

# Navigation Basics

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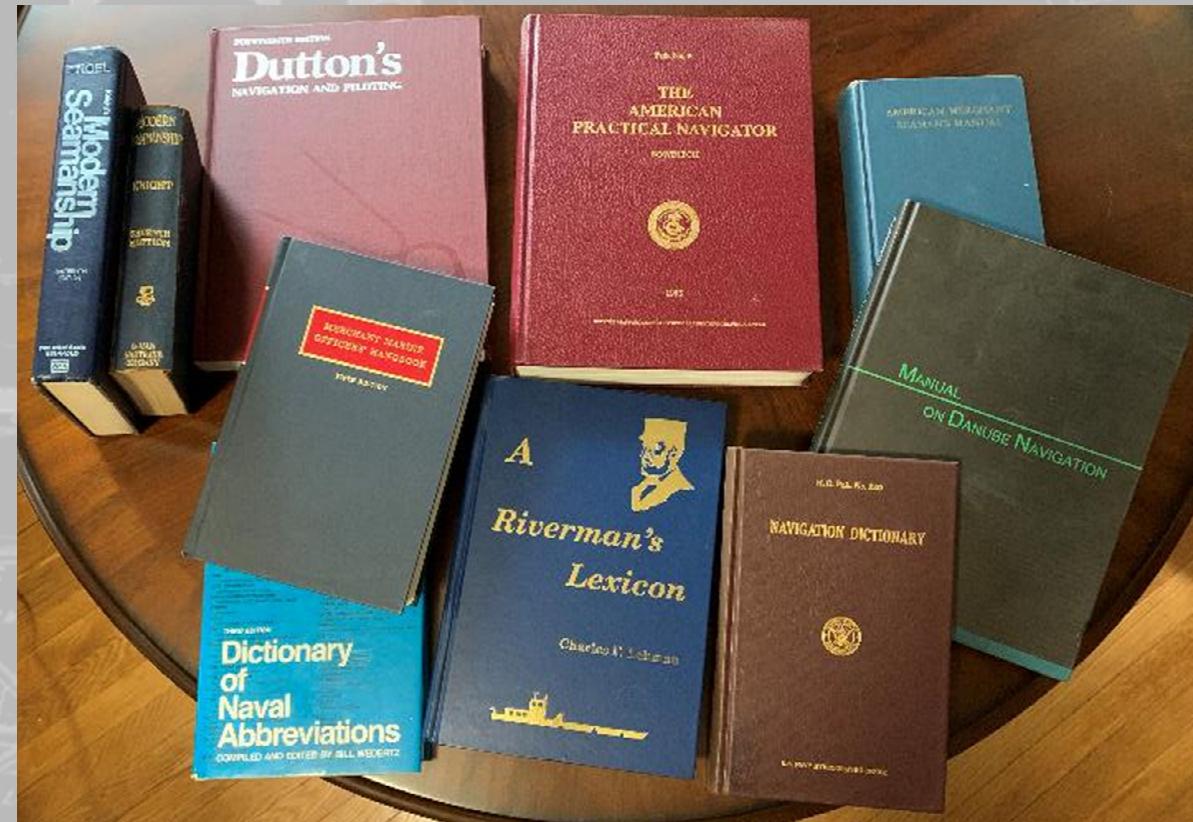
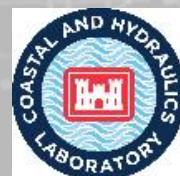
Coastal and Hydraulics Laboratory

Engineer Research and Development Center

10 May 2021



US Army Corps  
of Engineers ®



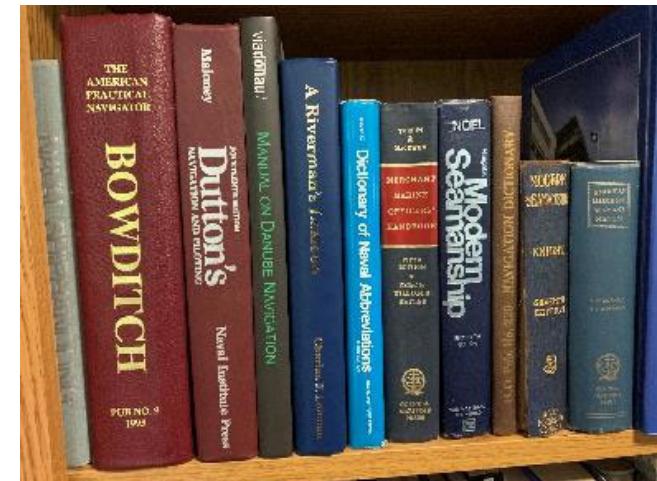
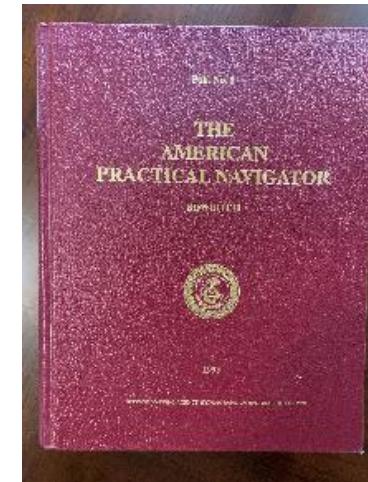


# Two thousand years of tradition unimpeded by progress

2



- Vessel terms
- Vessel types
- Channel terms
- Aids to Navigation (AtoN)
- Ports
- Inland waterway terms
- Locks



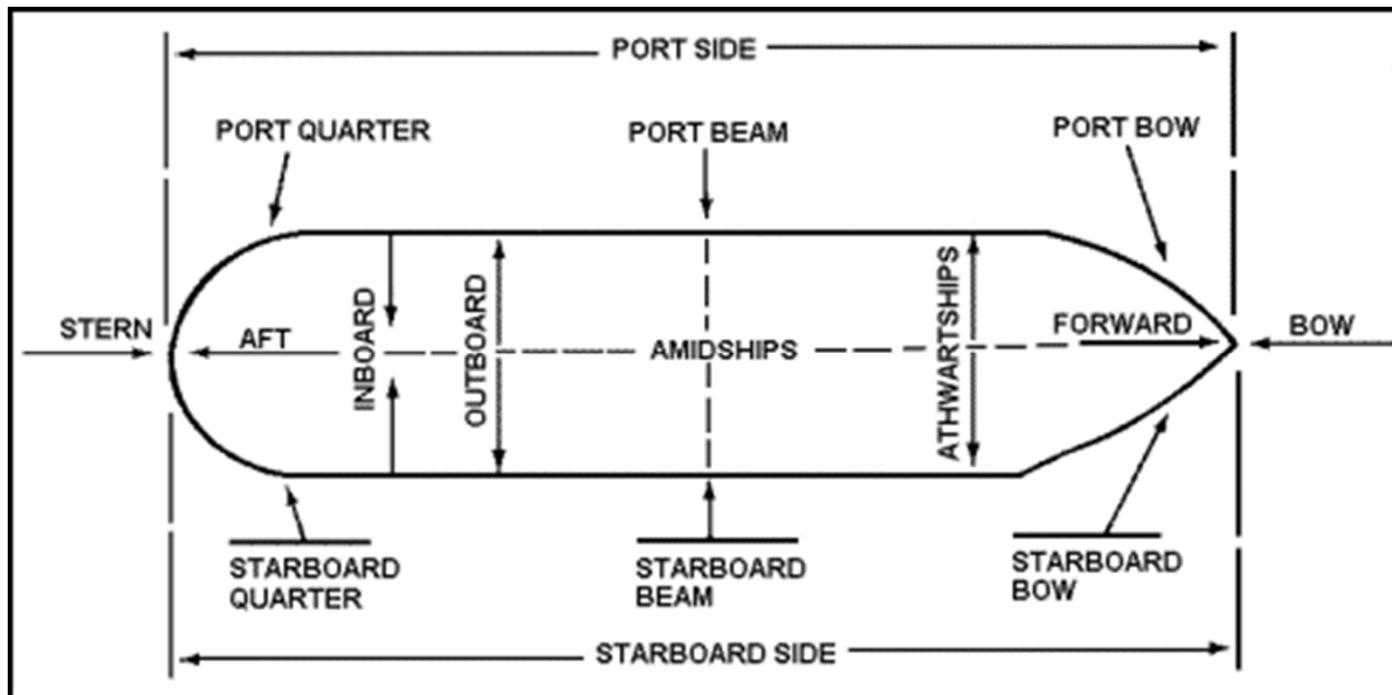


# Vessel terms

3



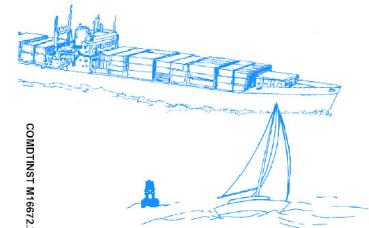
- Vessel: “every description of water craft, including nondisplacement craft and seaplanes, used or capable of being used as a means of transportation on water.” (Navigation Rules)



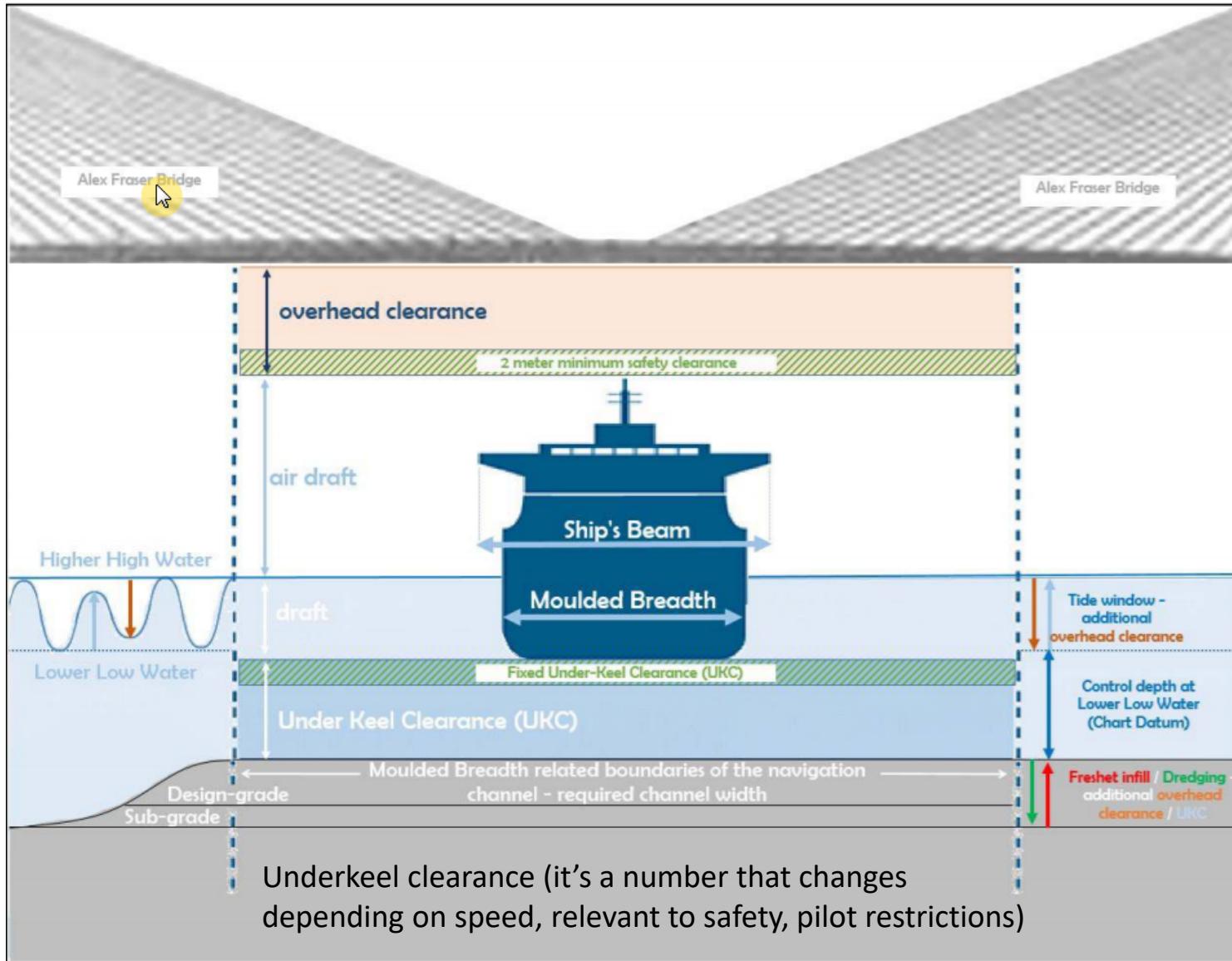
U.S. Department  
of Transportation  
United States  
Coast Guard



NAVIGATION RULES  
INTERNATIONAL—INLAND



CONTINUED FROM PAGE 22





# Vessel types

- These are from AIS
- There are many others...



Identifiers to be used by ships to report their type			
Identifier No.	Special craft		
50	Pilot vessel		
51	Search and rescue vessels		
52	Tugs		
53	Port tenders		
54	Vessels with anti-pollution facilities or equipment		
55	Law enforcement vessels		
56	Spare – for assignments to local vessels		
57	Spare – for assignments to local vessels		
58	Medical transports (as defined in the 1949 Geneva Conventions and Additional Protocols)		
59	Ships and aircraft of States not parties to an armed conflict		
Other ships			
First digit <sup>(1)</sup>	Second digit <sup>(1)</sup>	First digit <sup>(1)</sup>	Second digit <sup>(1)</sup>
1 – Reserved for future use	0 – All ships of this type	–	0 – Fishing
2 – WIG	1 – Carrying DG, HS, or MP, IMO hazard or pollutant category X <sup>(2)</sup>	–	1 – Towing
3 – See right column	2 – Carrying DG, HS, or MP, IMO hazard or pollutant category Y <sup>(2)</sup>	3 – Vessel	2 – Towing and length of the tow exceeds 200 m or breadth exceeds 25 m
4 – HSC	3 – Carrying DG, HS, or MP, IMO hazard or pollutant category Z <sup>(2)</sup>	–	3 – Engaged in dredging or underwater operations
5 – See above	4 – Carrying DG, HS, or MP, IMO hazard or pollutant category OS <sup>(2)</sup>	–	4 – Engaged in diving operations
	5 – Reserved for future use	–	5 – Engaged in military operations
6 – Passenger ships	6 – Reserved for future use	–	6 – Sailing
7 – Cargo ships	7 – Reserved for future use	–	7 – Pleasure craft
8 – Tanker(s)	8 – Reserved for future use	–	8 – Reserved for future use
9 – Other types of ship	9 – No additional information	–	9 – Reserved for future use

# Bulk carrier



Seagoing



Great Lakes

# Tugs and towboats



# Dredges



# Fishing boats



# Pleasure craft



# Passenger ships



# RoRo ships



# Tankers



# High speed craft



© Eberhard Hahn

vesseltracker.com



# Wing in ground (WIG)

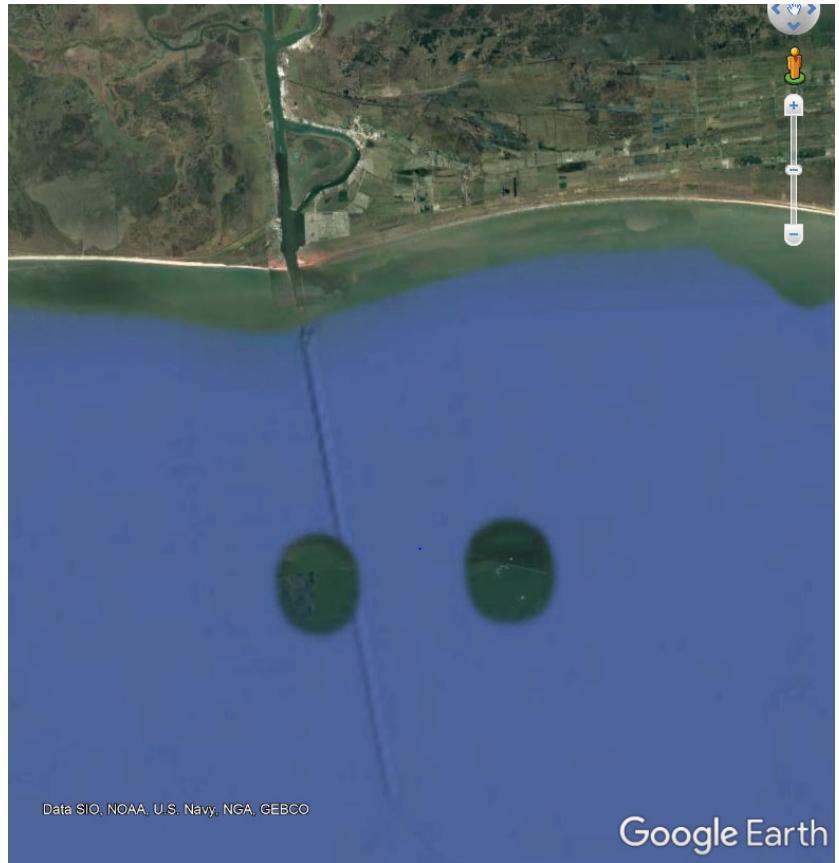
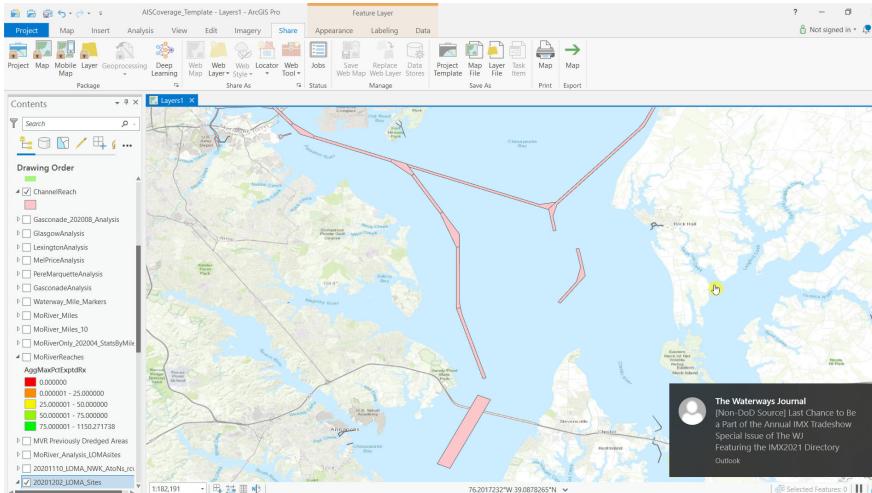
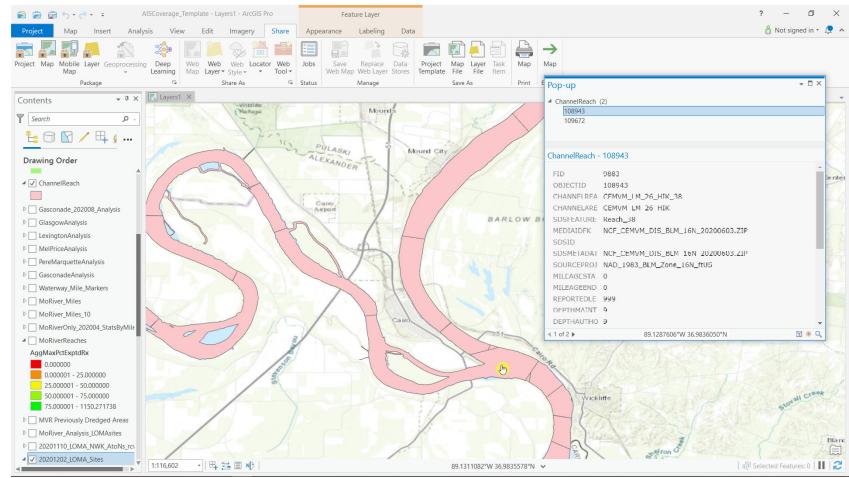




# Channels



16

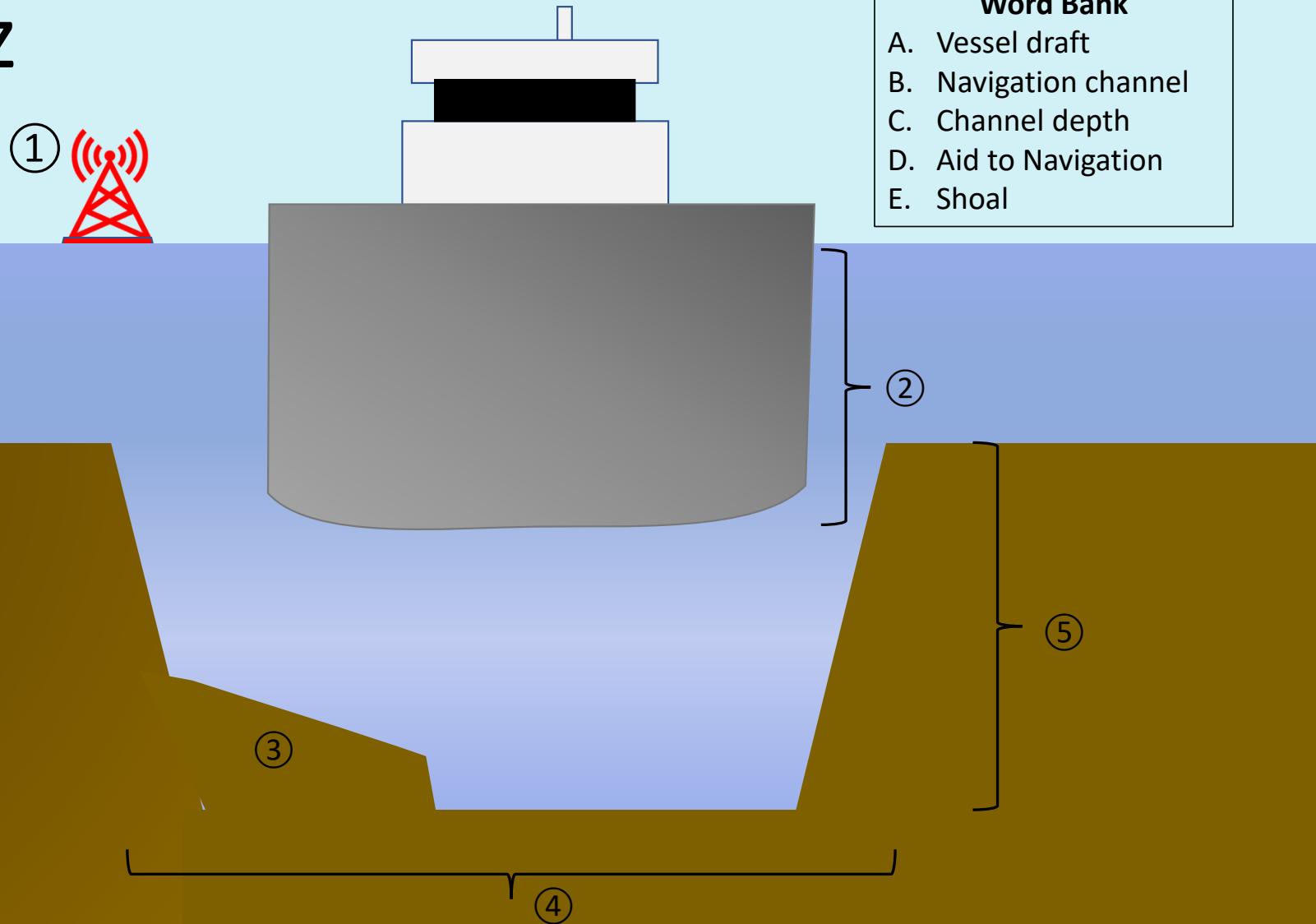


Calcasieu – Google Earth Satellite Image

Example of a  
Navigation  
Channel  
with/without  
Shoaling



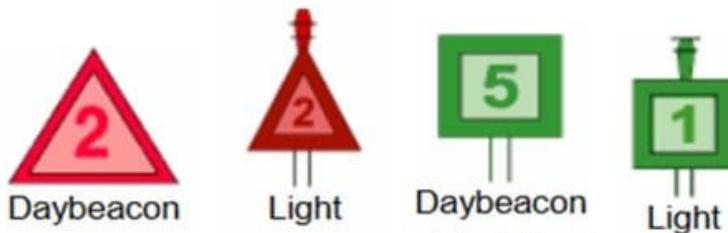
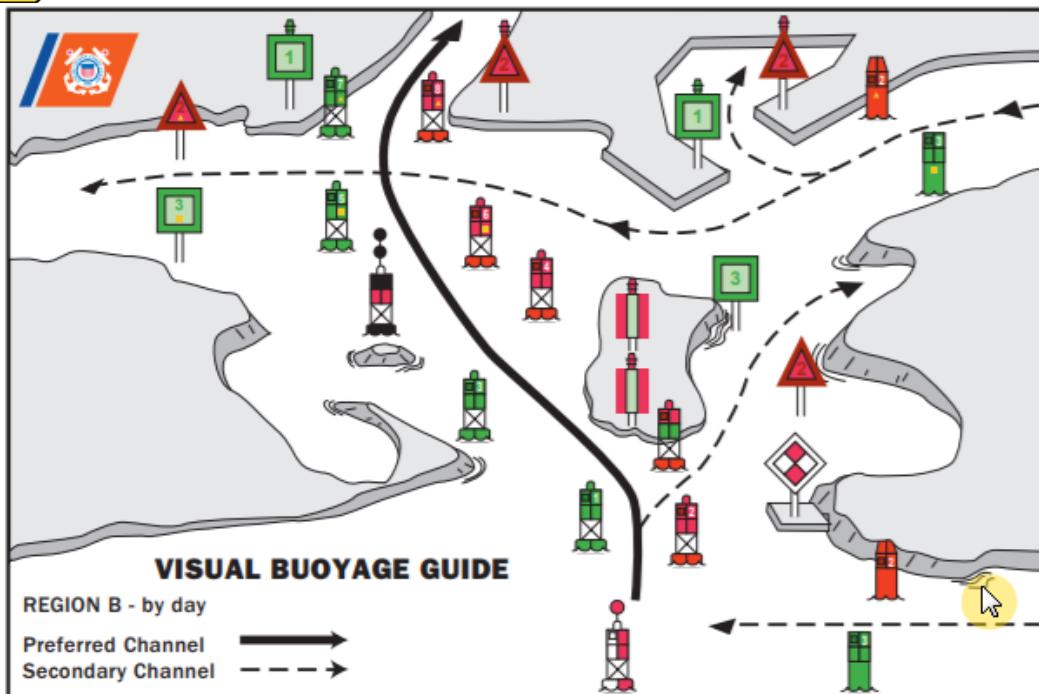
# Pop Quiz





# Aids to navigation (AtoN)

19





# Ports

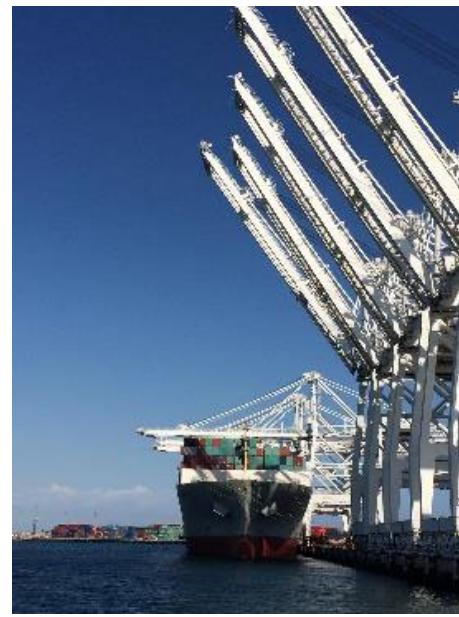
20



- Berths
- Docks
- Piers
- Terminals
- Port-Related authorities:
  - USCG Captain of the Port
  - Port authority
  - Pilots
- "Sea buoy"



# Coastal Port Examples

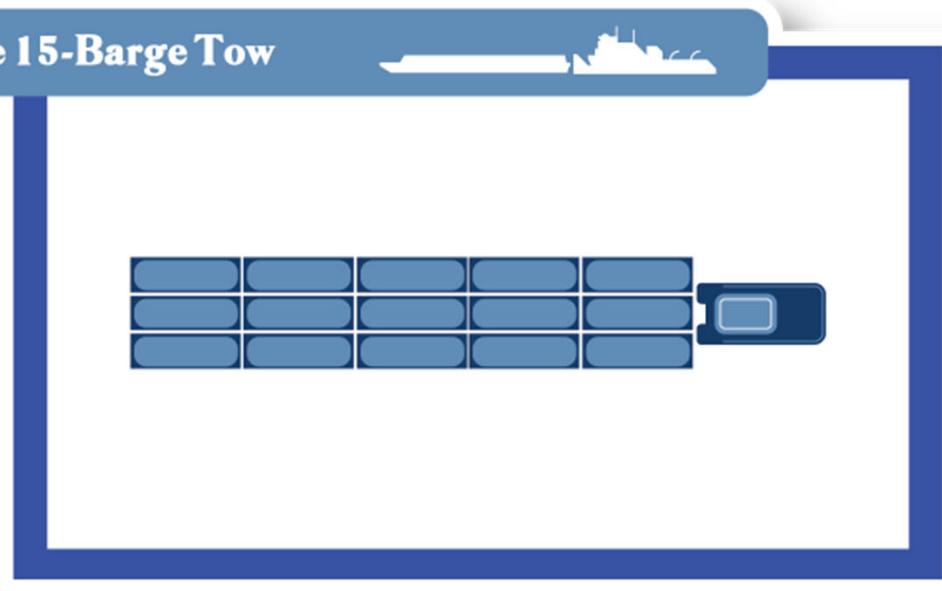


# Inland waterways

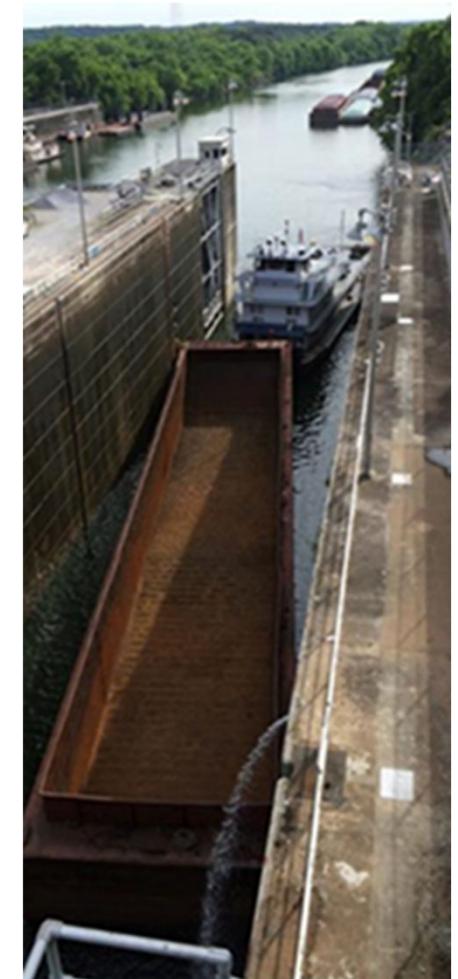
- Fleeting areas
- Towboat
- Tow terms – barge, flotilla



One 15-Barge Tow

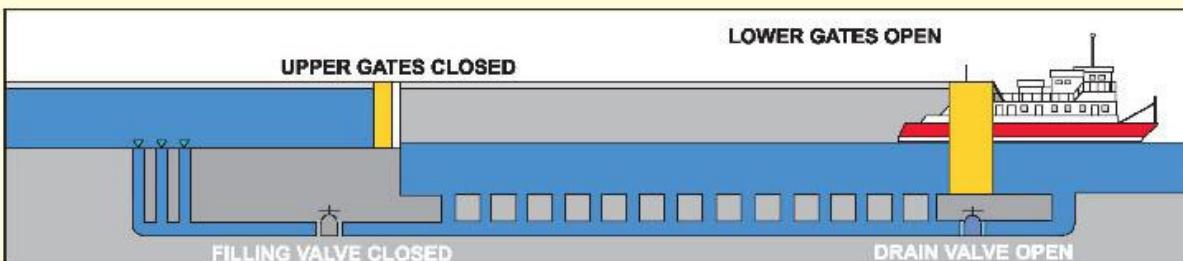
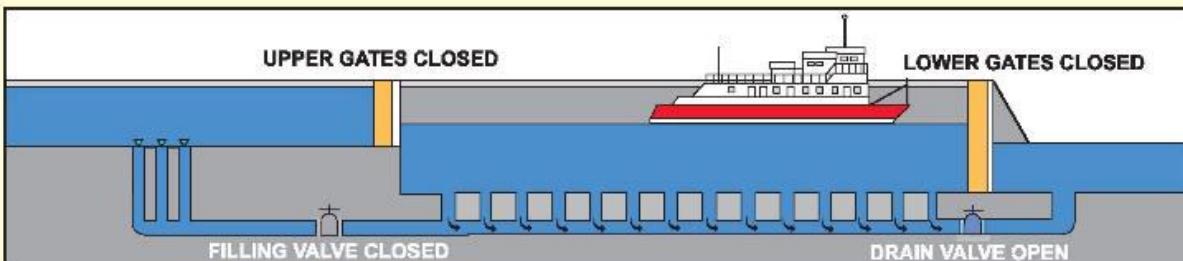
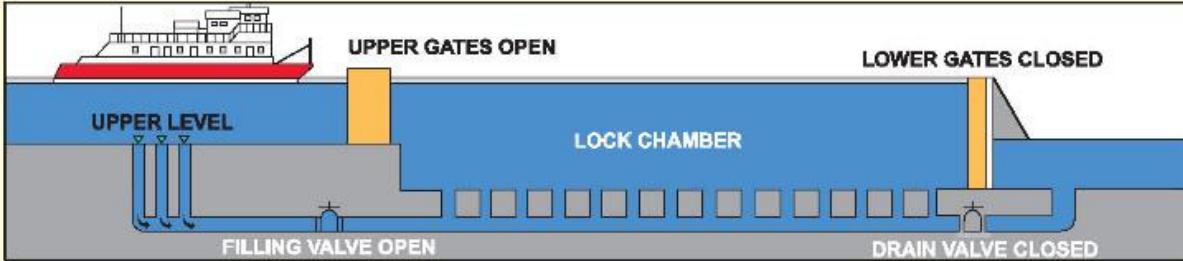


# Inland Tows

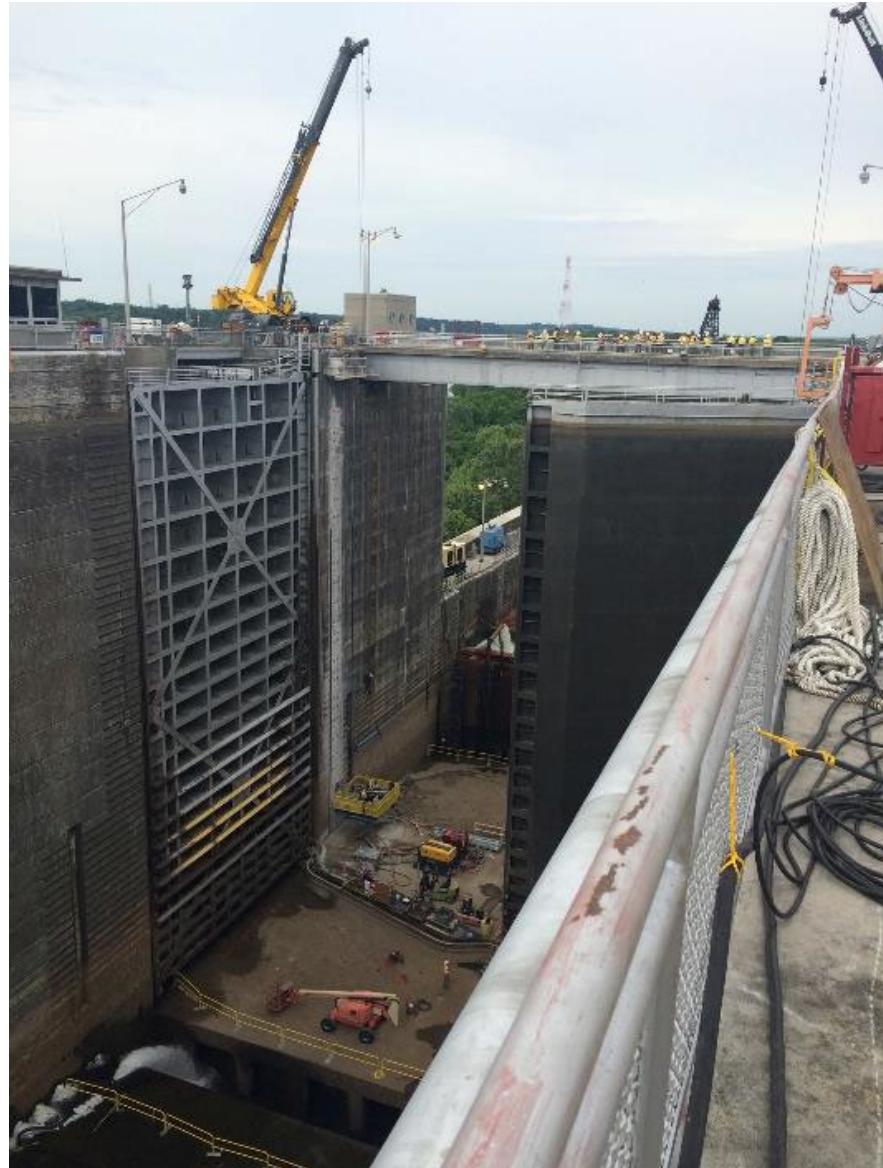


# Locks

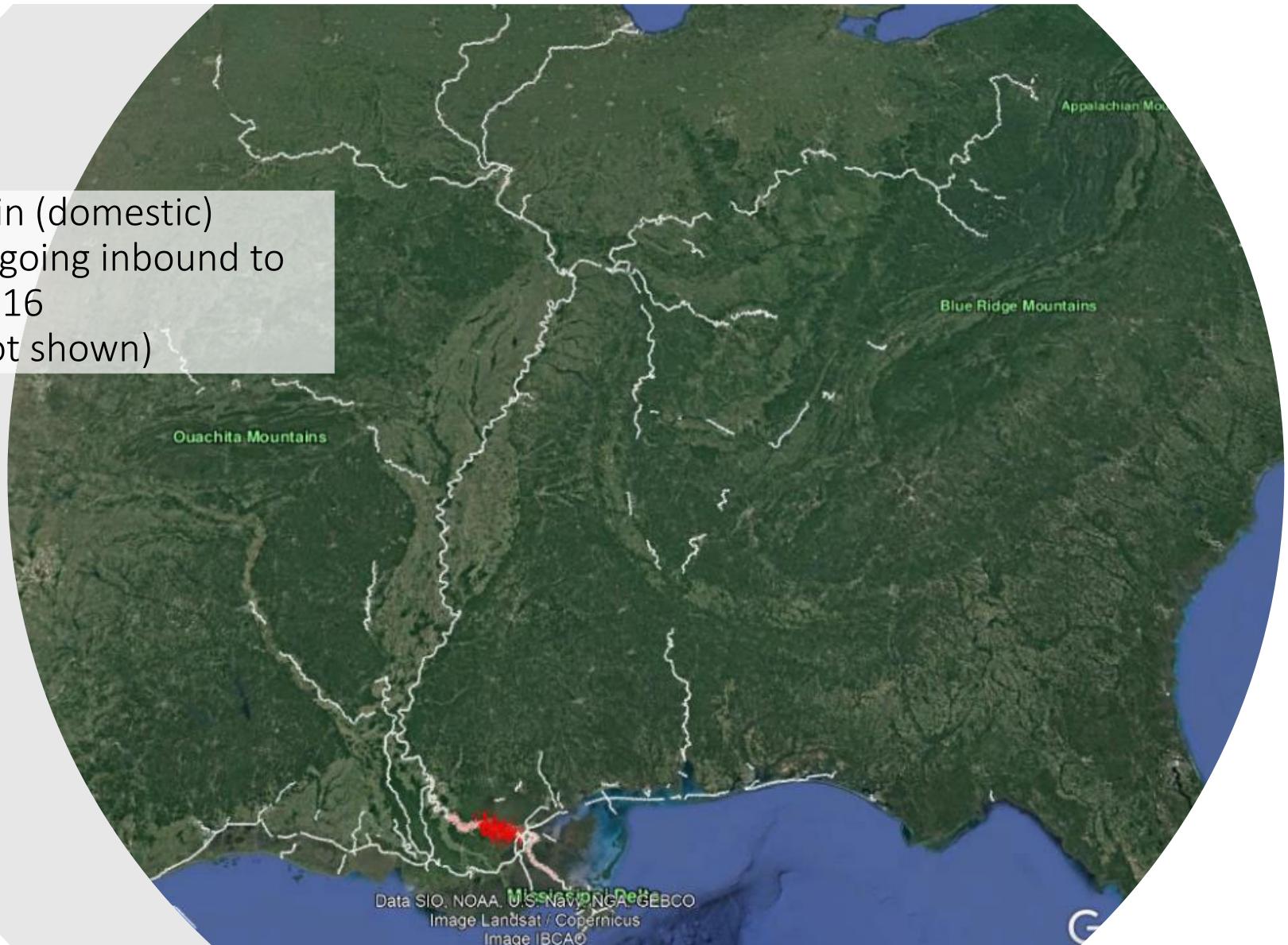
## How Locks Operate



# De-Watered Lock (Wilson Lock and Dam)



Extent of U.S. origin (domestic)  
reaches for traffic going inbound to  
New Orleans in 2016  
(Foreign origins not shown)



Boats are  
Delicious!

Questions?

