



Connecting Past to Future: The Grand Calumet River Area of Concern

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The Calumet Region



Land and Life from the Air

The crossroads of the Calumet region is on full display in this 2003 Landsat satellite image.

A PISHOONK BOG fills a depression left by a giant block of ice when glaciers piled up the range of hills, now forested and known as the Valparaiso Moraine, more than 14,000 years ago.

B SAND RIDGES feature cypress in clearly visible as a band on the ring of trees along Michigan City Road. Trains stop one of the three sand ridges left by receding Lake Michigan.

C BARRY-OHIO AIRPORT Just north of the airport, ancient sandy ridges alternate in a still visible washboard "dune-and-swale" pattern.

D THE LITTLE CALUMET AND GRAND CALUMET RIVERS, trapped between the sand ridges, meander through pancake flatlands in search of Lake Michigan. They meet just south of O'Brien Lock and Dam.

E O'BRIEN LOCK & DAM now serves as a continental divide. Water flows south and west to the Cal-Sag Channel or north through the Calumet River main stem, headed to the Great Lakes and Atlantic.

F CALUMET-SAG CHANNEL The Calumet region is connected to the Illinois Waterway and Mississippi River by this canal.

G U.S. STEEL'S SOUTH WORKS began in 1880 at a site that is today cleared and awaiting redevelopment.

H LAKE CALUMET George Pullman built his factory and company town just west of here in 1882. Other manufacturers followed, attracting workers and their families from around the world.

I ISLAND BYWAY came to Lake Michigan in 1900, where it would eventually reshape the shoreline into a nearly two-mile-long peninsula.

J U.S. STEEL built a new plant and the city of Gary in 1906 atop the former route of the Grand Calumet River.

K BETHLEHEM STEEL came to Burns Harbor in 1967.

L WEST BEACH Visitors can see the traces of past sand mining here. The struggle to protect the dunes from further encroachment led to the creation of the Burns Park in 1936 (M) and the Indiana Dunes National Lakeshore in 1966.

M MT. BALDY is visible just west of Michigan City. A migrating sand dune, it moves about four feet to the southeast each year.

N DUNES LEARNING CENTER From its forest clearing, this center opens the rich landscape to the next generation of Calumet leaders.



Cross-Section of the Region

Bedrock layers of Silurian dolomite, millions of years in the making, appear at Thornton Quarry and the aptly named Steeple Island on Chicago's South Side. Above the bedrock, the landscape testifies to the most recent activity of glaciation, as shown in this generalized profile. The mile-high glacier piled unsorted rubble, sand, and clay into long hills called moraines, which mark the glacier's last advance. Melting ice formed an ancestral Lake Michigan, whose shoreline receded in several distinct stages. The three most prominent are marked by three sandy beach ridges that rise gently above the otherwise flat, clay bottom of the ancestral lake.

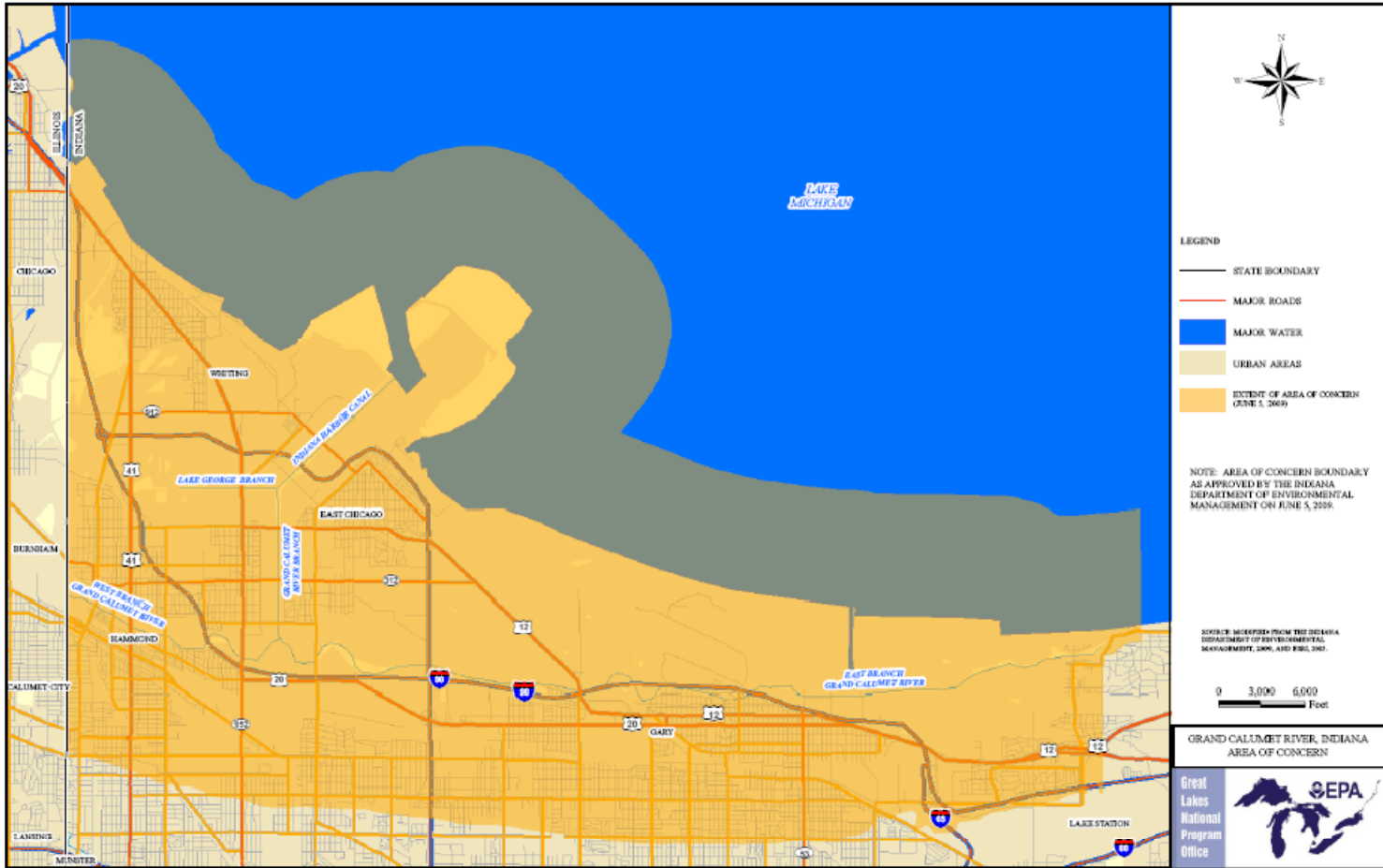
ADDITIONAL INFORMATION: This map has been produced by Chicago Metropolitan with the support and partnership of the National Science Foundation, National Geographic Society, and the University of Chicago. Funding for this project was provided by the National Science Foundation, National Geographic Society, and the University of Chicago. The map is a composite of several maps and data sources, including the National Science Foundation, National Geographic Society, and the University of Chicago. The map is a composite of several maps and data sources, including the National Science Foundation, National Geographic Society, and the University of Chicago. The map is a composite of several maps and data sources, including the National Science Foundation, National Geographic Society, and the University of Chicago.

For more information on visiting these and other sites, visit ohio.gov/indianasag/calumet.

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Grand Calumet River (GCR) Area of Concern (AOC) Boundary





Historical Moments

- Pre WWII:
 - 1869: George H. Hammond chooses a tract of land next to the Grand Calumet River (West branch) to build a slaughterhouse and meat packing plant
 - 1901: United States Steel Corporation founded
 - 1902: Open-hearth steel mill built at Indiana Harbor, East Chicago (Inland Steel)
 - 1930: Lever Brothers Hammond plant becomes operational
 - Population & manufacturing growth lead to nearly 20 diverse “man-made” discharges into the GCR



Historical Moments, cont'd

- Post WWII:
 - Manufacturing & population continued to grow & unregulated discharges continued
 - The Indiana Harbor Ship Canal became a leader in the amount of commercial tonnage shipped and received on the Great Lakes
 - Navigational dredging of the Canal with open lake dumping continued



Historical Moments, cont'd

- 1970s:
 - December 2, 1970: The United States Environmental Protection Agency (U.S. EPA) is officially formed
 - Federal environmental laws passed
 - Community interest in the environment is heightened
 - Media environmental awareness is raised



Historical Moments, cont'd

- 1980s:
 - International Joint Commission (IJC) designates AOCs in the 1987 Protocol of the Great Lakes Water Quality Agreement (GLWQA)
 - Called for Remedial Action Plans
- 1990s:
 - Citizens Advisory for the Remediation of the Environment (CARE) committee formed by IDEM
 - CARE designates all 14 beneficial uses for the Grand Calumet River



Historical Moments, cont'd

- 1990s Cont'd:
 - 1991:
 - IJC publishes approved guidelines for listing and delisting Areas of Concern in the Great Lakes Basin Ecosystem.
 - Remedial Action Plan (RAP) phase 1 prepared
 - 1997/1998: RAP Phases 2 and 2.5 submitted
 - Emphasis on matching projects with beneficial use impairments (BUIs)
 - Clean up, remediation and restoration projects are being planned



The Grand Calumet River AOC Today!

- Delisting targets for each Beneficial Use Impairment submitted to U.S. EPA in December 2008
- Segment approach adopted
- Major projects underway
 - U.S. Steel completed five mile dredge
 - One mile stretch in Hammond being dredged with Legacy Act funding (match and project oversight by Natural Resource Damage Assessment program)
 - Army Corp navigational dredging project on Indiana Harbor Ship Canal



Beneficial Use Impairments and Delisting Targets – What Are They?

- Beneficial Use Impairments (BUIs)
 - Beneficial Use Impairments: Defined by the GLWQA as a “change in the chemical, physical, or biological integrity of the Great Lakes system” sufficient to cause impairment to designated beneficial uses
 - Four categories of impairments: human use and welfare; human health; ecological health and welfare; and fish and wildlife habitat
- Delisting Targets
 - Goals with set endpoints that once met, means a BUI can be delisted



Beneficial Use Impairments

- Restrictions on fish and wildlife consumption
- Tainting of fish and wildlife flavor
- Degradation of fish and wildlife populations
- Fish tumors or other deformities
- Bird or animal deformities or reproduction problems
- Degradation of benthos
- Restriction on dredging activities
- Eutrophication or undesirable algae
- Restrictions on drinking water consumption, or taste and odor
- Beach closings
- Degradation of aesthetics
- Added costs to agriculture and industry
- Degradation of phytoplankton and zooplankton populations
- Loss of fish and wildlife habitat



The Segment Approach and the AOC Matrix

- The Segment Approach
 - Divides the AOC into defined habitat and areas (segments) and focuses on which BUIs apply to each segment
 - Major components:
 - Beaches
 - River and Canal
 - Habitat
 - Segments have different characteristics
 - A BUI may apply to one segment but not another
 - i.e., Beach closings apply to the beaches segment, but not the river and canal
 - Activities and projects are focused on specific BUIs within individual segments



Matrix Building Blocks

	A	B	C	D	E	F	G	H	I	J	K
1	GRAND CALUMET RIVER AREA OF CONCERN (AOC)										
2											
3	BUI No. 8 BUI No. 9 BUI No. 10 BUI No. 11 BUI No. 12 BUI No. 13 BUI No. 14										
4	AOC SEGMENTS				Degradation of benthos	Restrictions on dredging activities	Eutrophication or undesirable algae	Beach closings	Degradation of aesthetics*	Degradation of phytoplankton and zooplankton populations	Loss of fish and wildlife habitat*
5	A	GCR/IHC to Columbus Dr. (includes Lagoons)			Yes	Yes	Yes	No ? (Delete ?)	Yes ? (Delete ?)	Yes ?	Yes
6		A-4	WBGCR-II		Yes	No	Yes	No	Yes	Yes ?	Yes
7	B	Indiana Harbor Ship Canal (includes Lake George Branch to Land Bridge)			Yes	Yes	Yes	No	Yes ? (Delete ?)	Yes ?	Yes
8		B-1	Navigation Channel		No	Yes	No	No	No	No	No
9		B-2	L. George Branch								
10		B-3	South Branch								
11	C	Riverine Wetlands			Yes ?	Yes ?	No	No	Yes ? (Delete ?)	No	Yes
12		C-1	Grant St. Bridge		Yes?	Yes	No	No	Yes?	No	Yes
13		C-2	US Steel Oxbow		Yes?	Yes	No	No	Yes?	No	Yes
14	D	Inland Water Bodies			Yes	Yes ?	Yes	No	Yes ? (Delete ?)	Yes ?	Yes
15	E	Beaches & Near Shore			Yes	No ?	Yes	Yes	Yes ? (Delete ?)	Yes ?	Yes
16		E-1	Jeorse Park								
17		E-2	Hammond Beach		?						

EXAMPLE



Matrix Project Page

	A	B	C	D	E	F	G	H
1	Segment							
2	Dune & Swale Habitat			BUI No. 5	BUI No. 7	BUI No. 8	BUI No. 12	BUI No. 14
3	F-2.5 DuPont (1/5) 180 Acres managed by TNC (1995) Protection Status -- Conservation Easement to IDNR			Degraded fish and wildlife populations*	Bird or animal deformities or reproduction problems	Degradation of benthos	Degradation of aesthetics*	Loss of fish and wildlife habitat*
4	Segment Impairment			Yes	Yes	Yes ?	Yes	Yes
5	Baseline Determined							
6	When			1979				1979
7	Methodology			Natural Heritage Program Community Inventory & Assessment				Natural Heritage Program Community Inventory & Assessment
8	Author			Natural Land Institute & IDNR/DNP				Natural Land Institute & IDNR/DNP
9								
10	Delisting Target Established							
11	When			2008				2008
12	Modifications Needed							
13								
14								
15	Restoration projects determined			Five Projects				Five Projects
16	Project Description			Weed Management				Weed Management
17	Project ID			F-2.5-1				F-2.5-1
18	Project Mgr			TNC				TNC
19	Start Date			1995				1995
20	Project Length			On-Going				On-Going
21	Projected Cost			Not tracked at site level				Not tracked at site level
22	Milestones (Dates)			Reducing weed densities to level that spot treatment can be used for control & management. Management units (MU's) have been ID'd to track progress				Reducing weed densities to level that spot treatment can be used for control & management. Management units (MU's) have been ID'd to track progress
23	Progress Report Frequency			Annual				Annual
24	Completion Determination			MU's with weed densities that can be controlled and managed w/spot treatment as opposed to broadcast spraying				MU's with weed densities that can be controlled and managed w/spot treatment as opposed to broadcast spraying
25								
26	Monitoring Plan Established							
27	When			1995				1995
28	Participants			TNC				TNC
29	Frequency			On-going				On-going
30	Duration			On-going				On-going
31								
32	Projects linked to other segments			Other sites in which TNC is doing weed management				Other sites in which TNC is doing weed management
33	Which Ones							
34								
35								
36								
37								
38								
39								
40								

RETURN



The Future!

- Continued work on the GCR Matrix to identify project needs
- Working on Beach issues – Sanitary Surveys being utilized at two AOC beaches in an attempt to identify sources
 - High beach closing levels at Jeorse park being looked at
 - Looking at potential funding to perform microbial source tracking
- Dune and Swale habitat
 - Great Lakes Restoration Initiative request for funding to perform restoration on 230 acres of AOC habitat
- Finishing the planning process to deal with contaminated sediment in the remaining segments of the Grand Calumet River and Indiana Harbor & Ship Canal



Questions?

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Marquette Park Lagoons