



Image by [K-line](#).

# Texas Coastal Bend Industrial Development Harbor Island Information Booklet

**Created by  
Camille Chenevert,  
Jace Hodder,  
Emily Fucile, and  
Jim Blackburn**

**October 7, 2019**

## Contents

Introduction and Purpose .....	3
Background Information .....	5
Corpus Christi Ship Channel Deepening.....	7
PCCA Desalination Plant.....	8
Harbor Island VLCC Terminal .....	10
Axis Midstream Terminal and Pipeline .....	11
Texas Gulf Terminals .....	13
Bluewater Texas Terminal.....	14
All Projects .....	16
Project Permitting and Status .....	17
Harbor Island Zoning .....	19
City Boundaries .....	20
Introduction to Area Ecology .....	22
Parks, Recreation, and Historic Areas .....	29
Roberts Point Park.....	29
Ferry Landing.....	29
Port Aransas Nature Preserve .....	29
Aransas Pass (Lydia Ann) Lighthouse .....	30
Lighthouse Lakes Paddling Trail .....	30
Mission Aransas National Estuarine Research Reserve .....	31
Redfish Bay State Scientific Area.....	32
Works Cited.....	35

## Introduction and Purpose

Hello,

I am Jim Blackburn, the owner of a company called Sustainable Planning and Design (SuplDes). I have several excellent young professionals working for me at SuplDes, including Jace Hodder, Camille Chenevert, and Emily Fucile who prepared the following maps and information about the various projects that are proposed for Port Aransas and the natural resources, social resources and physical realities of the Port Aransas area.

Port Aransas is the site of multiple proposed industrial developments associated with the export of oil from the Permian Basin in far west Texas. Here are the proposed projects:

1. The Port of Corpus Christi is proposing to deepen the Corpus Christi Ship Channel to a maximum depth of 80 feet in addition to its current ongoing improvement project to 54 feet.
2. There is at least one desalinization plant that will discharge highly concentrated brine and metals into the pass between the bays and the Gulf.
3. Two onshore deepwater docks are proposed for Harbor Island – one capable of docking two Very Large Crude Carriers (VLCCs) – and another designed to accommodate two Suezmax-sized vessels.
4. Two offshore loading terminals – one by Trafigura about 20 miles to the south of Port Aransas and one by Phillips 66 just north of the Port Aransas - are proposed.

I commissioned this work because I wanted to help spread the word about the current threat to Port Aransas from these oil and gas-related proposals, and I also wanted to emphasize the fabulous ecological resources that surround Port Aransas. The potential impact of these proposed projects to Port Aransas, to Harbor Island and to the Aransas and Corpus Christi Bays is unprecedented in my forty years of advocating for the Texas Coast, and I want to help in this battle for the future of this important ecological region.

I am opposed to the development of these onshore facilities, to the deepening of the Corpus Christi Ship Channel to 80 feet, and to the discharge of the reject brine water. However, based on my experience in being involved in environmental fights on the Texas coast for over 40 years, I have come to recognize that in order to successfully oppose projects in Texas, we must also propose solutions. To this end, I support the Trafigura and Phillips 66 offshore terminal proposals provided they follow best industry standards.

Oil can be safely exported with minimal environmental impact through these offshore terminals. **There is no need to negatively impact Harbor Island and Aransas and Corpus Christi Bays in order to pump oil out of Texas to the world.**

I am offering this compilation of information as a gift to the people of Port Aransas who are fighting the development of Harbor Island. This short report has been prepared with my resources with no financial help from any offshore facility. In chapter 19 of *The Book of Texas Bays*, I wrote about the original fight against development of Harbor Island. The

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development proposal was similar to the proposal pending today except that then, the project was intended to import rather than export crude. That proposal was defeated by brains and willpower. Defeating the current threat and protecting Port Aransas will require brains and willpower and some help from the rest of the State if not the nation.

Port Aransas, Corpus Christi Bay and Aransas Bay are jewels. We should protect them, particularly where alternatives exist that do not require sacrificing these precious resources.

Our bays and estuaries are in amazing shape, considering the lack of priority that they get from our state government. The endangered wild whooping crane flock which winters in and around Port Aransas is recovering. Hurricane Harvey made a brutal hit on Port Aransas, yet our human population is also recovering. But I fear that the people and the surrounding natural system will not be able to recover from the massive blow that these projects would deliver.

We are in the last decades of the expansion of the oil and gas industry. Texas has been at the center of the oil and gas industry for over a century and our bays – amazingly – have endured to date. Our neighbors over in Louisiana have not been so fortunate, having lost over a million acres of wetlands, with much of that loss being associated with canals and brine disposal.

We do not need to destroy our coast to have economic development and to support the oil producers in the Permian. The offshore terminal proposals provide excellent, safe loading facilities with minimal impact. We should as a state, as a population, as a community, support those here as well as the Enterprise proposal in Freeport. The oil will be exported as long as there is a market elsewhere in the world. Let's do it smart.

If you are interested in helping in this fight for the coast, please consider contributing to the Port Aransas Conservancy, <https://portaransasconservancy.com/>.

Thank you,  
Jim Blackburn

## Background Information

The Port of Corpus Christi Authority (PCCA) and industry stakeholders are proposing large changes to the land use, ecology and economy of Port Aransas and other Texas Coastal Bend areas in a race to accommodate larger vessels which carry huge amounts of oil. Crude carrying vessels are becoming larger and with the existing infrastructure, there is no place near Corpus Christi which can fully load these larger vessels. Because their draft is greater than the channel depth, larger ships can only be partially loaded onshore and then move offshore to be fully loaded by smaller ships. This process is known as reverse lightering. The Coastal Bend projects attempt to accommodate Suezmax Ships and Very Large Crude Carriers (VLCCs).

The PCCA sees this as an opportunity to grow the Port’s influence in exporting crude oil and to bring jobs to the area. Many Port Aransas citizens and groups oppose the proposed projects because of concerns over their environmental and economic impact. Often dubbed “the best kept secret on the Gulf Coast,” Port Aransas views itself as a small fishing community and receives much of its income from tourism (Portaransas.com, n.d.). The proposed projects could have profound impacts on the sensitive bay ecosystem upon which the city relies for its recreational tourism based economy.

Oil Tanker Sizes				
Type	Length	DWT (K)	Draft (ft)	Capacity (barrels)
Aframax	870 ft	80-120	<79	500-800,000
Suezmax	900 ft	120-200	<66	1,000,000
VLCC	1,100 ft	180-320	66-100	2,000,000

Table 1: Oil tanker sizes, multiple sources.



Figure 1: Ship Size Comparison by TxDOT Maritime Department, n.d., p 3.

The purpose of this document is to summarize collected information on all the proposed and underway projects related to the shipment of crude oil near Corpus Christi. The maps and descriptions in this document begin to analyze the projects collectively. The information provided here begins a process of analyzing the developments’ cumulative impacts.

## Corpus Christi Ship Channel Improvement (Permitted)

Port Aransas Conservancy - Permitted Ship Channel Improvement

9/23/2019



Projected Coordinate System: NAD 1983 UTM Zone 14N

Data Sources: TPWD, Port of Corpus Christi, NOAA, DOI, TxDOT, City of Port Aransas, NWI, USFW, USCB, Nueces County Appraisal District, Mission Aransas

Figure 2: Permitted Corpus Christi Ship Channel Improvement Project.

The Corpus Christi Ship Channel Improvement project plans to deepen and widen the Corpus Christi Ship Channel (CCSC). This project is headed by the U.S. Army Corps of Engineers (U.S.A.C.E.) in partnership with the PCCA and was authorized by congress in the 2007 Water Resources Development Act. The Improvement project is jointly funded by PCCA and the federal government. U.S.A.C.E. in cooperation with the PCCA plans to deepen the channel to between -47 feet mean lower low water (MLLW) and -54 feet MLLW. The channel is permitted to a width of 500-600 feet through the channel. The width will be approximately 530 feet from Port Aransas to the Harbor Bridge and the La Quinta Ship Channel will be extended 1.4 miles into the Gulf at -54 feet MLLW. The Corps will be adding 200-foot-wide Barge Shelves at -14 feet MLLW across Corpus Christi Bay. Restoration features to protect wetland habitat are already underway. The project has been permitted and is already underway. The project is expected to be completed by 2021.

## Corpus Christi ShipChannel Deepening

Port Aransas Conservancy - Channel Deepening Project (proposed)

9/18/2019

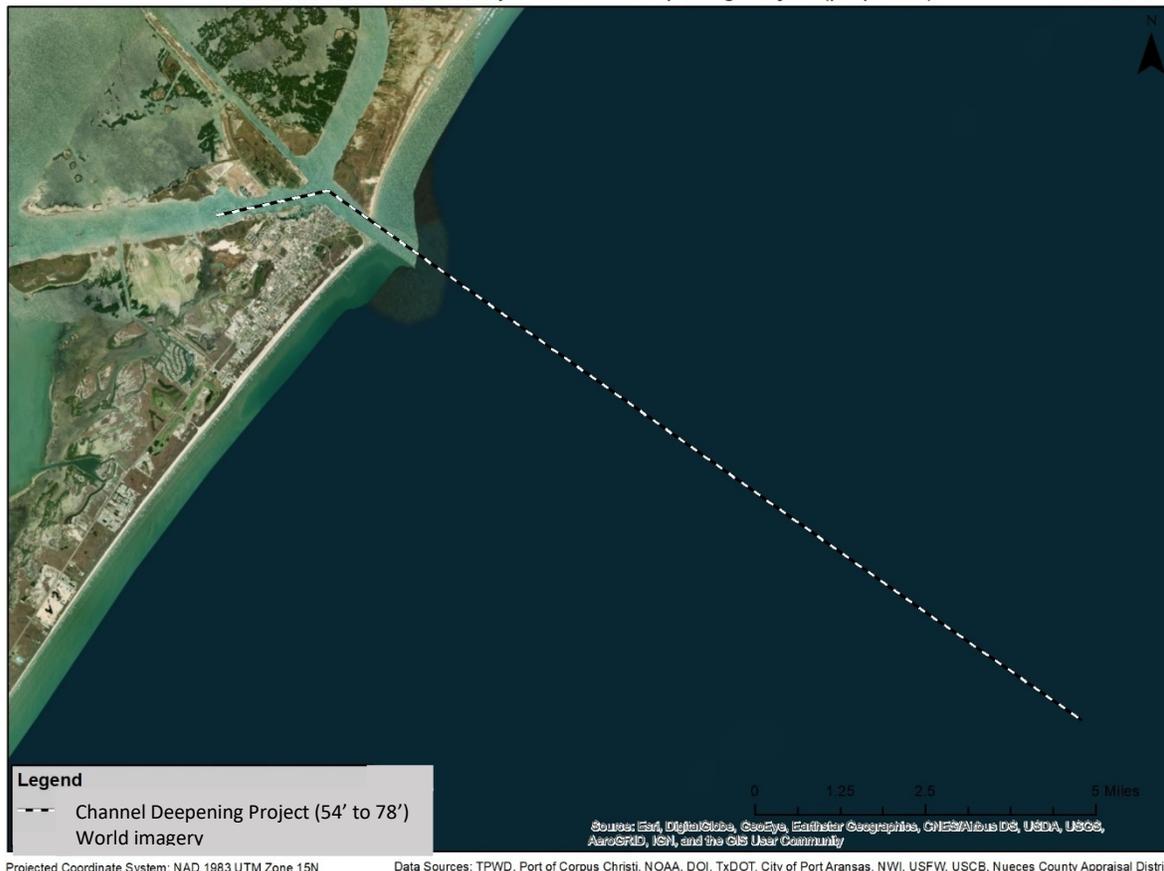


Figure 3: Proposed Corpus Christi Ship Channel Deepening Project.

The PCCA proposes deepening the CCSC from Harbor Island to the Gulf of Mexico to a depth of -78 and -80 feet MLLW (SWG-2019-00067). This project would not increase the width of the channel. The CCSC Deepening Project proposes deepening a length of 12.8 miles and would generate 38.9 million cubic yards (MCY) of dredge material. This dredge material would be placed at an Offshore Dredge Material Disposal Site 2.9 miles southeast of the Aransas Pass South Jetty and used where possible to create perimeter dikes. The Deepening Project would add approximately 0.39 MCY to the yearly maintenance quantity of dredging, leading to a total of 1.083 MCY of spoil being dredged each year for channel maintenance.

The purpose of this project, according to the PCCA’s U.S.A.C.E. permit application, is to accommodate fully laden very large crude carriers (VLCCs) exporting oil from the Corpus Christi region. The port claims the Channel Deepening project is the best option to accommodate VLCCs, judging it against alternatives including an offshore Single Point Mooring (SPM) facility and an offshore platform.

Although the PCCA supports Phillips 66’s Bluewater Texas Terminal which includes two SPMs. The PCCA claims that stakeholders and insiders have analyzed future crude oil export needs which show that the Channel Deepening is needed, but that evidence has not been shown to the public.

<https://portaransasconservancy.com/75-dredging/>

## PCCA Desalination Plant

Port Aransas Conservancy - Proposed Desalination Plant

9/23/2019



Projected Coordinate System: NAD 1983 UTM Zone 14N

Data Sources: TPWD, Port of Corpus Christi, NOAA, DOI, TxDOT, City of Port Aransas, NWI, USFW, USCB, Nueces County Appraisal District, Mission Aransas

Figure 4: Proposed PCCA Desalination Plant.

The PCCA is seeking permits to build a seawater desalination plant on Harbor Island in order to provide industry stakeholders and the city of Corpus Christi with a sustainable and drought-proof source of potable water. The project would impact 33 acres of Harbor Island; the site was formerly the FINA tank farm. Each plant would be capable of producing 20 million gallons per day (MGD) using a reverse osmosis system. The plant would draw seawater from the CCSC, then filter and clean the water through reverse-osmosis and chemical treatment. Seawater desalination produces a hypersaline and chemically treated water called brine as a byproduct. The PCCA's plan is to discharge the brine directly into the CCSC using an HDPE pipeline to a multi-port diffuser located 300 feet south of Harbor Island. In order to produce 50 MGD, the system will discharge an average of 95.6 MGD of brine (TCEQ Industrial Wastewater Permit Application, 2018). A major concern with discharging brine is the waste's high salinity content of up to 75 ppt compared to sea water which is 35 ppt (Roberts, 2009). A critical literature review on the topic of seawater desalination discharge shows that similar systems have caused negative environmental impacts including increased salinity and damage to surrounding organisms—particularly seagrass (Roberts, 2009)

The PCCA modeled the effects of brine discharge using a modeling program called CORMIX. The model predicted "the system effluent will increase the ambient concentration less than 1% beyond the aquatic life mixing zone, this increase is considered insignificant versus the natural variation and will not lead to the degradation of local water quality," (TCEQ Industrial Wastewater Permit

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Application, 2018, p 131). The PCCA model estimates freshwater inflows will balance the effects of the hypersaline brine. However, high salinity regimes are known to affect organisms in the bay such as sea grass and shrimp. The PCCA's TCEQ permit application admits,

Natural fluctuations in freshwater inflows into the Bay can have an immense impact on organisms within the Bay system. For example, if a long drought persists and creates a situation of very little freshwater inflow into the Bay, it may cause hypersaline (high salt) conditions that in turn affect bay shrimp catches which need a certain salinity range in order to mature in healthy numbers. (TCEQ Industrial Wastewater Permit Application, 2018, p 131).

The PCCA has been clear that the desalination plants are meant to produce potable water, especially at times of drought. According to their own permit this is precisely when the bay is most sensitive to salinity changes. The proposal then is to discharge hypersaline brine into a bay system with a toxically saline environment in a time of drought. This will surely affect the organisms of the area negatively.

The PCCA has stated that they are not planning to build the desalination plant themselves but are seeking the permit on part of an unknown industry client who may have an interest in constructing such a plant (Acosta, "Tide of opposition forms," 2018).

## Harbor Island VLCC Terminal

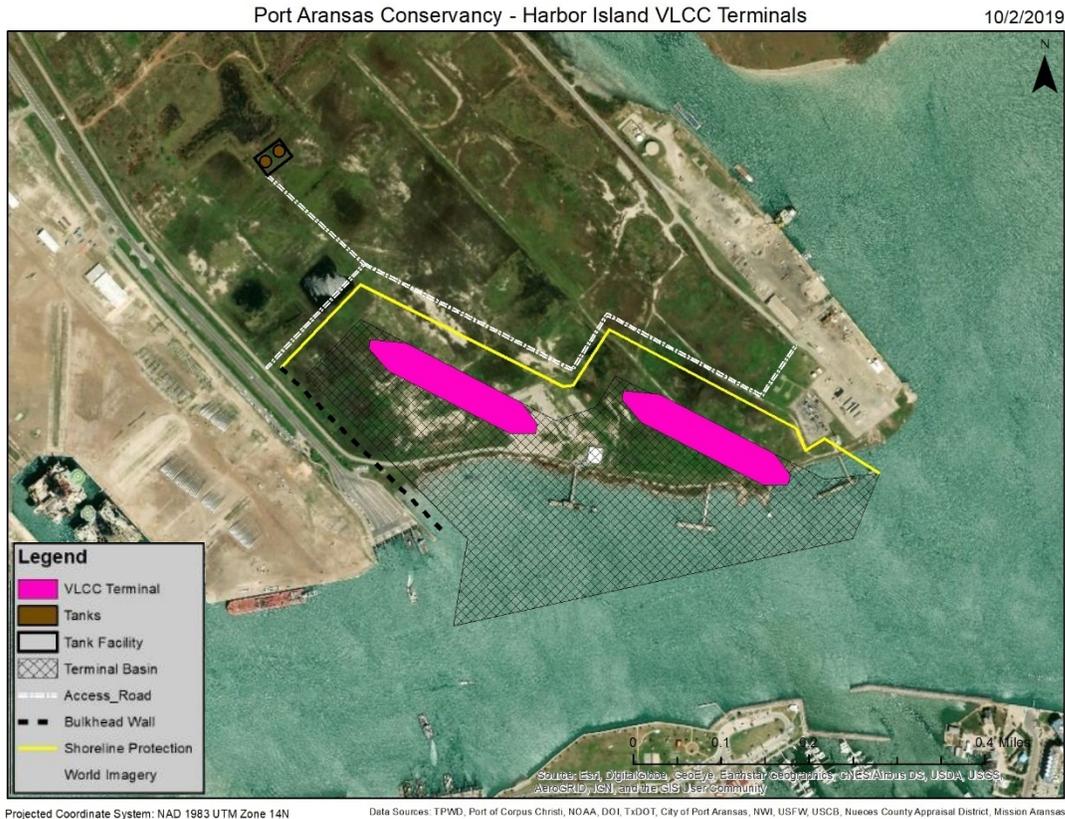


Figure 4: Proposed PCCA Desalination Plant.

The PCCA has authorized a 50-year lease agreement with Lone Star Ports, LLC and The Carlyle Group for a marine storage terminal able to accommodate the full loading of two VLCCs. The PCCA will construct two docks and Lone Star will build storage infrastructure and place pipelines to connect the terminal to Lone Star's long-term storage facility on the Intracoastal Waterway. This pipeline is the AXIS Midstream Pipeline. The PCCA's revised permit mentions the installation of storage infrastructure but fails to provide many details on the storage tanks which are included in the application plats. Based on the scaling of the map, the two storage tanks have a diameter of between approximately 48 to 52 feet. Based on the typical API 650 Tank Sizes, a tank with a 48 to 52 foot diameter would have a nominal capacity of between 12,500 bbl and 15,000 bbl or 525,000 to 630,000 gallons (International Tank Service, Inc., n.d.). The PCCA notes on the plats that, "typical upland facility to be designed and built by others, is included for informational purposes only." This means the size and design of the storage tanks are susceptible to change, however, their presence at the VLCC terminal is expected and should therefore be considered in analyzing the project's impacts.

The terminal would involve the moving of 6.5 MCY of dredged material. The permit application proposes "shore-based pile installation for foundations, bulkheads, wall anchors; dredging the vessel berths; piles for loading platform; erecting loading arms; and final infrastructure installation" (SWG-2019-00245). This includes 1,275 feet of cellular wall, 725 linear feet of bulkhead, breasting structures, jetty platforms, access structures, and associated terrestrial structures.

The site of the PCCA's Harbor Island VLCC Terminal is directly across the channel from a popular park called Roberts Point Park. It also shares proximity with the Port Aransas ferry landings and route, which means ferries would need to adapt to larger carriers navigating next to their route. (<https://portaransasconservancy.com/harbor-island-terminal>)

# Axis Midstream Terminal and Pipeline

Port Aransas Conservancy - Axis Midstream Pipeline Staging Facilities and Tanks

9/25/2019

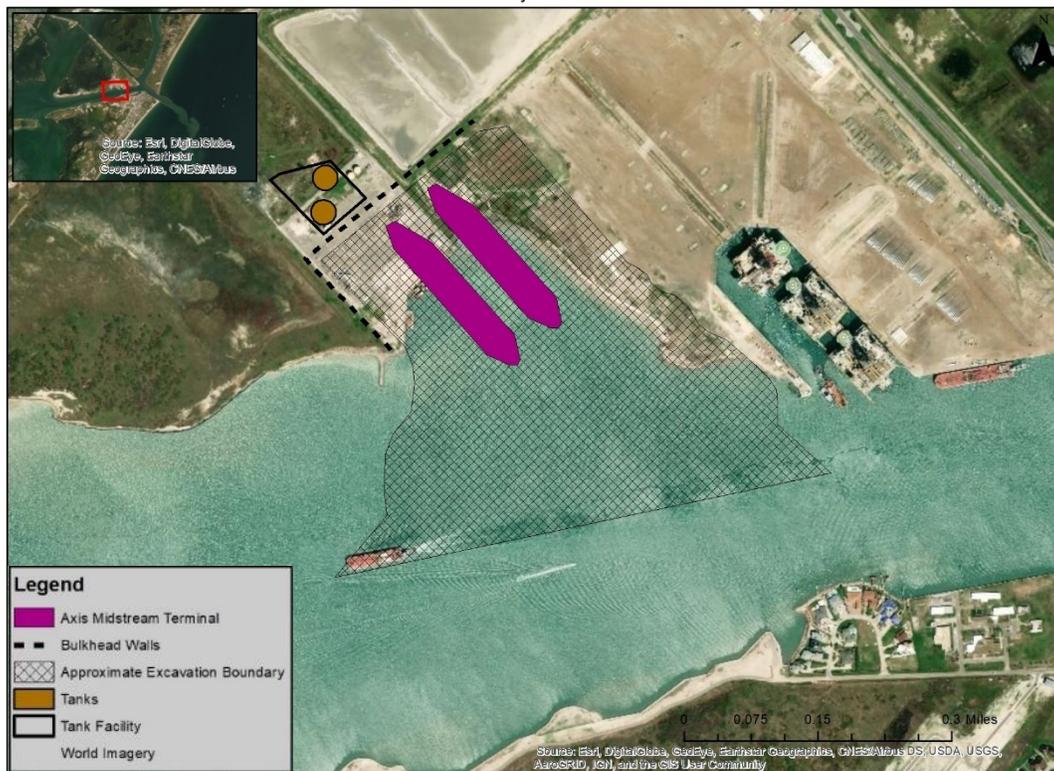


Projected Coordinate System: NAD 1983 UTM Zone 14N Data Sources: TPWD, Port of Corpus Christi, NOAA, DOI, TxDOT, City of Port Aransas, NWI, USFWS, USCB, Nueces County Appraisal District, Mission Aransas

Figure 6: Proposed Axis Midstream Pipeline, Staging Facilities and Tanks.

Port Aransas Conservancy - Axis Midstream Terminal

9/25/2019



Projected Coordinate System: NAD 1983 UTM Zone 14N Data Sources: TPWD, Port of Corpus Christi, NOAA, DOI, TxDOT, City of Port Aransas, NWI, USFWS, USCB, Nueces County Appraisal District, Mission Aransas

Figure 7: Proposed Axis Midstream Terminal.

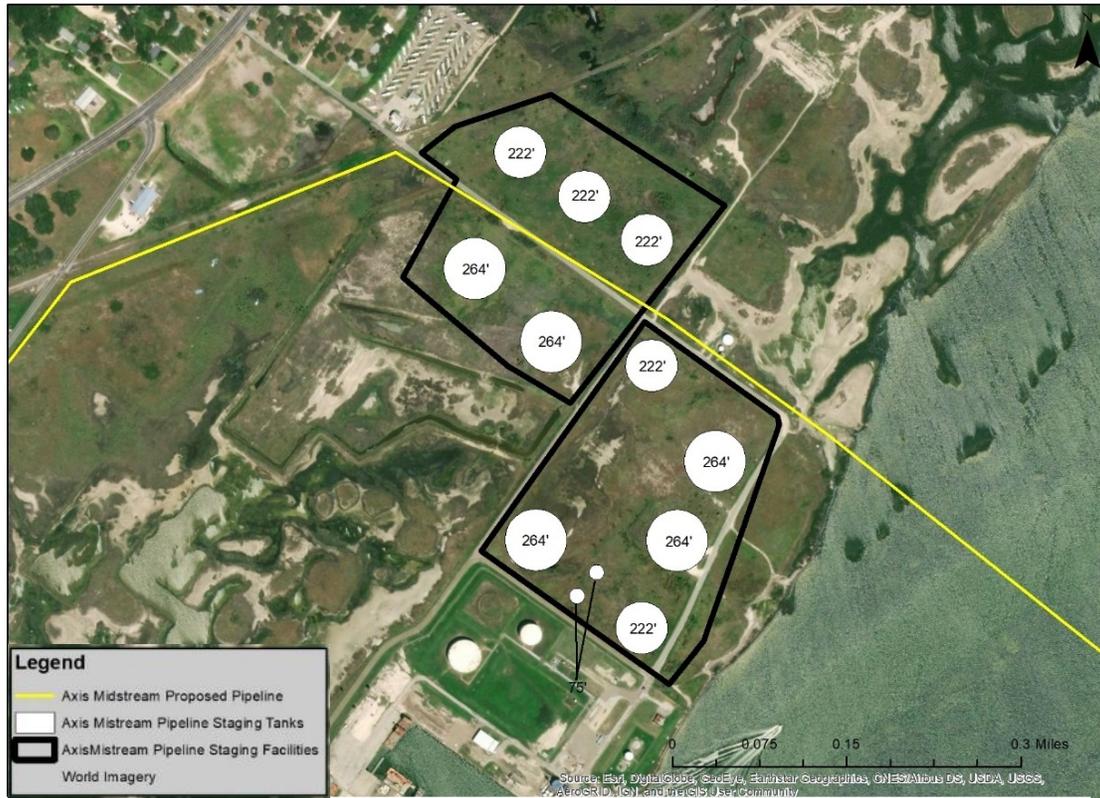


Figure 8: Proposed Axis Midstream Staging Facility.

On the west side of the Port Aransas Ferry Terminal from the Harbor Island VLCC project, the Axis Midstream Terminal and Pipeline has been proposed to accommodate Suezmax Carriers. Suezmax-sized vessels are smaller than VLCCs with a draft of 56 feet. In connection with the PCCA and Lone Star Ports, LLC, AXIS Midstream Holdings, LLC proposes a terminal facility capable of fully loading two Suezmax-sized vessels with accompanying storage facilities (SWC-2028-00789). This project involves a series of facilities and pipeline bundles from Taft to Harbor Island. Pipeline bundles would carry the crude oil between the terminal and a Midway Tank Farm located south of the City of Taft. The 35 mile pipelines are designed to move oil at 80,000 barrels an hour and pipeline installation would cause approximately 32.52 acres of temporary trench and fill impacts in “waters of the US, including wetlands.” (SWG-2018-00789). The following facilities are included in the Axis Midstream Terminal and Pipeline application:

**Harbor Island Loading Terminal:** This approximately 20-acre site would contain two vessel birthing slips and the necessary infrastructure to load carriers. The ship berths would be approximately 730 feet by 1164 feet with a depth of 54 feet MLLW and would result in 2,785,552 CY of dredge impacts. The tanks located at the Harbor Island terminal would hold two 80,000 bbl internal floating roof tanks. All tanks involved in this project are internal floating roof tanks.

**Aransas Pass Staging Facility:** Northwest of the GIWW from Harbor Island, the PCCA plans a 60-acre staging facility to include 12 above ground storage tanks, associated piping, pigging areas, two ship loading pumps, a recycle pump area, and an emergency access road. The total storage capacity of the tanks in the Aransas Pass facility is 4.3 million bbl. Approximately 16.8 acres of wetlands would be permanently filled to build the Aransas Pass Staging Facility.

**Midway Tank Farm:** The 60-acre Midway Tank Farm will hold multiple above ground bulk fluid tanks. The eleven multi-sized tanks have a collective storage capacity of 3.701 million bbl.

The project proposes a sum of 8.161 million bbl of storage in tanks. The planned Loading Terminal and pipelines cross the Redfish Bay State Scientific Area (RBSSA). This area is protected by the state of Texas because of the presence of seagrass. See page 33 for more information on RBSSA.

## Texas Gulf Terminals

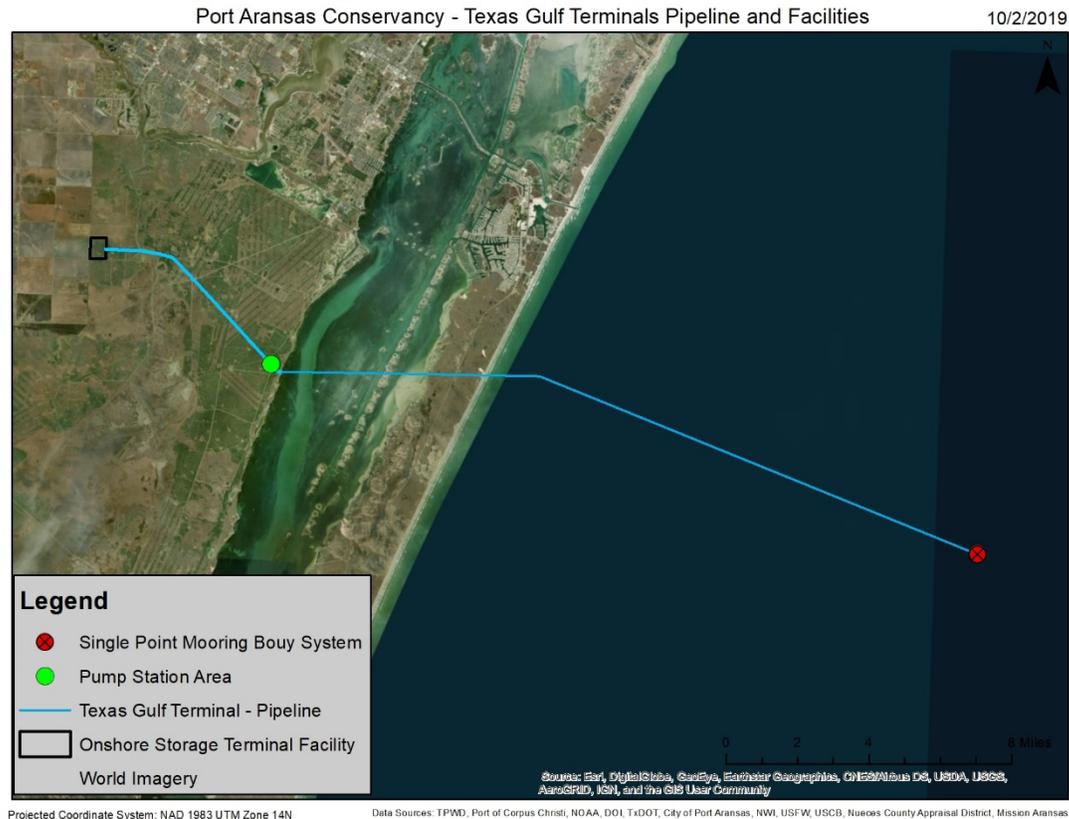


Figure 9: Proposed Texas Gulf Terminals Project.

Trafigura, a multi-national commodity trading company, has proposed an offshore project to accommodate VLCCs. Trafigura's Texas Gulf Terminals loads VLCCs at a Single Point Mooring (SPM) buoy system which is connected to inshore components via two 30-inch pipelines spanning 14.7 miles. The system is capable of loading crude oil at a flow rate of up to 60,000 barrels per hour (bph). The SPM system is located 12.7 nautical miles off the coast of Padre Island in Kleberg County in a water depth of approximately 93 feet. According to Trafigura's application with the Maritime Administration, loading a VLCC will take 48 hours and they expect to load approximately eight vessels a month. The plan includes an onshore valve station on North Padre Island, an onshore storage terminal facility (OSTF), and a booster station. The OSTF, which consists of the infrastructure necessary to receive, store, measure, and transport crude oil, would occupy approximately 150 acres in Nueces County. The proposed booster station would occupy 8.25 acres in Kleberg County and would hold pumping infrastructure to push crude oil through the pipelines.

Many Port Aransas residents see the Trafigura project as a safer and less invasive alternative to the Harbor Island VLCC Terminals. Kleberg county has also expressed support for this project. The PCCA has come out against this project because they see the location as putting more of the Gulf coast at risk and lacking the same safety resources as the onshore facility. Both the Trafigura project and Phillips 66's Bluewater Project would fall under federal oversight, which the PCCA claims would poorly control vapor release from crude loading causing air quality issues.

## Bluewater Texas Terminal

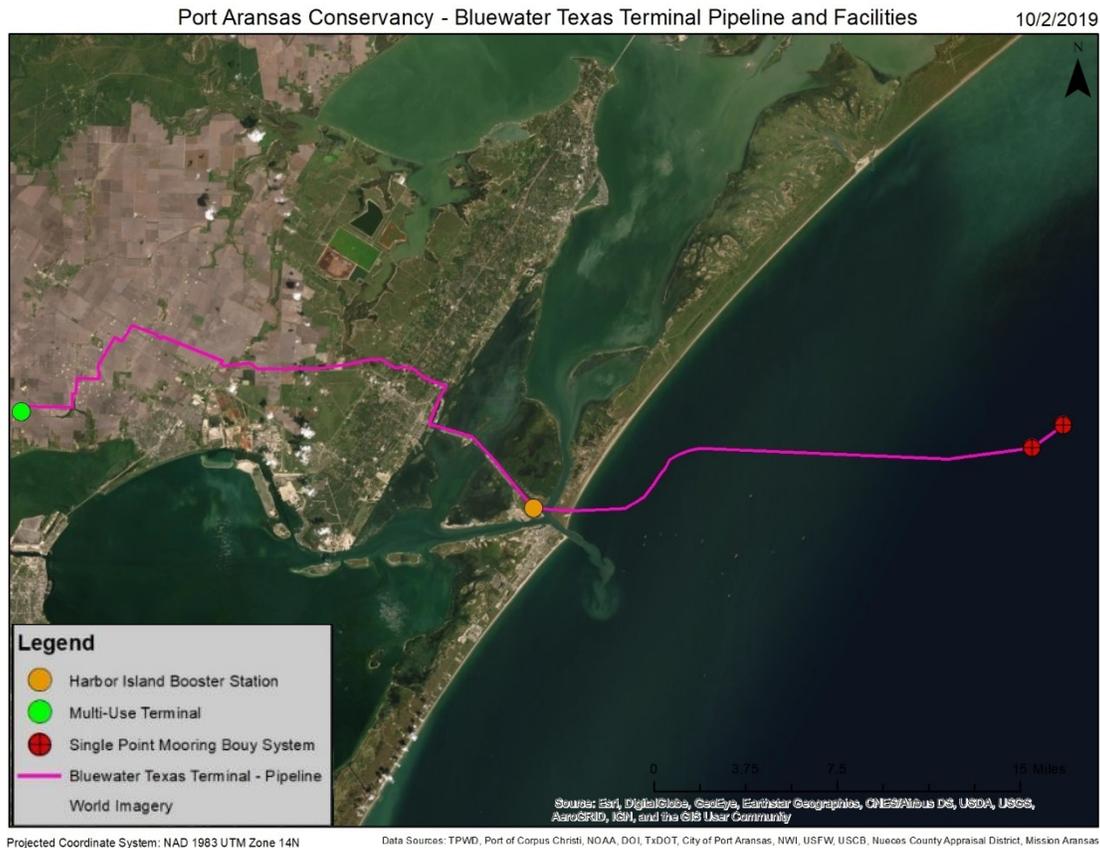


Figure 10: Proposed Bluewater Texas Terminal Project.

Phillips 66 proposes an offshore VLCC loading option with both inshore and offshore components. Phillips 66 is an American multinational energy company headquartered in Houston. As shown in figure 10, 55 miles of pipelines would connect a multi-use terminal near the city of Taft to two offshore Single Point Mooring (SPM) buoy systems including one Catenary Anchor Leg Mooring System (CALM) system. The Bluewater Texas Terminal involves two underwater, 30" pipelines which reach 15 nautical miles offshore in the Gulf of Mexico. This SPM system would allow two VLCCs to dock and unload/fill the carrier without coming inshore. The mooring system would be located approximately 21 miles east of the Port of Corpus Christi. The Bluewater Texas Terminal facility proposes a 19-acre booster station with two crude oil and two water storage tanks on Harbor Island. This system could load up to 1.56 million bpd.

The PCCA supports the Bluewater Texas Terminal which they believe will be "complementary" to the PCCA's proposed project. Many Port Aransas residents that hope to avoid massive inshore projects also support the Phillips 66 project.

10/2/2019

Port Aransas Conservancy - All Projects

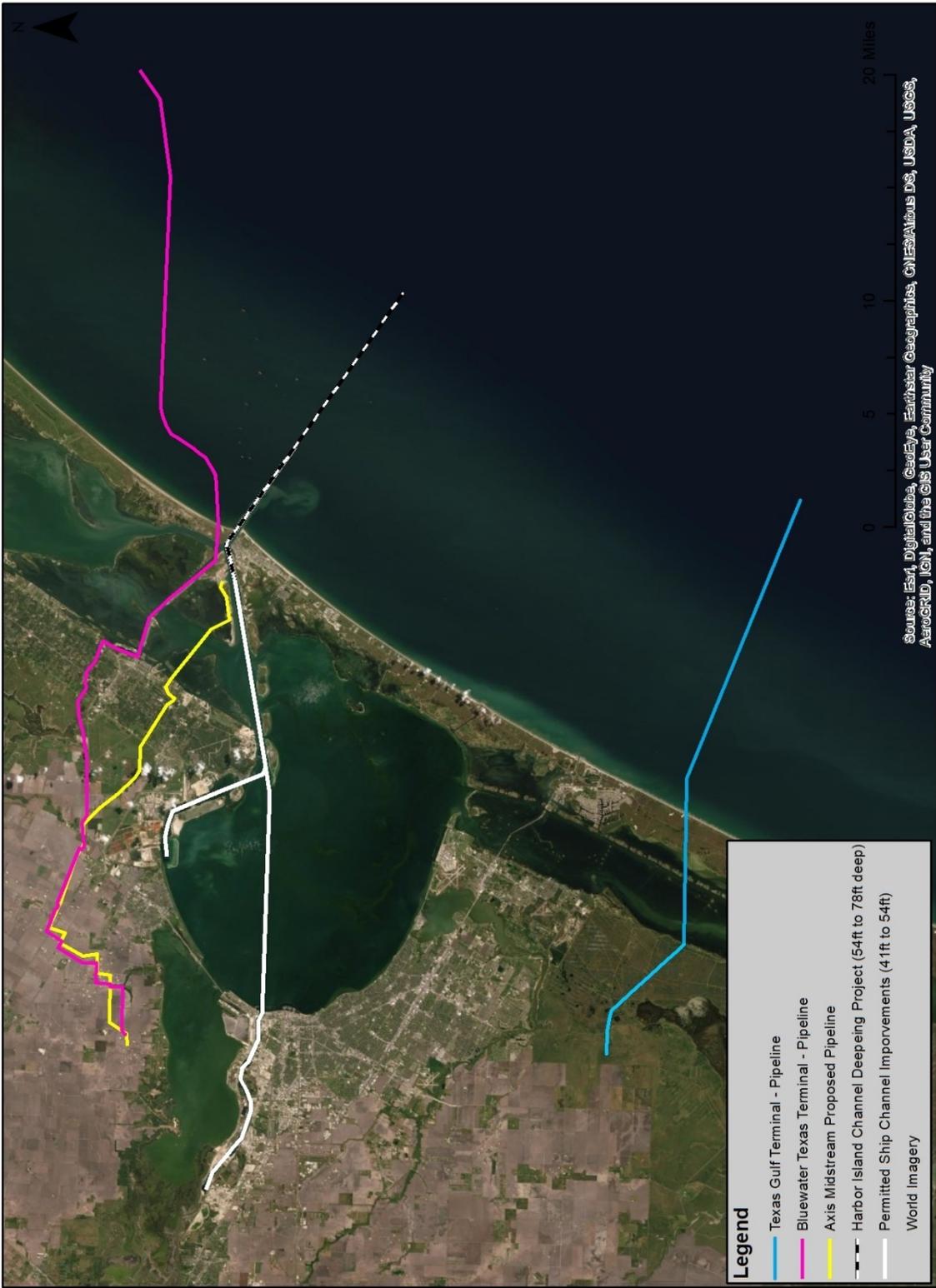


Figure 11: All projects wide scale.

## All Projects

Project	Leading Stakeholder	Location	Activity details
Permitted Corpus Christi Ship Channel Improvement	U.S. Army Corps of Engineers	From the Inner Harbor to the Gulf of Mexico	Plan to deepen channel from 47' to 54' and 56' was authorized by Congress in 2007. The channel was widened to 530' from Port Aransas to the Harbor Bridge and the La Quinta Ship Channel will be extended 1.4 miles into the Gulf at 41' MLLW. Restoration features to protect wetland habitat are already underway.
Corpus Christi Ship Channel Deepening	Port of Corpus Christi	From Harbor Island to 10.6 mi into the Gulf (total of 12.8 mi)	Deepen the CCSC beyond the current authorized project depths of -54 and -56 ft to maximum depths of -78 and -80 ft MLLW to accommodate transit of fully laden VLCCs.
Harbor Island VLCC Terminal	POCC; Lone Star Ports LLC	Harbor Island	Ship berth capable of fully loading two VLCCs with bulkhead, cellular wall, jetty platforms, storage tanks, and other associated structures.
AXIS Midstream Terminal	Axis Midstream Holdings LLC; Port of Corpus Christi	Harbor Island	Propose to turn 250 acres of land into a facility capable of fully loading two Suezmax-sized vessels with a tank farm south of Taft and pipeline bundles to connect the facilities.
Desalination Plant	Port of Corpus Christi	Harbor Island (Former FINA Tank Farm)	Two desalination plants capable of producing at least 20 million gallons of potable water per day "to ensure an uninterrupted source of water for residents and industry stakeholders in the event of a drought." Would discharge 95 million gallons of brine per day.
Texas Gulf Terminals	Trafigura	Offshore Padre Island in Kleberg County; Pipeline through King Ranch	Single Point Mooring Buoy system (SPM) offshore; two 30" pipeline bundles; a booster station; an onshore valve station on North Padre Island; an onshore storage terminal facility (OSTF).
Bluewater Texas Terminal	Phillips 66	San Patricio & Nueces County; Harbor Island	Two 30" pipelines; booster station at Harbor Island w/ two crude oil and two water storage tanks; two SPMs; CALM system. Has onshore, inshore, and offshore components.

9/18/2019

Port Aransas Conservancy - Harbor Island Project Area

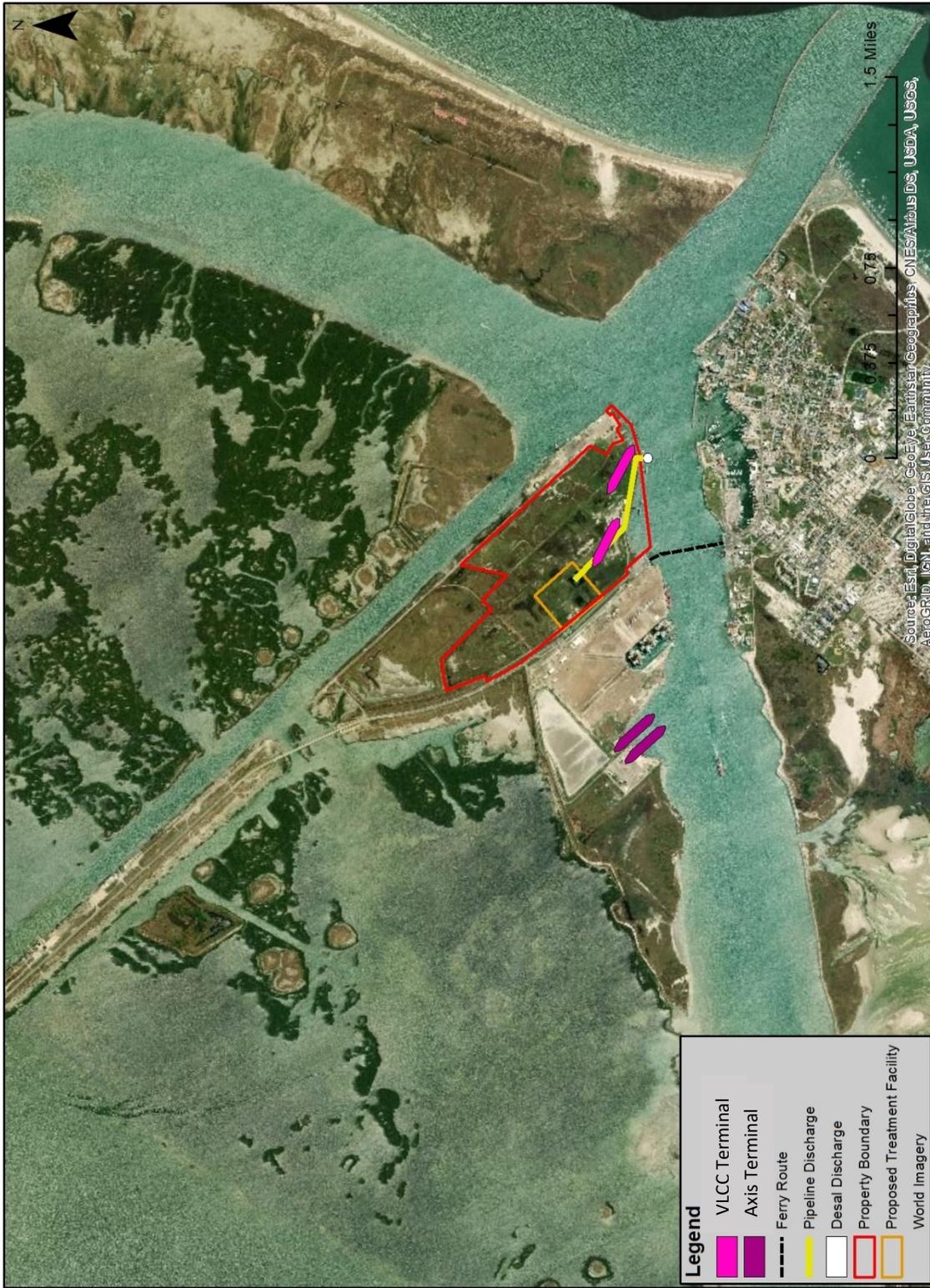


Figure 12: All Harbor Island projects.

## Project Permitting and Status

Project	Permitting Agencies	Permit Number(s)	Permitting Status	Cost
Permitted Corpus Christi Ship Channel Improvement	U.S.A.C.E.	Channel Deepening: SWG-2006-00515	Permitted and Construction Begun	\$327 million
	U.S.A.C.E.	Barge Shelves: SWG- 2018-00280		
AXIS Midstream Terminal	T.C.E.Q.	RN110575685	<a href="#">Withdrawn</a>	
	T.C.E.Q.	RN110758570 (Staging facility)	<a href="#">Air New Source Permit for new registration issued</a>	
	U.S.A.C.E.	SWG-2018-00789	Pending	
Desalination Plant	T.C.E.Q.	RN105622112	<a href="#">Wastewater permits pending;</a> Commissioner's Agenda on 11/6/2019 for determination on whether the permit will be referred to the State Office of Administrative Hearings	~\$250,000
	EPA	TX0138347		
Corpus Christi Ship Channel Deepening	U.S.A.C.E.	SWG-2019-00067	Pending	
Harbor Island VLCC Terminal	U.S.A.C.E.	SWG-2019-00245	Pending	
Texas Gulf Terminals	Maritime Administration/ DOT	MARAD-2018-0114	<a href="#">"Stop clock" in order to prepare EIS</a>	
Bluewater Texas Terminal	Maritime Administration/ DOT	MARAD-2019-0094	<a href="#">Extended Scoping Period and Preparing EIS</a>	>\$25 million
	Texas Railroad Commission	10011	TX Railroad Commission issued interstate pipeline registration on 2/22/2019	

The chart above summarizes the permitting status of the projects above to the best of our knowledge as of October 7, 2019.

## Harbor Island Zoning

Port Aransas Conservancy - Harbor Island Project Area and Zoning

9/18/2019

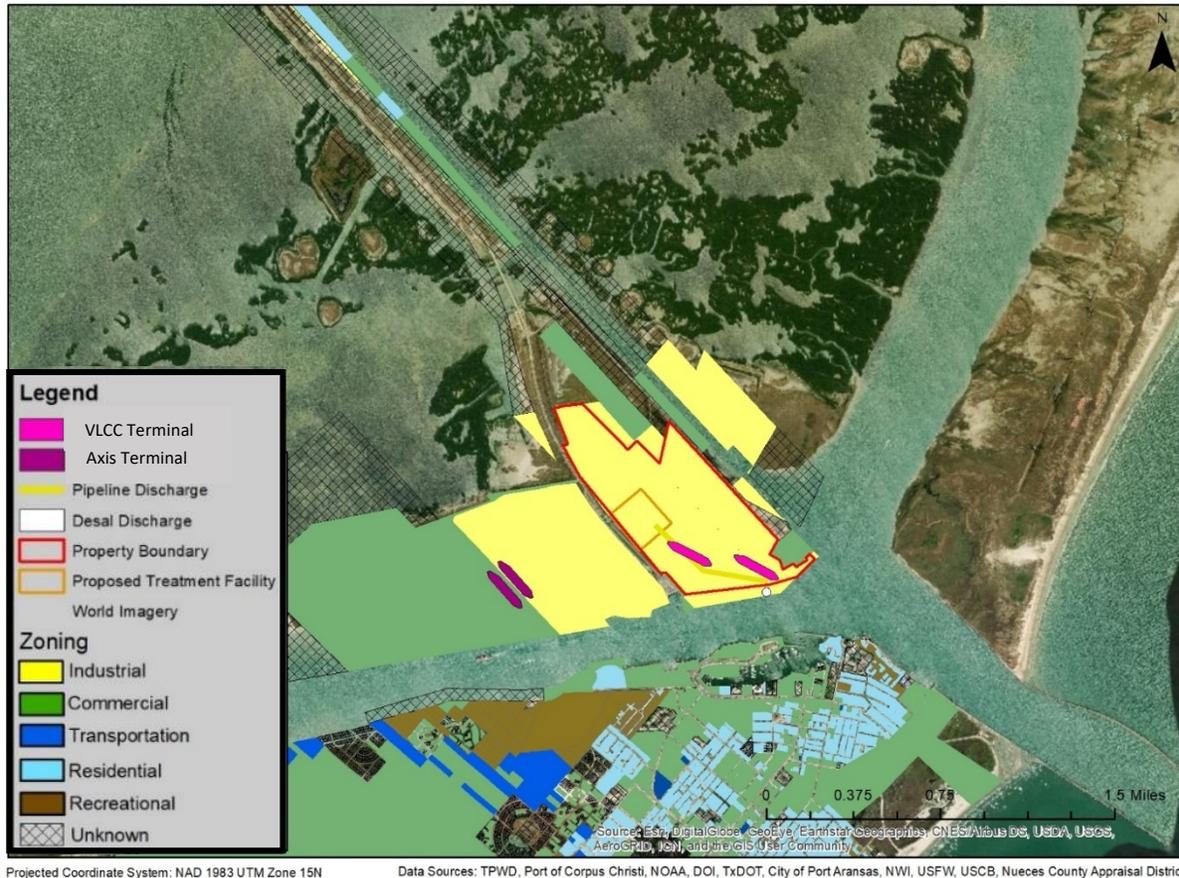


Figure 13: Harbor Island Zoning with projects overlaid.

According to Port Aransas City code of ordinances, Harbor Island falls in the “HI Harbor Island district.” This district allows certain industrial uses, but not all. While in figure 13 the land is labeled industrial by the city, light industrial may be a better description of the allowed uses. The following uses are allowed on Harbor Island,

- (1) Any lawful, non-dwelling, non-residential use listed in R-1, R-2, TR-1, TR-2, TR-3, C-1, C-2, or I-1; (2) Light manufacturing; **(3) Marine terminals; (4) Storage Facilities for oil and/or gas;** (5) Ship yards; (6) Fabrication yards; (7) Offshore oil/gas support services; (8) Cruise ship/Gaming ship terminal; (9) Research and testing laboratories; (10) Communication towers; (11) Concrete and asphalt batch plants; (12) Seafood processing, packing, and storage; (13) Dwellings for resident watchmen/caretakers; (14) Dredge material placement areas. Ordinance No. 2014-06.

Marine terminals and the storage of oil and gas are allowed at Harbor Island. Before a 2014 the site was zoned for heavy industrial uses. A plan by Matrin Midstream for heavy industry use sparked controversy amongst the people of Port Aransas who did not want heavy industry and development to change the unique nature of their town. To ensure the current ordinances show a shift towards light industrial use. “In order to prevent the development of Harbor Island in a way which would adversely affect, damage or destroy the aesthetics or environment of the City,” the City Council passed the current ordinance which allows the uses listed above and shows a shift toward light industry zoning (Ordinance No. 2014-06).

## City Boundaries

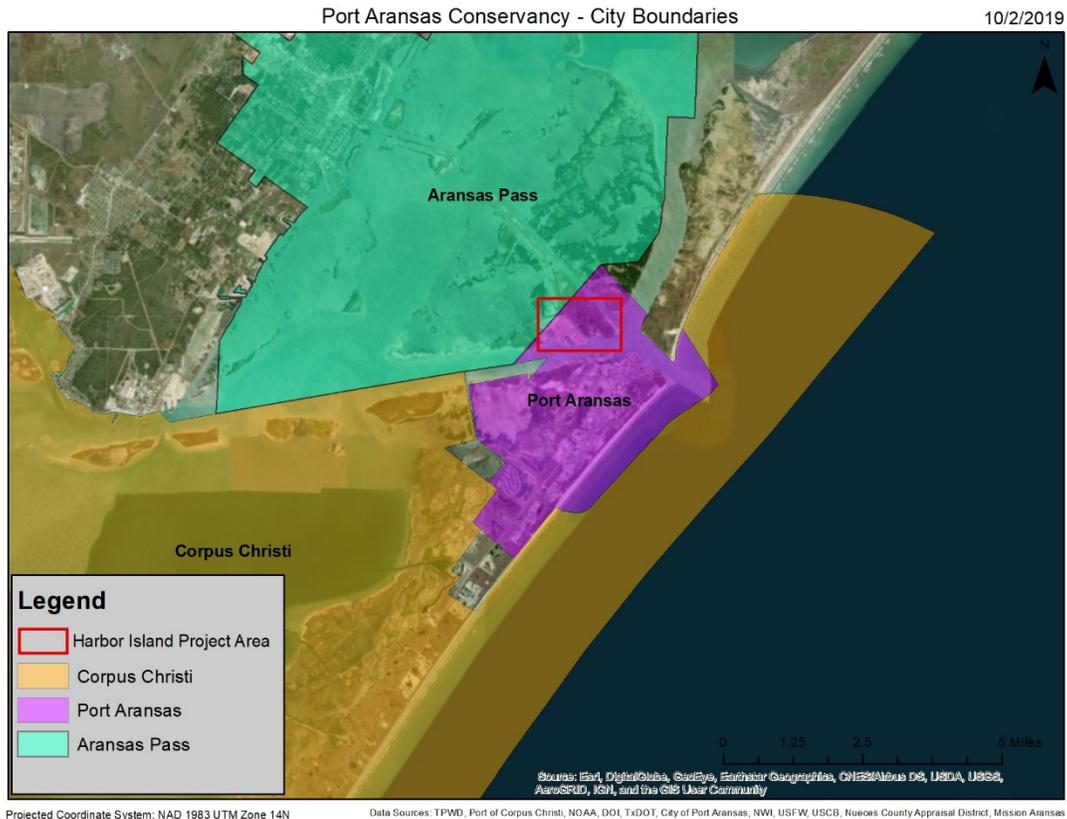


Figure 14: City boundaries.

The City of Port Aransas was incorporated in 1911 with its original boundaries including only the tip of Harbor Island which today is directly across the CCSC from Robert’s Point Park. A set of ordinances were passed between 1970 and 1980 to incorporate more of Harbor Island into Port Aransas. These include Ordinance 70-2 in 1970, Ordinance 73-1 in 1973, and Ordinance 80-6 in 1980. As shown in figure 14, the boundaries of the City of Port Aransas now encompass over 900 acres on Harbor Island, including the area in which the PCCA’s VLCC Terminal and Channel Deepening project are proposed.

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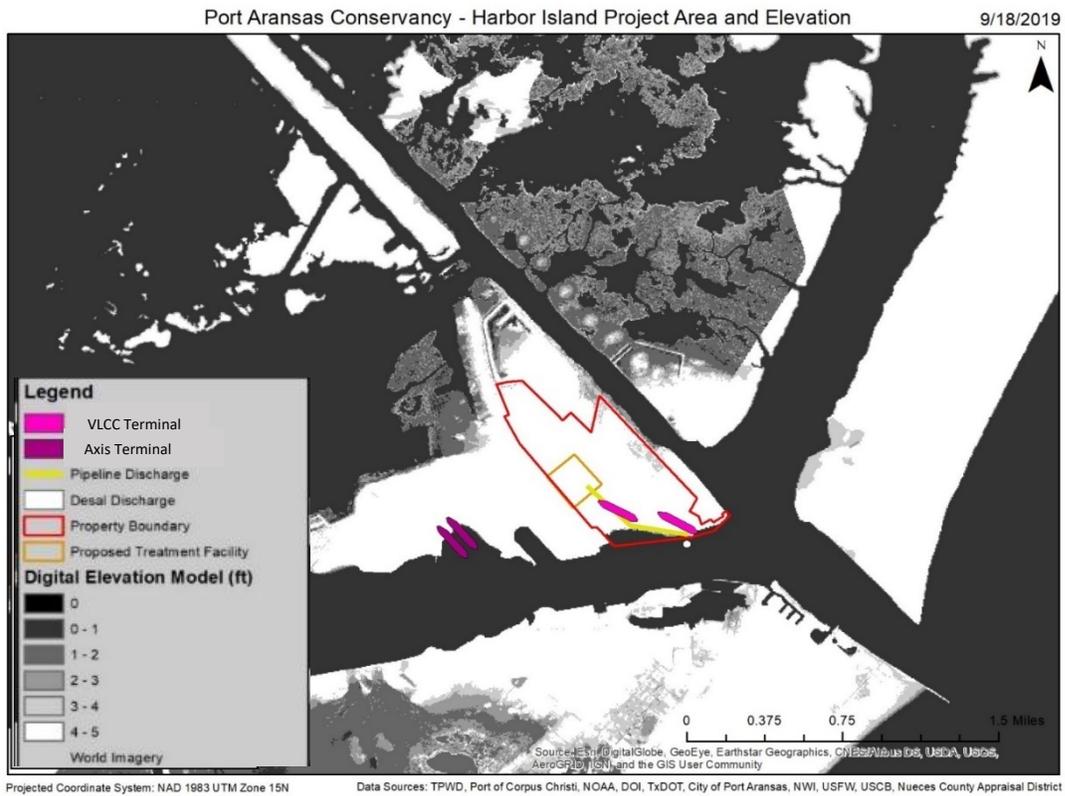


Figure 15: Harbor Island elevation map.

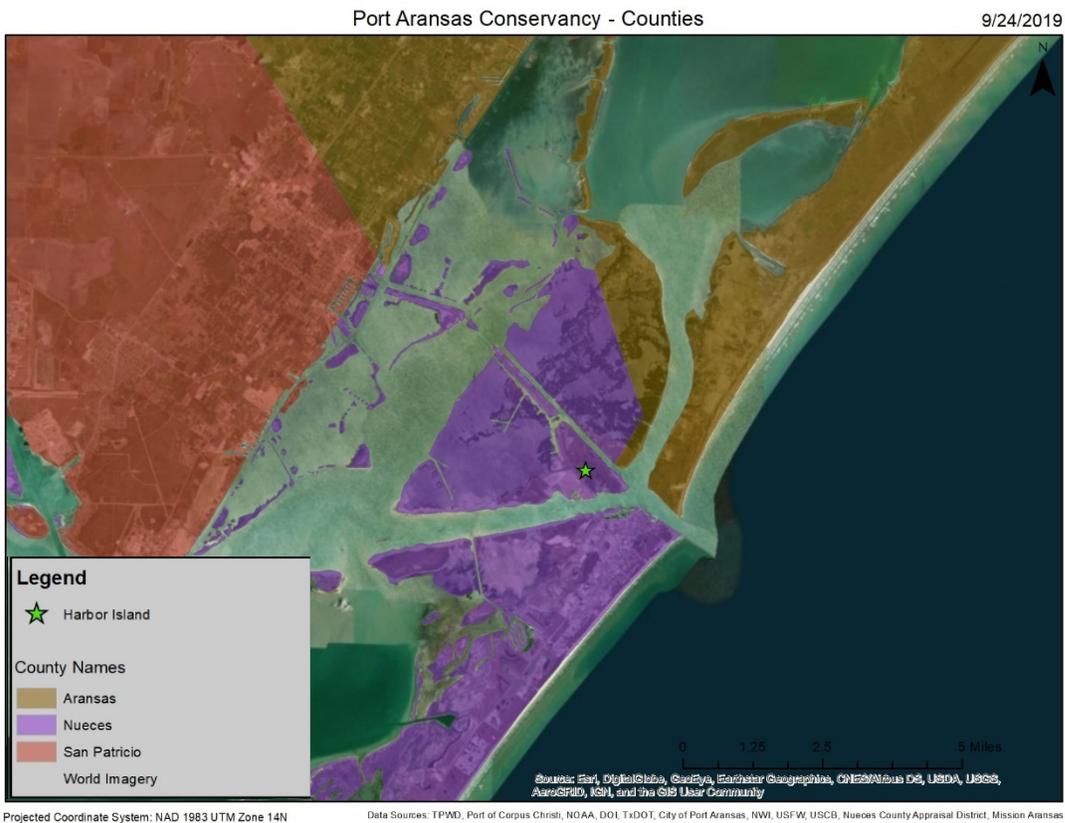


Figure 16: County boundaries near Harbor Island.

## Introduction to Area Ecology

The Port Aransas/Harbor Island area includes wetland habitats which are home to a diverse amount of animal and plant species. This makes the area an attractive destination for recreation including fishing, kayaking, and wildlife watching. Port Aransas defines itself as a small fishing town and opposes the industrialization of the surrounding wetlands.

The area is home to seagrass, red drums, piping plovers, whooping cranes, Kemp's ridley nesting turtles, and many other valuable ecological resources.



### Seagrass

Although often overlooked, seagrasses provide coastal zones with a number of ecosystem goods and services. Seagrasses are considered ecosystem engineers. This means that the plants alter the ecosystem all around them in multiple ways. Many seagrass species produce an extensive underground network of roots which stabilizes sediment and reduces coastal erosion (FFWCC, 2019). This system also assists in oxygenating the sediment, which provides a hospitable environment for sediment-dwelling organisms. Seagrasses also enhance water quality by stabilizing heavy metals, pollutants, and excess nutrients (FFWCC, 2019). The long blades of seagrasses slow the movement of water which reduces wave energy and offers further protection against coastal erosion and storm surge.



### Red Drum

Red Drum prefer shallow waters (1-4 feet deep) along the edges of bays with submerged vegetation such as seagrasses. They are found over all bottom types but prefer areas with submerged vegetation and soft mud (TPWD, 2019). These fish are also commonly found around oyster reefs. Breaks in continuity of shorelines such as coves, points, jetties, old pier pilings, and guts attract them. Red drum are one of the most recreationally sought-after fish, with many Southern states reserving red drum harvest strictly for recreational anglers (ASMFC, 2013).



### **Piping Plovers**

Piping plovers are a small sand-colored, sparrow-sized shorebird that nests and feeds along coastal sand and gravel beaches in North America. The total population is currently estimated at about 6,510 individuals. A preliminary estimate showed 3,350 birds in 2003 on the Atlantic Coast alone, 52% of the total (Cornell Lab of Ornithology, 2017). The population has been increasing since 1999. Their breeding habitat includes beaches and sand flats. Piping plovers migrate from their northern range in the summer to the south in the winter months, migrating to the Gulf of Mexico, the southern Atlantic coast of the United States and the Caribbean (Cornell Lab of Ornithology, 2017). They begin migrating north beginning in mid-March. Migration south begins in August for some adults and fledglings, and by mid-September most piping plovers have headed south for winter (Cornell Lab of Ornithology, 2017).



### **Whooping cranes**

Whooping cranes are the tallest North American bird, and are an endangered crane species named for its whooping sound. Along with the sandhill crane, it is one of only two crane species found in North America. The whooping crane's lifespan is estimated to be 22 to 24 years in the wild (Cornell Lab of Ornithology, 2017). After being pushed to the brink of extinction by unregulated hunting and loss of habitat to just 21 wild and two captive whooping cranes by 1941, conservation efforts have led to a limited recovery. The total number of cranes in the surviving migratory population, plus three reintroduced flocks and in captivity, now exceeds 800 birds (Cornell Lab of Ornithology, 2017).



### **Kemp's ridley nesting turtles**

Kemp's ridley nesting turtles also called the Atlantic ridley sea turtles, are the rarest species of sea turtle and are critically endangered (NOAA, 2015). Kemp's ridley sea turtle generally prefers warm waters, but inhabits waters as far north as New Jersey. These turtles migrate to the Gulf of Mexico and the western Atlantic, where they often inhabit the waters off Louisiana, among other states that border the gulf. Hunting first depleted the numbers of Kemp's ridley sea turtle, but today, major threats include habitat loss, pollution, and entanglement in shrimping nets (National Geographic, 2016). In September 2007, Corpus Christi, Texas, wildlife officials found a record of 128 Kemp's ridley sea turtle nests on Texas beaches, including 81 on North Padre Island (Padre Island National Seashore) and four on Mustang Island (NOAA, 2015).

## Wetland Types

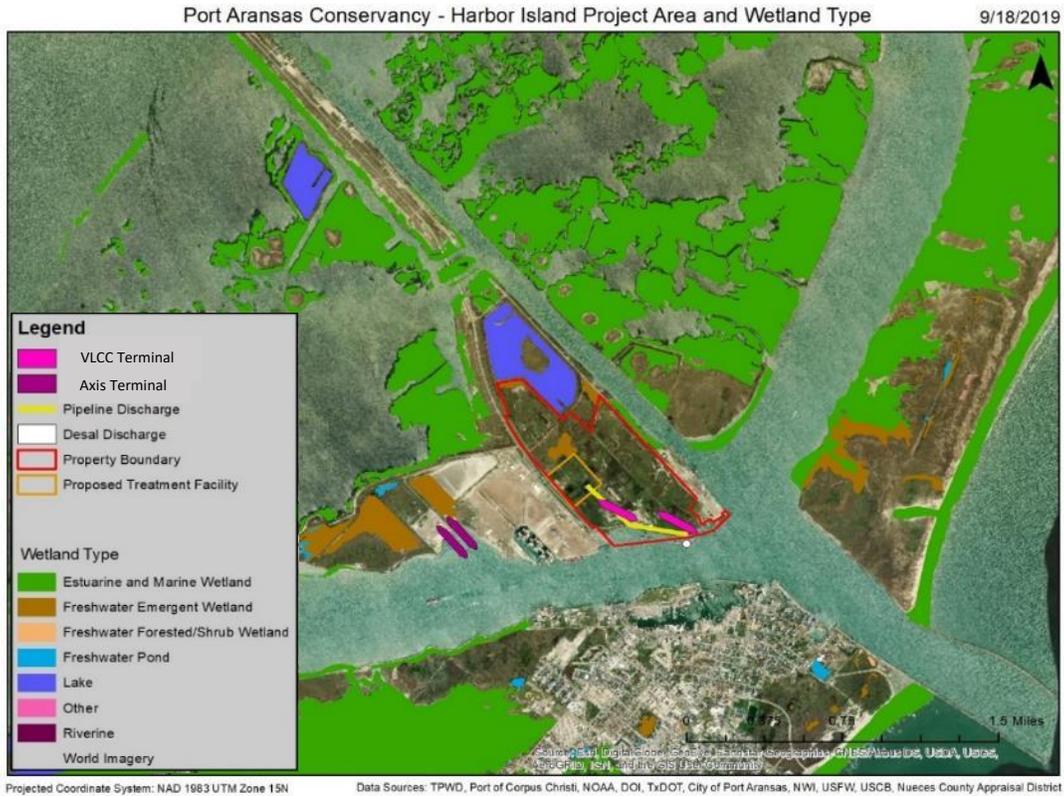


Figure 17: Map of wetland types surrounding Harbor Island with projects overlaid.

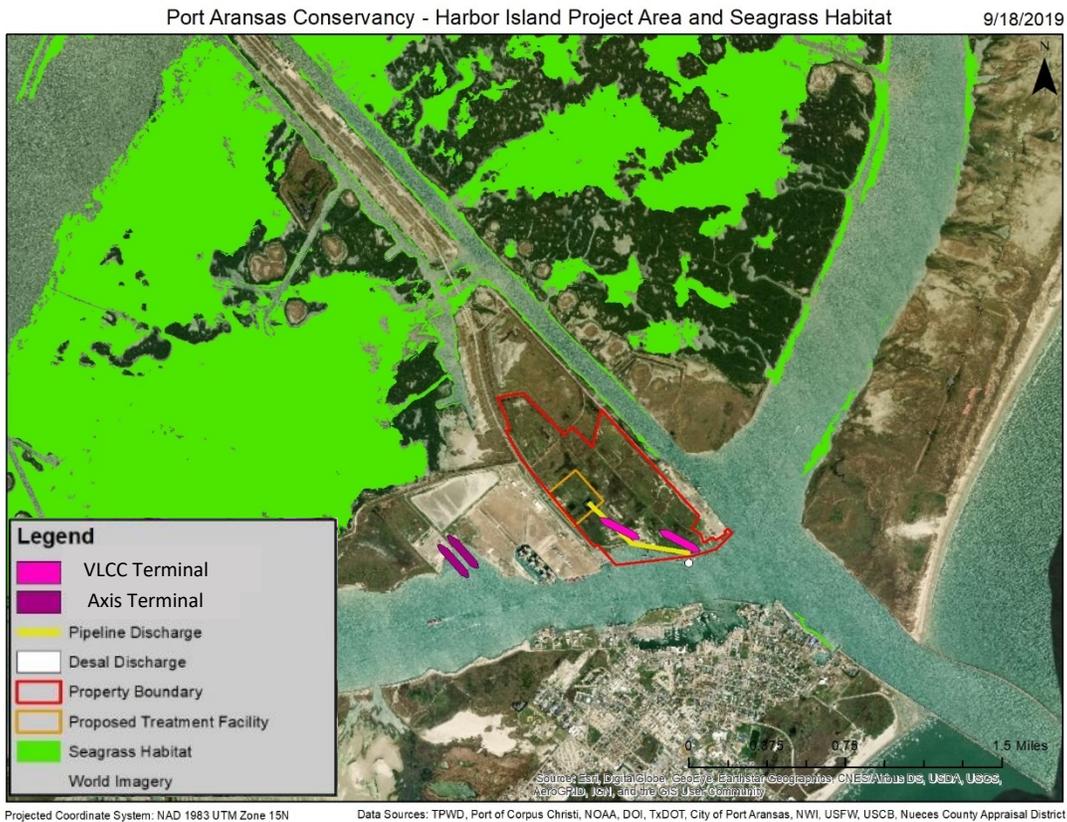
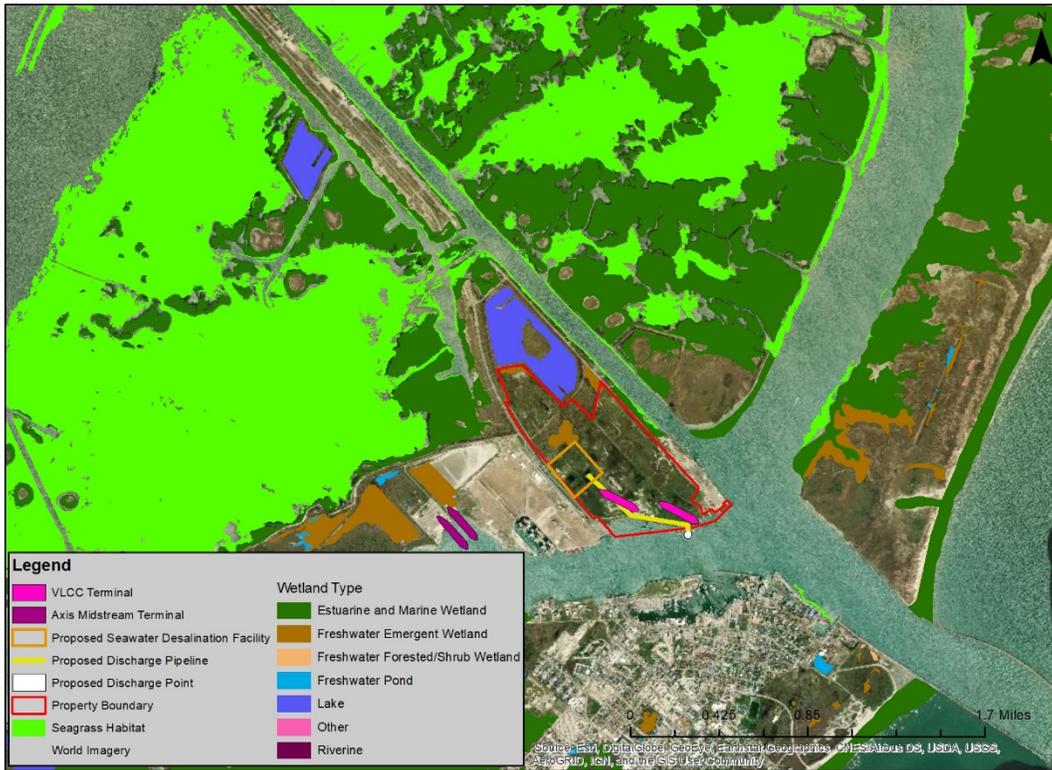


Figure 18: Sea grass habitat surrounding Harbor Island with projects overlaid.

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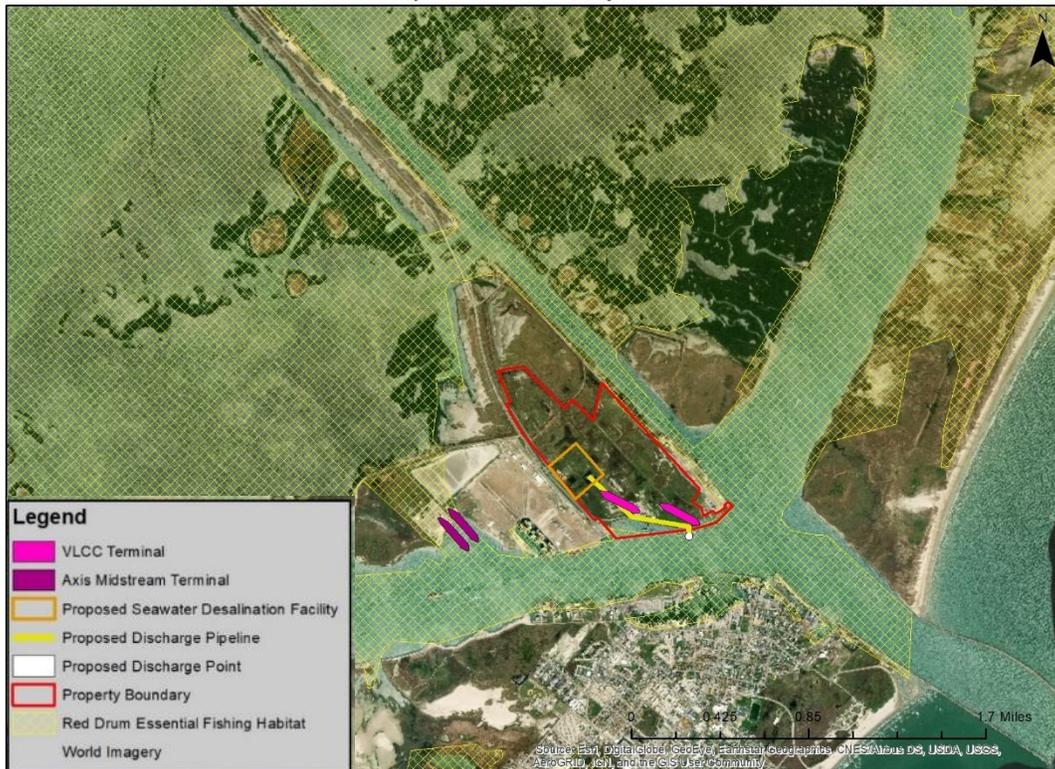
Port Aransas Conservancy - Harbor Island Project Area and Seagrass Habitat / Wetland Type 10/2/2019



Projected Coordinate System: NAD 1983 UTM Zone 14N Data Sources: TPWD, Port of Corpus Christi, NOAA, DOI, TxDOT, City of Port Aransas, NWI, USFW, USCB, Nueces County Appraisal District, Mission Aransas

Figure 19: Sea grass habitat and wetlands surrounding Harbor Island with projects overlaid.

Port Aransas Conservancy - Harbor Island Project Area and Red Drum EFH 10/2/2019



Projected Coordinate System: NAD 1983 UTM Zone 14N Data Sources: TPWD, Port of Corpus Christi, NOAA, DOI, TxDOT, City of Port Aransas, NWI, USFW, USCB, Nueces County Appraisal District, Mission Aransas

Figure 20: Red drum habitat surrounding Harbor Island with projects overlaid.

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Port Aransas Conservancy - Whooping Crane Territories and Sitings

10/2/2019



Figure 21: Whooping crane territories from the DOI and from anecdotal territories.

Port Aransas Conservancy - Harbor Island Project Area and Whooping Crane Sitings

10/2/2019

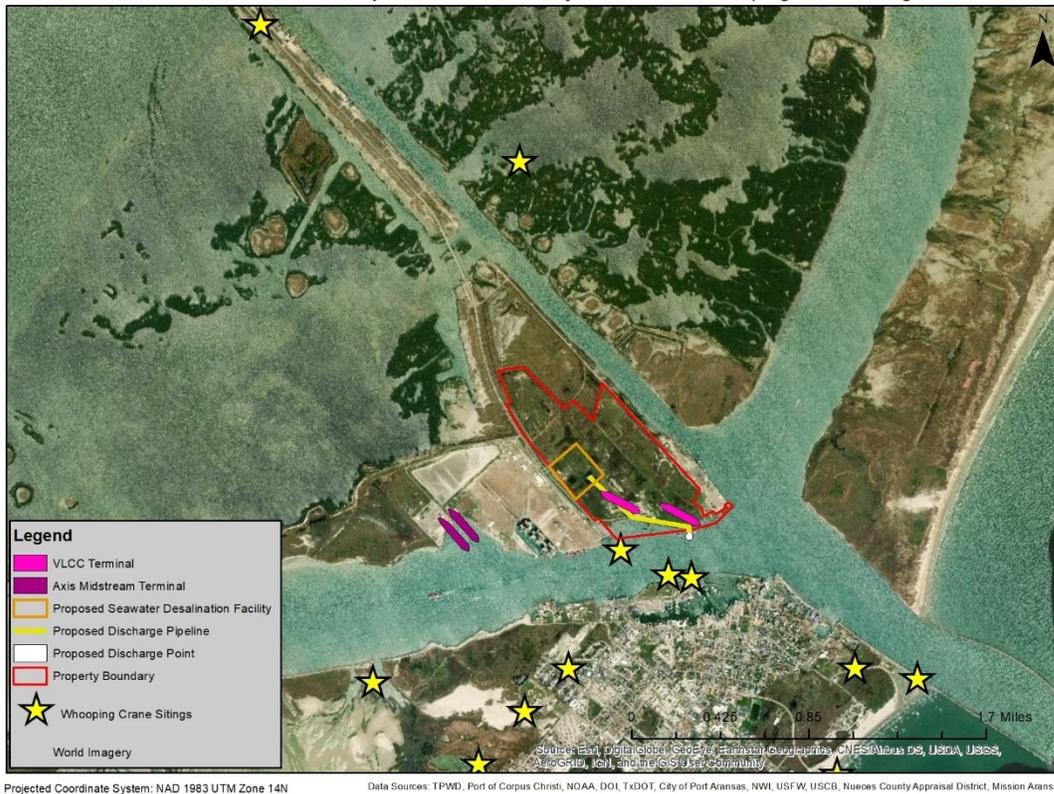


Figure 22: Whooping crane sightings near Harbor Island with projects overlaid.

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Port Aransas Conservancy - Harbor Island Project Area and Piping Plover Critical Habitat 10/2/2019

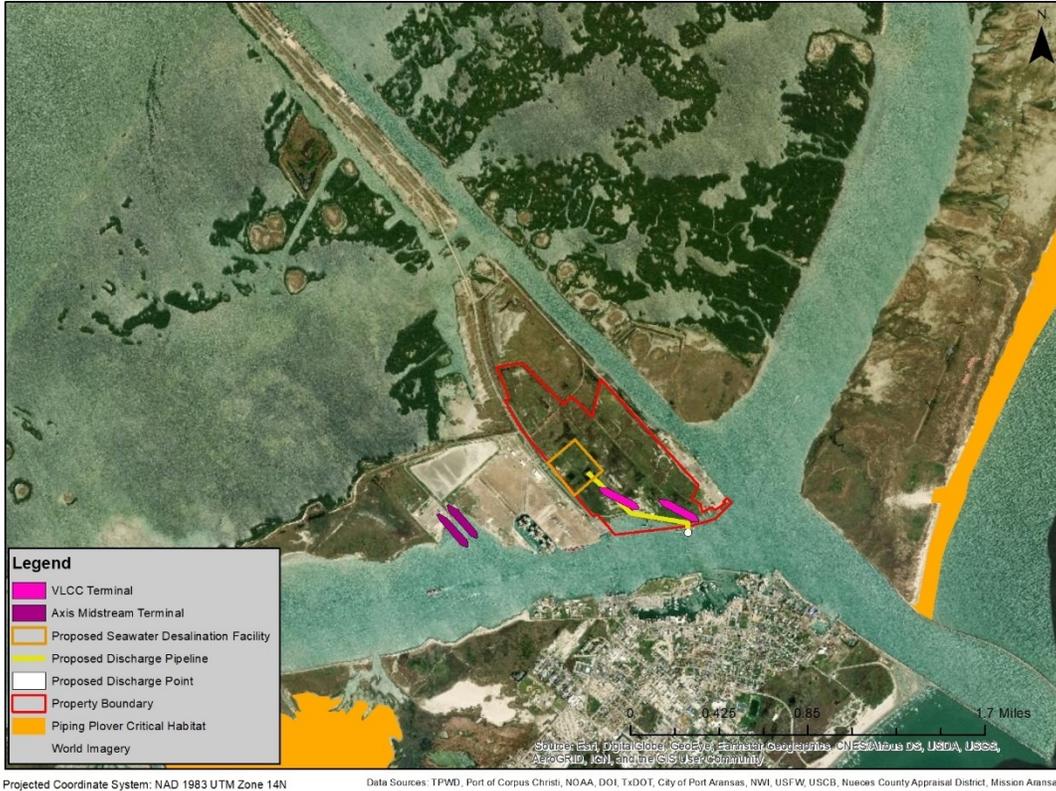


Figure 23: Piping plover habitat surrounding Harbor Island with projects overlaid.

Port Aransas Conservancy - Harbor Island Project Area and Kemp's Ridley Nesting Habitats 10/2/2019

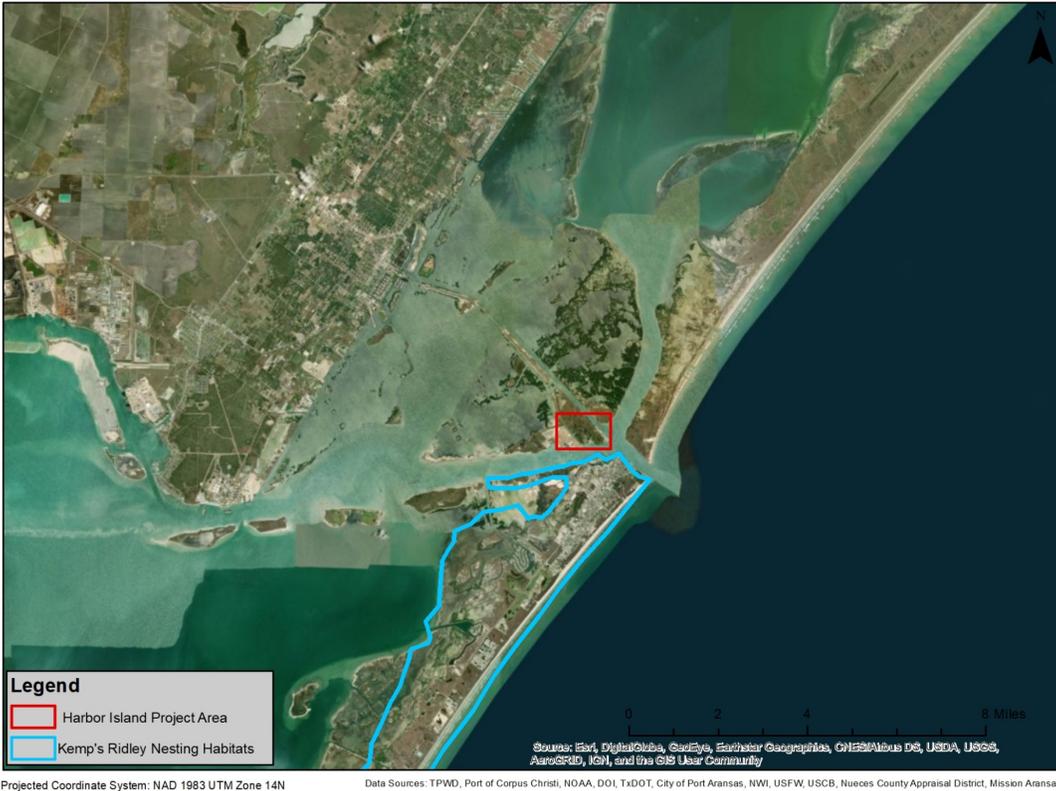


Figure 24: Kemp's ridley nesting habitat surrounding Harbor Island.

## **Parks, Recreation, and Historic Areas**

### **Roberts Point Park**

Beside the Ferry Landing sits Roberts Point Park (see figure 24). The park is located on a peninsula jutting into the ship channel creating the municipal harbor that has 250 boat slips for permanent and transient vessels. This 50-acre park was built through volunteer efforts and a Texas Parks and Wildlife Outdoor Recreation grant. Roberts Point Park is the host site for Port Aransas events throughout the year and is a popular tourist destination. The PCCA's VLCC Terminal is planned directly across the channel of the park.

### **Ferry Landing**

The Port Aransas Ferry connects Harbor Island to Mustang Island through the Ship Channel. This free public transportation service provides enjoyment for tourists and residents alike. Two to six ferries run the route as needed, usually three vessels are run at a time. The ferries hold up to 20 regular passenger vehicles per trip, usually making a trip every 10-20 minutes.

### **Port Aransas Nature Preserve**

The Port Aransas Nature Preserve lies south of the CCSC from the proposed Axis Midstream Terminals. The area outlined in black in figure 24 below was formerly known as Charlies Pasture after Charlie Bujan, an early resident who allowed his and others' cattle to graze freely in the area. The area has a long tradition of providing residents with a natural get away. The Nature Preserve covers 1,217 acres and provides nearly 3 miles of trails and boardwalks over the algal flats. It is a popular destination for birders who look for waterfowl, grebes, heron and egrets, cormorants, shorebirds, and flaming pink Roseate Spoonbills. This area is an important habitat for endangered and threatened bird species including the piping plover.



Figure 25: The Aransas Pass Lighthouse and Lighthouse lakes paddling trail.

## Aransas Pass (Lydia Ann) Lighthouse

The Aransas Pass or Lydia Ann Lighthouse is located on North Harbor Island. Congress first authorized the construction of a lighthouse at Aransas Pass in 1851 to improve visibility along the Texas Coast. The lighthouse was completed in 1857 to include an octagonal, 55-foot, Red Brick light tower coated in brown paint and a small keeper's dwelling. The lighthouse switched hands several times during the Civil War and was partially destroyed by troops. The lighthouse was restored during reconstruction. The Coast Guard deactivated the Lydia Ann Lighthouse in 1952 but is still used as a private navigation aid today. Since deactivation, the lighthouse has been passed between private hands. The Lighthouse is currently owned by Charles Butt, CEO of Texas Grocery store, H-E-B. Two lightkeepers watch over the tower and control its lantern.

## Lighthouse Lakes Paddling Trail

The Lighthouse Lakes Paddling Trail offers kayakers the unique experience of paddling through a black mangrove estuary and back lakes near the historic Lydia Ann Lighthouse. On this trail paddlers encounter all five species of seagrass found in Texas, migrating and coastal birds, and a thriving and diverse marine population. The Lighthouse Lakes Trail is the first Texas Paddling Trail supported by Texas Parks and Wildlife. The trail falls within the Redfish Bay Scientific Area which is managed by Mission-Aransas National Estuarine Research Reserve. The trail is made up of four loops ranging in length from 1.25 miles to 6.8 miles (TPWD: Lighthouse Lakes Paddling Trail, n.d.).

## Mission Aransas National Estuarine Research Reserve

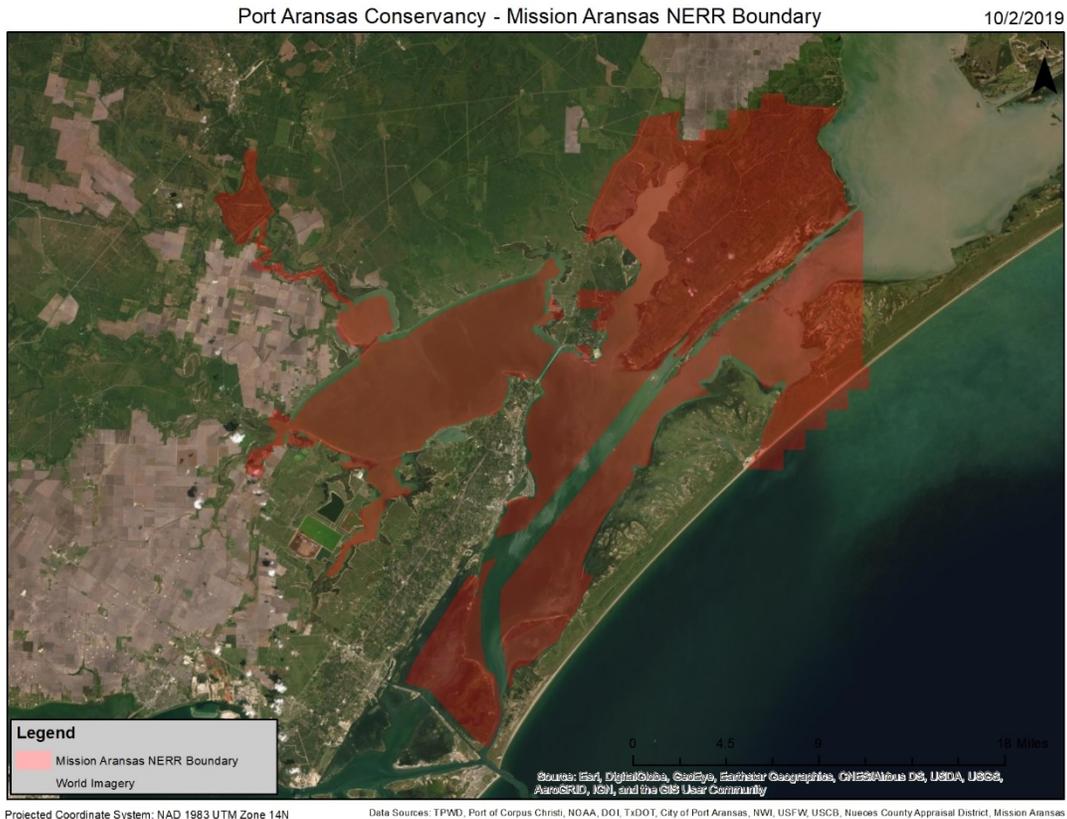


Figure 26: Mission Aransas National Estuarine Research Reserve boundaries.

The Mission-Aransas National Estuarine Research Reserve or Mission-Aransas NERR manages and studies the land and wetlands. According to the about section of their website,

The Mission-Aransas NERR is a federal and state partnership that conducts research, education, and stewardship programs. This program is funded by the National Oceanic and Atmospheric Administration and is managed by the University of Texas Marine Science Institute. There are 28 Reserves around the country and each reserve is a "living laboratory" in which scientists conduct research and educators communicate research results.

The mission of the Mission-Aransas Reserve is to develop and facilitate partnerships that enhance coastal decision making through an integrated program of research, education, and stewardship. This mission allows us to achieve our vision of forming a center of excellence that creates and disseminates knowledge necessary to maintain healthy Texas coasts. The Reserve has three primary goals: (1) to improve knowledge of Texas coastal zone ecosystems structure and function, (2) to promote understanding of coastal ecosystems by diverse audiences, and (3) to promote public appreciation and support for stewardship of coastal resources.

About: Mission-Aransas National Estuarine Research Reserve, n.d.

Administered by the University of Texas, the Reserve engages with local knowledge to learn from and manage their 185,708 acres of coastal wetland, terrestrial, and marine environments.

## Redfish Bay State Scientific Area

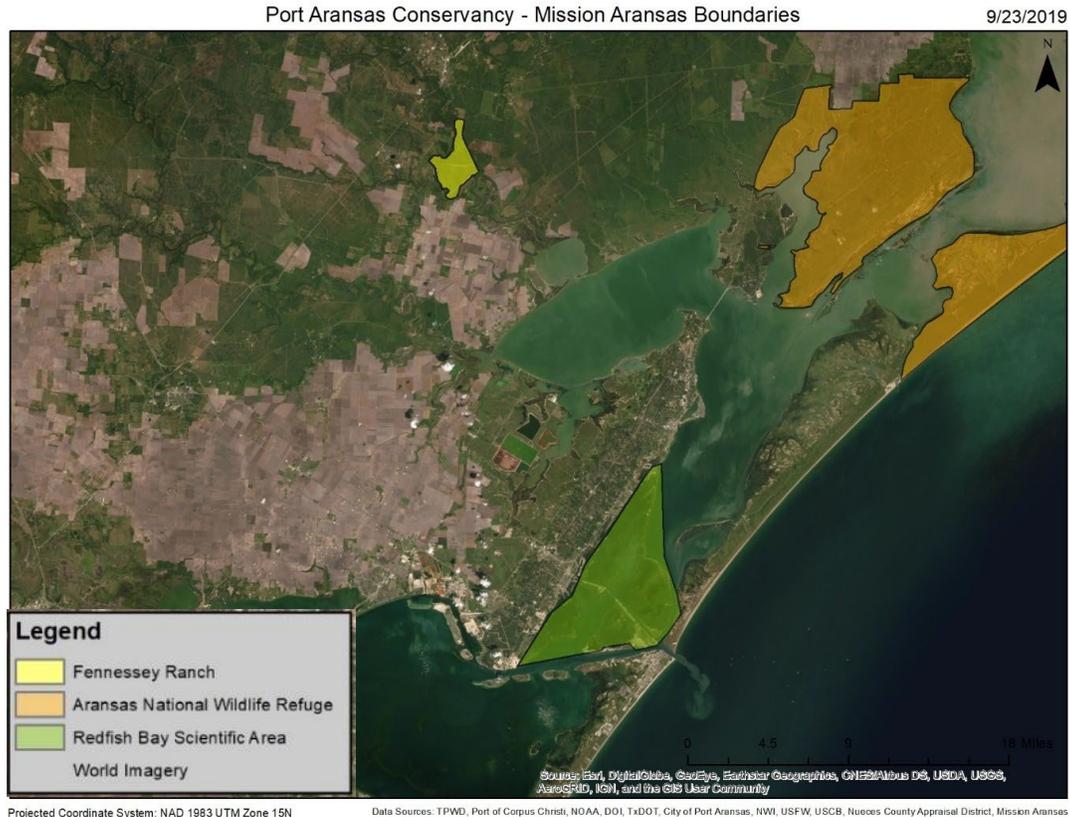


Figure 27: Redfish Bay State Scientific Area and other large land owners near Harbor Island.

The PCCA's VLCC Terminal, the Midstream Terminal and Pipeline, and the Bluewater Texas Pipeline run through the Redfish Bay State Scientific Area (RBSSA). The Redfish Bay Scientific Area is defined by the Texas Administrative Code Title 31 on Natural Resources Part 2 Section 57.921. The Area is 32,000 acres includes some 14,000 acres of seagrass beds. Redfish Bay was proclaimed a state scientific area in 2000 on account of its large population of seagrass which provides valuable fish habitat. Texas Parks and Wildlife designated this area as a voluntary "prop-up" zone, encouraging boaters to avoid prop scarring the seagrass. These voluntary measures proved ineffective in preventing boat damage to seagrass but mandatory measures passed in 2006 reduced prop scarring by 40%. Section 57.921 subsection D reads,

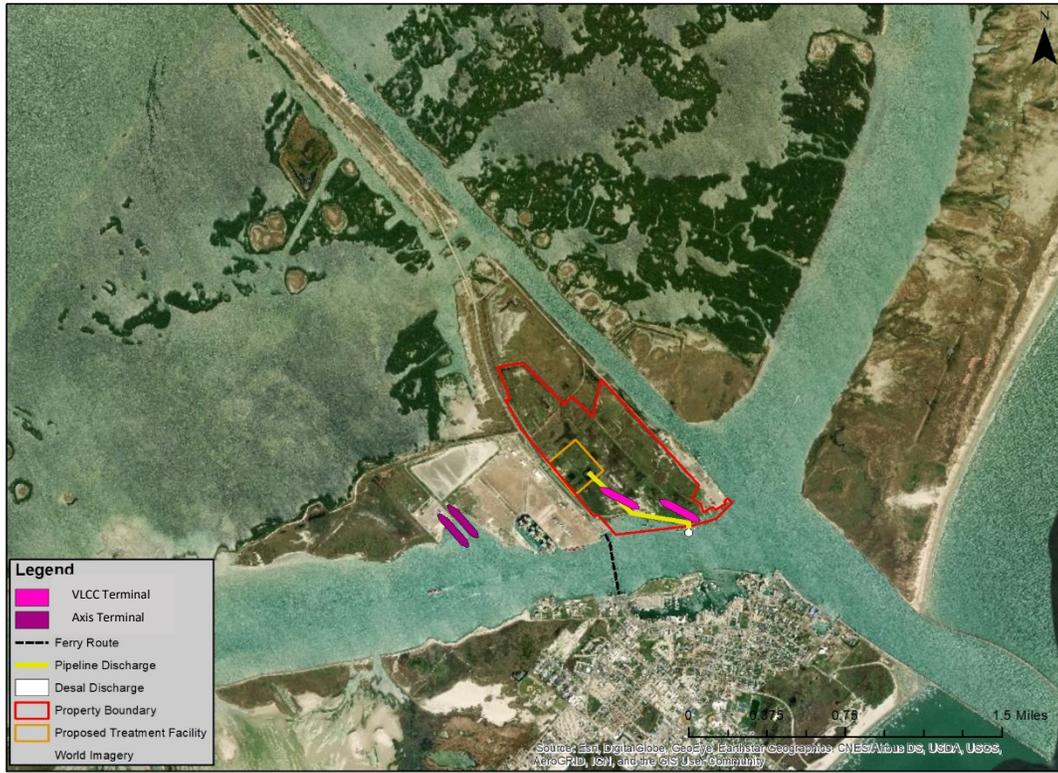
- (1) In this section, "seagrass plant" means individuals from the following marine flowering plant species: Star Grass (*Halophila engelmannii*), Manatee Grass (*Cymodocea filiformis*), Shoalgrass (*Halodule beaudettei*), Turtle Grass (*Thalassia testudinum*), and Widgeon Grass (*Ruppia maritima*).
- (2) Within the Redfish Bay State Scientific Area, no person shall cause or allow any rooted seagrass plant to be uprooted or dug out from the bay bottom by a submerged propeller, except as may be permitted by a coastal lease issued by the Texas General Land Office or otherwise permitted under state law.
- (3) Notwithstanding paragraph (2) of this subsection, it is not a violation to:
  - (A) anchor a vessel within the Redfish Bay State Scientific Area; or
  - (B) use electric trolling motors within the Redfish Bay State Scientific Area.

The ordinance excludes the property owned by the PCCA located on the southern strip of Harbor Island adjacent to the CCSC, however the property owned by the PCCA on the east of the island bordering the Aransas channel is still within the boundaries of RBSSA.

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Port Aransas Conservancy - Harbor Island Project Area

9/18/2019



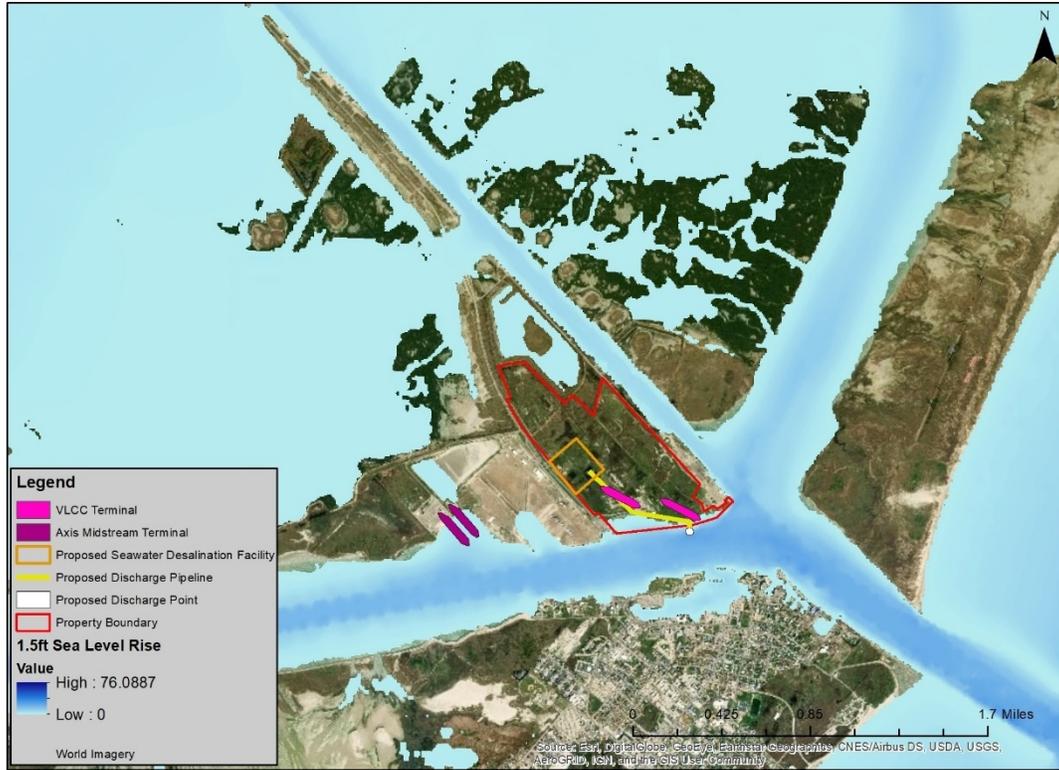
Projected Coordinate System: NAD 1983 UTM Zone 15N

Data Sources: TPWD, Port of Corpus Christi, NOAA, DOI, TxDOT, City of Port Aransas, NWI, USFW, USCB, Nueces County Appraisal District

Figure 28: Current sea level with projects overlaid.

Port Aransas Conservancy - Harbor Island And Sea Level Rise Scenario

10/2/2019



Projected Coordinate System: NAD 1983 UTM Zone 14N

Data Sources: TPWD, Port of Corpus Christi, NOAA, DOI, TxDOT, City of Port Aransas, NWI, USFW, USCB, Nueces County Appraisal District, Mission Aransas

Figure 29: Projection of 1.5 feet sea level rise at Harbor Island with projects overlaid.

SUSTAINABLE PLANNING & DESIGN

Port Aransas Conservancy - Harbor Island And Sea Level Rise Scenario

10/2/2019



Figure 30: Projection of 3 feet sea level rise at Harbor Island with projects overlaid.

Port Aransas Conservancy - Harbor Island And Sea Level Rise Scenario

10/2/2019

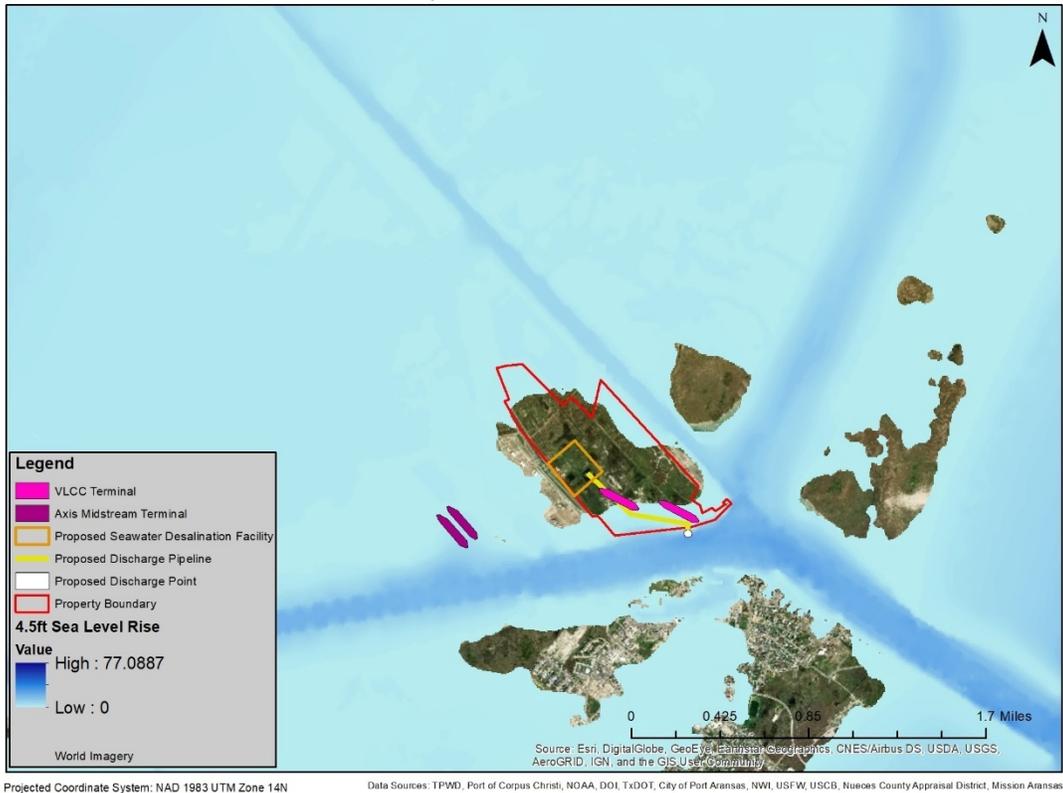


Figure 31: Projection of 4.5 feet sea level rise at Harbor Island with projects overlaid.

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