 2003



# Northerly Island History

- ▶ After demolition of the airport - conversion to public park and dedication to the Chicago Park District





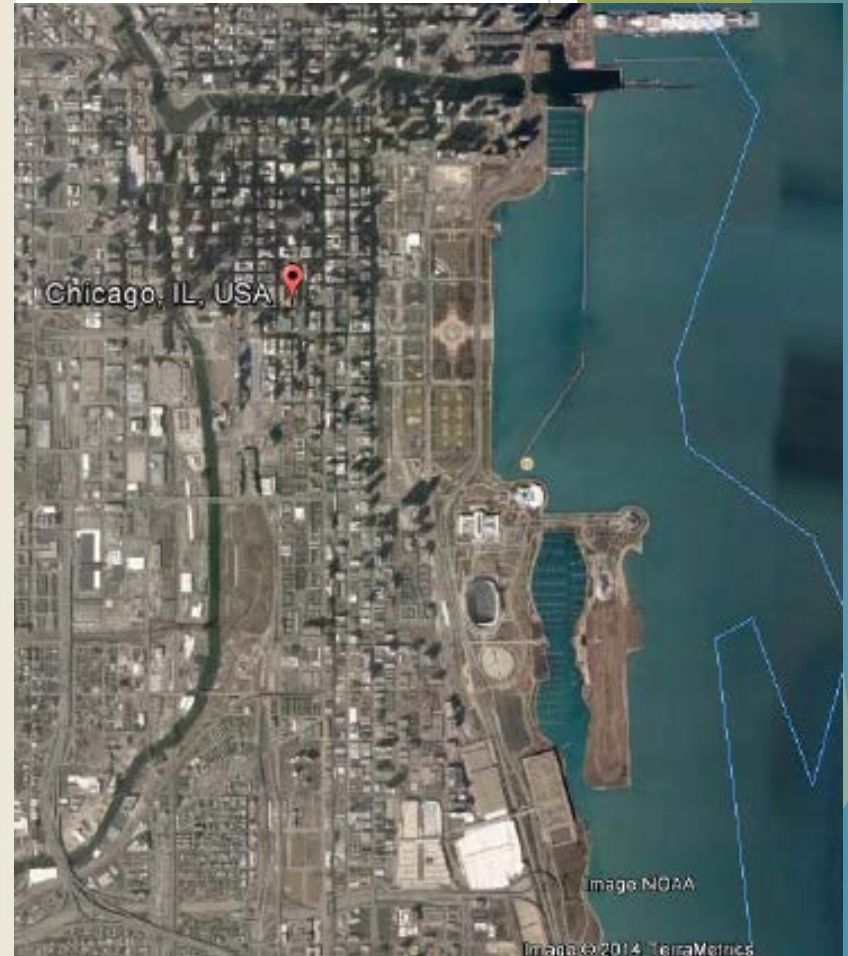
# Northerly Island -Concept Plan

- ▶ Re-envisioning of Chicago Lakefront
- ▶ Fully Urban Aquatic Eco-Park
- ▶ Fully Integrated into Chicago's Museum Campus



# Northerly Island -Concept Plan

## ► Initial Phase - Project Area & Location





# Northerly Island -Concept Plan

## ► Initial Phase -Concept Plan

**Project Location:** Northerly Island is a 91-acre manmade peninsula on the shores of Southern Lake Michigan in Chicago, Illinois. Northerly Island is located adjacent to the Adler Planetarium in the famous Museum Campus Park where it provides protection to Burnham Harbor Marina from wave action. The area to be restored is the southern 40 acres of the island.

**Project Description:** Currently, the southern portion of Northerly Island is being used for passive recreation. A paved bicycle path meanders throughout the park and is surrounded by a failing grass-like field that provides important stop-over habitat for many species of migratory birds. The field consists of a combination of invasive species and random native plants. In addition, much of the field is mowed and has very little ecological value. Aquatic resources in the project area are limited to the surrounding lake. The perimeter of the project area is contained using revetment walls that provide a monotonous ecosystem with very few macrophytes and habitat niches for aquatic organisms to thrive. Overall, the southern portion of Northerly Island is providing very little ecosystem benefits and lowering the ecological integrity of the surrounding area.

**Ecosystem Benefits:** The project will restore approximately 40-acres of coastal habitat in southern Lake Michigan. Restored habitats will include: 16-acres of oak savanna, 10-acres of mesic prairie, 3.3-acres of wet prairie, 2.2-acres of emergent marsh, 4.1-acres of pond, and 1.7-acres of lacustrine littoral habitat. Restoration will greatly benefit habitat for a variety of migratory and resident bird species, fish, amphibians, reptiles, insects, and mammals. Specifically, the state threatened banded killifish (*Fundulus diaphanous*) and mudpuppy (*Ambystoma maculosus*) may benefit from this project.

**America's Great Outdoors:** This project will build upon the Administration's Initiative, America's Great Outdoors, to protect and restore our lands and waters and provide places for Americans to experience the great outdoors.

**Schedule:**

Activity	Start Date	End Date
Final Construction Contract	Q3 2022	Q3 2023

**Estimated Project Costs:**

Federal	\$4,500,000
Nonfederal	\$2,400,000
<b>Total</b>	<b>\$6,900,000</b>

\* The project is expected to generate 10 jobs in peak industry

**Nonfederal Partner:** Chicago Park District

## Northerly Island Great Lakes Fishery & Ecosystem Restoration Project

### Study Area Measures

- lacustrine (1.7-ac)
- pond (4.1-ac)
- emergent marsh (2.2-ac)
- wet prairie (3.3-ac)
- mesic prairie (10.0-ac)
- savanna (1.6-ac)

Wet Prairie (WP)

Pond (P)

Emergent Marsh (EM)

Mesic Prairie (MP)

Lacustrine (L.L.)

Savanna (S)

Existing Conditions

Southern Border Looking North

Great Lakes  
RESTORATION



# Northerly Island – Project Funding

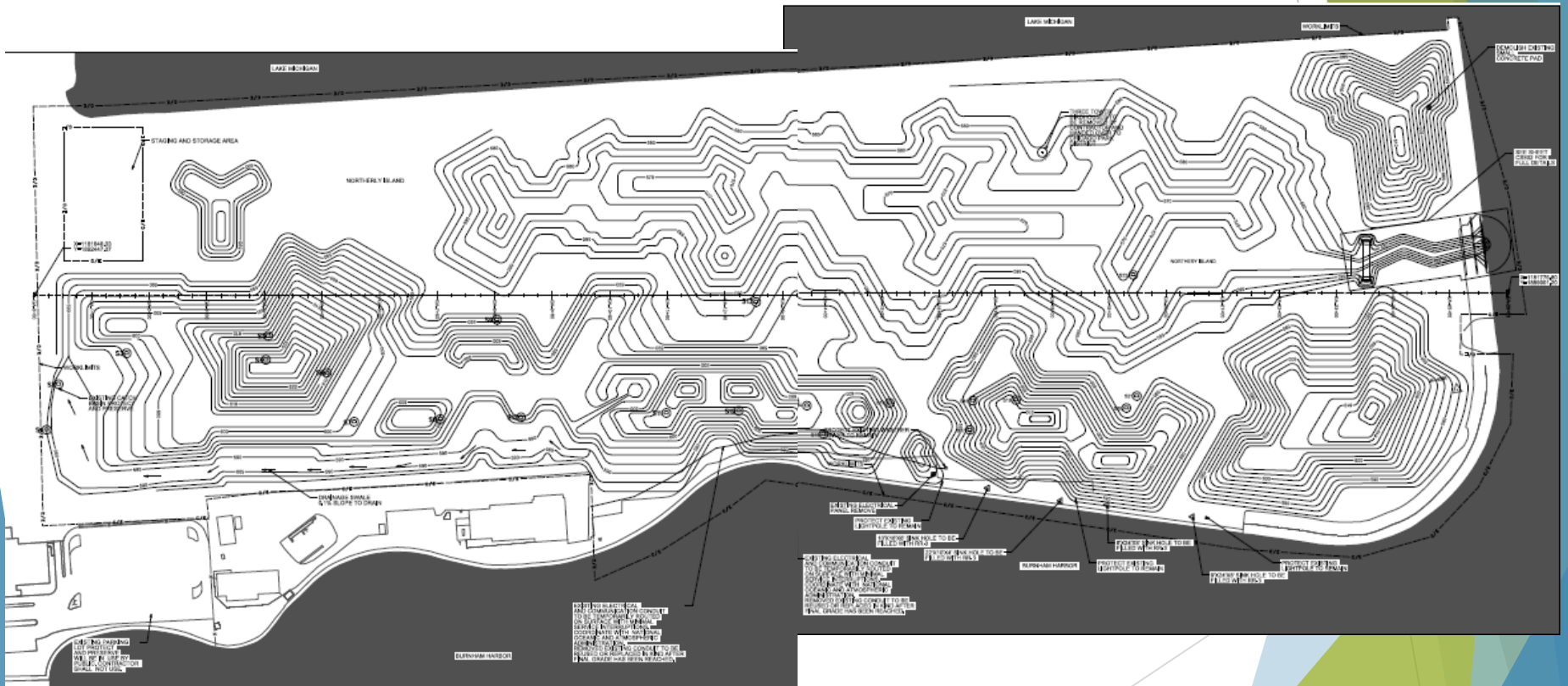
- ▶ Total Project Cost - \$7.5 Million
- ▶ Section 506 of Water Resources Development Act – 2000
- ▶ Great Lakes Fisheries and Ecosystem Restoration (GLFER) program implemented by the USACE
  - ▶ Requires 35% match by non-federal sponsor, can include land, easements, etc.
  - ▶ Funded through annual Energy and Water Appropriations



US Army Corps  
of Engineers ®  
Chicago District



## ► Overall Grading Plan









# Northerly Island - Native Plant Communities

## ► General Planting Plan



PLAN VIEW

LEGEND	
	WET PRAIRIE
	MESIC PRAIRIE
	SAVANNA
	EMERGENT MARSH
	POND
	LACUSTRINE



# Northerly Island – Native Plant Communities

- ▶ Oak Savanna – 18 Acres
  - ▶ 287 Oaks
  - ▶ 54 – 6 Foot Trees
  - ▶ 36 – 15 Gallon Trees
  - ▶ 126 – 5 Gallon Trees
  - ▶ 18 – 15 Gallon Shrubs
  - ▶ 2060 – 5 Gallon Shrubs
  - ▶ 4476 – Shrub Plugs
  - ▶ 86,000 Herbaceous Plugs





# Northerly Island - Oak Savanna





# Northerly Island – Native Plant Communities

- ▶ Mesic Prairie – 12.5 Acres
  - ▶ 740 – 5 Gallon Shrubs
  - ▶ 2308 – Shrub Plugs
  - ▶ 83,000 Herbaceous Plugs





# Northerly Island - Mesic Prairie





# Northerly Island – Native Plant Communities

- ▶ Wet Prairie – 3 Acres
  - ▶ 678 – 5 Gallon Shrubs
  - ▶ 32,000 Herbaceous Plugs



Jeffrey Phippen



# Northerly Island - Wet Prairie



©2006 Gary Fewless



# Northerly Island – Native Plant Communities

- ▶ Emergent Marsh – 3 Acres
  - ▶ 12 – 5 Gallon Shrubs
  - ▶ 68,000 Herbaceous Plugs & Tubers



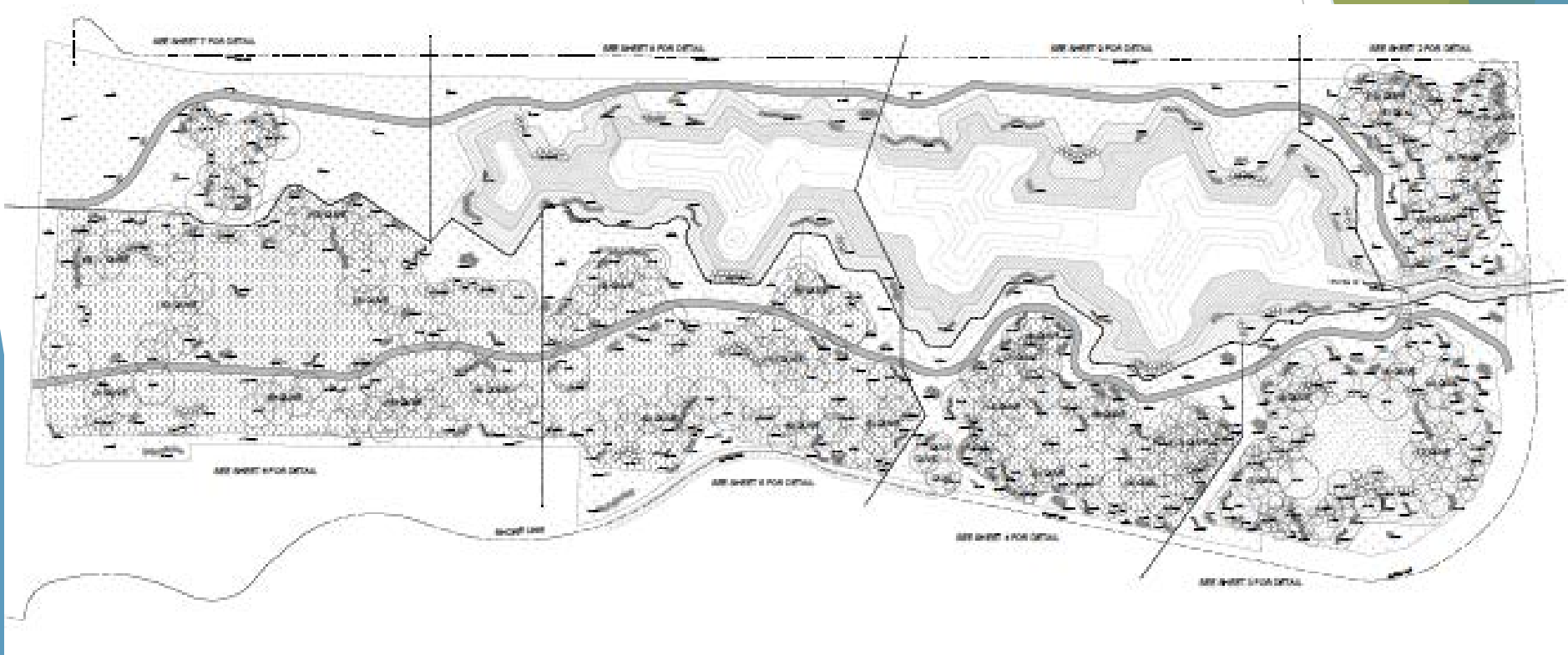


# Northerly Island - Emergent Marsh



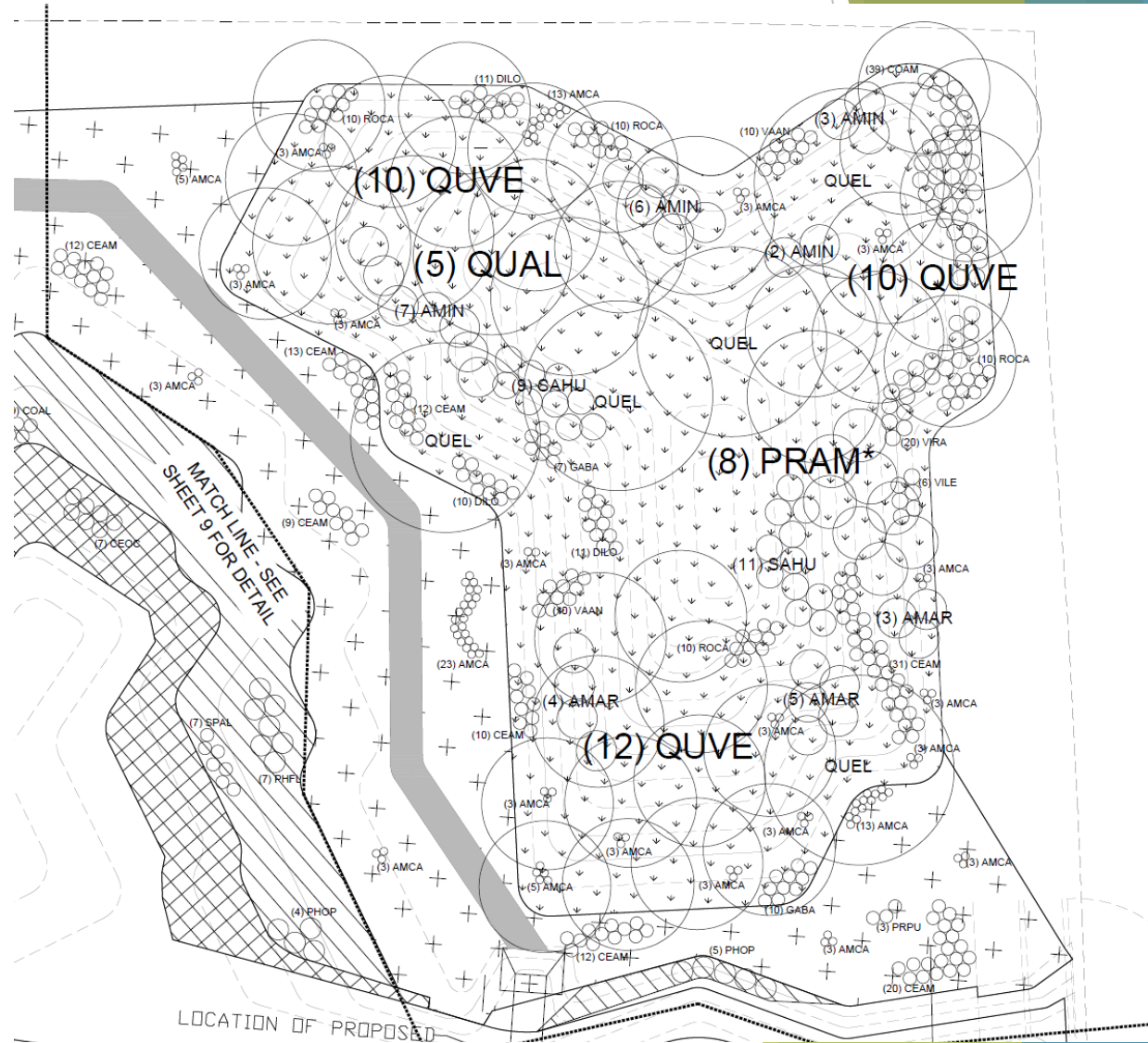
# Northerly Island - Project Specifications

## ► Tree and Shrub Planting Plan - Contractor Designed





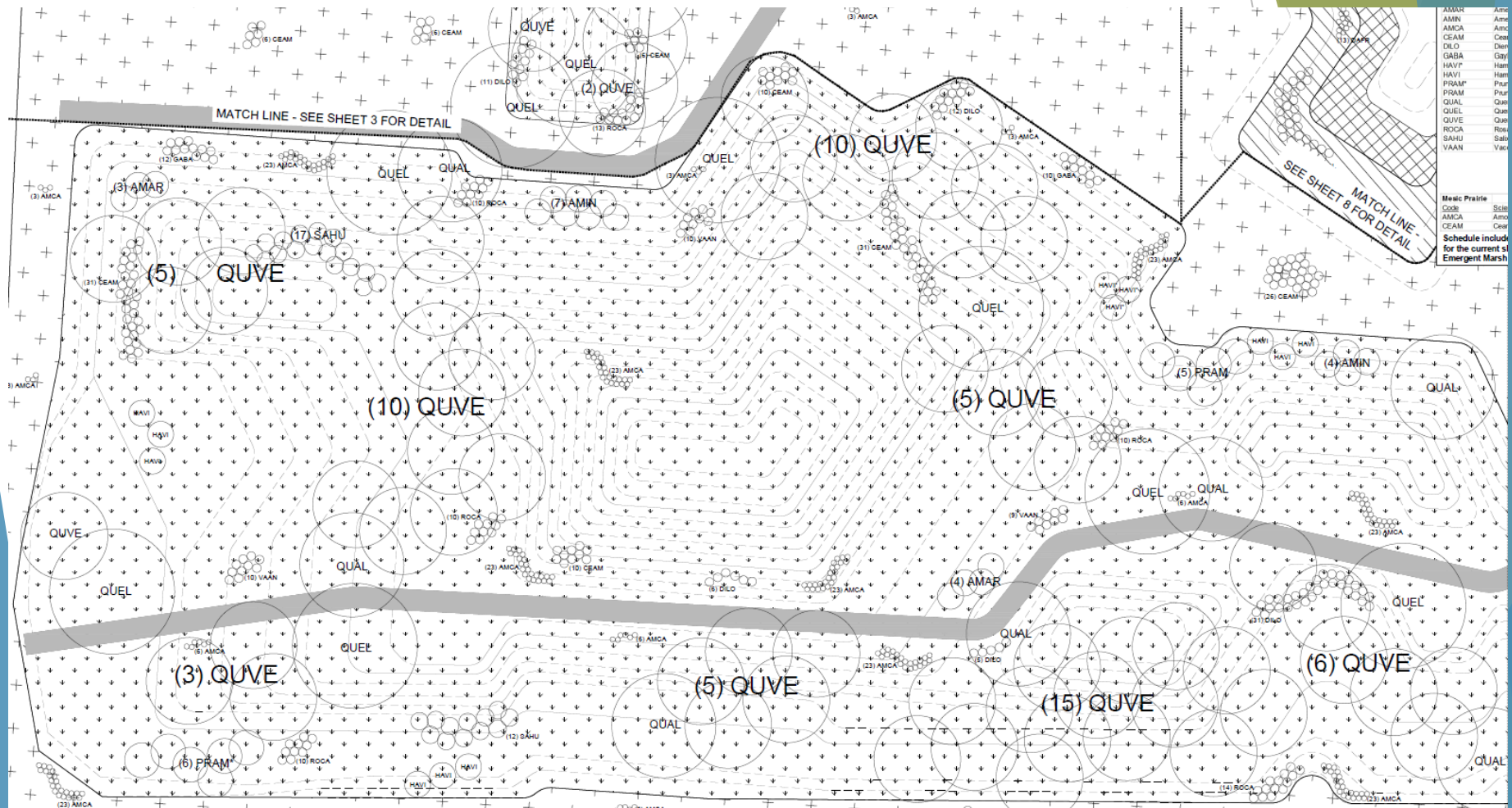
▶ Tree and Shrub  
Planting Plan -  
SE Berm





# Northerly Island - Project Specifications

## ► Tree and Shrub Planting Plan - NW Berm



# Construction Phase

June 2013



Initial Construction of Berms-  
Subsoil Varied  
Mostly sand; some limestone  
rip rap



# Construction Phase



June 2013



Initial Construction of Berms-  
Subsoil Varied  
Mostly sand; some limestone  
rip rap



# Construction Photos





# Construction Phase

September 2013





# Construction Phase

September 2013





# Construction Phase

Tree and Shrub Planting Begins Late September 2013





# Construction Phase

Tree and Shrub Planting and Native Seeding and Erosion Blanket Installation through early December 2013





# Construction Phase

December 10, 2013



# Construction Phase

Winter 2013 - 2014





# Construction Phase

Winter 2013 - 2014



# Construction Phase

Winter 2013 - 2014





# Construction Phase

April 2014



# Construction Phase

April 2014





# Construction Phase

April 2014



# Construction Phase

April 2014





# Construction Phase

April 2014

Predators!





# Construction Phase

Early May 2014 –  
Plug Planting  
Begins





# Construction Phase

Early May 2014  
– Plug Planting  
Begins





# Construction Phase

June 2014





# Construction Phase

June 2014





# Construction Phase

June 2014





# Construction Phase

June 2014 - Challenges





# Construction Phase

June 2014





# Construction Phase

June 2014





# Construction Phase

June 2014





# Construction Phase

June 2014





# Construction Phase

June 2014





# Construction Phase

## Timber Crib





# Construction Phase

## Timber Crib





# Construction Phase

## Timber Crib





# Construction Phase

## Timber Crib





# Construction Phase

## Timber Crib





# Construction Phase

View From Timber Crib





# Construction Phase

View From Timber Crib





# Construction Phase

View From Timber Crib





# Construction Phase

*Carex pennsylvanica* – Comes Back!





# Construction Phase

Early July





# Construction Phase

Early July





# Construction Phase

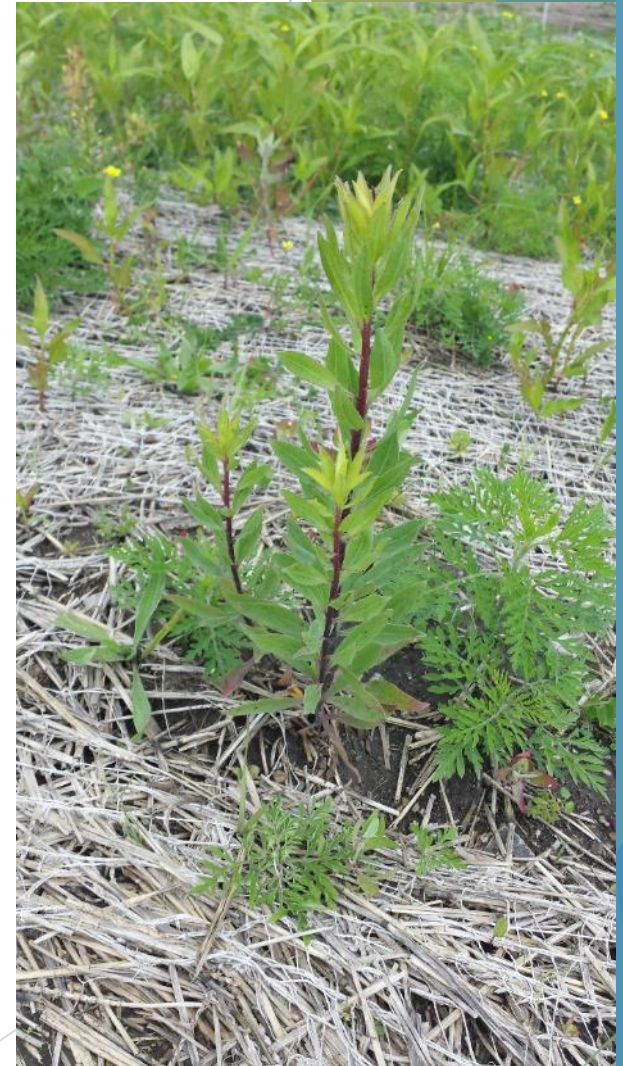
Early July





# Construction Phase

Plug Health – Mid July





# Construction Phase

Mid July – Plugging simultaneous with trees, shrubs, seeding & erosion blanket





# Construction Phase

Mid July – Plugging simultaneous with trees, shrubs, seeding & erosion blanket – Definitely not ideal





# Construction Phase

Mid July – Planted areas are growing, but.....





# Construction Phase

Weed seed was extensive





# Construction Phase

Weed seed was extensive; time to start the herbicide





# Construction Phase

August – Wet Prairie and Emergent Plugging Begins





# Construction Phase

August – Wet Prairie and Emergent Plugging Begins





# Construction Phase

August – Wetland Planting Selfie





# Construction Phase

August – Wet Prairie and Emergent Plugging Begins





# Construction Phase

August – Don't hit yourself in the nose with a post





# Construction Phase

August – Wet Prairie and Emergent Marsh





# Construction Phase

August – Wet Prairie and Emergent Marsh





# Construction Phase

August – Wet Prairie and Emergent Marsh





# Construction Phase

August 2014 – Wet Prairie and Emergent Marsh





# Construction Phase

Early September 2014 – Assessing Progress





# Construction Phase

Early September 2014 – Assessing Progress





# Construction Phase

Early September 2014 – Assessing Progress





# Construction Phase

Cool Stuff Happens in Chicago





# Construction Phase

Cool Stuff Happens in Chicago





# Construction Phase

Early September 2014 – Assessing Progress





# Construction Phase

Early September 2014 – Assessing Progress





# Construction Phase

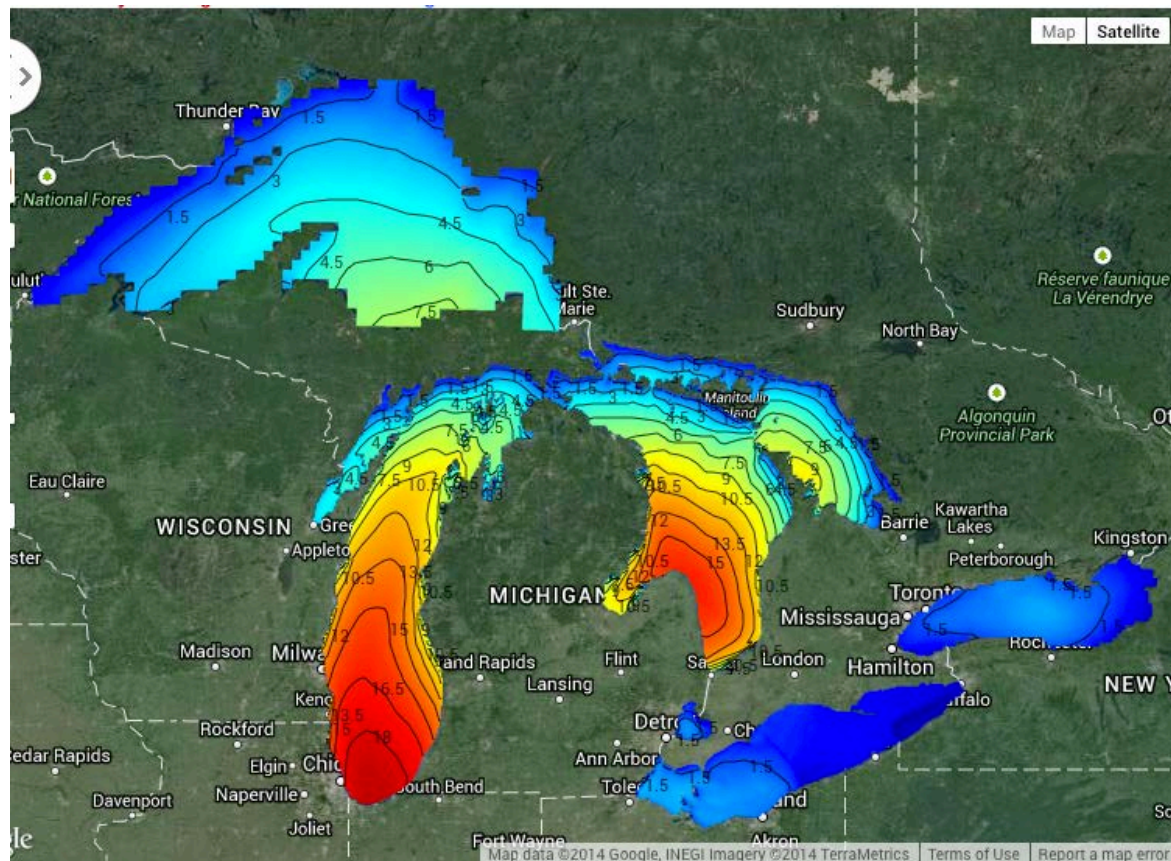
Early September 2014 – Assessing Progress





# Expect the Unexpected

October 31, 2014 – “The Halloween Howler” Storm  
Full North by Northeast Fetch –  
60 MHP sustained winds  
21.7 Ft (6.6m) recorded swells





# Expect the Unexpected

## Massive Erosion





# Expect the Unexpected

## Massive Erosion





# Expect the Unexpected

## Massive Erosion





# Expect the Unexpected

## Massive Erosion





2015

The background features a series of overlapping, semi-transparent triangles in various shades of blue and green. These triangles are positioned primarily on the right side of the image, creating a dynamic, layered effect. The colors range from a deep teal to a bright lime green. The overall composition is minimalist and modern.



# Progress Toward Completion

## Planting of the Timber Crib





# Progress Toward Completion

## Planting of the Timber Crib





# Progress Toward Completion

## Planting of the Timber Crib





# Progress Toward Completion

Path Paving and Final Grading – Finally - July 1, 2015





# Progress Toward Completion

## Planting





# Progress Toward Completion

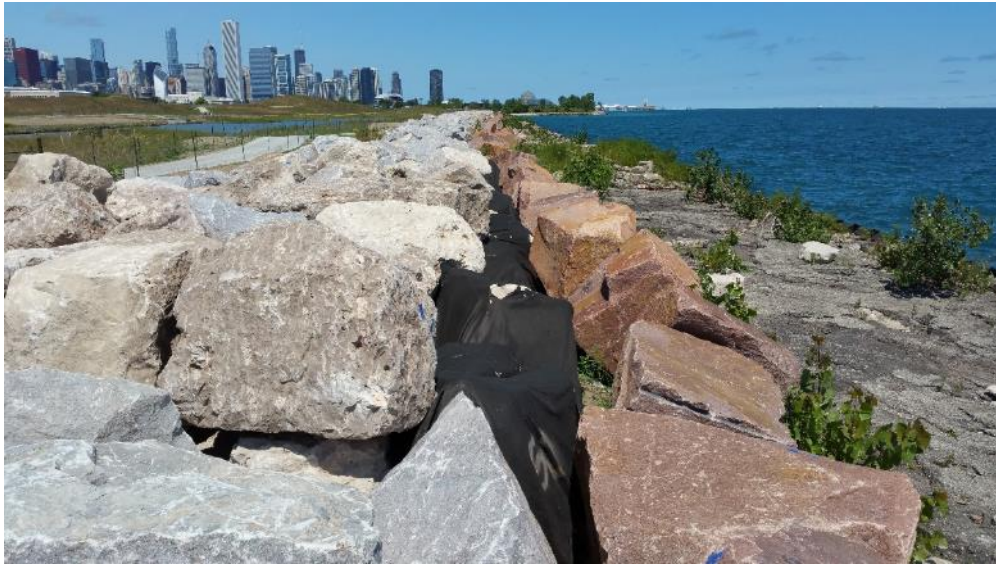
## Completion of Erosion Repairs on Seawall





# Progress Toward Completion

## Completion of Erosion Repairs on Seawall





# Next Challenge....





# Next Challenge....

Carp





# Next Challenge....

Carp



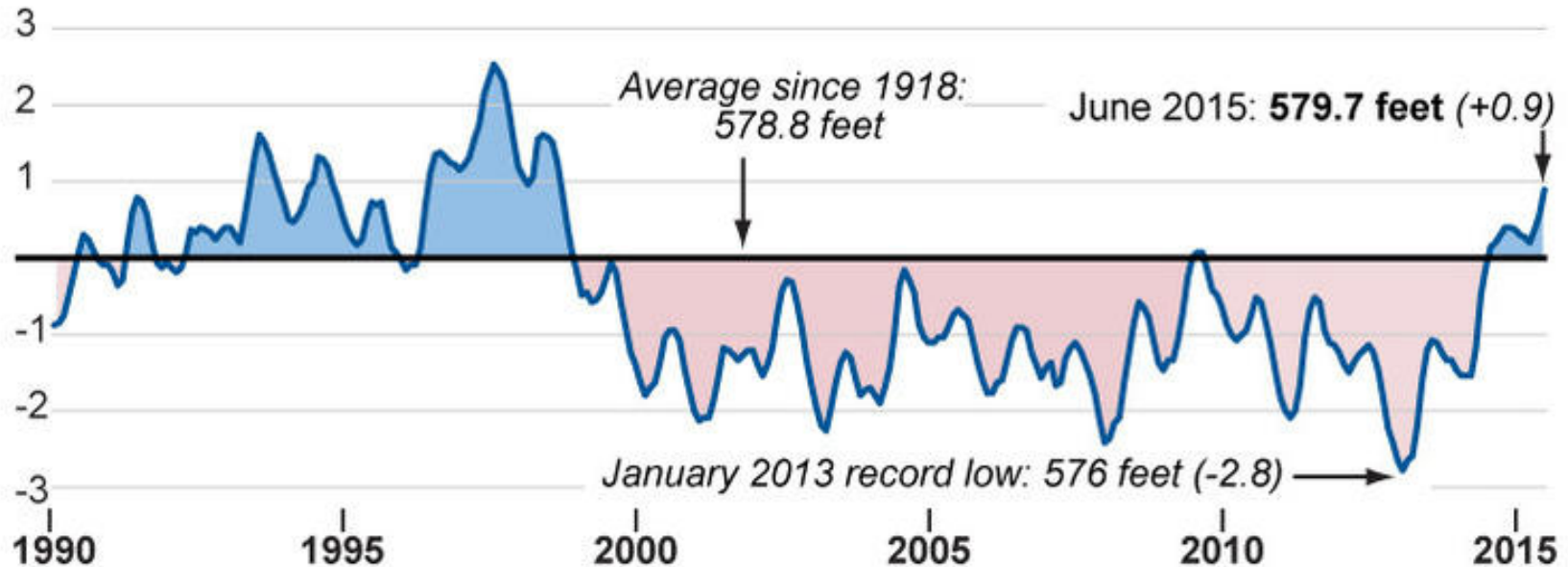


# Next Challenge....

## Water Levels

### Average Lake Michigan and Huron levels

*Departure from average, in average monthly feet above IGLD85\**



\*Elevation benchmark against which all water level stations in the Great Lakes are compared.

Sources: NOAA

@ChiTribGraphics



# Next Challenge....

Water Levels





# Next Challenge....

## Water Levels





# But, Progress.....

Establishment in Upland Areas





# But, Progress.....

Establishment in Upland Areas





# But, Progress.....

Establishment in Upland Areas





# But, Progress.....

Habitat





# Some Finishing Touches....

## People Exclusion Fence





# Ready for the Public





# Ready for the Public





# Ribbon Cutting

Grand Opening to the Public





# Work Goes On

## Supplemental Plantings in the Fall





# Work Goes On

## Supplemental Plantings in the Fall





# déjà vu All Over Again

October 2015 Storms





# The Future

- ▶ Adaptive Management
  - ▶ Overseeding December 2015
  - ▶ Supplemental Wetland Plugging June 2016
  - ▶ Invasive Species Control through 2017
  - ▶ Prescribed Burning Spring 2016 and 2017
- ▶ Project Completion Date is October 2017



# Questions?



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