

US ARMY CORPS OF ENGINEERS ROCK ISLAND DISTRICT

Navigation System
Operation and Maintenance
Tom Heinold, Chief of Operations Division

Distillers Grains Technology Council
Des Moines, Iowa
09 AUG 2023



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AREA OF RESPONSIBILITY

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Parts of five states

- Three state capitols
- Lead Corps district for Regulatory issues in Iowa

Five river basins

- Upper Mississippi, Illinois, Des Moines, Iowa/Cedar and Rock

Twelve locks and dams on the Mississippi River

- Dubuque, IA to Hannibal, MO

Six locks and dams on the Illinois Waterway Inland Navigation Design Center

- Nationwide support

National Flood Fight Center

- Nationwide support





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ROCK ISLAND DISTRICT'S CIVIL WORKS AUTHORITIES



- Flood Risk Management
- Regulatory
- Environmental Stewardship
- Ecosystem Restoration
- Natural Resource Management
- Emergency Management
- Water Supply
- Recreation
- Navigation
- Continuing Authorities Program



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WHY DO WE CARE ABOUT INLAND WATERWAYS?



- Most cost-effective mode of bulk goods transportation
- Our international competitiveness depends on them!
 - » (62% of US grain exports are shipped down the Mississippi on barges)
 - » Post-Panamax is open for business!
- Reduce road congestion (and wear)
- Safest
- Most environmentally sound / least polluting
- Alternative to rail & road (no monopoly)
- Reliable navigation pools provide ancillary benefits (water supply, cooling water, recreation, improved environmental habitats)



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STATE OF THE DISTRICT'S INFRASTRUCTURE

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Rock Island District operates and maintains the second longest nine-foot navigation channel in the Corps of Engineers.

- 17 Dams and 20 Locks
- 582 Miles of Navigation Channel
- 800+ Million Tons of Cargo Locked each year
- > \$1 Billion Transportation Annual Cost Benefit

Most locks and dams on the Upper Mississippi and Illinois Waterway were constructed in the 1930s and 40s and have far exceeded their projected 50-year lifespan.

Major maintenance and rehabilitation are needed to restore these aging facilities to full capability, prevent major disruptions, and provide opportunities for growth.

According to the 2019 U.S. Department of Agriculture study titled **“Importance of Inland Waterways to U.S. Agriculture,”** failure to modernize these and other locks and dams increases costs of U.S. farm exports and helps foreign exporters close the cost gap with the United States.





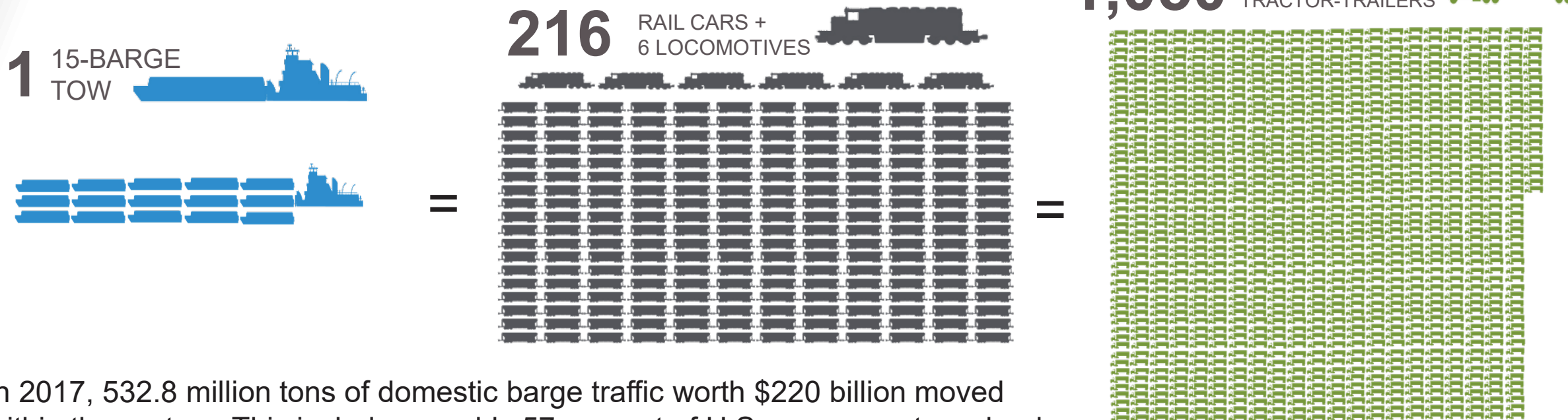
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IMPORTANCE OF INLAND NAVIGATION

The inland waterway navigation system, to include the Upper Mississippi River system, saves between \$7 and \$9 billion annually over costs of shipping by other modes. Cargo capacity is a major factor in the system's efficiency.



In 2017, 532.8 million tons of domestic barge traffic worth \$220 billion moved within the system. This includes roughly 57 percent of U.S. corn exports, valued at \$4.8 billion, and 59 percent of U.S. soybean exports, valued at \$12.4 billion.

Barge transportation is also environmentally friendly. On one gallon of fuel, a towboat can move one ton of cargo 647 miles as opposed to rail which can go 477 miles and truck which can only do 145 miles. Inland towing carbon dioxide emissions are also less at 15.62 grams per ton-mile as compared to 21.19 for rail and 154.08 for truck.



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SNAPSHOT – LOCK 19, KEOKUK, IA



Lock and Dam 19 Commodity Tonnage (2022)

Food and Farm Products	10,732,790
Chemicals and Related Products	3,731,470
Crude Materials, Inedible, Except Fuels	1,186,340
Primary Manufactured Goods	1,167,200
Petroleum and Petroleum Products	645,560
Coal, Lignite, and Coal Coke	163,500
Manufactured Equipment & Machinery	35,250
Waste Material	--
Unknown or Not Elsewhere Classified	4,800
Total Tonnage	17,666,910



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MISSISSIPPI RIVER LOCK DEWATERINGS

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Typical Dewatering Activities:

- Close mid-DEC / early JAN
- Clean sills, set bulkheads, pump down the chamber
- Inspect normally-submerged components (and repair what we can)
- Place bulkhead sill beams and encase in concrete
- Repair / replace bubbler systems
- Repair sills
- Repair miter gate seals
- Replace miter gate anchorages
- Repair vertical concrete in the chamber
- Open by late FEB or early MAR



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LOCK 15 DEWATERING – WINTER 2021-2022

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FLASHBACK – LAGRANGE LOCK

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- Unsafe conditions for both Towing Industry and Lock personnel
- Steeply decreasing reliability of service
- Delays in restoring service after flooding conditions



Was the Nation's "Poster Child" for decaying infrastructure



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2020 LAGRANGE MAJOR REHABILITATION / MAJOR MAINTENANCE

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Vertical concrete pre-cast panel installation



New gate machinery base







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19 MAY 2020 – STARVED ROCK LOCK

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2020 STARVED ROCK MAJOR MAINTENANCE

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2020 MARSEILLES MAJOR MAINTENANCE

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2023 ILLINOIS WATERWAY CLOSURES

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MARSEILLES LOCK





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2023 ILLINOIS WATERWAY CLOSURES

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DRESDEN ISLAND LOCK





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2023 ILLINOIS WATERWAY CLOSURES

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BRANDON ROAD LOCK





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National Research Council Findings

- NRC Suggests Appropriate Maintenance Investment Range of 2-4% PRV
- FY 15 USACE Infrastructure Plant Replacement Value* (PRV) = \$268B

Est FY15 PRV =	\$268,000,000,000	% PRV	
NRC "High" (4%) =	\$10,720,000,000	4.00%	← Fiscally Impossible
NRC "Low" (2%) =	\$5,360,000,000	2.00%	← Exceeds Corps TOTAL Budget
TOTAL FY15 O&M Budget =	\$2,600,000,000	0.97%	← < 1%, Incl "O"
O&M Allocated for Just Maintenance =	\$618,500,000	0.23%	← Current Reality and WHY O&M Efficiencies are SO Important

Akin to buying a \$30,000 car and spending \$69 annually on maintenance and repair for its life, with no warranty service

Like Other Agencies, the Corps is Not Close to NRC Recommendations... EVEN IF O&M is Optimized...this is a National Infrastructure Priority





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FUNDING TRENDS

1990's – 2000's: "Fix as it Fails"

- Reliability decreased significantly; things were breaking faster than we could fix them

Early 2010's: Stemmed the Tide

- Got to a "steady state" where we were able to keep up with items that would stop navigation, but the system continued to age, and we weren't making any progress

Late 2010's to the present: Making Progress

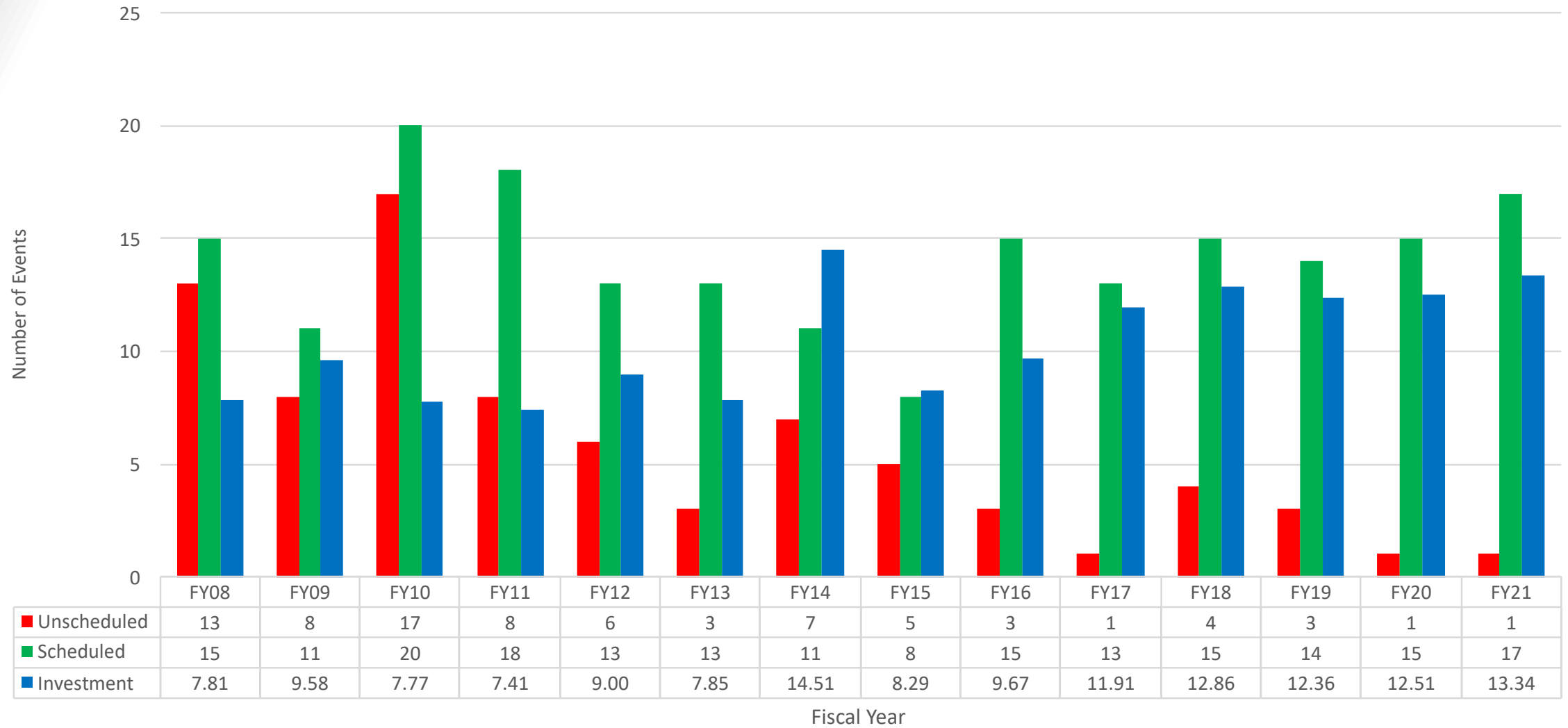
- Restoring the reliability, safety and efficiency of the system, and even making progress toward capital reinvestment



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Scheduled & Unscheduled Lock Stoppages Greater Than 7 Days With Combined Construction and O&M Investments (Hundred Thousands)



■ Unscheduled ■ Scheduled ■ Investment



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NAVIGATION & ECOSYSTEM SUSTAINABILITY PROGRAM (NESP)



- **1200' Locks** at Locks 20, 21, 22, 24, and 25 on the Mississippi River along with 1200' Locks at Peoria and LaGrange on the Illinois Waterway + other Navigation & Ecosystem improvements
- FY20: \$4.5M received (\$3M for Navigation, \$1.5M for Ecosystem)
 - Funds used to advance designs and ready projects for construction
 - At the end of FY21, over \$20M in construction ready projects
- FY21: Still no Construction New Start, continued design efforts
 - \$5M received (\$2.625M for Navigation, \$2.375M for Ecosystem)
- FY22: **\$732M for Lock 25**, \$97 for LD22 fish passage
- FY23: \$67.7M total (initial appropriation + work plan)
- FY24 PBud \$0, but House & Senate markups include funding



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OTHER NEWS NATIONWIDE

- Soo Lock under construction soon
- Upper Ohio (Montgomery, Dashields, Emsworth)
- TJ O'Brien Major Rehabilitation
- Brazos & Colorado River crossings of the Gulf Intracoastal Waterway (GIWW)
- New Inner Harbor Navigation Canal Lock (New Orleans) development
- Composite gates and other technological developments



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THANK YOU

for the opportunity to speak with you today!

are there any

QUESTIONS?

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