

A HISTORIC LOOK AT GALVESTON DISTRICT'S NAVIGATION PROGRAM & COASTAL RESILIENCY

Christopher Frabotta
Operations Division Chief
USACE-Galveston District



US Army Corps
of Engineers®

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Christopher Frabotta
Chief, Operations Division
Southwestern Division – Galveston District
Date: 11 February 2021



US Army Corps
of Engineers®



GALVESTON DISTRICT NAVIGATION SYSTEM

3



LEADING U.S. PORTS

(2019 tonnage)

Houston #1 – 284.9 million tons

#1 Foreign Tonnage & #2 Total Tonnage

Corpus Christi #4 – 111.2 m.tons

America's Energy Gateway

Beaumont #5 – 101.1 m.tons

#1 Military Port in World

Texas City #16 – 41.3 m.tons

Serves Largest Petrochemical Complex

Port Arthur #19 – 33.9 m.tons

Vital Break-Bulk Port

Freeport #23 – 29.8 m.tons

Connecting Global Services
Via Caribbean Relay Port

Galveston #47 – 11 m.tons

#1 Cruise Ship Port in gulf

Brownsville #68 – 6.6 m.tons

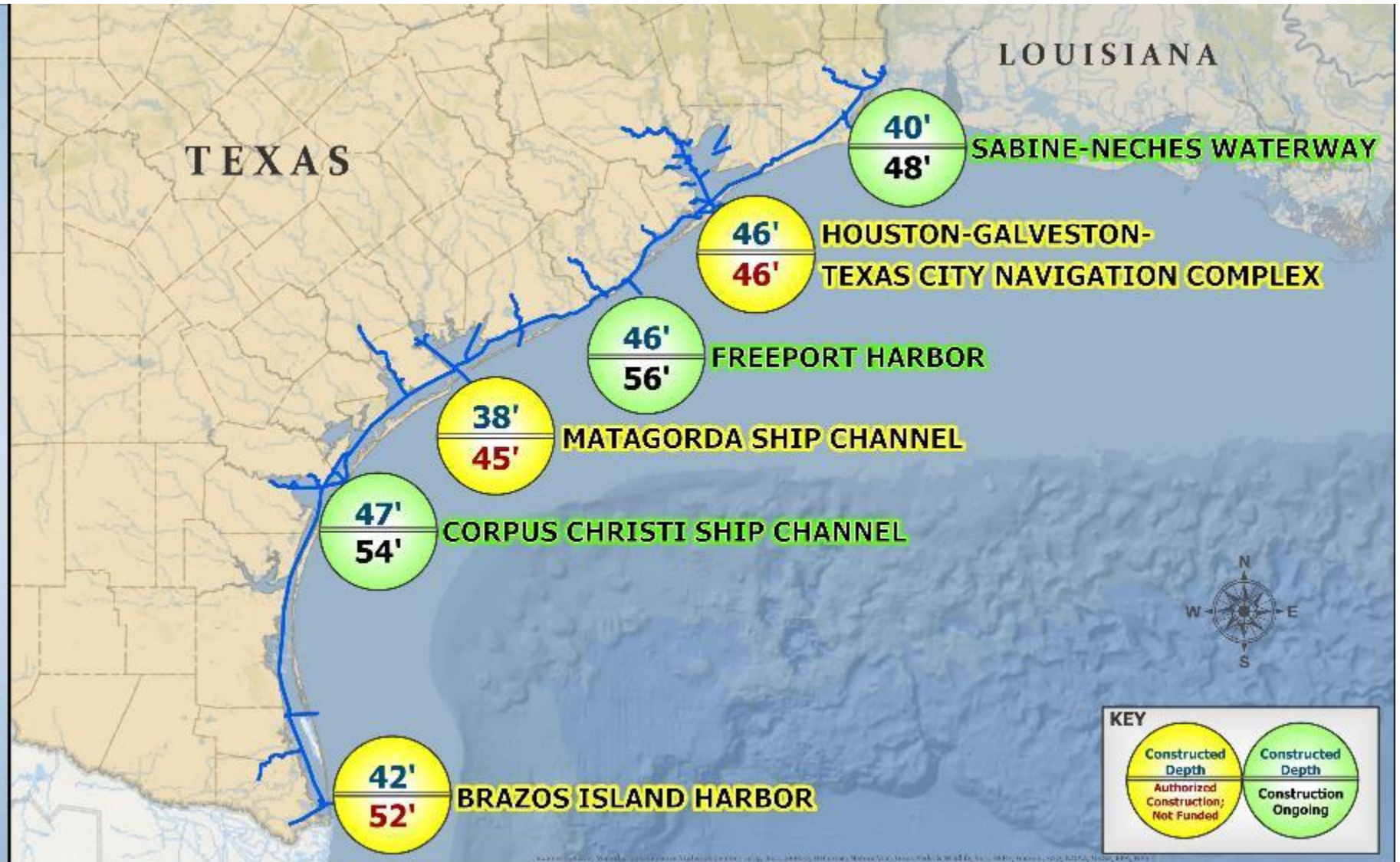
#1 Ship Recycling Port

Calhoun County Port #76 - 5.2 m.tons

(Matagorda Ship Channel)

Victoria #102 – 2.7 m.tons

#2 Shallow-Draft Port for Domestic
Crude Petroleum





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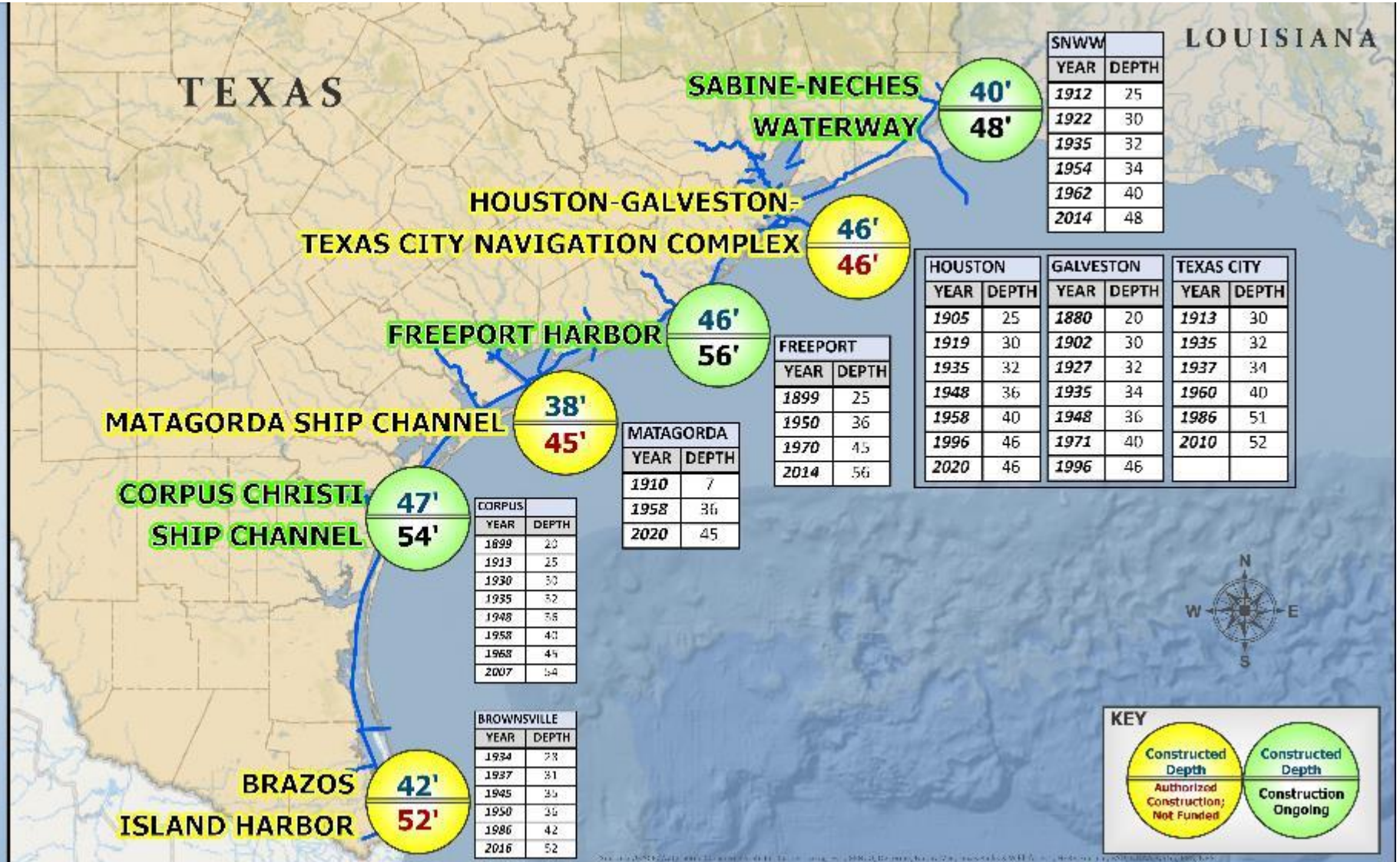
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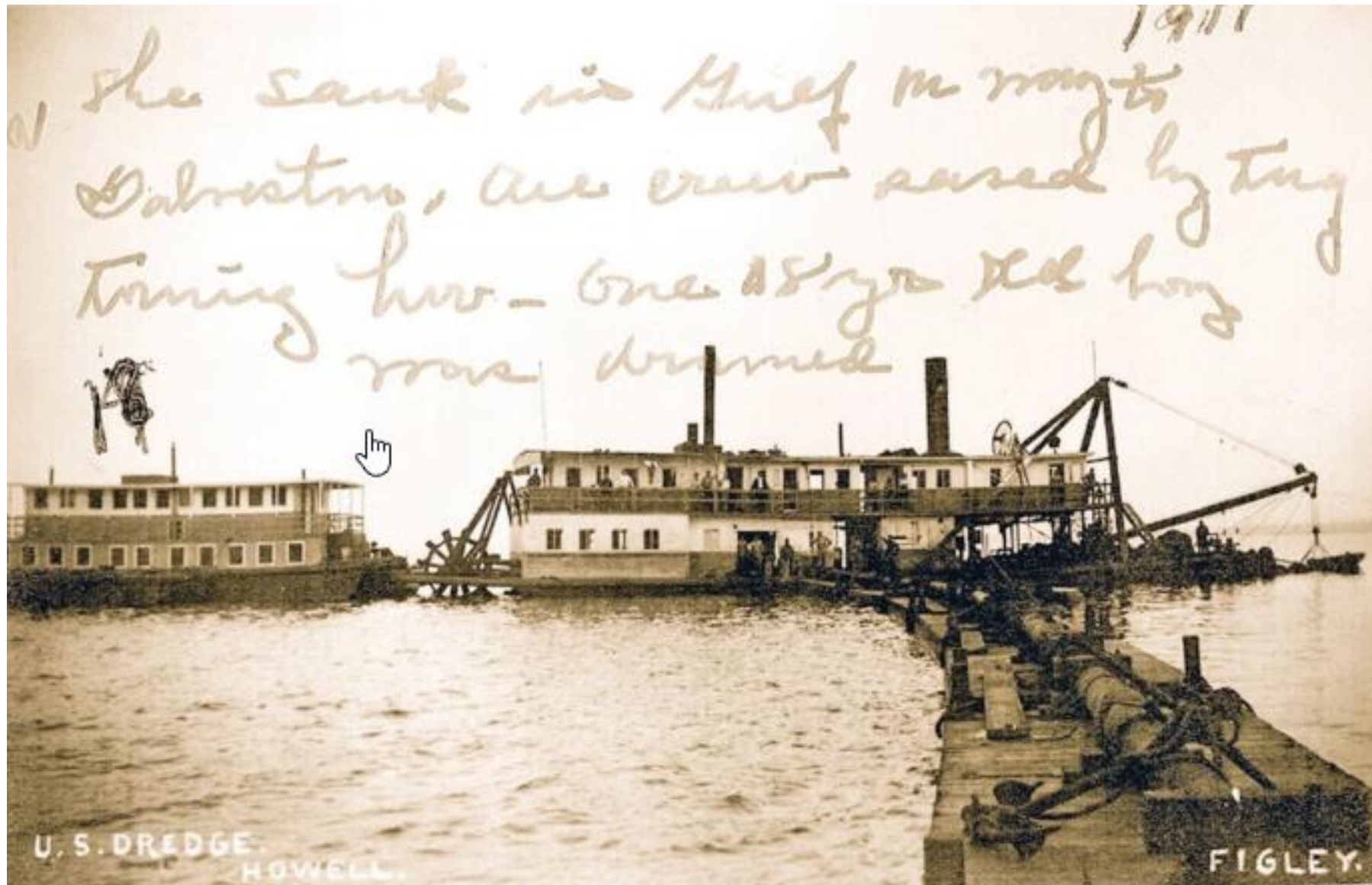
#2 Shallow-Draft Port for Domestic
Crude Petroleum



HYDRAULIC PIPELINE DREDGE 'GEORGE SEALY'



HYDRAULIC PIPELINE DREDGE 'HOWELL'



HYDRAULIC HOPPER DREDGE 'GENERAL C.B. COMSTOCK'






U.S. ARMY CORPS OF ENGINEERS DREDGE PLANT RECRUITMENT PAMPHLET

8



LOOKING TOWARDS THE FUTURE



a rewarding
CAREER
with the
Corps of Engineers
DREDGING FLEET

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
An equal opportunity employer

Looking towards the Future

One of the most important decisions you face prior to graduation is the selection of a challenging and meaningful career. It is, therefore, desirable to thoroughly evaluate job opportunities offered to you. You should consider the organization with which you will be associated, the promotional opportunities leading to advancement and the personal challenges and satisfaction to be gained from the position you select. The Corps of Engineers has career openings for licensed Third Mates and Third Engineers (Steam and/or Diesel) aboard Hopper and Sidecasting Dredges that are engaged in improving and maintaining waterways in the Continental United States and in Overseas areas. We believe these employment opportunities warrant your careful consideration.



WHO WE ARE

The Corps of Engineers, Department of the Army is the largest engineering and construction organization in the world. It has earned a reputation for transforming impossible tasks into realities. The variety of the engineering projects, both civil and military, performed by the Corps is unparalleled by any industrial or governmental organization.

WHAT WE DO

In addition to the work of improving and maintaining the navigable waterways and harbors of the United States, our responsibilities encompass the following major areas:

Design and construction of beach restoration and nourishment projects which include the installation of jetties, groins and placement of material to restore offshore slopes to a stable condition.

The design and installation of structures and revetments for channel stabilization and to protect the slopes and levees of major waterways such as the Missouri and Mississippi Rivers.


The construction, maintenance and operation of flood control structures, hydro-electric dams including irrigation and recreation features, and the locks, spillways and dams required in canalized projects.

The design and construction of major structures and facilities for the Army and other military services including guided-missile sites, air bases, hospitals, training facilities, munitions plants and similar facilities that are vital to defense and to the advancement of the Country.

The design and construction of major structures and facilities for NASA and other Civil Agencies including vertical assembly buildings, gantry cranes, control stations and launching pads for space exploration.

Surveying and mapping of the Earth's surface and preparation of Lunar and Mars mapping programs. Development and distribution of maps required by the U.S. Army.

PAGE ONE



THE DREDGING FLEET OF THE CORPS OF ENGINEERS

The descriptions and illustrations provided in this brochure furnish general information concerning the operation and missions of the Corps of Engineers Dredging Fleet. The missions of individual units in their assigned Districts are briefly covered on pages six to 13 inclusive. A table of vital statistics is given on pages four and five and characteristic hopper dredge components are flagged on page three opposite.

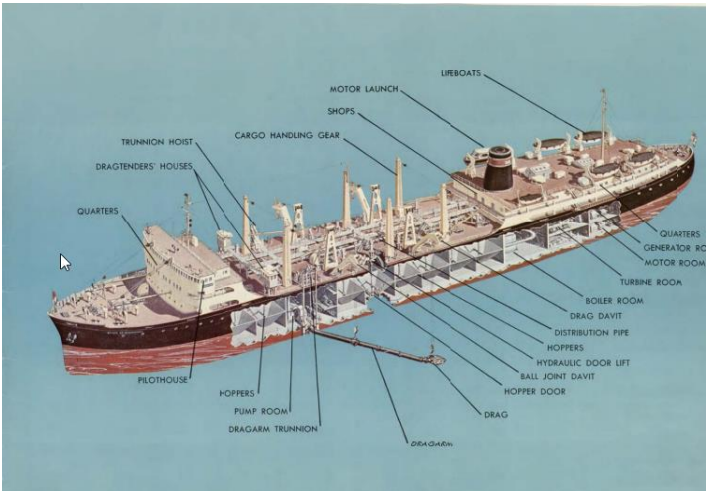
THE HOPPER DREDGE works on a principle similar to a vacuum cleaner. The dredge has pipes called dragarms extending from each side of the hull. Drags at the end of each dragarm are lowered to the bottom and slowly pulled over the area to be dredged. Pumps create suction in the dragarm and the silt or sand is drawn up through the arms and deposited in bins in the mid-section of the dredge. When the bins are full, the dredge proceeds to a place of disposal where the load is either directly pumped ashore or material is dumped through bottom doors in deep water. When disposing loads by pump-

ing out, the dredge pumps draw the material out of the hopper bins and force it through a pipeline into a disposal area on shore.

Dredging is also performed by sidecasting the material, which is discharged through a sidecasting boom outside the channel limits on certain projects where littoral currents carry the dredged material from the channel area.

Survey vessels fitted with electronic equipment make underwater surveys to determine when the desired project depth of the channel has been obtained by the dredge.

PAGE TWO



TRUNNION HOIST
DRAGTENDERS' HOUSES
QUARTERS
PILOTHOUSE
HOPPERS
PUMP ROOM
DRAGARM TRUNNION
MOTOR LAUNCH
SHOPS
CARGO HANDLING GEAR
LIFEBOATS
QUARTERS
GENERATOR ROOM
MOTOR ROOM
TURBINE ROOM
BOILER ROOM
DRAG DAVIT
DISTRIBUTION PIPE
HOPPERS
HYDRAULIC DOOR LIFT
BALL JOINT DAVIT
HOPPER DOOR
DRAG
DRAGARM

TYPICAL HOPPER DREDGE COMPONENTS (DREDGE ESSAYONS)

PAGE THREE



SALIENT FEATURES of the HOPPER DREDGES of the CORPS OF ENGINEERS												
Dredge	Year Built	Length Beam & Depth (feet)			Maximum Hopper Capacity (cu. yds.)	Maximum Draft Loaded	Propulsion H.P. & Type* (all twin screw)	Dredge Pumps				
								No.	Size	Horsepower Each Hopper	Pump-out	
ESSAYONS	1950	525	72	40	8270	31' 0"	8000 TE	2	32"	1850	—	
GOETHALS	1938	476	69	36	6422	29' 0"	6000 TE	2	30"	1300	3000	
BIDDLE	1947	352	60	30	3060	24' 4"	6000 TE	2	28"	1150	—	
COMBER	1947	352	60	30	3524	24' 4"	6000 TE	2	28"	1150	3000	
GERIG	1947	352	60	30	3060	24' 4"	6000 TE	2	28"	1150	—	
LANGFITT	1947	352	60	30	3060	24' 4"	6000 TE	2	28"	1150	—	
HARDING	1939	308	56	29	2682	20' 3"	4240 D	2	20"	1000	—	
MARKHAM	1960	339	62	28	2681	20' 0"	5300 DE	2	23"	650	1000	

*TE—Turbo-Electric; DE—Diesel-Electric; D—Diesel Direct Drive

PAGE FOUR

Dredge	Year Built	Length Beam & Depth (feet)			Maximum Hopper Capacity (cu. yds.)	Maximum Draft Loaded	Propulsion H.P. & Type (all twin screw)	Dredge Pumps				
								No.	Size	Horsepower Each Hopper	Pump-out	
MACKENZIE	1924	268	46	23	1656	21' 0"	2400 DE	1	26"	900	—	
HAINS	1942	216	40	16	885	13' 0"	1400 DE	1	20"	410	4' 0	
HOFFMAN	1942	216	40	16	920	13' 0"	1400 DE	1	20"	410	—	
HYDE	1945	216	40	16	720	13' 0"	1400 DE	1	20"	410	—	
LYMAN	1945	216	40	16	920	13' 0"	1400 DE	1	20"	410	—	
DAVISON	1945	216	40	16	720	13' 0"	1400 DE	1	20"	410	—	
PACIFIC	1937	180	38	14	500	11' 3"	1200 D	1	18"	340	—	
McFARLAND	1967	300	74	33	3140	23' 0"	6000 DE	2	26"	2800	2800	

PAGE FIVE

GALVESTON DISTRICT

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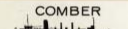
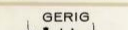

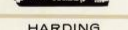
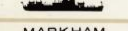
To accomplish this mission, the GALVESTON District operates two hopper dredges, the 3060 cubic yard capacity McFARLAND and the 1656 cubic yard capacity A. MACKENZIE. These vessels operate 24 hours a day, six or seven days a week, 12 months a year, except when under repair. Work schedules for the crew are arranged on a rotating shift basis to allow two to four consecutive days off duty each two weeks, including at least one four-day off period each four weeks.

DREDGE MACKENZIE

DREDGE McFARLAND

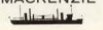

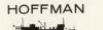

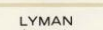
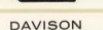
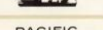
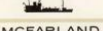


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Dredge	Year Built	Length Beam & Depth (feet)	Maximum Hopper Capacity (cu. yds.)	Maximum Draft Loaded	Propulsion H.P. & Type* (all twin screw)	No.	Dredge Pumps Size	Horsepower Each Hopper	Pump-out
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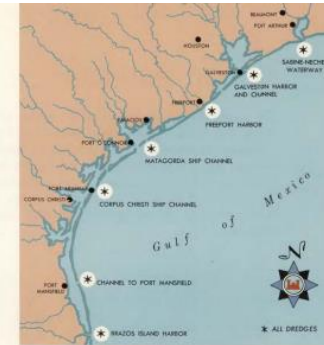
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DREDGE MCFARLAND



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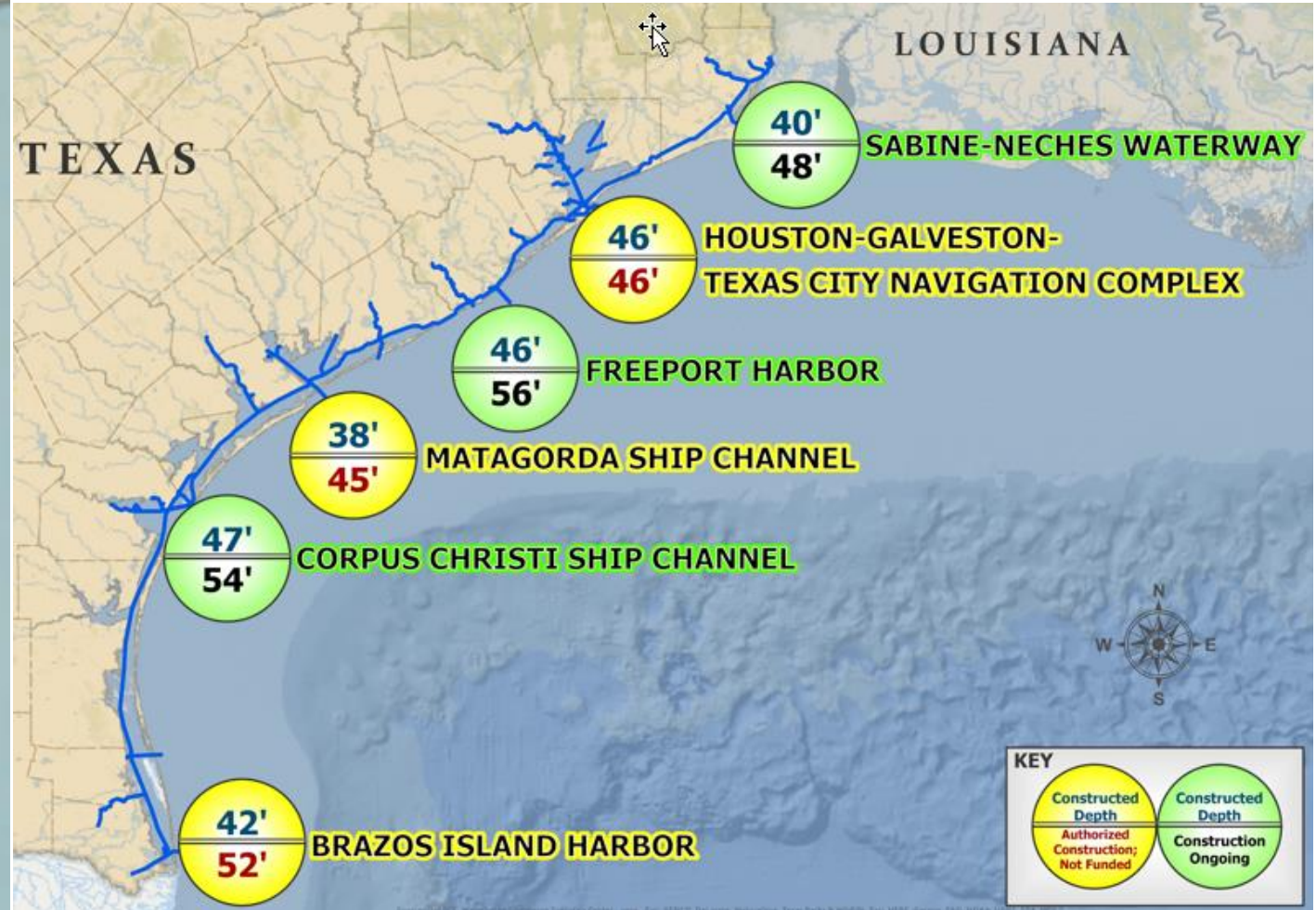


DREDGE MACKENZIE

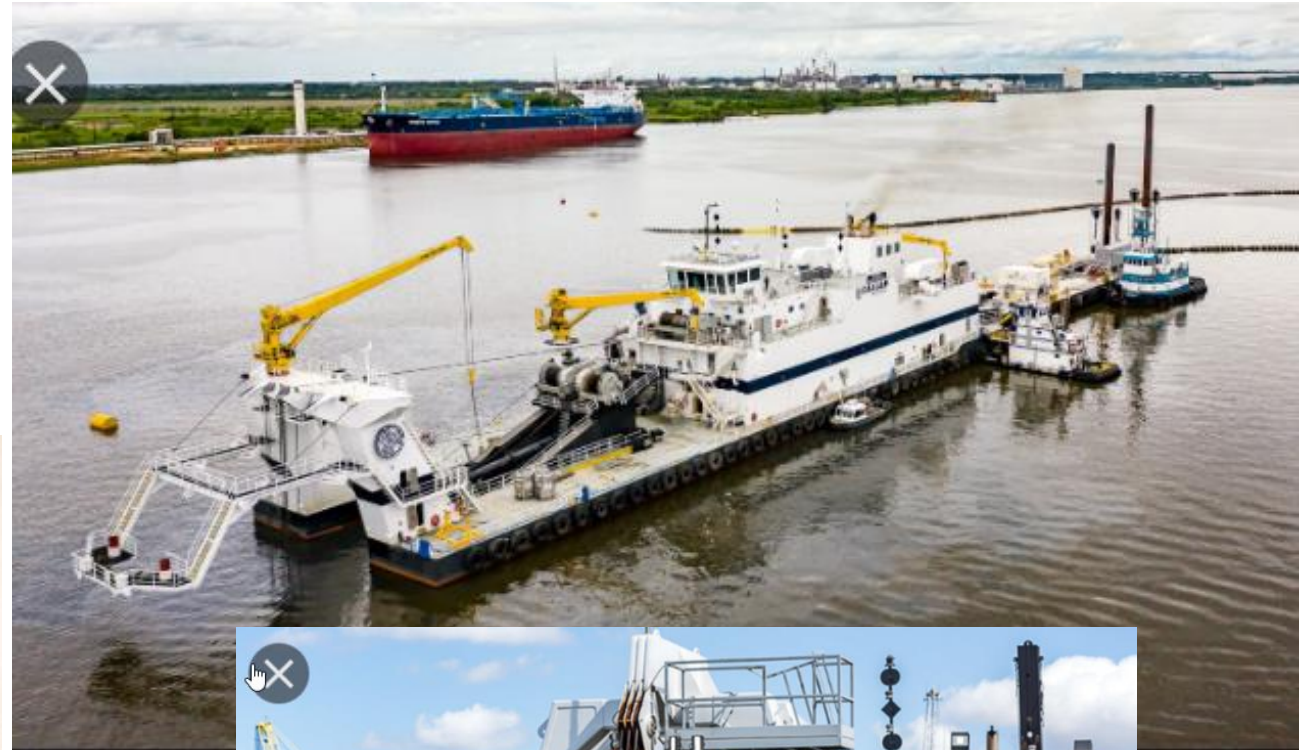
DREDGE MCFARLAND







HYDRAULIC PIPELINE DREDGES



TRAILING SUCTION HOPPER DREDGES



SPLIT-HULL HOPPER DREDGE



MECHANICAL DREDGING EQUIPMENT

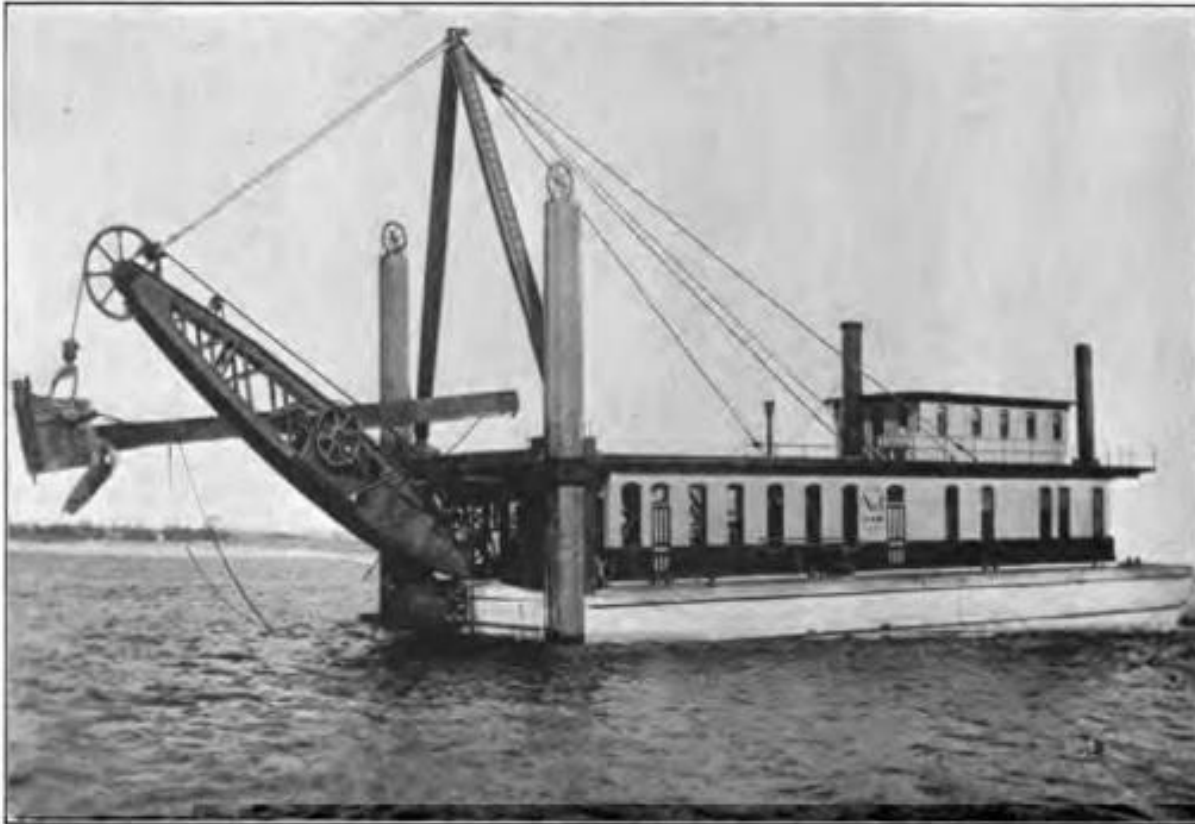


FIG. 9.—Six yard Bucyrus dipper dredge owned by Daly & Hannan—equipped with 16" X 18" main engines. (Courtesy of the Bucyrus Co.)



RESILIENT NAVIGATION



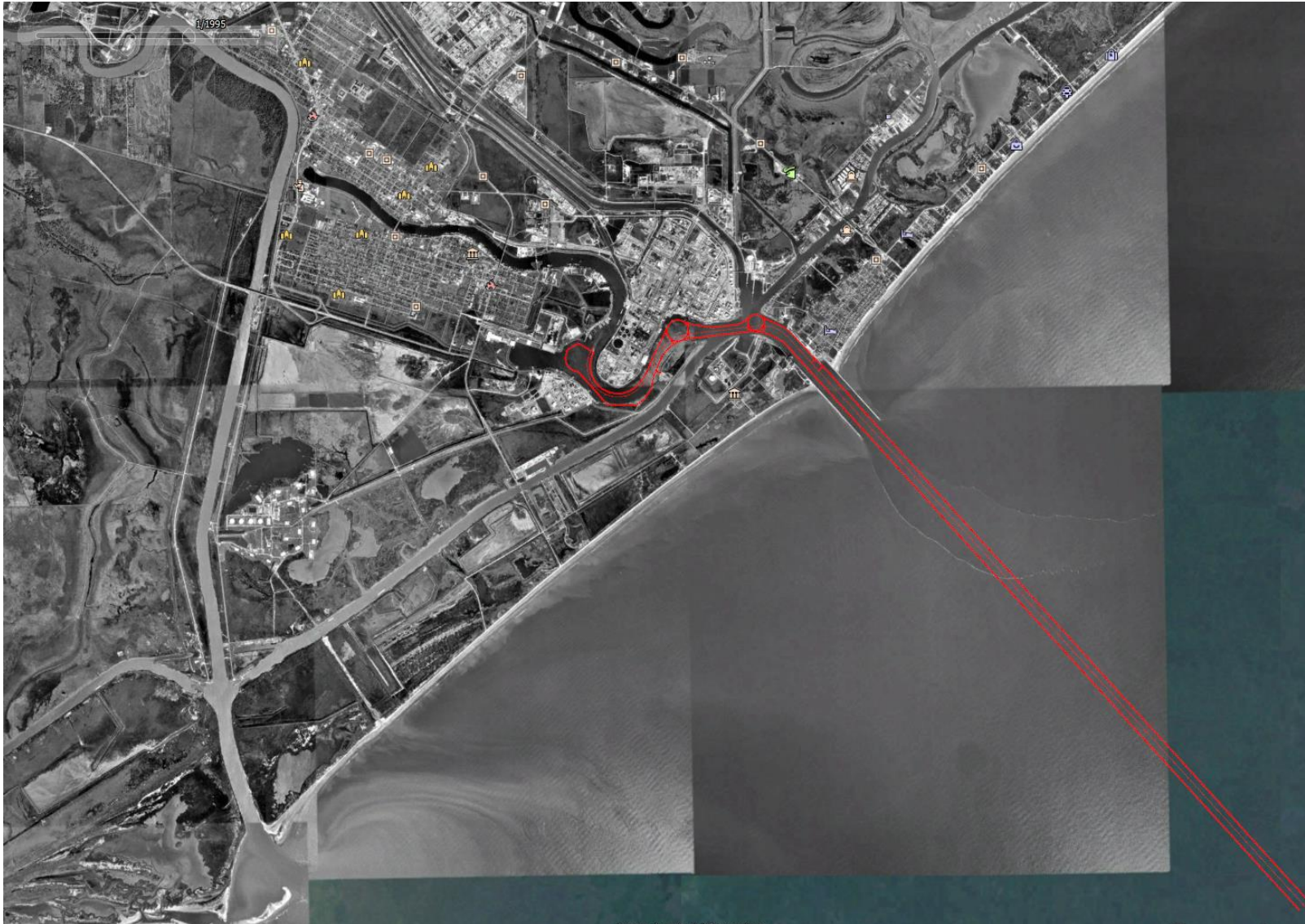
RESILIENT NAVIGATION



RESILIENT NAVIGATION



RESILIENT NAVIGATION



This map illustrates the Texas Gulf Coast region, showing major cities, rivers, and waterways. Key locations include Houston, Galveston, Victoria, Port Lavaca, Matagorda, Bay City, West Columbia, El Campo, and Corpus Christi. The Colorado River and Brazos River are highlighted, with callouts for 'Brazos River Floodgates' and 'Colorado River Locks'. Other labeled waterways include Galveston Bay, Matagorda Bay, San Antonio Bay, Copano Bay, Aransas Bay, and Rockport Bay. The Gulf of Mexico is shown to the south.



RESILIENT NAVIGATION

- **Minimize shoaling at river crossings**
- **Safety**



Brazos River Floodgates



Colorado River Locks

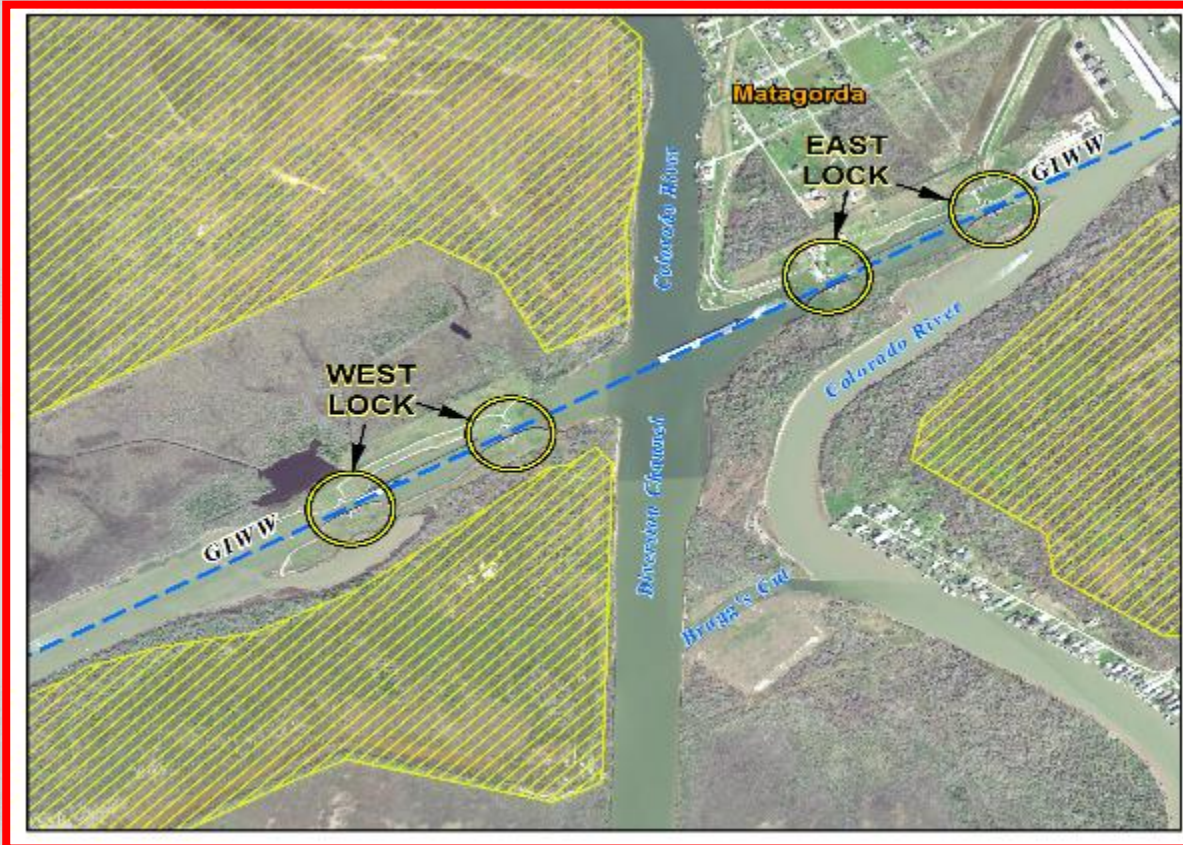


BUILDING STRONG®

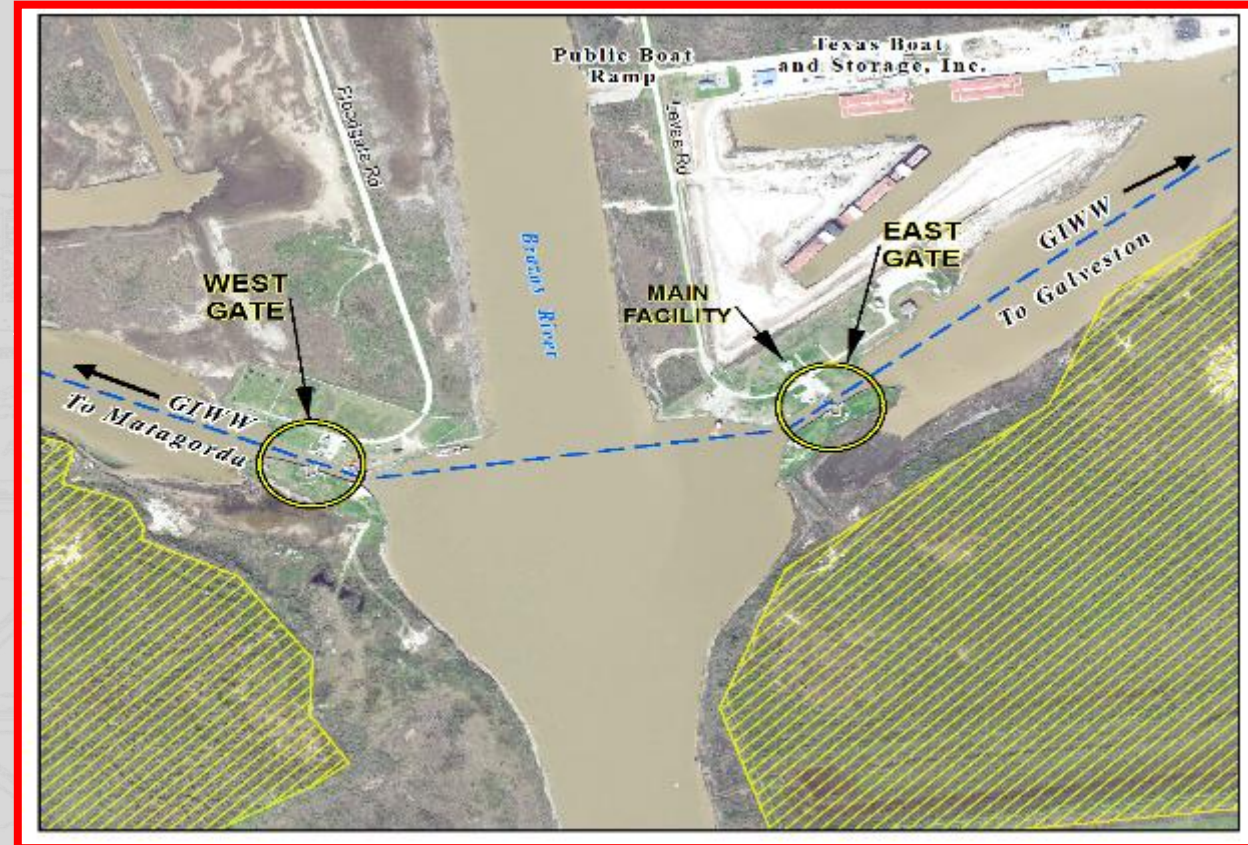
RESILIENT NAVIGATION

27

Colorado River Locks

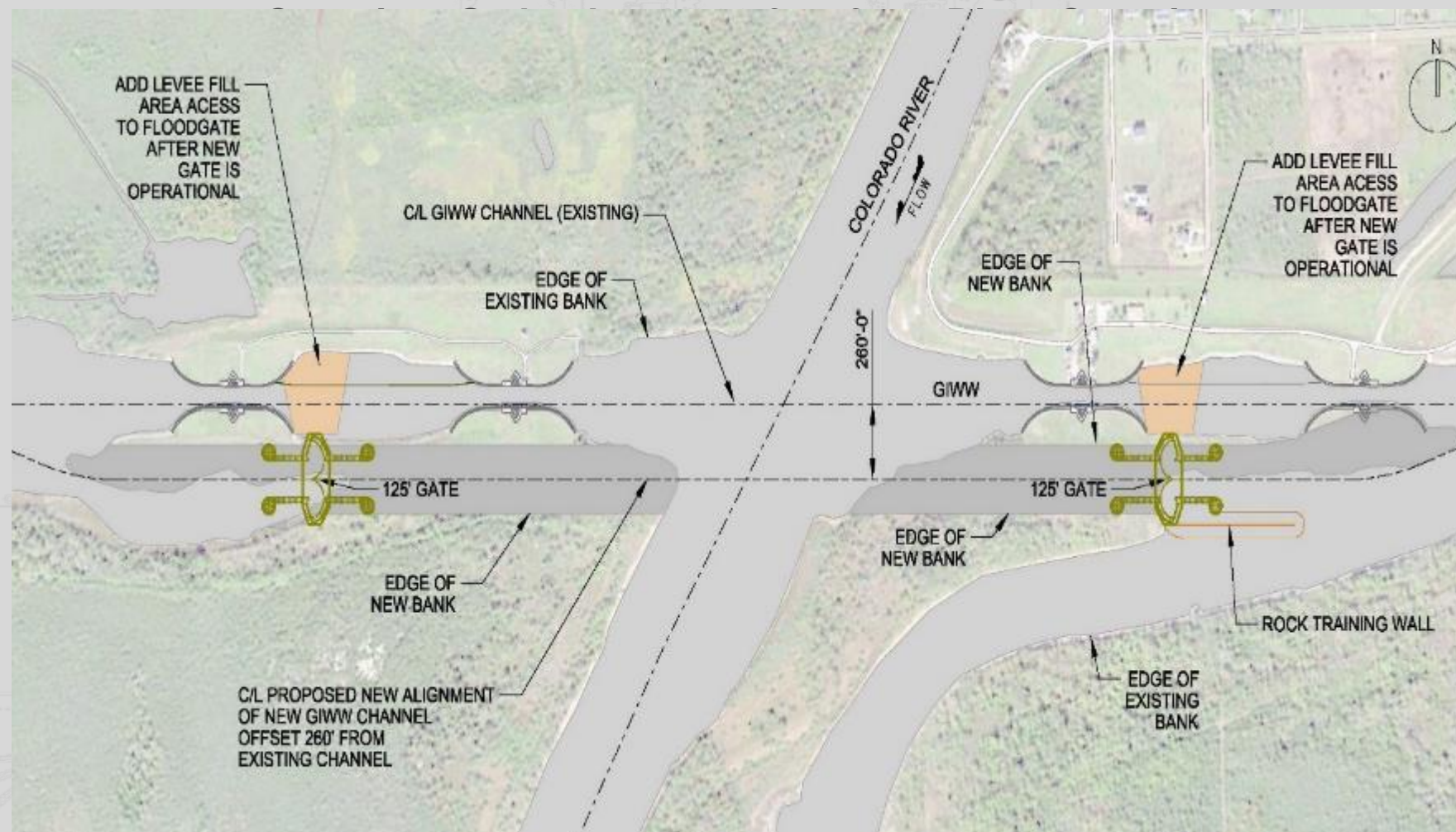


Brazos River Floodgates



RECOMMENDED PLAN (CRL COMPONENT)

Convert both locks to 125' flood Riverside floodgates on both sides of



US Army Corps of Engineers.

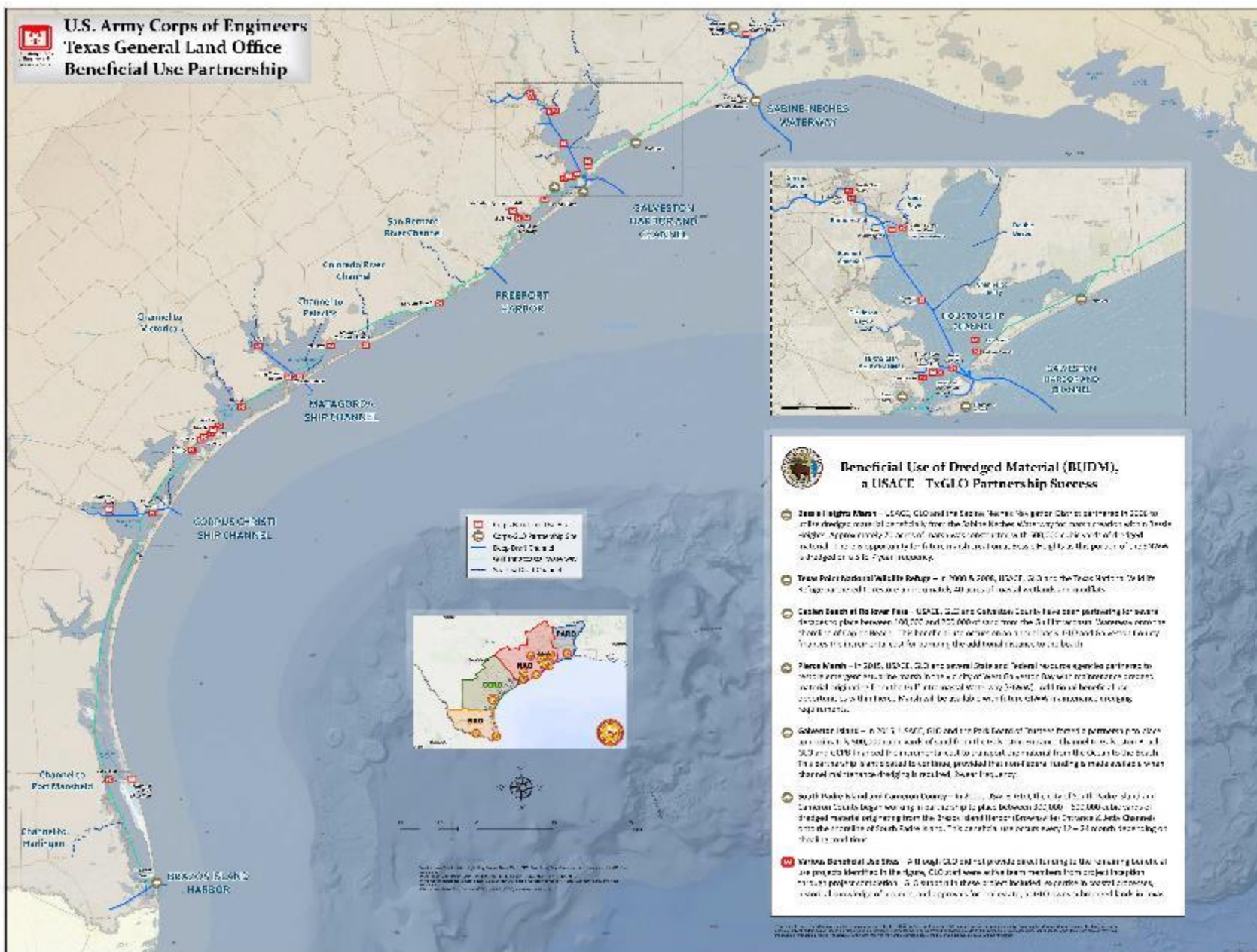


RECOMMENDED PLAN (BRFG COMPONENT)

125' Gates/Open West, New 125' Sector Gate on East setback ~1,200' from Existing

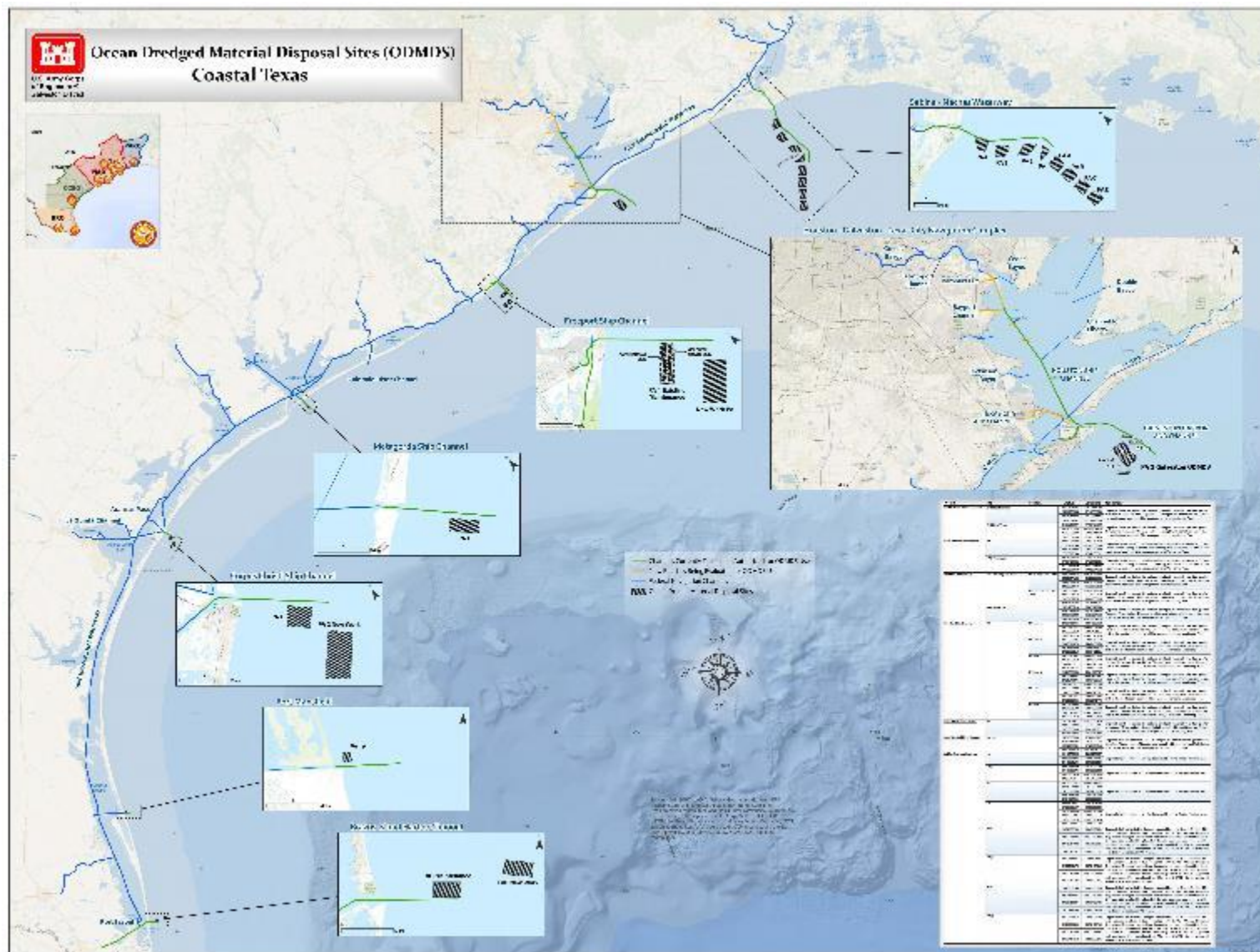


RESILIENCY NAVIGATION THROUGH BENEFICIAL USE





RESILIENT NAVIGATION THROUGH UNDETERMINED DREDGING/PLACEMENT OPT

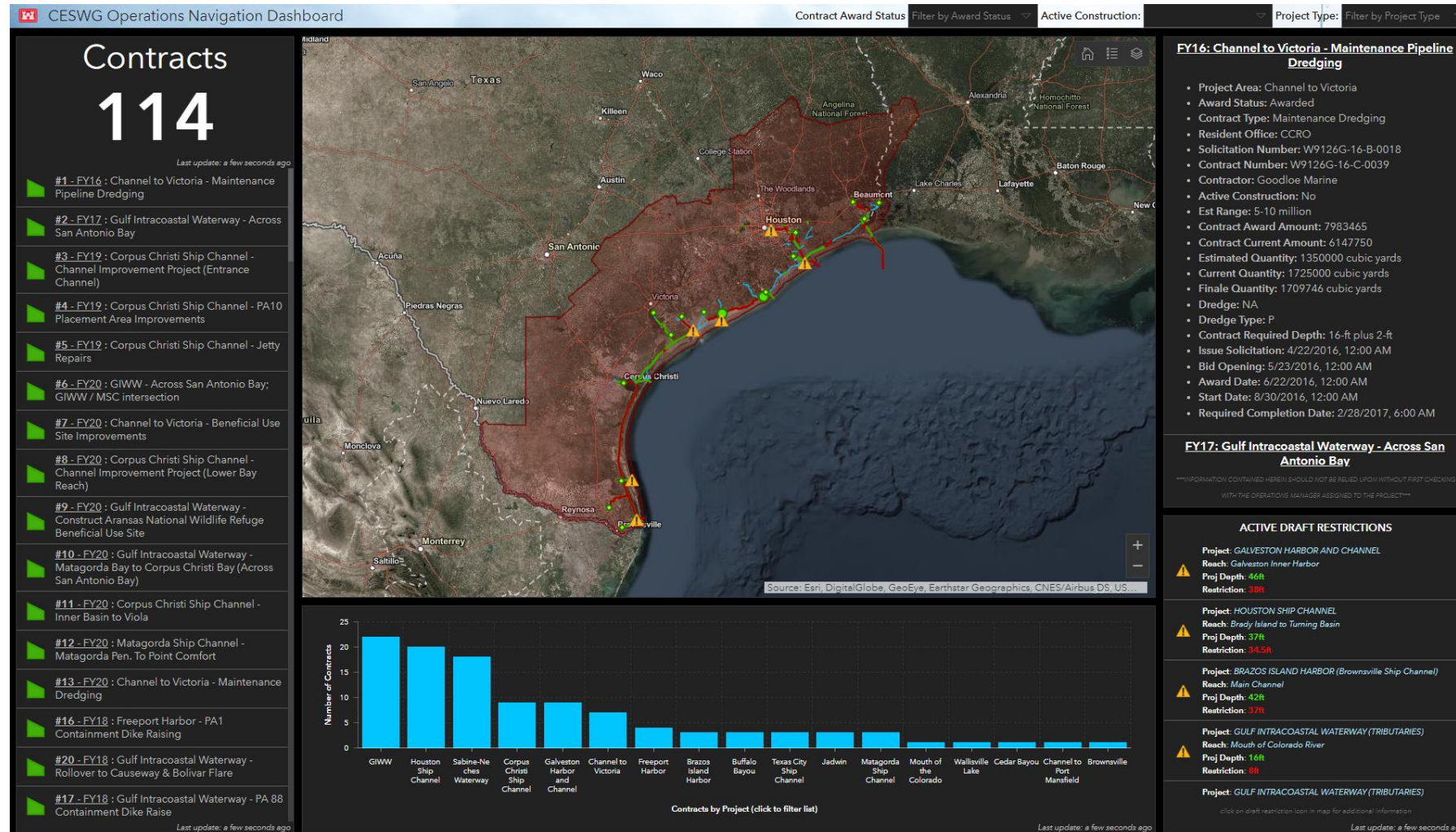




TECHNOLOGY & COMMUNICATION

OPERATIONS DASHBOARD

32



<https://www.swg.usace.army.mil/Missions/Navigation/Navigation-Projects-Contracts/>

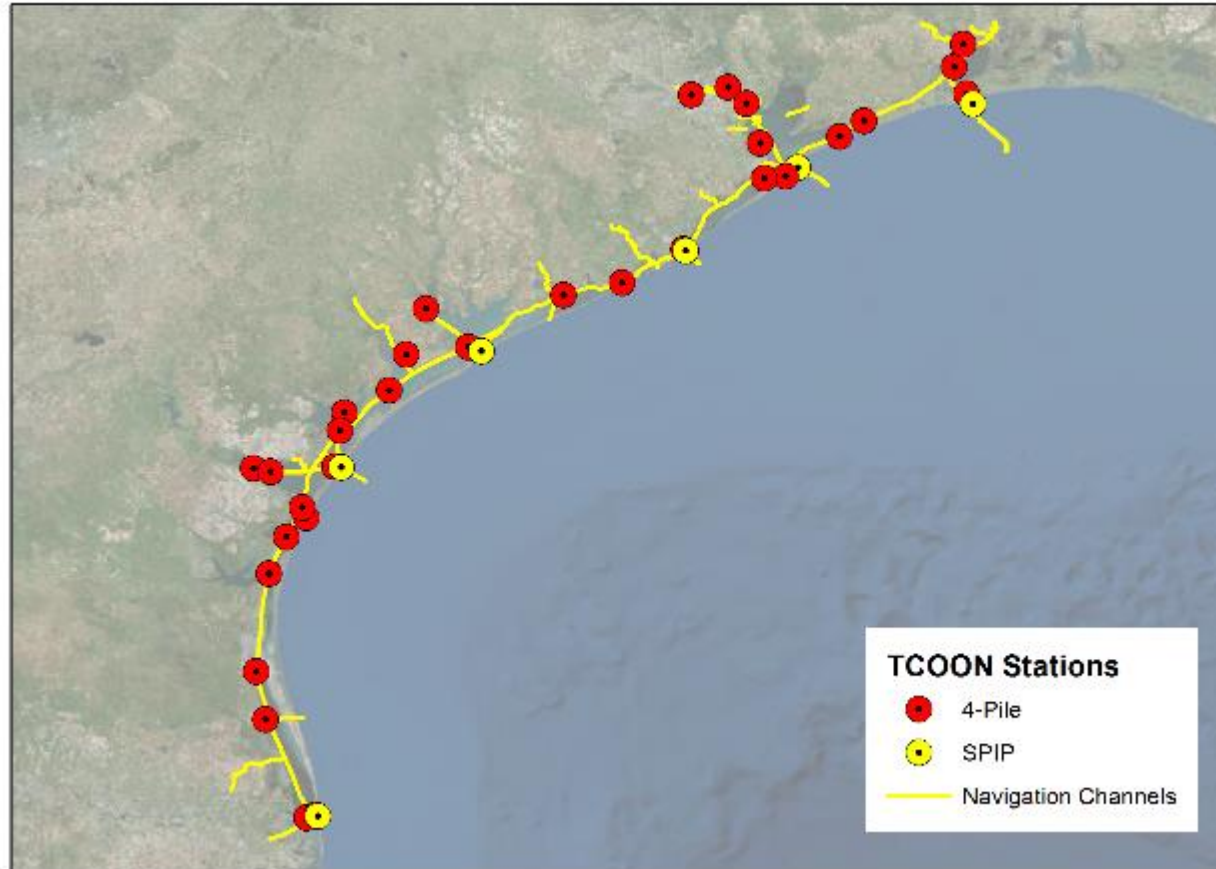
2/12/2021



TECHNOLOGY & COMMUNICATION

TEXAS COASTAL OCEAN OBSERVATION NETWORK

<https://tidesandcurrents.noaa.gov/map/index.shtml?region=Texas>





TECHNOLOGY & COMMUNICATION

TEXAS COASTAL OCEAN OBSERVATION NETWORK

<https://tidesandcurrents.noaa.gov/map/index.shtml?region=Texas>



TCOON Sentinel Platform (Galveston, TX)



TCOON 4-Pile Platform (Packery Channel, TX)



USE OF USACE EQUIPEMENT/STAFF FOR SMALL-SCALE O&M

- M/V SNELL
 - Mooring Buoy Deployment, Re-spacing, Maintenance
 - Repair of Navigation Structures
 - Debris Removal
 - Geo-Technical Sampling
- Special Purpose Dredges MURDEN / CURRITUCK
 - Small Maintenance Dredging Applications
- Sister-District Work Crews
 - Memphis District
 - Savannah District
 - Rock Island District
 - Wilmington District
 - Vicksburg District

USE OF USACE EQUIPEMENT/STAFF FOR SMALL-SCALE O&M





INNOVATIVE ACQUISITION METHODS

- Indefinite Delivery Indefinite Quantity Contracts (IDIQ)
 - Multi-Award Task Order Contracts (MATOC)
 - Single-award Task Order Contracts (SATOC)
- Base Contract plus Options
- Regional Contracting (combining like-work)

QUESTIONS



**US Army Corps
of Engineers.**

