LLM/BSC Watershed Protection Plan

Coastal/Habitat WG Meeting

February 3rd, 2021

Agenda

- Welcome and Introductions
- Modeling Efforts
- LLMBSC Existing Data
- Stakeholder Input for Model Assumptions
- Adjourn

Welcome & Introductions

Modeling Efforts

Water Quality Modeling

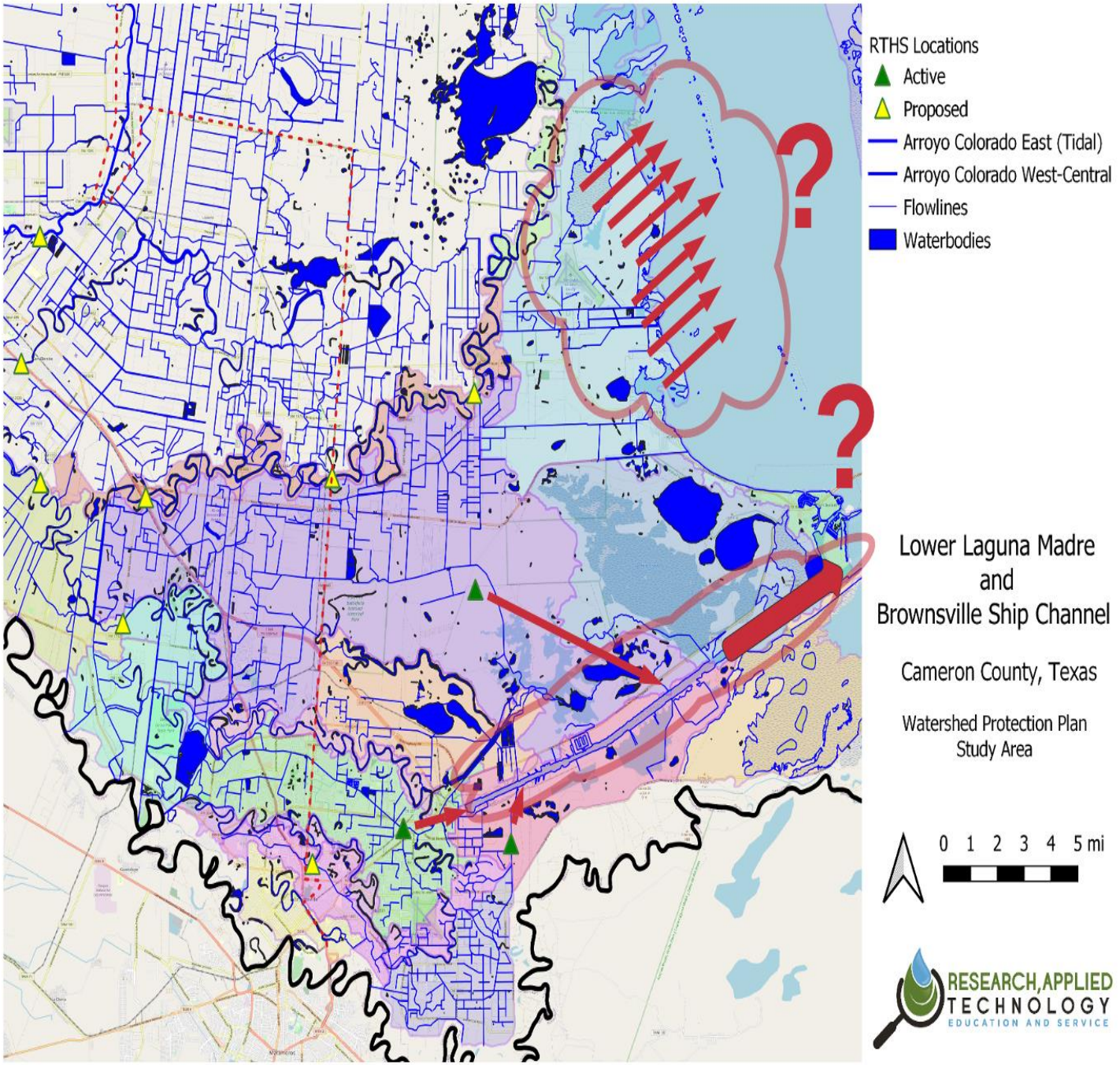
- **SELECT** calculates and allocates potential bacteria loadings from various sources via an ArcGIS environment at a sub-watershed level. Delineating the watershed into smaller sub-watersheds aids in targeting specific areas that may be “hot spots” for potential bacteria loadings.

Spatially Explicit Load Enrichment Calculation Tool (SELECT)

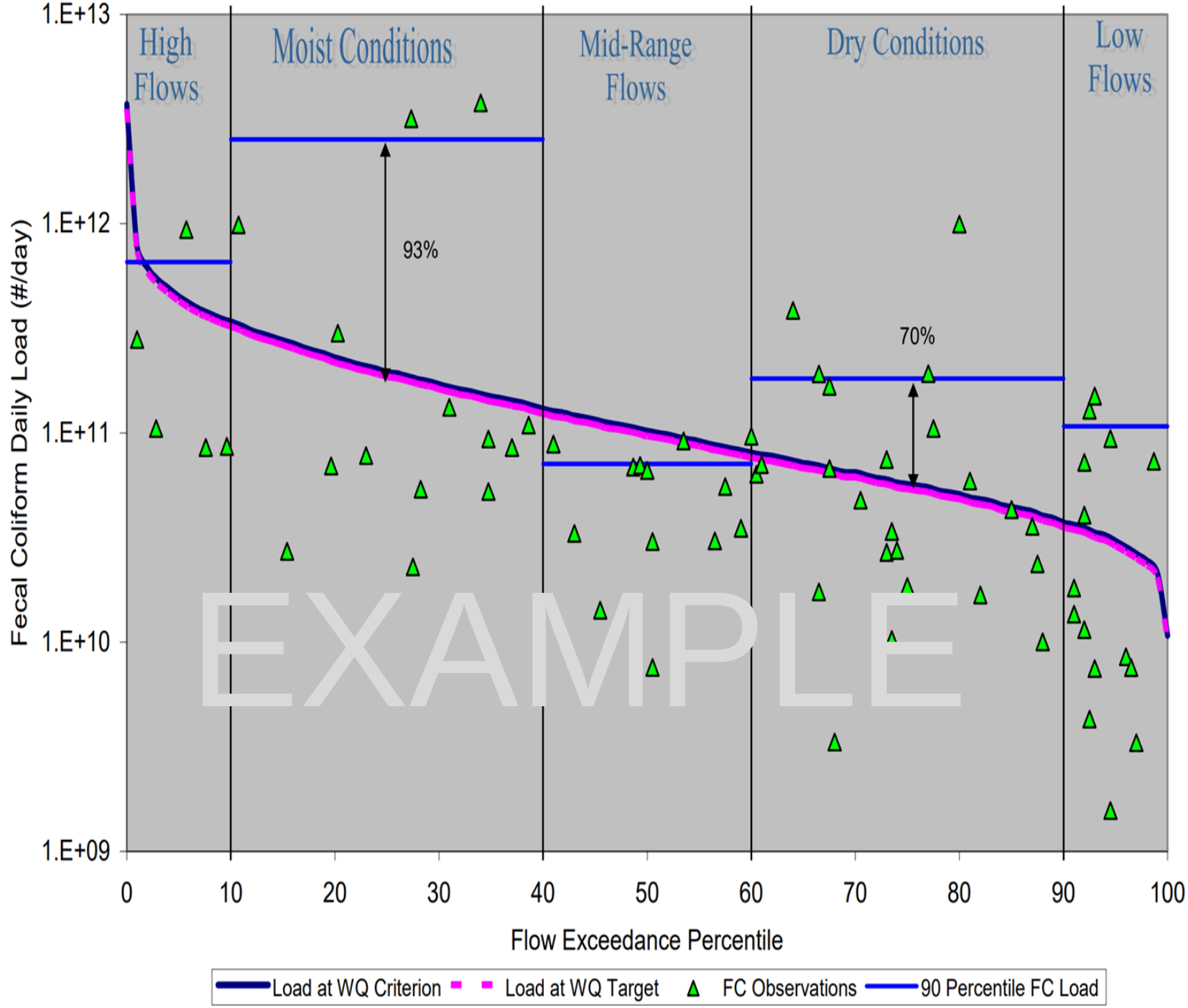
- Identify Potential Bacteria Loadings by Watershed

Load Duration Curves (LDCs)

- Flow Conditions where Loads are Exceeded
- Define Potential Load Reductions

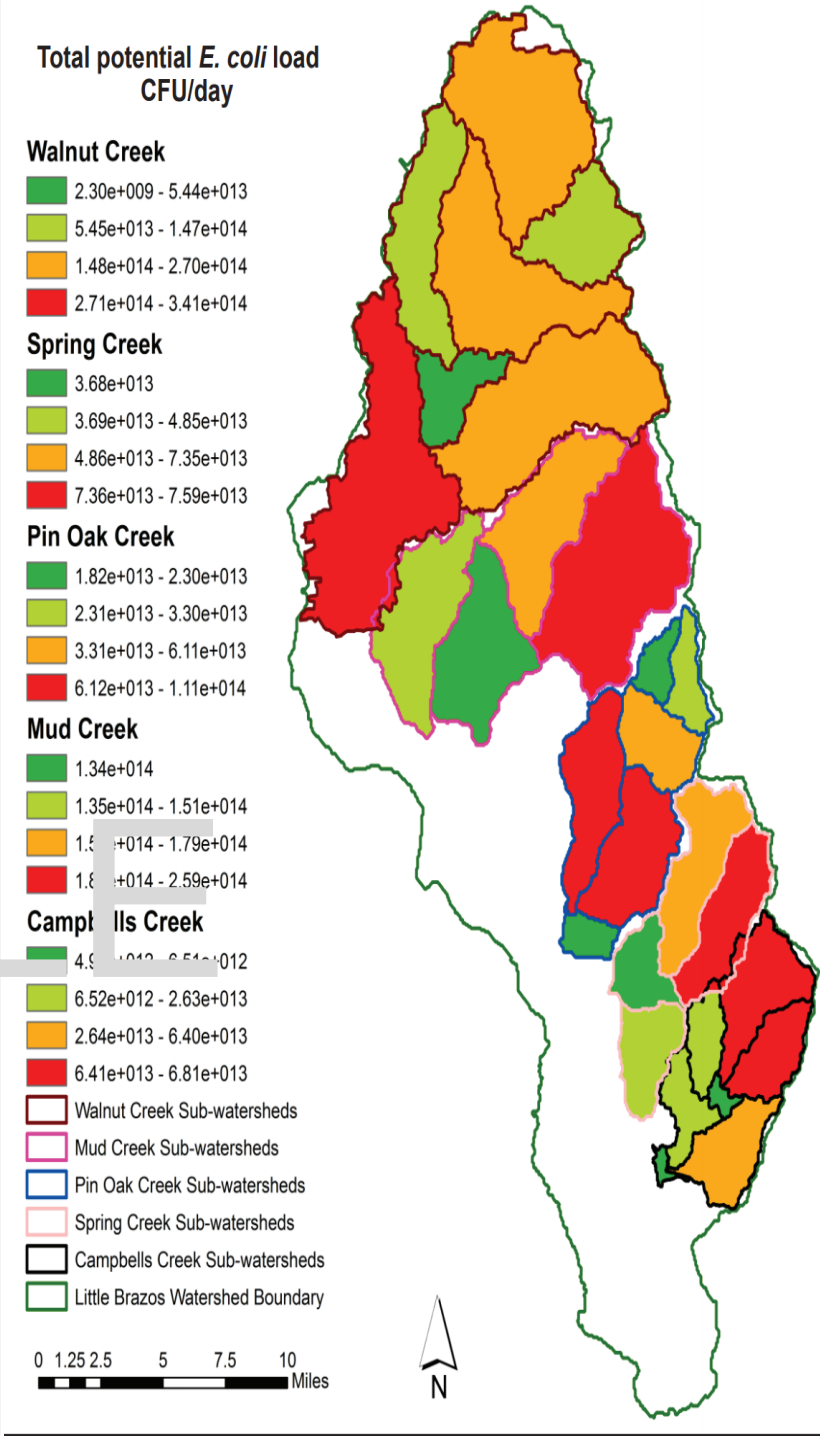


Load Duration Curves



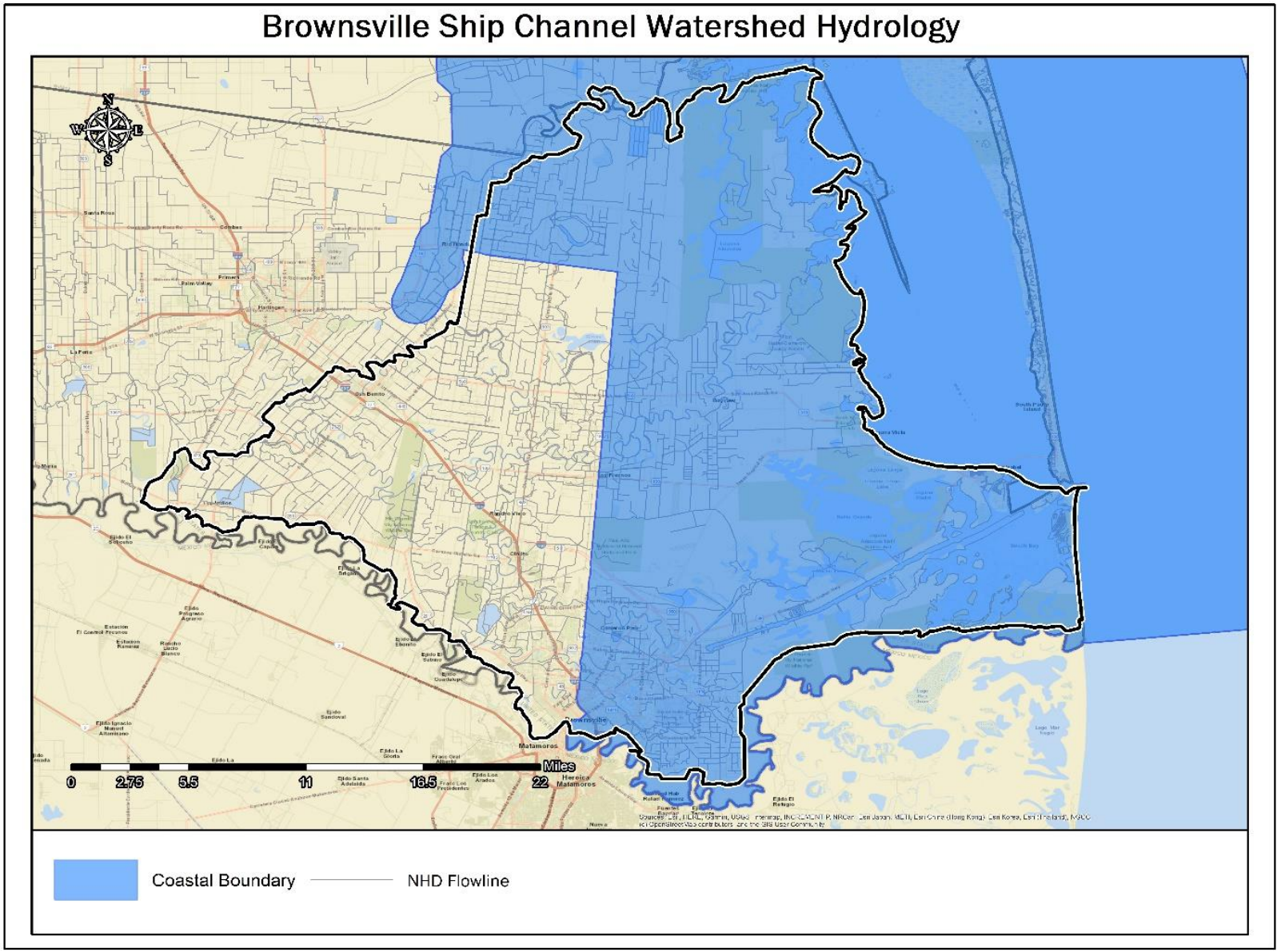
SELECT

Watershed	Potential *E. coli* sources	Daily potential *E. coli* load (CFU/day)	
		Minimum	Maximum
Walnut Creek	Cattle	2.30e+9	3.36e+14
	Deer	1.05e+6	8.97e+10
	Feral hogs	0	5.78e+12
	Poultry operations	0	6.37e+13
	OWTSs	9.69e+6	5.41e+11
	WWTFs	0	1.05e+9
Mud Creek	Cattle	1.30e+14	2.55e+14
	Deer	3.68e+10	7.37e+10
	Feral hogs	2.22e+12	3.98e+12
	Poultry operations	0	9.37e+12
	OWTSs	6.15e+6	2.53e+12
	WWTFs	0	1.43e+9
[illegible] Oak Creek	Cattle	1.73e+13	1.09e+14
	[illegible]er	6[illegible]+9	[illegible]3e+10
	F[illegible]ogs	7[illegible]3e+[illegible]	[illegible]e+12
	OWTSs	2[illegible]5e+1[illegible]	[illegible]3e+11
Spring Creek	Cattle	3.58e+13	7.40e+13
	Deer	1.37e+10	2.99e+10
	Feral hogs	9.70e+11	1.79e+12
	OWTSs	6.07e+10	2.67e+11
Campbells Creek	Cattle	4.80e+12	6.64e+13
	Deer	1.81e+9	2.70e+10
	Feral hogs	1.31e+11	2.05e+12
	OWTSs	4.25e+9	1.72e+12

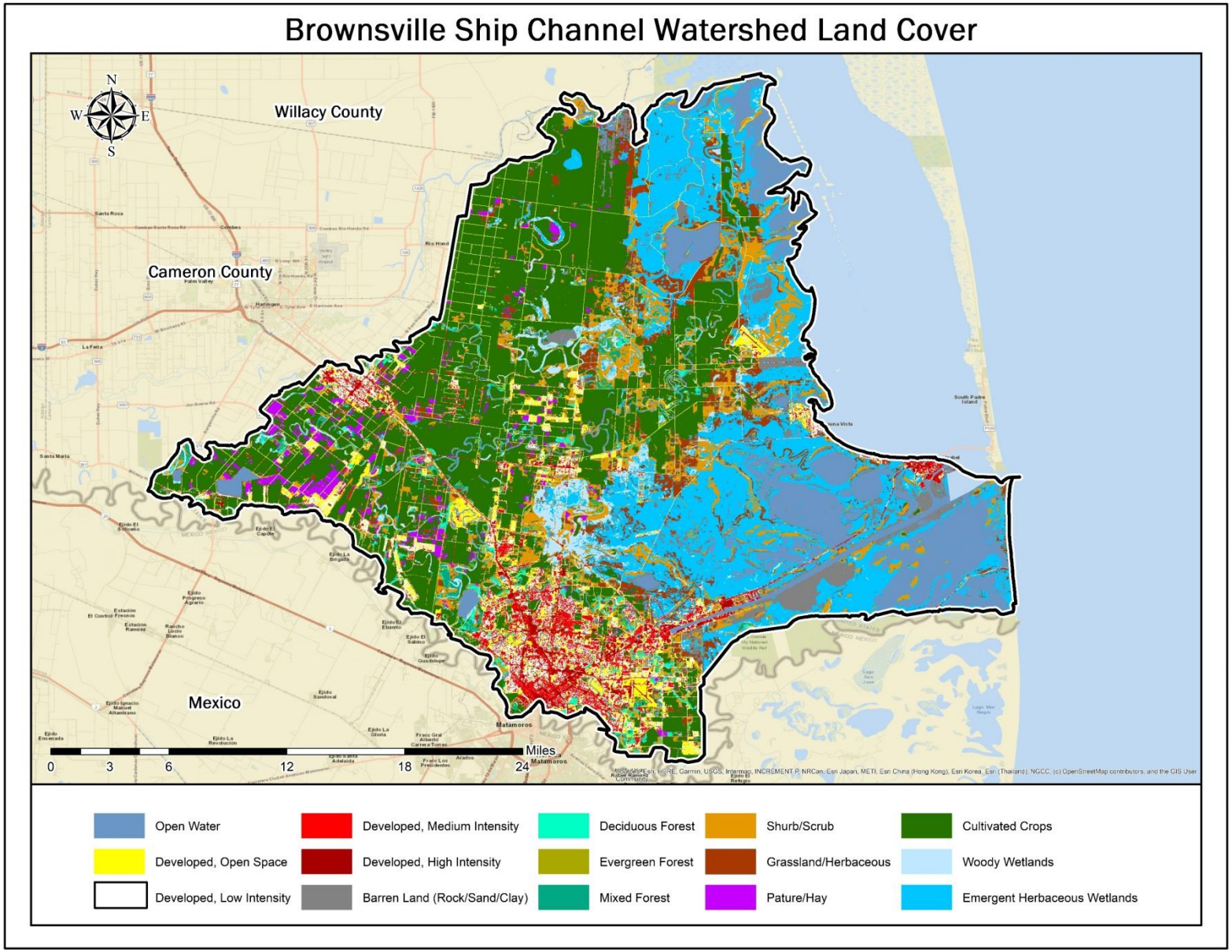


LLMBSC Existing Data

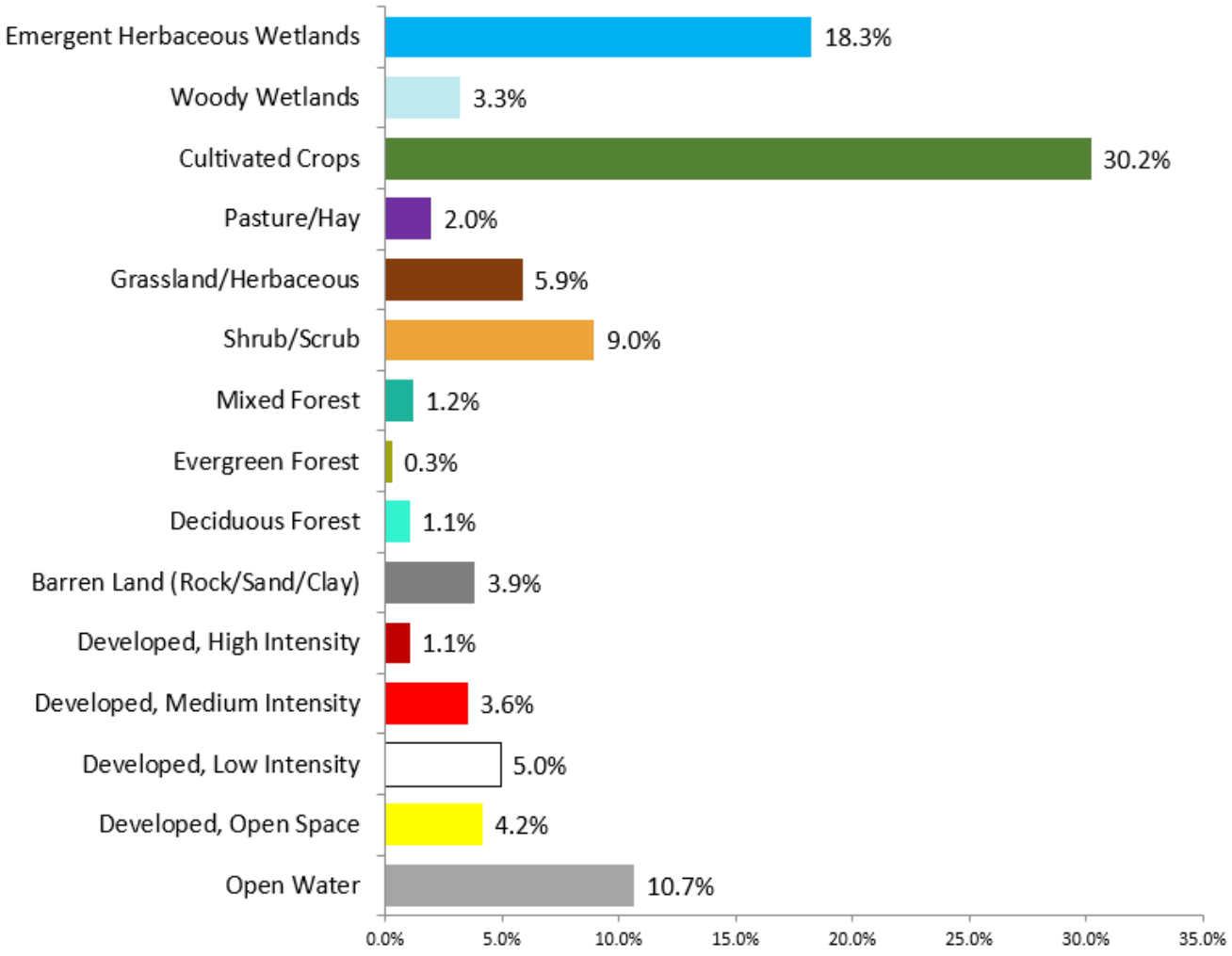
Coastal Areas



Land Cover

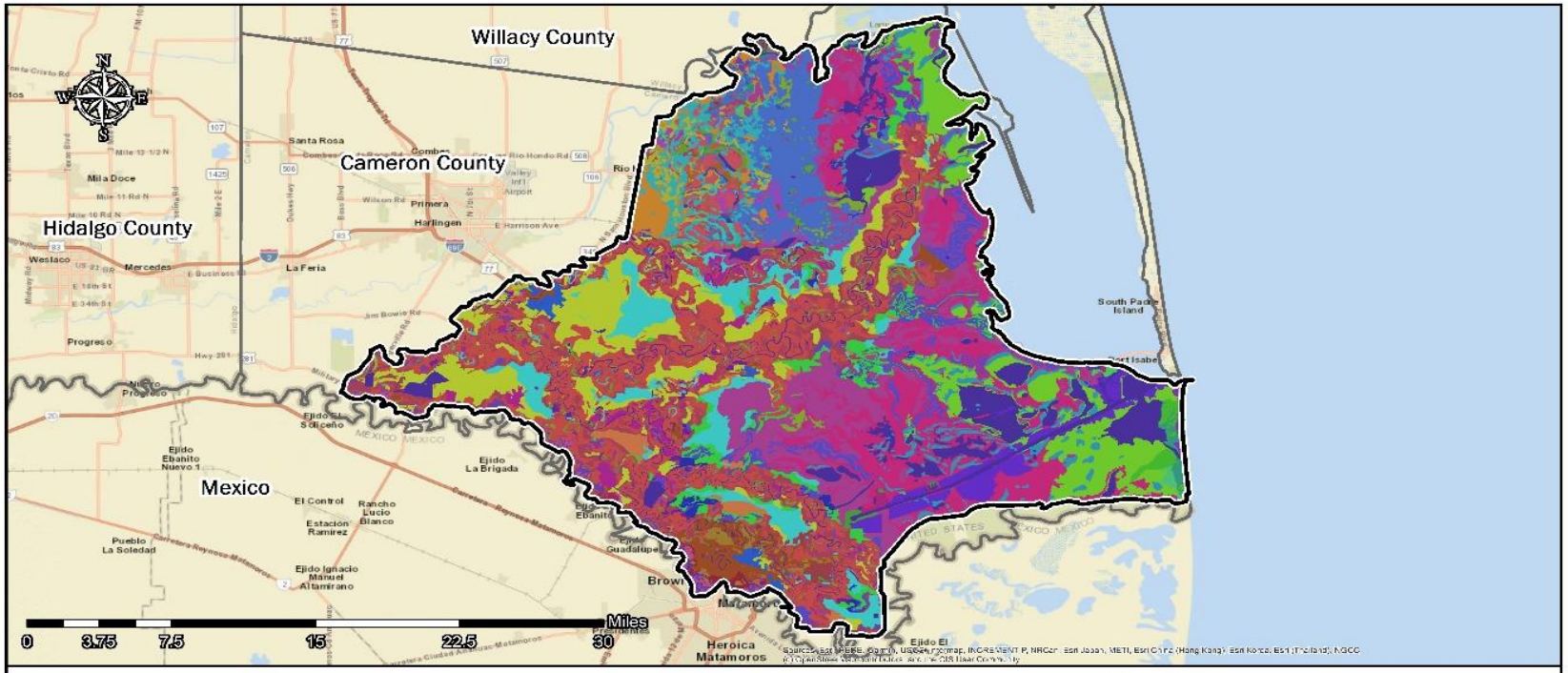

Brownsville Ship Channel Watershed Land Cover
Willacy County
Cameron County
Mexico
Matamoros
Miles
0
3
6
12
18
24
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land (Rock/Sand/Clay)
Deciduous Forest
Evergreen Forest
Mixed Forest
Shurb/Scrub
Grassland/Herbaceous
Pature/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands

Land Cover


Emergent Herbaceous Wetlands
18.3%
Woody Wetlands
3.3%
Cultivated Crops
30.2%
Pasture/Hay
2.0%
Grassland/Herbaceous
5.9%
Shrub/Scrub
9.0%
Mixed Forest
1.2%
Evergreen Forest
0.3%
Deciduous Forest
1.1%
Barren Land (Rock/Sand/Clay)
3.9%
Developed, High Intensity
1.1%
Developed, Medium Intensity
3.6%
Developed, Low Intensity
5.0%
Developed, Open Space
4.2%
Open Water
10.7%
0.0%
5.0%
10.0%
15.0%
20.0%
25.0%
30.0%
35.0%

Soil Map

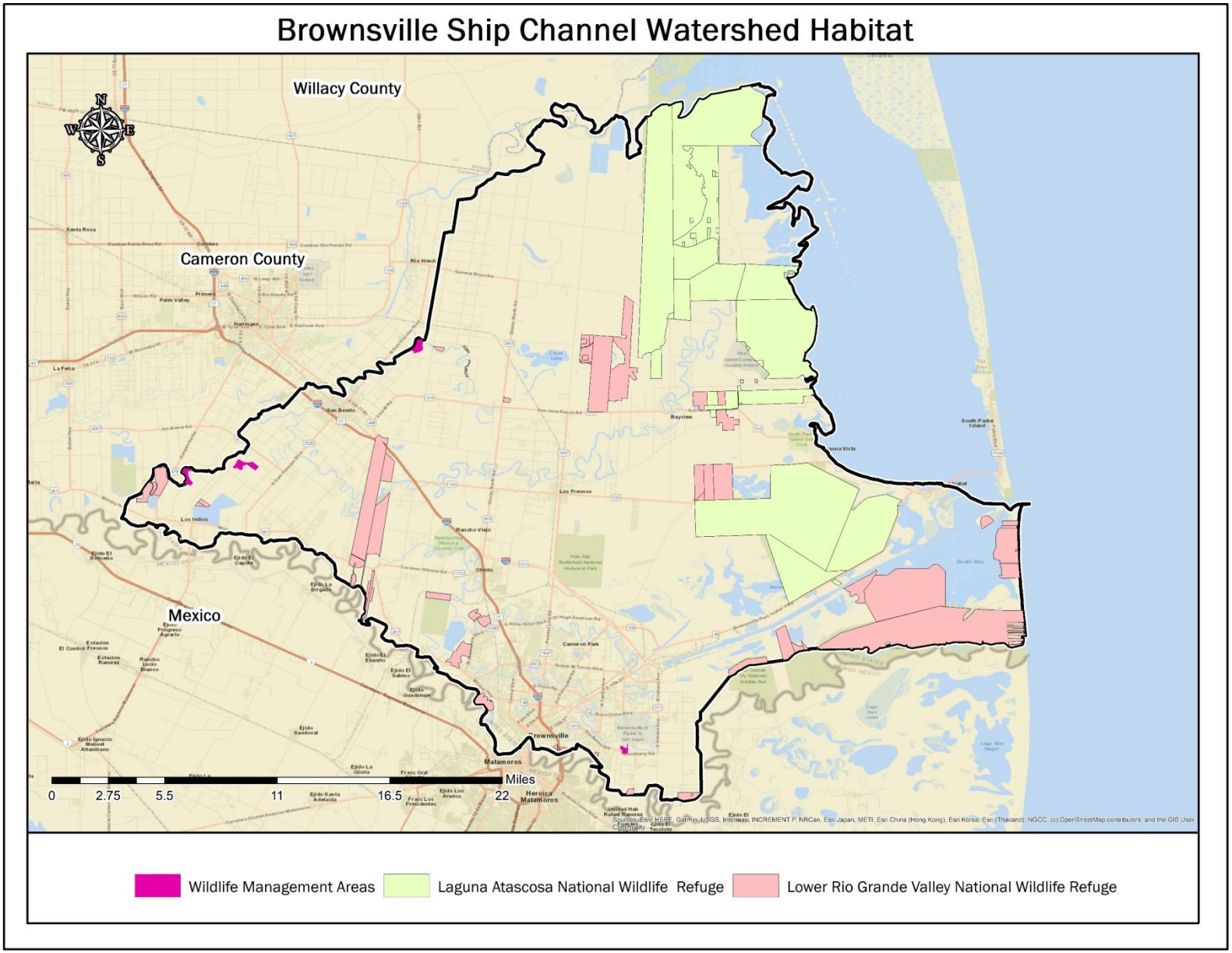
Brownsville Ship Channel Soil Map



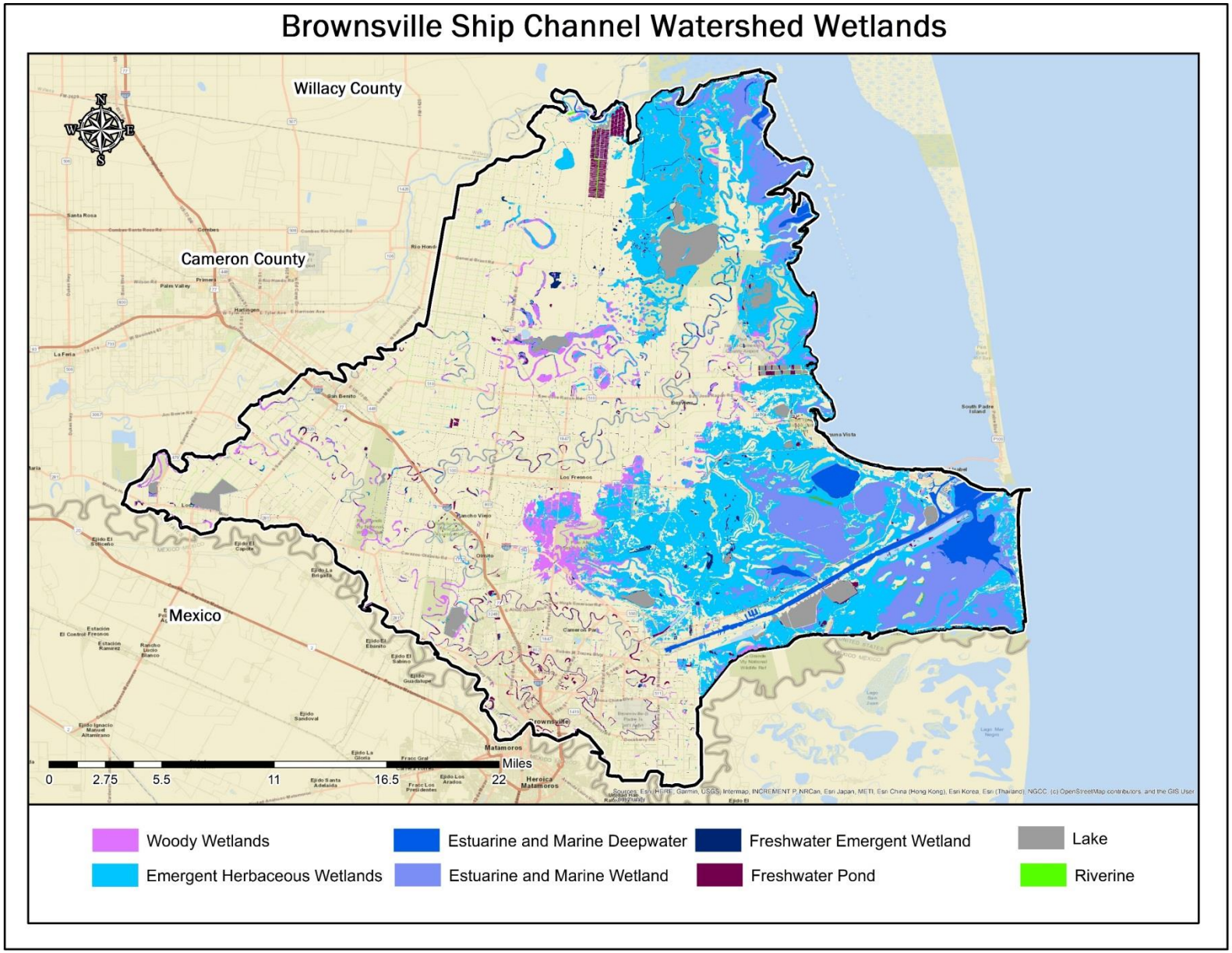
- Barrada clay, 0 to 1 percent slopes, very frequently flooded, occasionally ponded
- Benito clay, ponded
- Benito-Urban land complex, ponded
- Borrow pits
- Camargo silt loam, 0 to 1 percent slopes, rarely flooded
- Camargo silty clay loam, 0 to 1 percent slopes, rarely flooded
- Cameron silty clay
- Cameron silty clay, saline
- Chargo silty clay
- Coastal beach
- Daggerhill fine sand, 2 to 12 percent slopes, rarely flooded
- Delfina fine sandy loam, warm, 0 to 2 percent slopes
- Galveston fine sand, hummocky, occasionally flooded
- Grulla clay, frequently flooded and ponded
- Harlingen clay
- Harlingen clay, saline
- Harlingen-Urban land complex
- Hidalgo fine sandy loam, 0 to 1 percent slopes
- Hidalgo fine sandy loam, 1 to 3 percent slopes
- Hidalgo sandy clay loam, 0 to 1 percent slopes
- Hidalgo-Urban land complex, 0 to 1 percent slopes
- Laredo silty clay loam 0 to 1 percent slopes, rarely flooded
- Laredo silty clay loam, 1 to 3 percent slopes
- Laredo silty clay loam, saline
- Laredo-Olmito complex
- Laredo-Reynosa complex 1 to 3 percent slopes
- Laredo-Reynosa complex, 0 to 1 percent slopes
- Laredo-Urban land complex
- Latina sandy clay loam, 0 to 1 percent slopes, occasionally ponded, rarely flooded
- Lomalta clay, 0 to 1 percent slopes, occasionally ponded
- Lomalta occasionally ponded-Urban land complex, 0 to 1 percent slopes
- Lozano fine sandy loam
- Lyford sandy clay loam
- Matamoros silty clay
- Matamoros-Rio Grande complex
- Mercedes clay
- Mercedes clay, 0 to 1 percent slopes
- Mercedes-Urban land complex
- Miscellaneous water
- Mustang fine sand, 0 to 1 percent slopes, occasionally flooded, frequently ponded
- Mustang fine sand, saline, frequently flooded
- Olmito silty clay
- Olmito-Urban land complex
- Orelia clay loam, clayey subsoil variant, occasionally ponded
- Point Isabel clay loam, 1 to 5 percent slopes, rarely flooded
- Point Isabel-Urban land complex
- Porfirio sandy clay loam occasionally ponded, 0 to 1 percent slopes
- Racombes sandy clay loam, 0 to 1 percent slopes
- Raymondville clay loam
- Raymondville clay loam, saline
- Raymondville-Urban land complex
- Rio Grande silt loam
- Rio Grande silty clay loam
- Rio Grande-Urban land complex
- Rio Grande-Zalla complex
- Rio clay loam, ponded
- Sejita silty clay loam, 0 to 1 percent slopes, occasionally ponded
- Sejita-Urban land complex, 0 to 1 percent slopes, occasionally ponded
- Tiocano clay, 0 to 1 percent slopes, occasionally ponded
- Twinpalms occasionally flooded-Yarborough frequently flooded complex, 0 to 3 percent slopes
- Udipsamments, gently undulating, occasionally flooded
- Water
- Willacy fine sandy loam, 0 to 1 percent slopes
- Willacy fine sandy loam, 1 to 3 percent slopes
- Willamar fine sandy loam, 0 to 1 percent slopes
- Zalla loamy fine sand

Type of Soil	Area (sq mi)	Percentage
Barrada clay, 0 to 1 percent slopes, very frequently flooded, occasionally ponded	11	2%
Willamar fine sandy loam, 0 to 1 percent slopes	26	4%
Harlingen clay	14	2%
Sejita silty clay loam, 0 to 1 percent slopes, occasionally ponded	21	3%
Lomalta clay, 0 to 1 percent slopes, occasionally ponded	24	4%
Barrada clay, 0 to 1 percent slopes, very frequently flooded, occasionally ponded	15	2%
Water	25	4%
Laredo silty clay loam 0 to 1 percent slopes, rarely flooded	26	4%
Watershed Area	645	

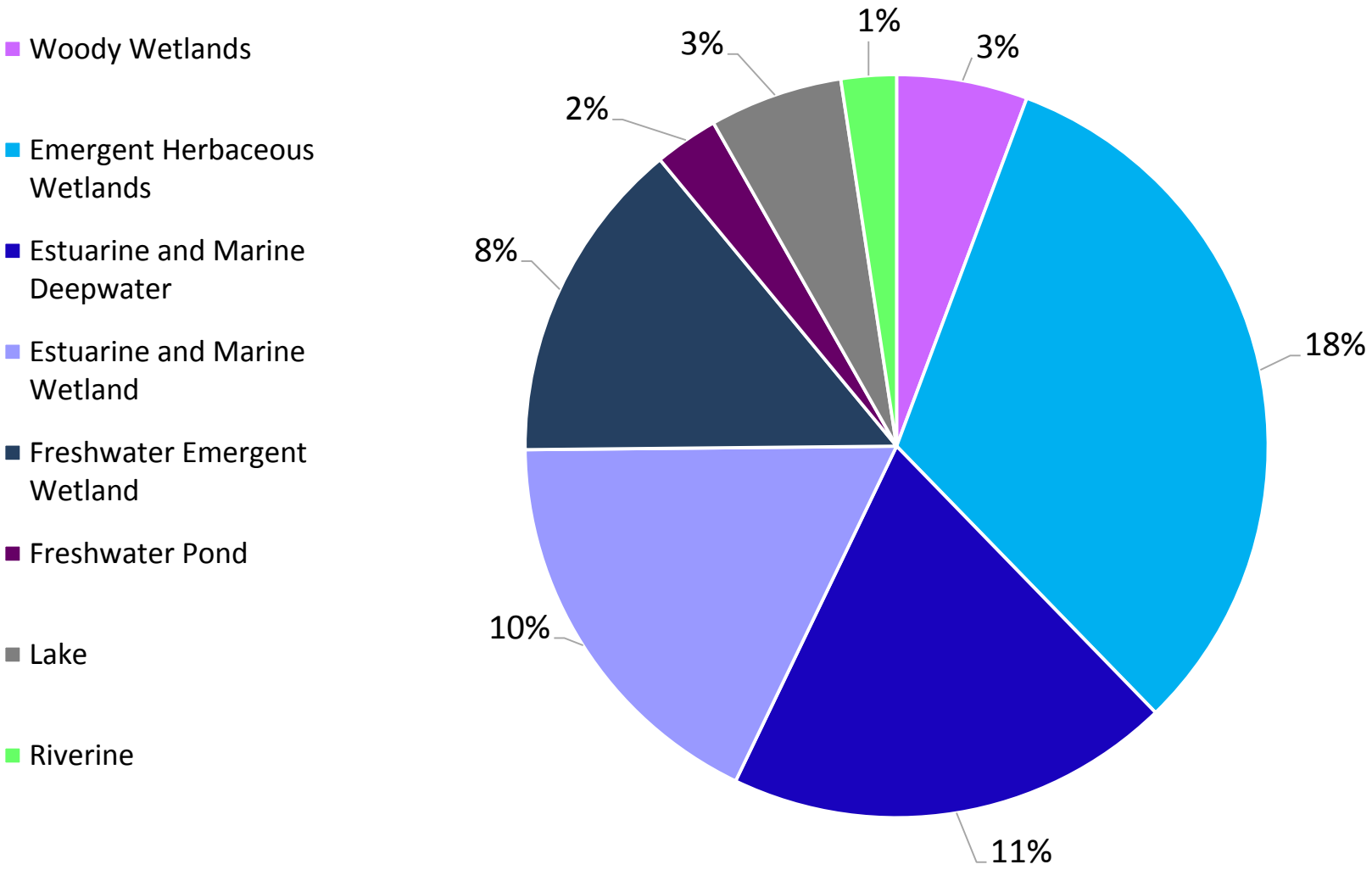
Habitat


Brownsville Ship Channel Watershed Habitat
Willacy County
Cameron County
Mexico
Miles
0
2.75
5.5
11
16.5
22
Wildlife Management Areas
Laguna Atascosa National Wildlife Refuge
Lower Rio Grande Valley National Wildlife Refuge

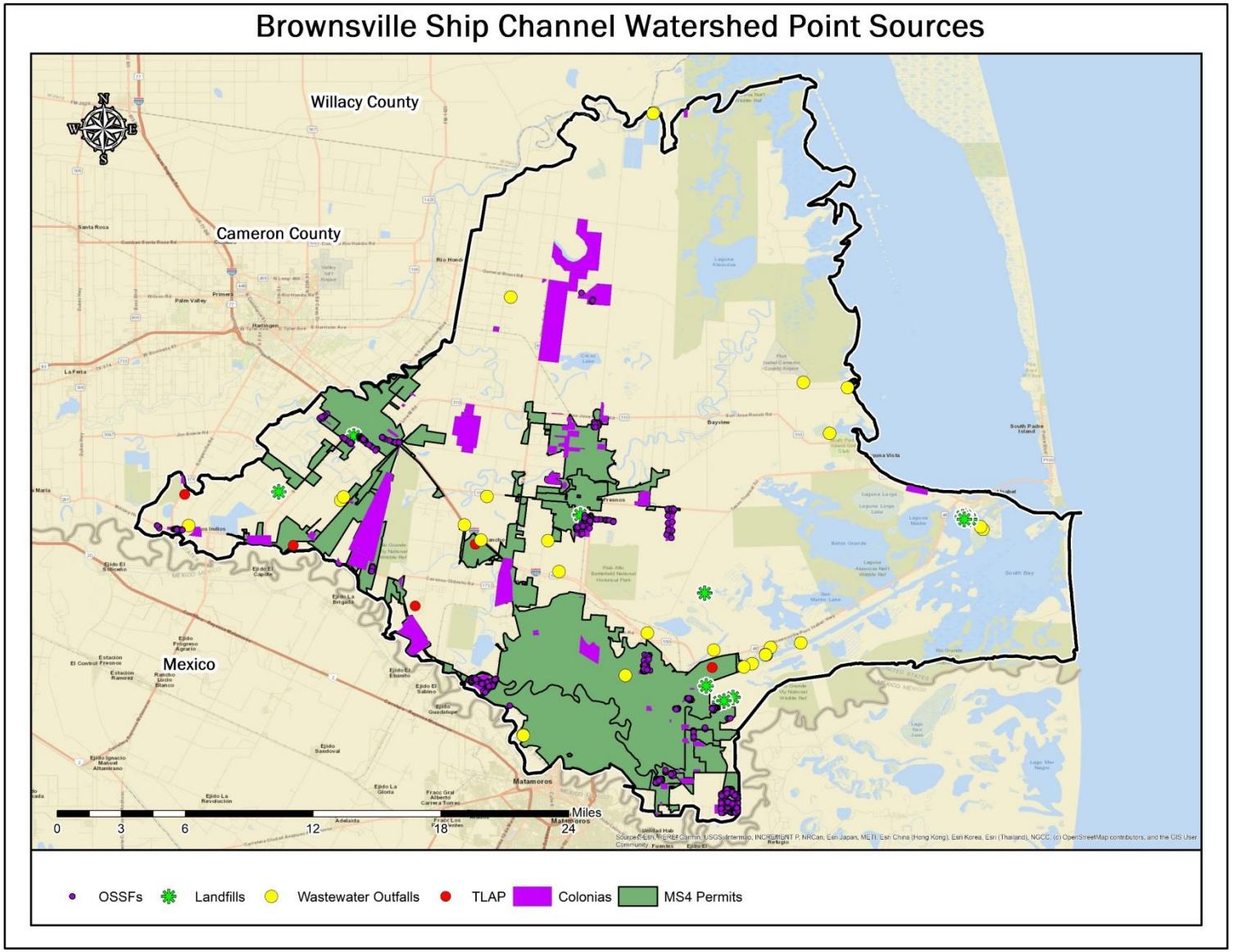
Habitat


Brownsville Ship Channel Watershed Wetlands
Willacy County
Cameron County
Mexico
Brownsville
Matamoros
Heroica Matamoros
South Padre Island
0
2.75
5.5
11
16.5
22
Miles
Woody Wetlands
Emergent Herbaceous Wetlands
Estuarine and Marine Deepwater
Estuarine and Marine Wetland
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

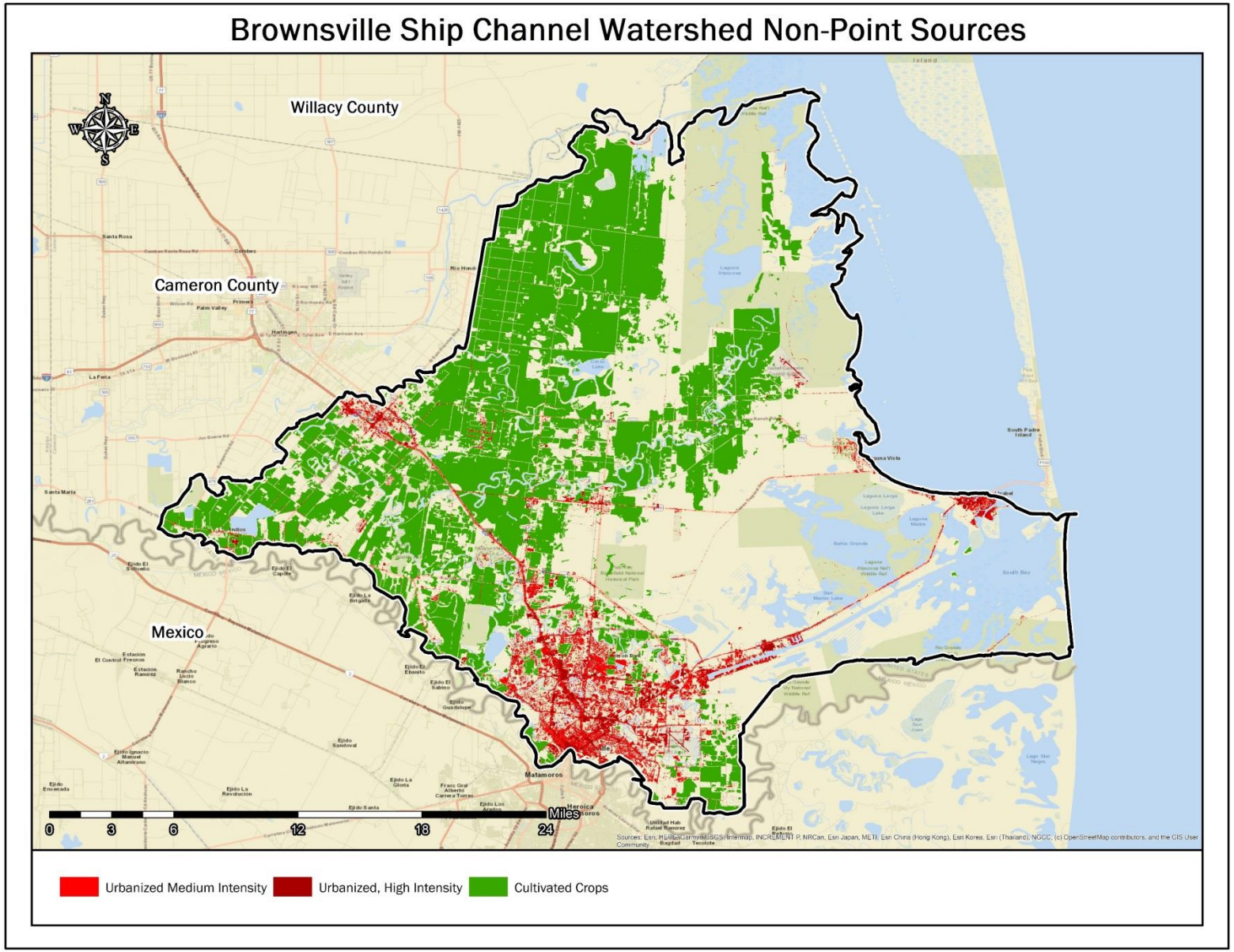
Habitat


Woody Wetlands
Emergent Herbaceous Wetlands
Estuarine and Marine Deepwater
Estuarine and Marine Wetland
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine
3%
18%
11%
10%
8%
2%
3%
1%

Point Source



Nonpoint Source

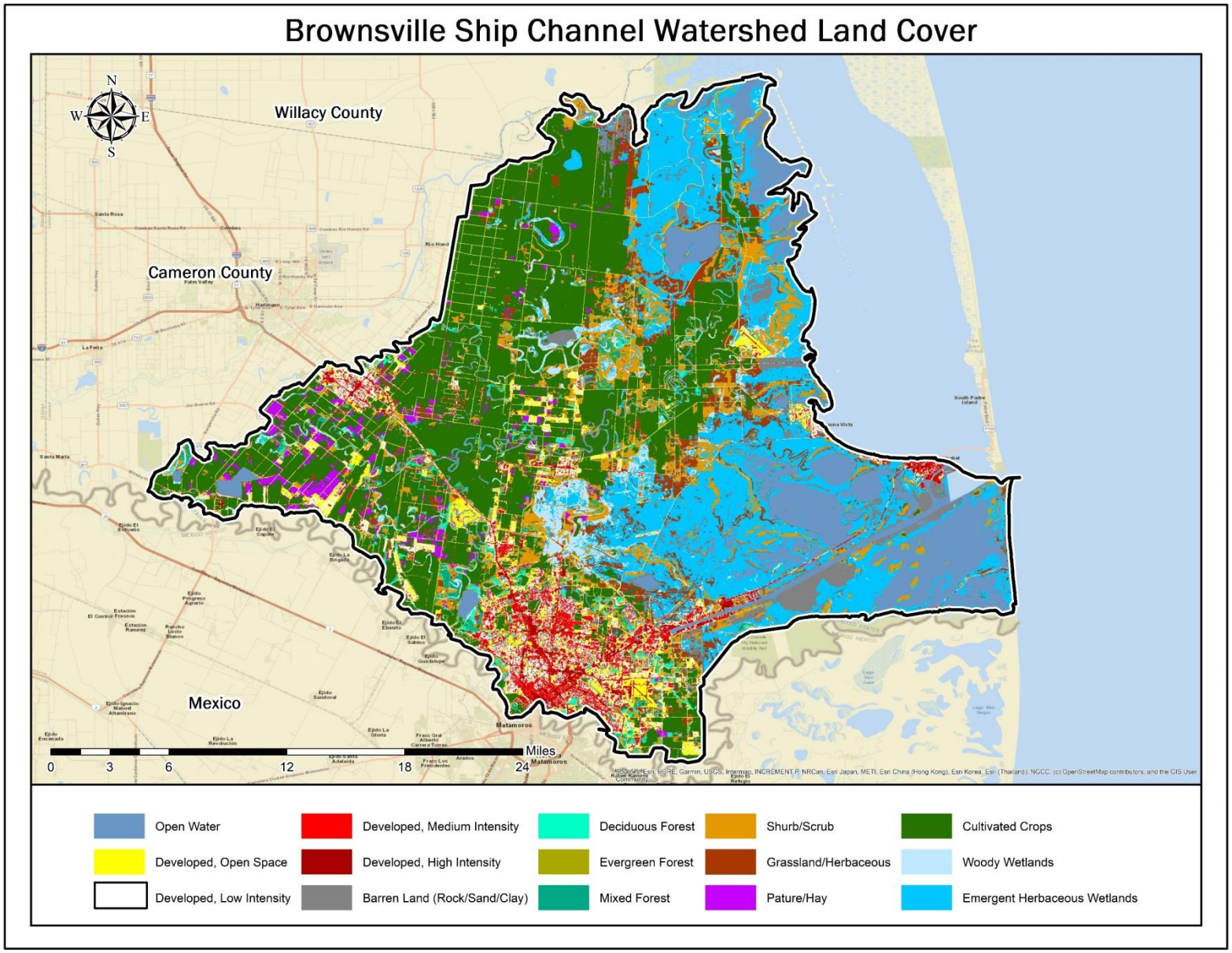


Existing Data Summary

Coastal Area	Texas General Land Office (TXGLO) and NHD
Land Cover	Texas Natural Resources Information System (TNRIS) and NLCD
Soil	Natural Resources Conservation Service (NRCS) website SSURGO (Soil Survey Geographic Database
Habitat	Texas Park and Wildlife Department (TPWD) and U.S. Fish and Wildlife Service (USFWS)
Wetlands	Texas General Land Office (TXGLO)
Point Source	TCEQ
Non-Point Source	Texas Natural Resources Information System (TNRIS) and NLCD

Modeling Assumptions

Land Use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Emergent Herbaceous Wetlands

Modeling Assumptions

- Feral Hog density

Source	Value
Texas A&M Agrilife Research (AgriLife) densities.	AgriLife has used a variety of hog densities, with a generic Texas range of **1.3-2.5 hogs per square mile**, depending on land cover type. This value is expected to be heavily modified by local stakeholders to reflect area or subwatershed populations.

Modeling Assumptions

- Livestock populations

Source	Value
United States Department of Agriculture National Agricultural Statistics Service (NASS) Agricultural Census data (most recent.)	County-level data validated by stakeholders is used to **derive a ratio of animals per land cover type**. This ratio is then applied to the area of the watershed in each county.

Modeling Assumptions

- Land cover change

Source	Value
UTRGV regional demographic projections	**National Land Cover Database (NLCD)** changes adapted using stakeholder input.

Modeling Assumptions

- Pet populations

Source	Value
American Veterinary Medicine Association (AMVA)	AMVA estimates of household ownership **(0.8 pets/household)** used as a starting figure, multiplied by number of households. This will be modified by stakeholders and area-specific reconnaissance.

Modeling Assumptions

- Deer and Nilgai Populations

Source	Value
Texas Parks and Wildlife Department (TPWD)	**TPWD Resource Management Unit (RMU)** data is used to define regional deer population estimates, which are applied to appropriate land cover types, as in Teague, 2009.

Modeling Assumptions

- Bird populations/fecal concentrations

Source	Value
TPWD, Stakeholders, EPA, TSSWCB	Bird populations are based primarily on TPWD staff knowledge (if available) and stakeholder knowledge. Of primary concern are the presence of colonial rookeries, swallow nesting sites over water, gulls concentrated at landfills, and other large concentrations of birds. EPA and TSSWCB values for bird fecal rates are used if stakeholder input indicates substantial, or substantially proximate (swallow colonies over bridges, etc.), numbers of birds exist on an annual basis to model. Values dependent on species of concern.

PREPARED IN COOPERATION WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY AND U.S. ENVIRONMENTAL PROTECTION AGENCY

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