

Future of Barging - A Carrier's Perspective



Marine Board Spring Meeting - May 2019



NO
STORAGE

LIMITED ACCESS
CAUTION
- NO HAND RAIL
- NO ENTRY WITHOUT NOTIFYING PILOT

Inland Barge Market Outlook - A Carrier's Perspective

Inland Barge Market - Who are we?

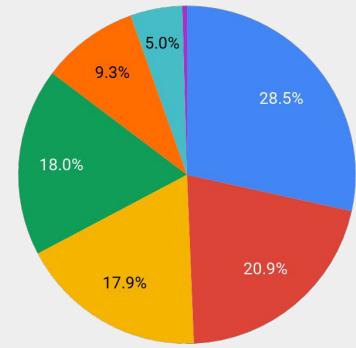
Facts about American Commercial Barge Line

- One of the nation's largest inland carriers
- 70 million tons of liquid and dry cargoes annually
- 3,600 barges and 130 towboats
- 11 fleets and three terminals
- ~2,100 employees



Inland Barge Industry

- 8,000 miles inland navigable waterways
- 30 Liquid and 31 Dry Carriers
- 33,000+ Mariners/50,000+ Jobs
- 540 million tons transported in 2018
 - 60% of U.S. grain exports
 - 22% of domestic petro. and petro. products
 - 20% of power generating coal



● Petroleum & Petroleum Products ● Coal ● Crude Materials ● Food & Farm Products
● Chemicals ● Manufactured Goods ● Other



- Continued Carrier Consolidation

- Technology Advancements

- Supply/Demand Equilibrium

- Winners and Losers



- Why Consolidation? Efficiencies of scale
 - Robust capability across end-markets and geography
 - Increased offerings and capabilities at less cost per unit
 - Absorption of regulatory compliance - person to a team
 - Generation-passing - leadership challenges, monetizing business
- Who benefits? Shippers and Carriers
 - Less carriers to choose from, but more robust capabilities
 - Scale to handle ship-load quantities to end-markets
- Carriers must be vertically integrated - just to get the work done!

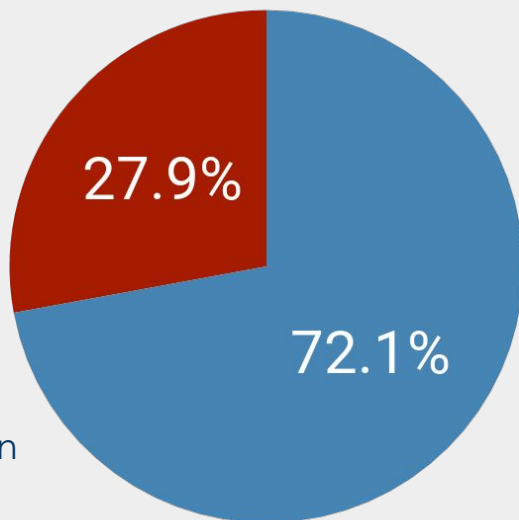
Continued Carrier Consolidation

Continued Carrier Consolidation

Liquid Fleet

TOP 7

Kirby
ACBL
Canal
Ingram
FMT
Blessey
Marathon

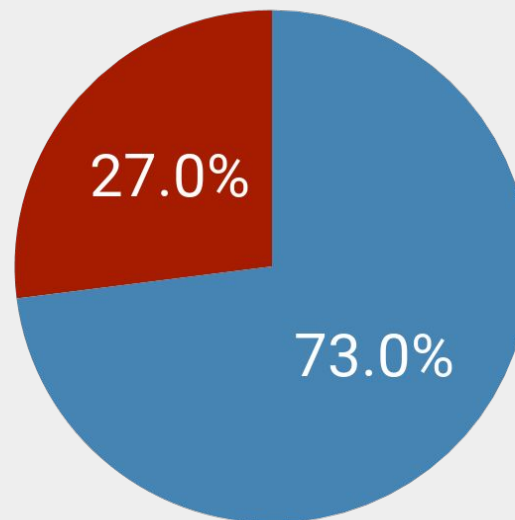


● Top 7 ● Other 23 Carriers

Dry Fleet

TOP 7

Ingram
ACBL
ADM
CGB
Cargill
SCF
CTC



● Top 7 ● Other 24 Carriers

	<u>Carriers</u>	<u>Fleet Size</u>
1998	92	22,967
2018	52	22,801



Same Fleet
Less Tons

Dry Avg.
Age
15
15

Liquid Avg.
Age
24
15



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- Navigation

- Vessel Operations

- Communication and Data



- Auto Pilot - how far away are we?
 - Auto-assist now
 - Drone assists
- Rose Point Electronic Mapping
 - Improved situational awareness, overall safety
 - Most efficient transit times
 - Voyage data recording
 - Exceptional and time-tested reliability
- Electronic buoys and other navigation aids
 - Hand-in-hand with Electronic Mapping

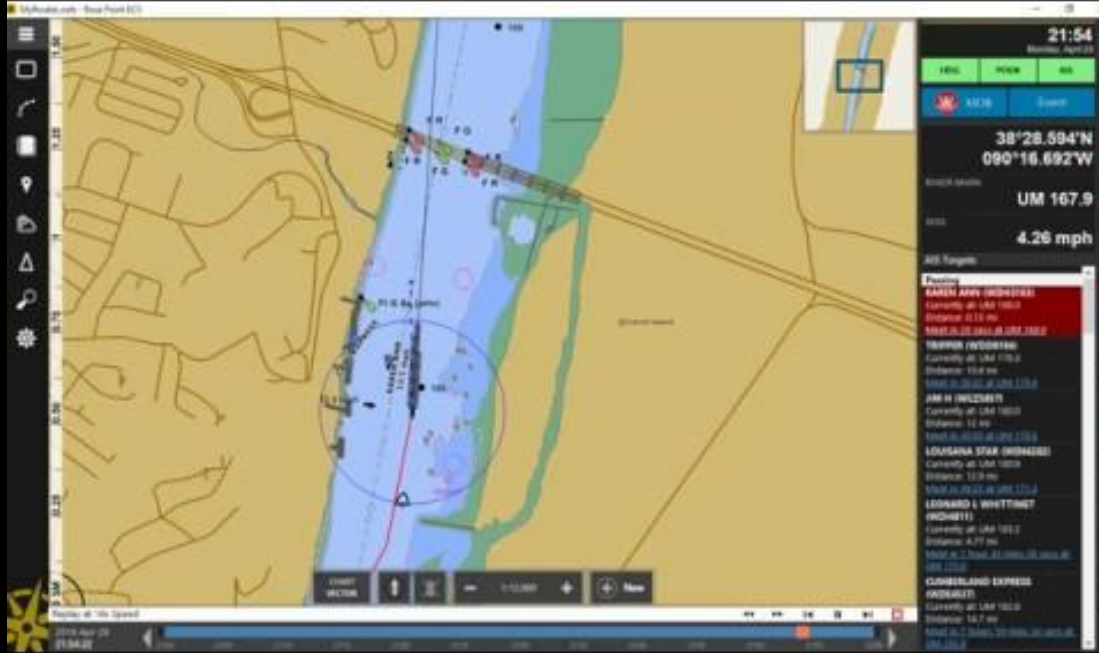
Vicksburg Bridge - Drone Assist





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Rose Point Electronic Mapping





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- Navigation

- Vessel Operations

- Communication and Data

Tier 3 → Tier 4 (804+ HP)

- SCRs on exhaust or EGR
- Increased electronics and cooling
- Increased cost 80%-100%
- Diesel Emissions Fluid (DEF)

SCR units Urea is sprayed into the exhaust to reduce Nox emissions



Propulsion Concepts

- Z-drive: fuel, maneuverability
- Diesel Electric: GenSets, electric motors
- Hybrid Diesel: electric boost motors
- Articulated or Multiple Steering Rudders - increase steering force

Old

- ❖ Reactionary; Trouble-shooting
- ❖ Swap Parts
- ❖ Excess Inventory
- ❖ Poor Records (paper)

Current

- ❖ Mfg Maintenance Schedules
- ❖ Managed Inventory
- ❖ Enterprise Asset Mgmt
- ❖ Electronic Sensors & Alarms

Future

- ❖ Condition-based & Predictive
- ❖ Real-time shoreside oversight
- ❖ PM's Based on Failure Analytics
- ❖ More sensors, AI & Data Mining
 - Vibration
 - Machine Learning
 - Onboard Oil Analysis
 - Crankshaft Electro-Mag



- Navigation

- Vessel Operations

- Communication and Data

- Work

- 5G cellular network: more and faster data
- Vessel-side similar to shore-side capabilities
- GPS, sensors, and Internet-of-Things
- Live, online training, Video conferencing
- More information shared securely between nearby vessels, service providers, lock operators

- Play

- Streaming media: hometown sports and shows
- Video calls with family and friends
- Online educational opportunities
- Is that 3-D or virtual reality?





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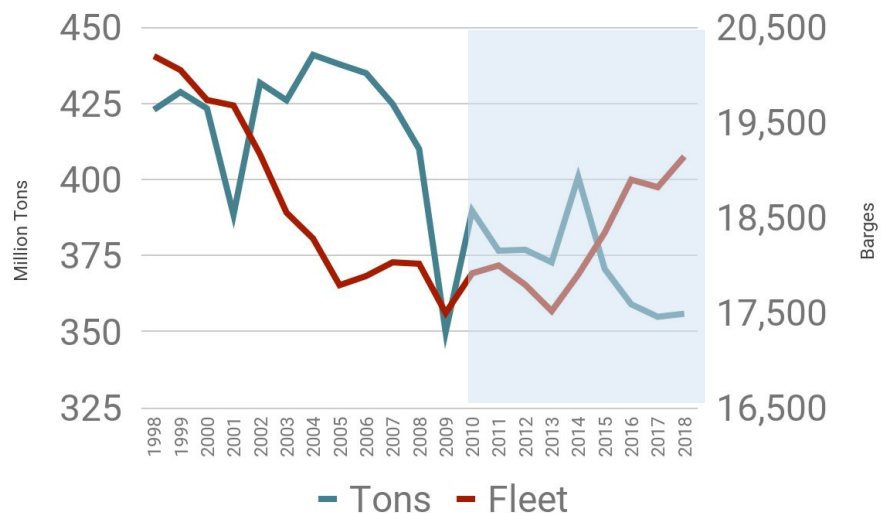


What drives it?

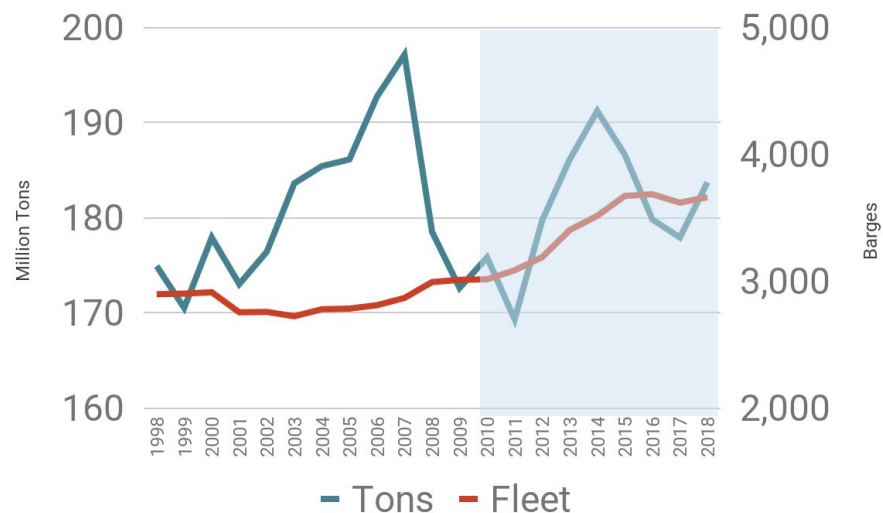
- End-market demand
- Energy renaissance
- Global Trade
- Cheap natural gas
- Barge Construction

Supply/Demand Equilibrium

Dry Demand v. Fleet 1998 - 2018



Liquid Demand v. Fleet 1998 - 2018



Supply/Demand Equilibrium

Cement

OLD



NEW

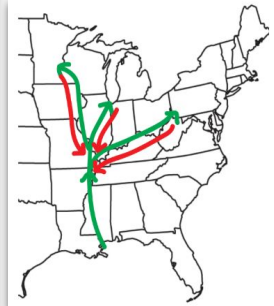


EAF v. Int. Mills

OLD



NEW



Fertilizer

OLD

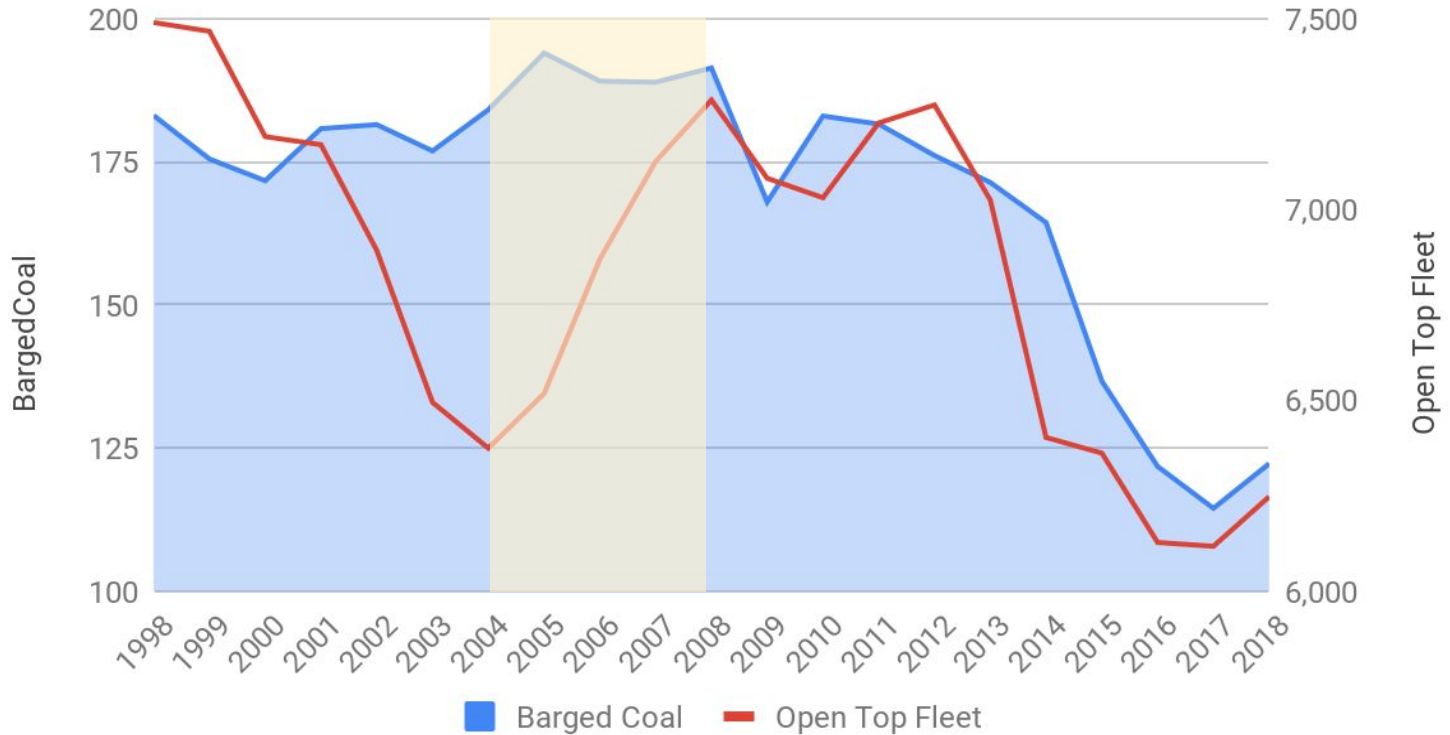


NEW

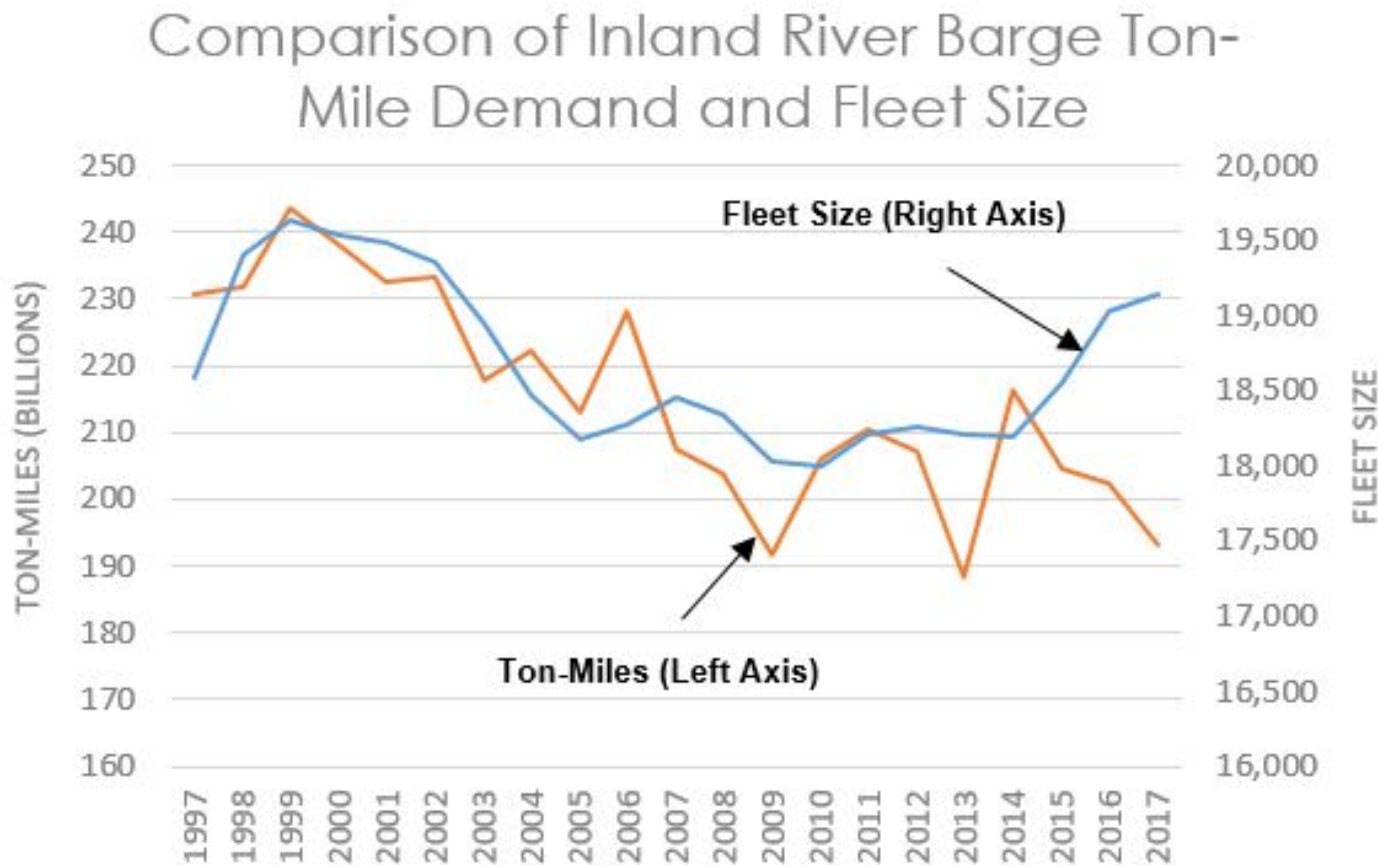


Supply/Demand Equilibrium

1998 - 2018 Barged Coal v. Open Top Fleet



Supply/Demand Equilibrium





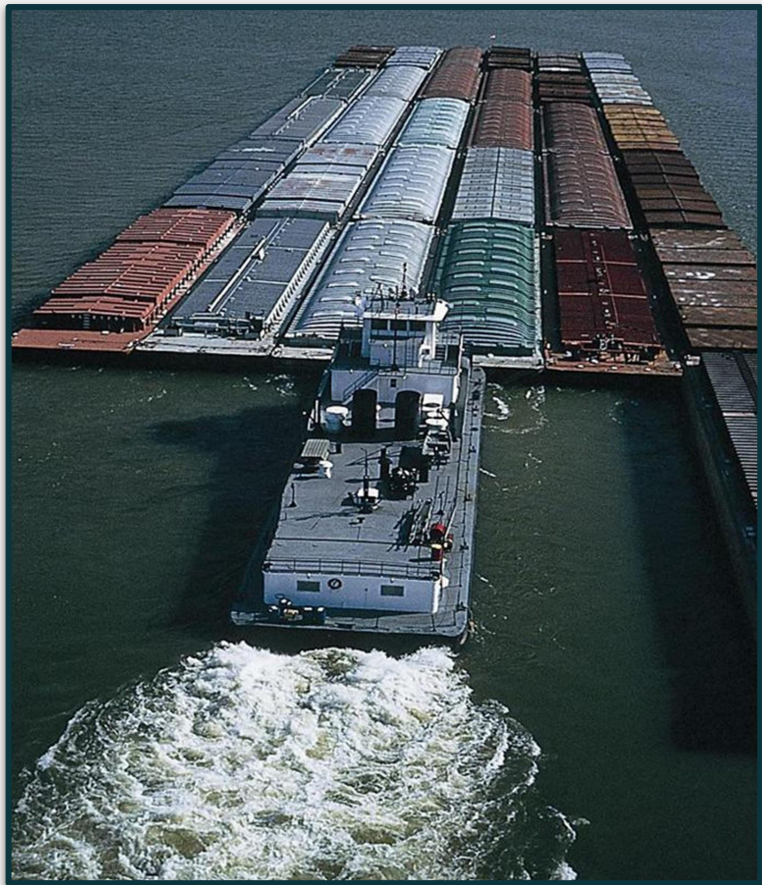
- Continued Carrier Consolidation

- Technology Advancements

- Supply and Demand Equilibrium

- Winners and Losers

Who will be the Biggest Winners and Losers?



- Shippers - Winners

- Carriers - Challenges

- Public - Winners

- Environment - Winners

Shippers - Winners

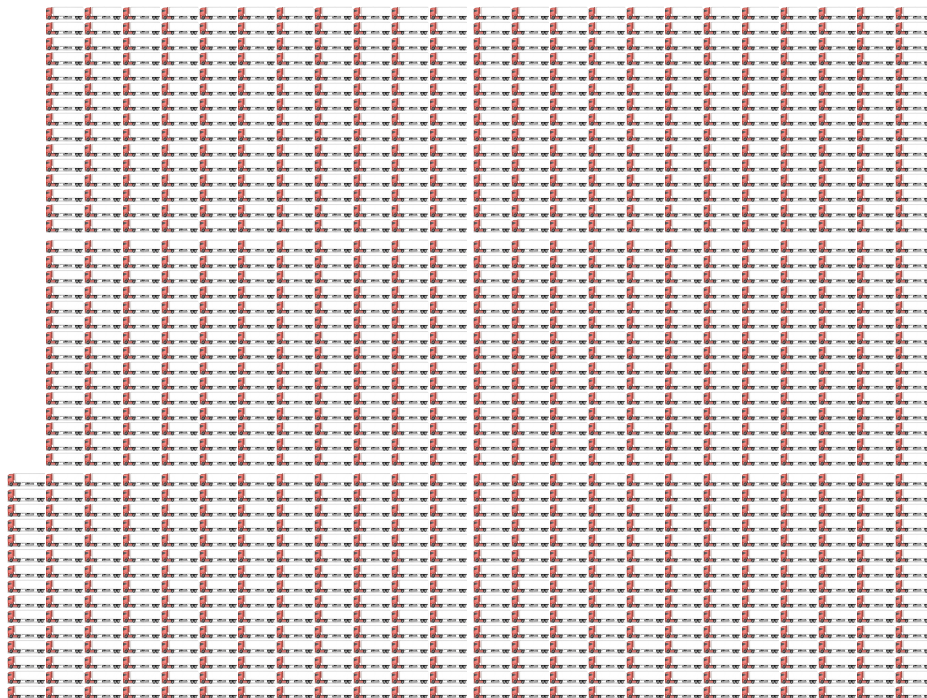
One 15-Barge Tow



216 Rail Cars + 6 Locomotives



1,050 Large Semi Tractor-Trailers





A loaded tank barge carries 27,500 barrels of gasoline, enough to keep about **2,500 automobiles** running for an entire year.

Units to Carry 27,500 Barrels of Liquid Cargo

1 barge



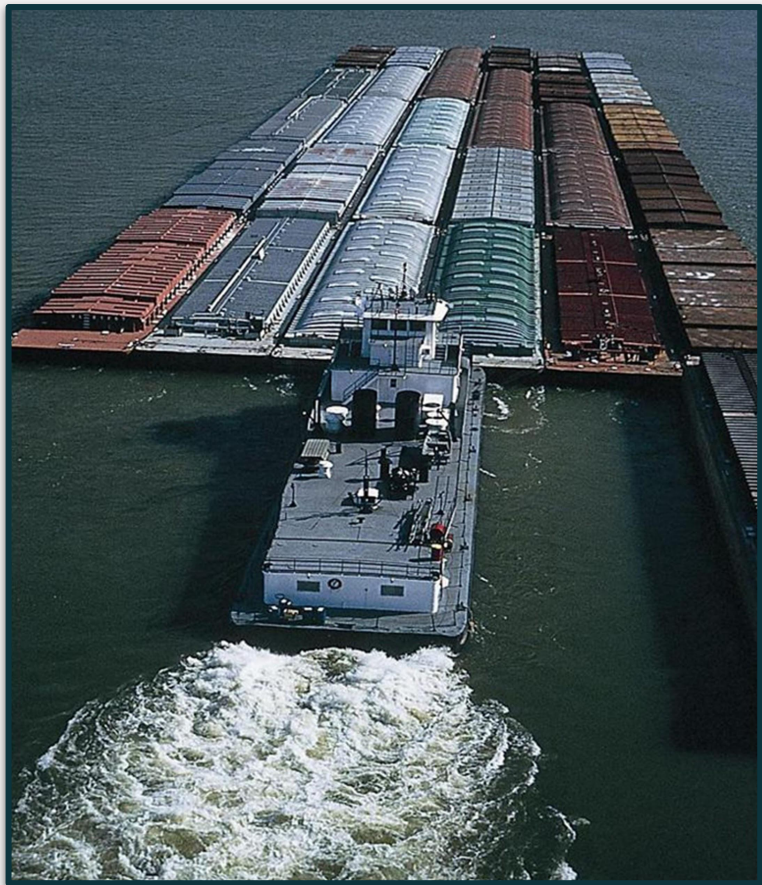
46 rail cars



144 trucks



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Certification and Watchkeeping for Seafarers
 TWIC
 Automatic Identification Systems
 Vessel Discharges
 Future of Navigation
 Federal Preemption
 Invasive Species
 Certain Dangerous Cargoes
 Marpol Annex VI
 Mariner Credentialing
 Vessel Security Plans
 Medical Standards
 Maritime Security
 IMO Polar Code
 Cyber Risk Management
 Marine Engine Emissions
 Renewable Energy
 Safe Manning
 Towing Vessel Inspection
 Ballast Water
 Jones Act
 International Convention on Standards
 Maritime Labor Convention
 State Actions
 Sewage No-Discharge Zones
 Certification and Watchkeeping for Seafarers
 State Taxes
 Fatigue and Crew Endurance
 Tank Barge Emissions
 ATONS
 Missouri River
 Infrastructure and Funding
 Tank Vessel Response Plans

Challenges - regulatory challenges are stifling

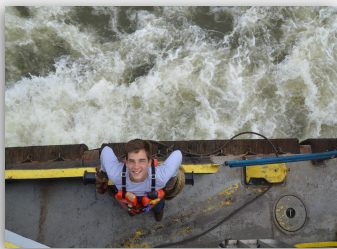
Carriers Challenges - SubM Cost and Benefit

- Four Areas of Impact/Cost
 - Audit/Survey: Costs = Time & Material
 - Training: Systems & Policies
 - New Equipment Requirements
 - Material Condition of Vessel
- SubM Benefit to Carrier
- SubM Challenges



User Taxes

- Barge Industry is only beneficiary contributing to the IWTF - \$115M annually
- Many benefit from our industry's contributions at no cost to them
 - Hydro electric industry
 - Water supply & irrigation
 - Real estate development
 - Flood protection
 - Commercial fishing
 - Industrial Water Supply
 - Municipal Water Supply
 - Recreational Boaters



Who will be the Biggest Winners and Losers?



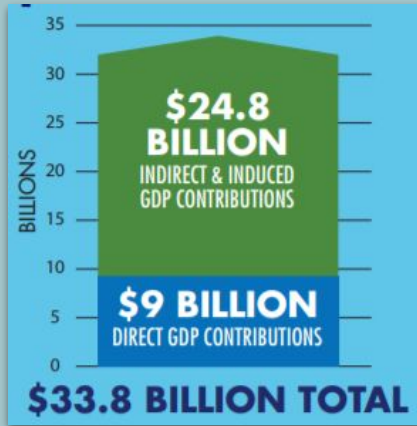
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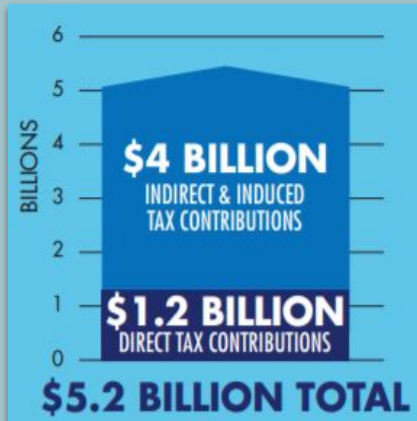
- Public - Winners

- Environment - Winners

GDP



TAXES



JOBS

50,480
Direct Jobs

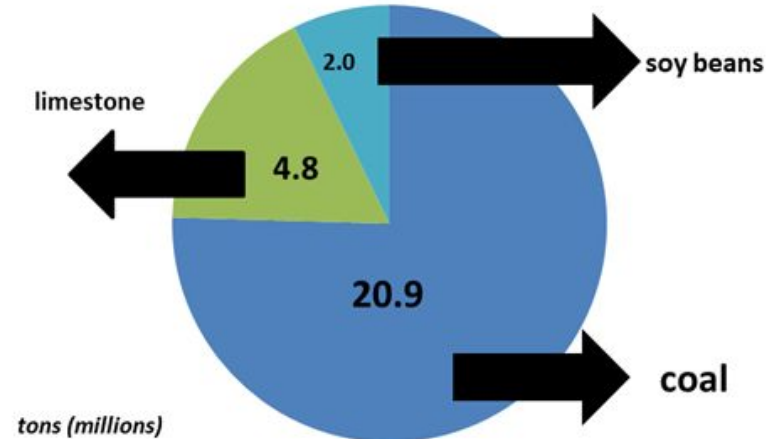
251,070
Indirect & Induced



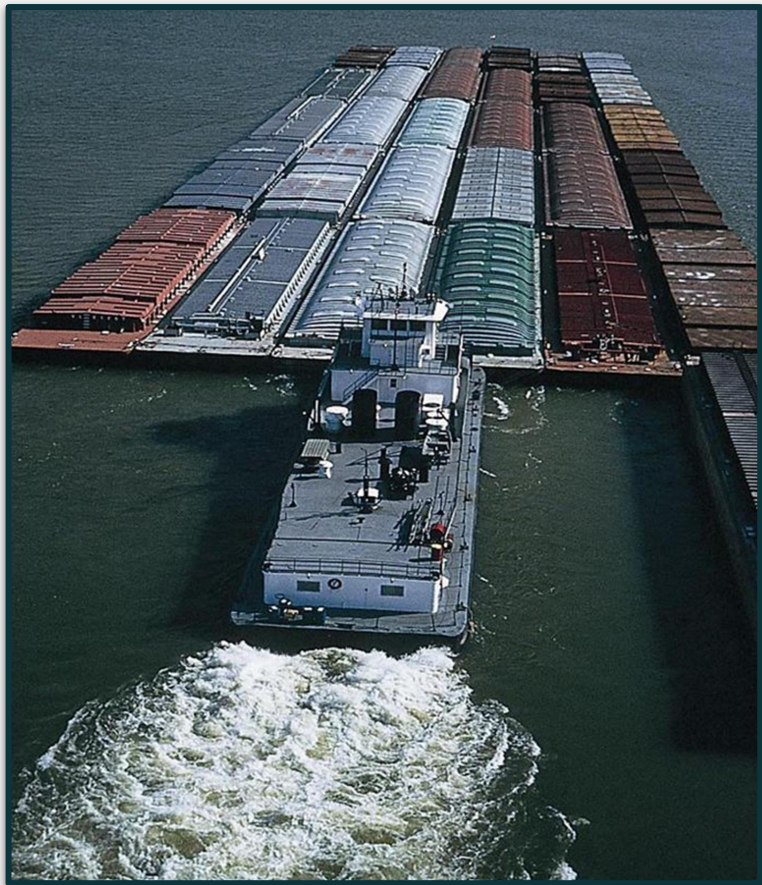
Easing Rail and Highway Congestion in our Communities

- Waterways provide great cargo capacity
- Move freight more safely, less congestion
- Barges carry 49 million truck trip equivalent

McAlpine's Top Commodities (2017)



Who will be the Biggest Winners and Losers?



- Shippers - Winners

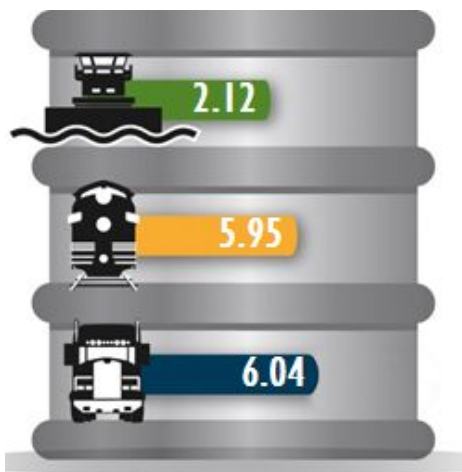
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- Public - Winners

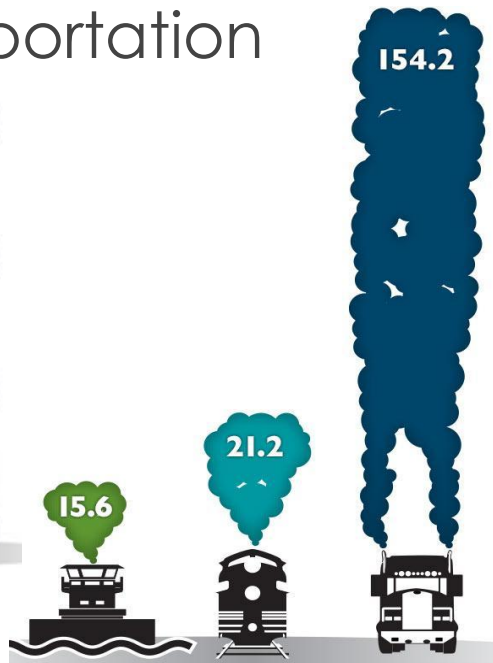
- Environment - Winners

Who will be the biggest winners and losers?

Barging is **THE** most efficient, greenest and safest mode of bulk transportation



Ton-Miles Traveled per Gallon of Fuel



Tons of CO₂ per Million Ton-miles



Spills of More Than 1000 Gallons



Fatalities



- Infrastructure Delivery

- More beneficiaries - sharing the cost burden



Infrastructure

- Improve reliability
- Improve capacity (NESP)
- Improve infrastructure delivery
- Improved Corps project delivery process
- Broaden beneficiaries support



Criton Corporation
Informa Economics IEG Barge Commodity Profile
Informa Economics IEG Barge Fleet Profile
National Waterways Foundation
Price Waterhouse Coopers
The American Waterways Operators
US Army Corps of Engineers
US Department of Transportation - Maritime Administration

Closing