

THE HISTORY OF CHICAGO IS THE HISTORY OF OUR WATER

**US Army Corps of Engineers
Chicago District
24 SEP 2019**



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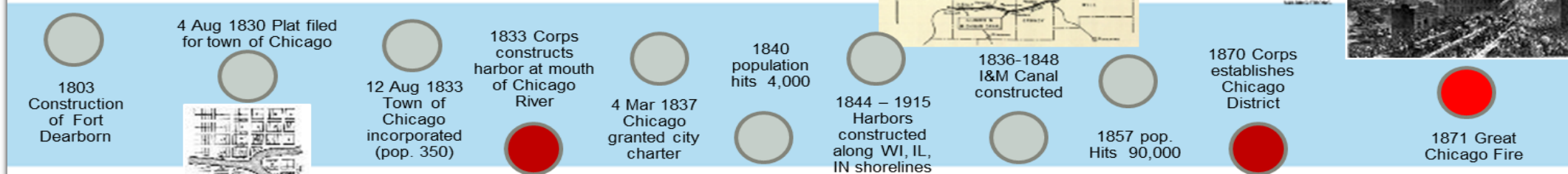


**US Army Corps
of Engineers**



A History of Success

(Value to the Nation)



James Thompson's original 1830 58-block plat of Chicago

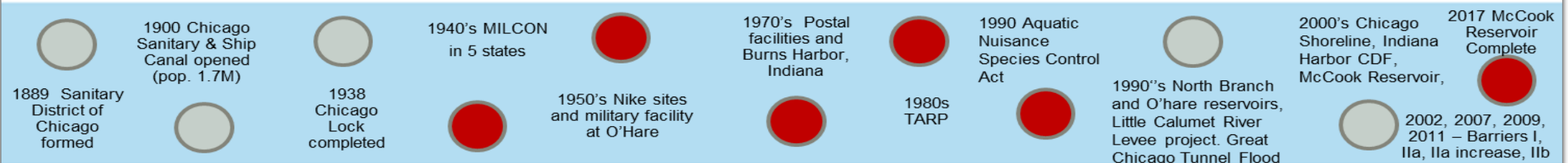
1803 - Fort Dearborn established

1871 – Great Chicago Fire

1893 – World Columbian Exposition

1933-34 – Century of Progress World's Fair

The Corps of Engineers' history is intertwined with Chicago's own. Vibrant and dynamic, looking forward and leading into tomorrow.



Steamship Traffic Through the Grand Port



Lockport Lock & Dam



Burns Harbor & Canal



Monroe Lock



Green Line Construction



Future of the Chicago Harbor

What problem did all of this effort aim to solve?

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A feasible land portage between the Great Lakes and the Illinois River that drove a demand for...

- ...An aquatic connection that brought
- ...People to harvest raw materials that
- ...Built a city in a swamp that
- ...Fueled massive growth requiring ports that
- ...Supported westward expansion that
- ...Created extensive human waste that was
- ...Dumped into the rivers and flushed into the Lake
- ...Where the people got their water
- ...That created disease
- ...So, they reversed the river flow that
- ...Created a permanent aquatic connection that both
- ...Allowed invasive species to pass, and
- ...Enhanced navigation & industrial growth
- ...That destroyed many ecosystems
- ...And this is our mission... past, present, future

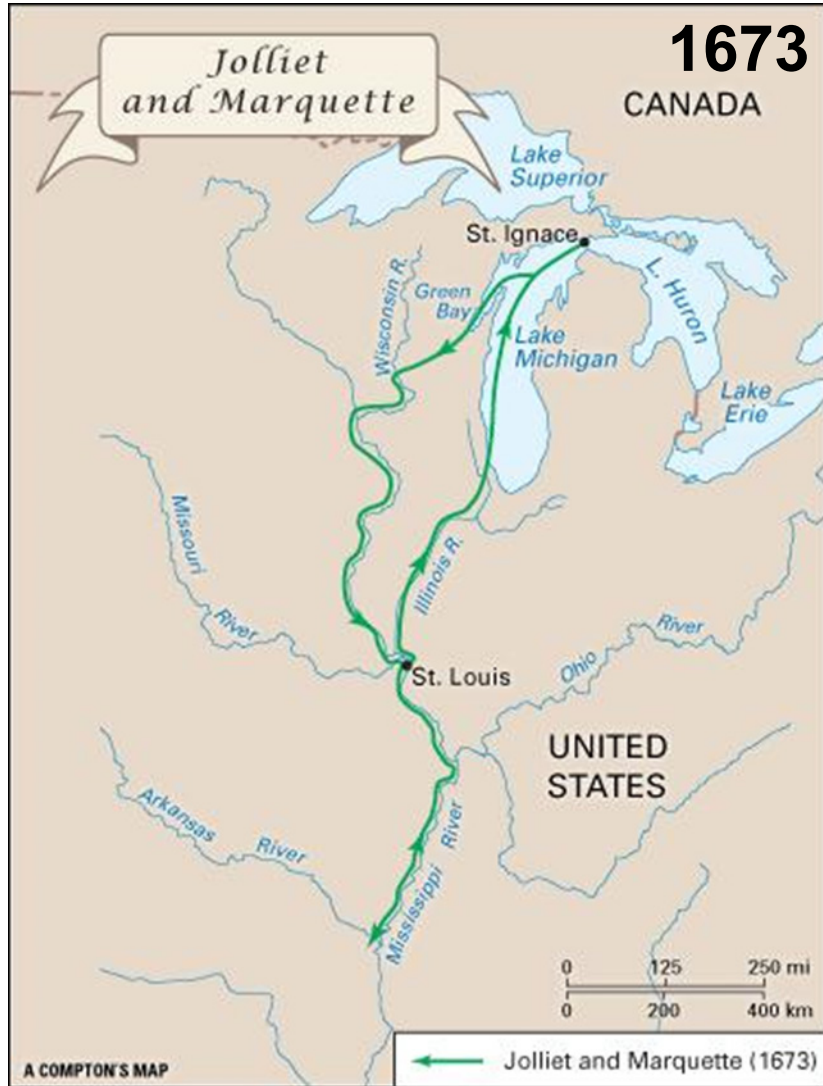


Terrain Overview - The Mississippi Watershed

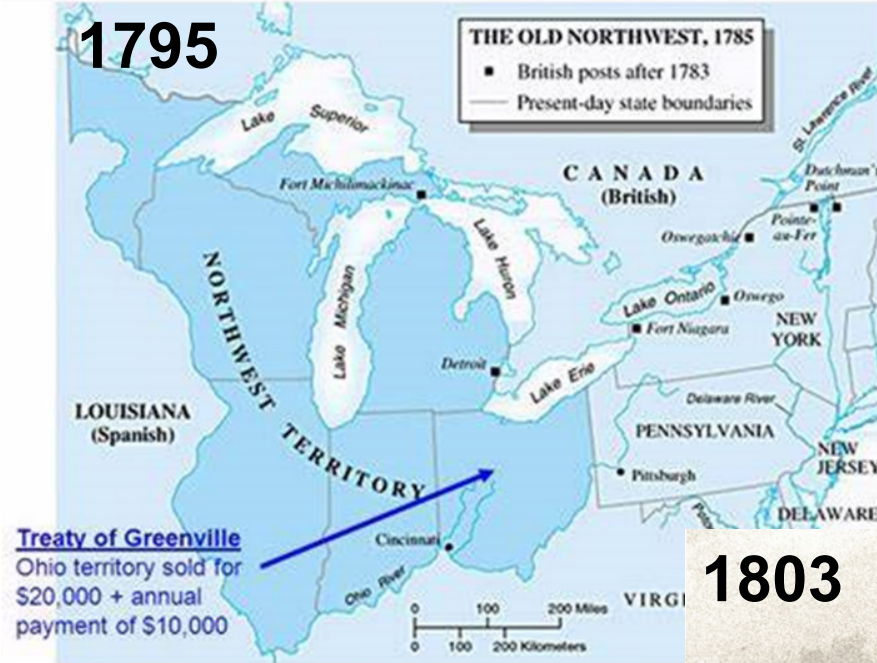


Discovery & Settlement 1673-1803

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"We could go with facility to Florida in a bark, and by very easy navigation. It would only be necessary to make a canal by cutting through but half a league of prairie, to pass from the foot of the Lake of the Illinois (Lake Michigan) to the St. Louis (Illinois) River, which empties into the Mississippi"



Treaty of Greenville concludes Battle of Fallen Timbers under BG "Mad" Anthony Wayne; Potawatomi Indians ceded a six square mile parcel at mouth of Chicago River to the United States

Army constructs Fort Dearborn at the mouth of the Chicago River. 1812 Fort Dearborn massacre by the Potawatomi Indians as part of the War of 1812; 52 men, woman and children killed



1803

Establishment 1803-1833

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1816

Major Stephen Long visited Illinois Territory to carry out the first survey of the Chicago Portage. *"The central position of the place- the facility the country affords for communicating both by land and water with almost every other part of the north and northwest frontier gives it a high claim to consideration as a military post"*

1828: Army infantry officers at Fort Dearborn dig a ditch through sandbar at the mouth of Chicago River, but it immediately fills in

1830: Army civil engineers Harrison and Guyon surveyed and mapped "the most practical route for connecting the waters of Lake Michigan with the Illinois River"; maps produced outline initial Chicago Harbor improvements and establishes the eventual I&M canal route



1830

First plat filled for the town of Chicago



1833

Chicago incorporated as a town; population of 350; first anti-pollution ordinance for the Chicago River



First Solutions 1833-1900 – Developing navigation and sanitation

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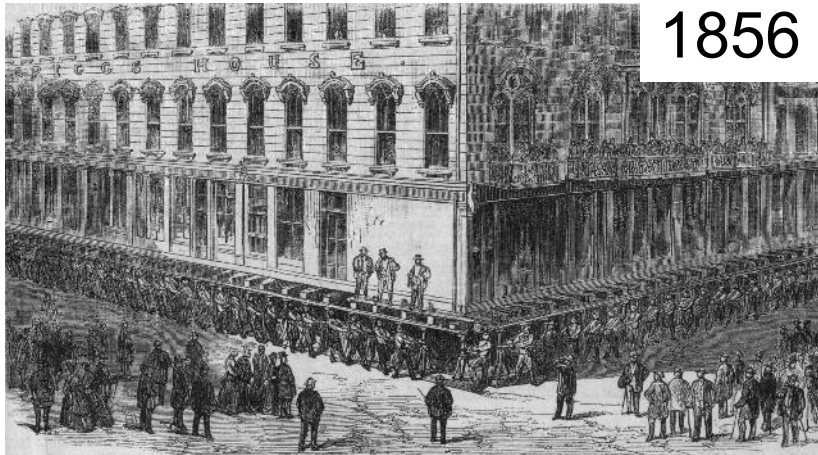


1836

Construction of the I&M canal begins by the State of Illinois

1843: Congress appropriates funds to improve Chicago, St Joseph, Michigan City, Milwaukee harbors and a year later overrode President's veto to construct new harbors at Kenosha and Racine

1848: I&M canal opens; flow of the South Branch of the Chicago River is intermittently reversed



1856

Chicago begins to raise the level of its streets for a new sewer system to address flooding and pollution in the streets; this sewer system increased the waste load discharged into the Chicago River

1867: first crib completed to protect city's drinking water source two miles out in the lake

1885: Chicago experiences second massive flood that threatens the water intake structures; used by local officials to petition for a more permanent diversion away from the Lake Michigan

1900



CSSC opens under controversy despite injunction by the City of St. Louis; Chicago population hits 1.5M making it 2nd largest city in the nation



Massive Growth 1900-1939 – Expanding navigation and dilution

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1906

LTC William Bixby predicts impacts to Lake Michigan water levels as a result of the free flow diversion through the CSSC; 30,000 cfs diversion reduced lake levels by 8.9" and if persisted would further reduce levels to 1.5' within 5 years

1910: Chicago population hits 3M; Indiana harbor is transferred to Federal Government; Chicago River is deepened to 21 feet; MWRDGC completes North Shore Channel to flush the North Branch Chicago River

1920: Corps issues permit to State of Illinois for improving the Illinois Waterway by constructing five new locks on the Des Plaines and Illinois Rivers

1922: Calumet-Saganaskee (Cal-Sag) channel constructed by MWRDGC over 11 years; partially reversing the Little Calumet River



1930

The Federal Government takes control of the Illinois Waterway project from the state; project finished in 1933; first Supreme Court decree issued mandating sewage treatment and timetable to reduce diversion from lake

1939: MWRDGC constructs the Chicago Controlling Works at the mouth of the Chicago River at Lake Michigan to prevent reversals of flow and still allow passage of navigation



Consolidation and Policy Change 1938-1972 – Environmental awareness

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1938

FDR passes the Flood Control Act of 1938 establishing a nationwide policy that flood control on navigable waters or their tributaries is in the interest of the general welfare and is the proper activity of the Federal Government when carried out in the cooperation with the States and local entities

1946: Congress authorized widening the Cal-Sag channel and constructing a lock and dam to control diversion, improving the Grand Calumet River for direct connection to Indiana Harbor and widening the CSSC from the Cal-Sag junction to Lockport; of the authorized project, only Cal-Sag channel widening and O'Brien lock and dam were constructed as a new focus on economic justification of public works projects and the necessary support of state and local interests

1955: The Chicago Sewage Disposal System is named one of the seven wonders of the modern engineering world

1959: The St Lawrence Seaway is completed; prior to completion several states petitioned for harbor improvements in anticipation of international shipping

1965: USACE constructs the O'Brien Lock and Dam completely reversing the Calumet and Little Calumet Rivers; construction of Burns Waterway Harbor is authorized



1972

Clean Water Act is passed



Mitigation 1972-2019 – Navigation & Contaminated Sediments

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1970: USACE authorized construction of confined disposal facilities to contain 10 years of spoil in areas specified by the newly formed USEPA: under Section 123, PL 91- 611, as well as project-specific authorities, USACE constructed and/or operated 45 CDFs and removed over 100 million cubic yards of contaminated sediments across the Great Lakes



1983

Chicago Area CDF constructed in Calumet Harbor after years of difficulty obtaining necessary items of local cooperation and dredging ceased for nearly a decade; facility has reached capacity and a DMMP is nearing completion with a recommendation to vertically expand the existing facility



2019



1950



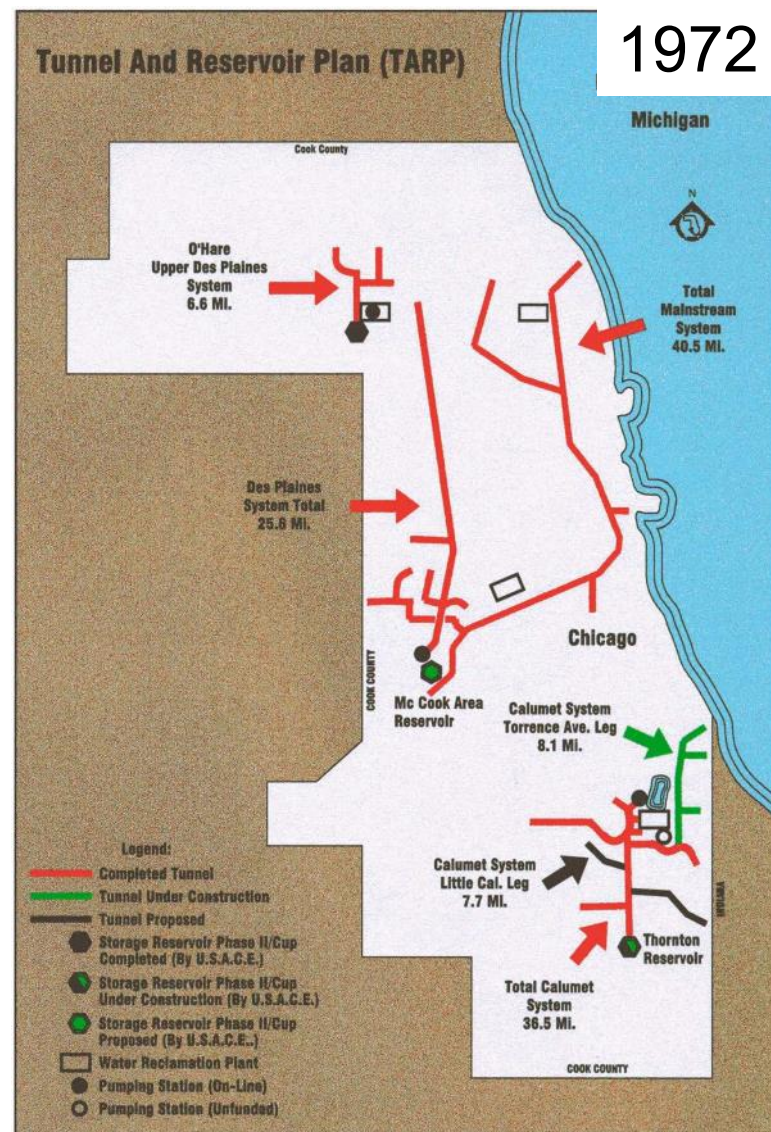
2012

Indiana Harbor CDF constructed in two stages on an abandoned refinery site after 40 years of ceased dredging; high levels of contamination in both dredged sediments and surrounding areas added complexities; designs underway to expand facility by raising the perimeter dikes



Mitigation 1972-2019 – Flood Risk Management

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MWRDGC adopts the Tunnel and Reservoir Plan (TARP) consisting of two phases; first phase consisting of the construction of a network of tunnels to capture the “first flush” from combined sewer overflows and a second phase consisting of large reservoirs to increase the capacity of the system to address flooding



First stages of the “Deep Tunnel” portion of the TARP goes online; the entire tunnel completed in 2006 consisting of a total of 110 miles of tunnels ranging between 9 and 33 feet in diameter



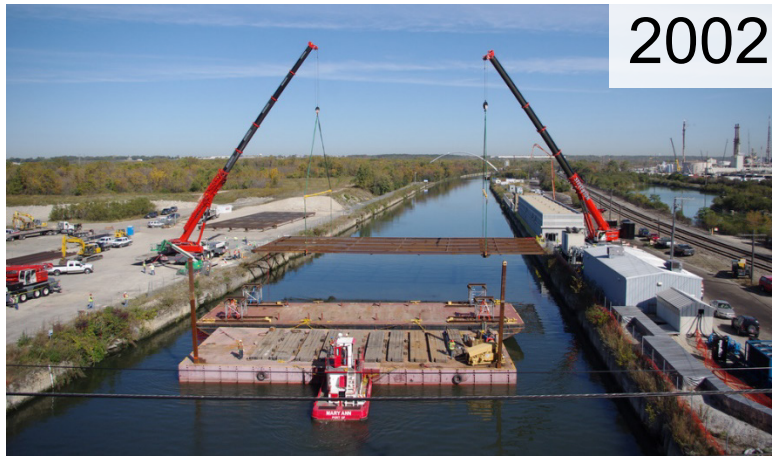
Stage 1 of the CUP-McCook Reservoir completed adding 3.5BG to the mainstream and Des Plaines deep tunnel systems
2019: Stage 2 under construction to add 6.5BG additional capacity by MWRDGC



Mitigation 1972-2019 – Aquatic Ecosystem Restoration & Protection

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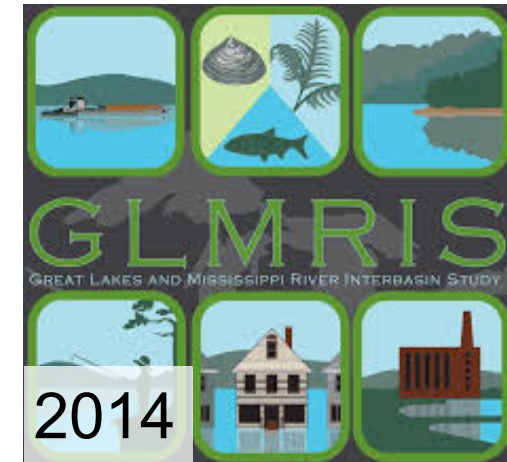
1988: USACE establishes environmental program recognizing that past practices unintentionally damaged sensitive ecosystems and asserts that adequate engineering expertise exists to correct these problems; LTG Henry Hatch *"It is we engineers who hold most of the keys to the solutions of the world's environmental problems."*



Construction completed on the first demonstration electric dispersal barrier to prevent invasive species transfer between the Great Lakes and Mississippi River basins through the CSSC; to date three barriers have been constructed and one underway with increasing effectiveness



To date have constructed 33 ecosystem restoration and protection projects totaling 4,100 acres of scarce habitat and 15 miles of stream restoration for federally listed threatened and endangered species mainly utilizing CAP and GLFER authorities and funds through both E&W Appropriations and USEPA-managed Great Lakes Restoration Initiative



Great Lakes and Mississippi Interbasin Study outlines a range of options and technologies to address the transfer of aquatic invasive species between basins; Brandon Road identified as priority area for addressing Asian carps



Solving the Dominant Engineering Challenges for Chicago

