LLM/BSC Watershed Protection Plan

AG WG Meeting

February 24, 2021

Agenda

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

Welcome & Introductions

Modeling Efforts

Water Quality Modeling

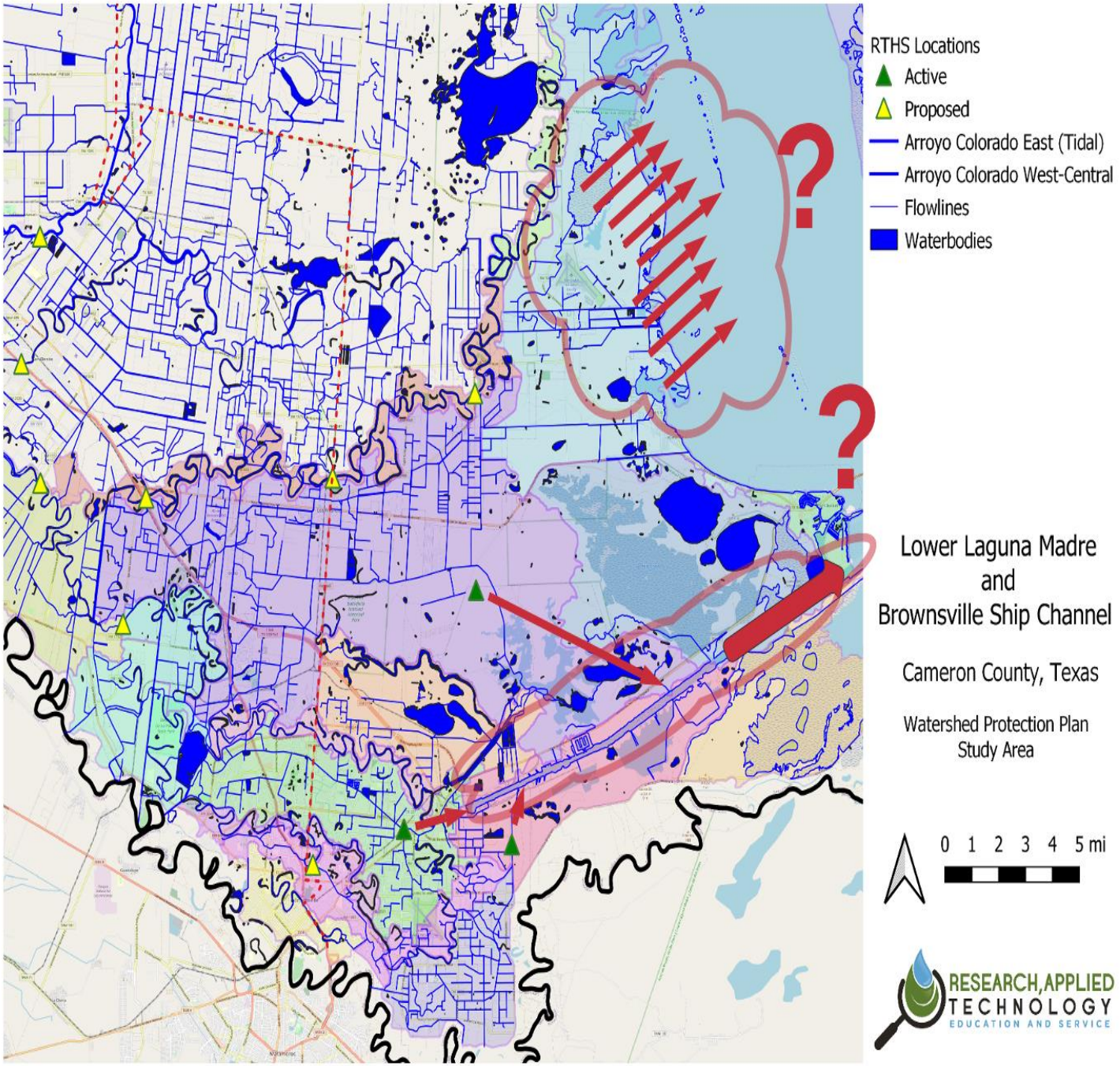
- **SELECT** calculates and allocates potential bacteria loadings from various sources via an ArcGIS environment at a sub-watershed level. Delineating the watershed into smaller sub-watersheds aids in targeting specific areas that may be “hot spots” for potential bacteria loadings.

Spatially Explicit Load Enrichment Calculation Tool (SELECT)

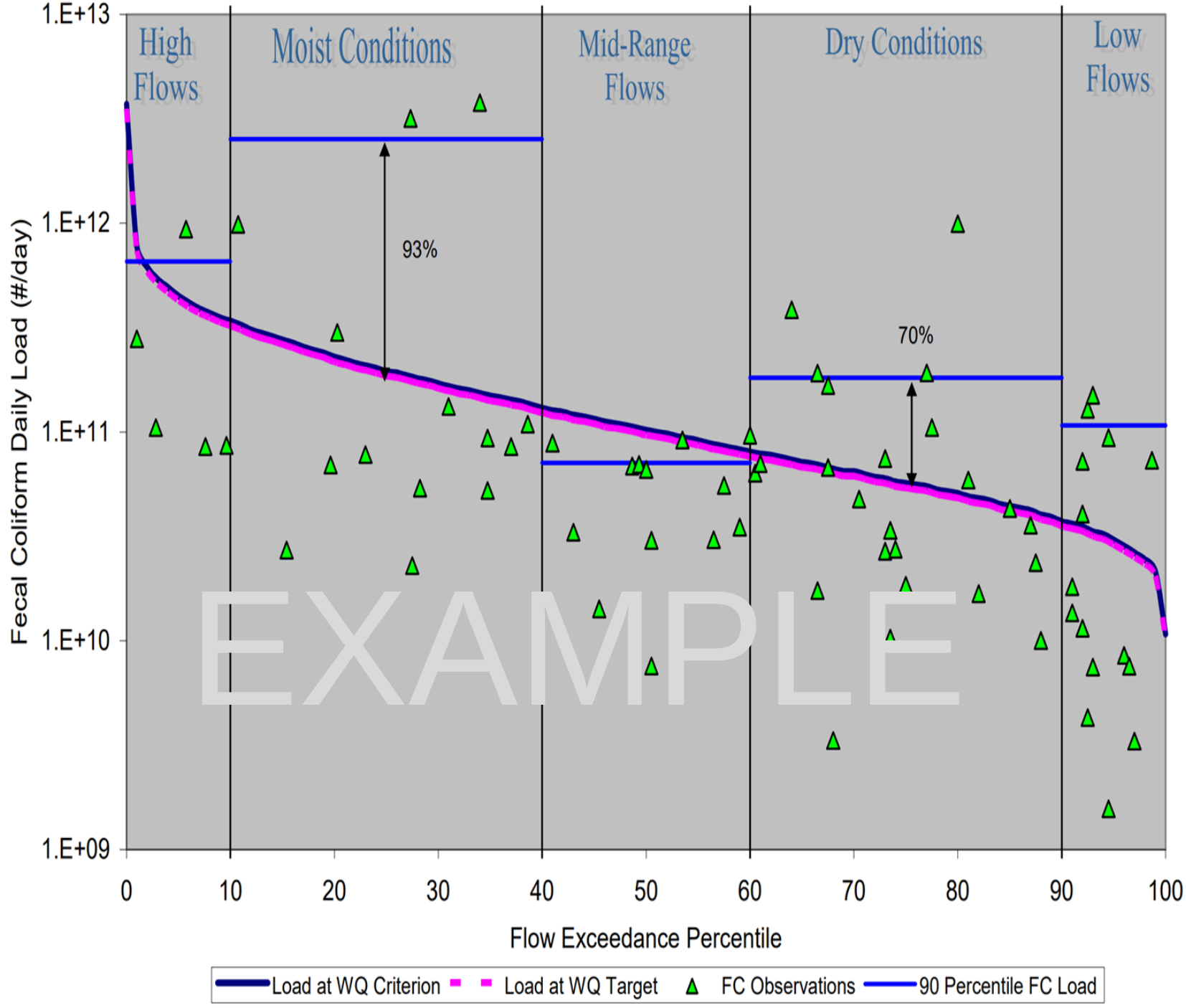
- Identify Potential Bacteria Loadings by Watershed

Load Duration Curves (LDCs)

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

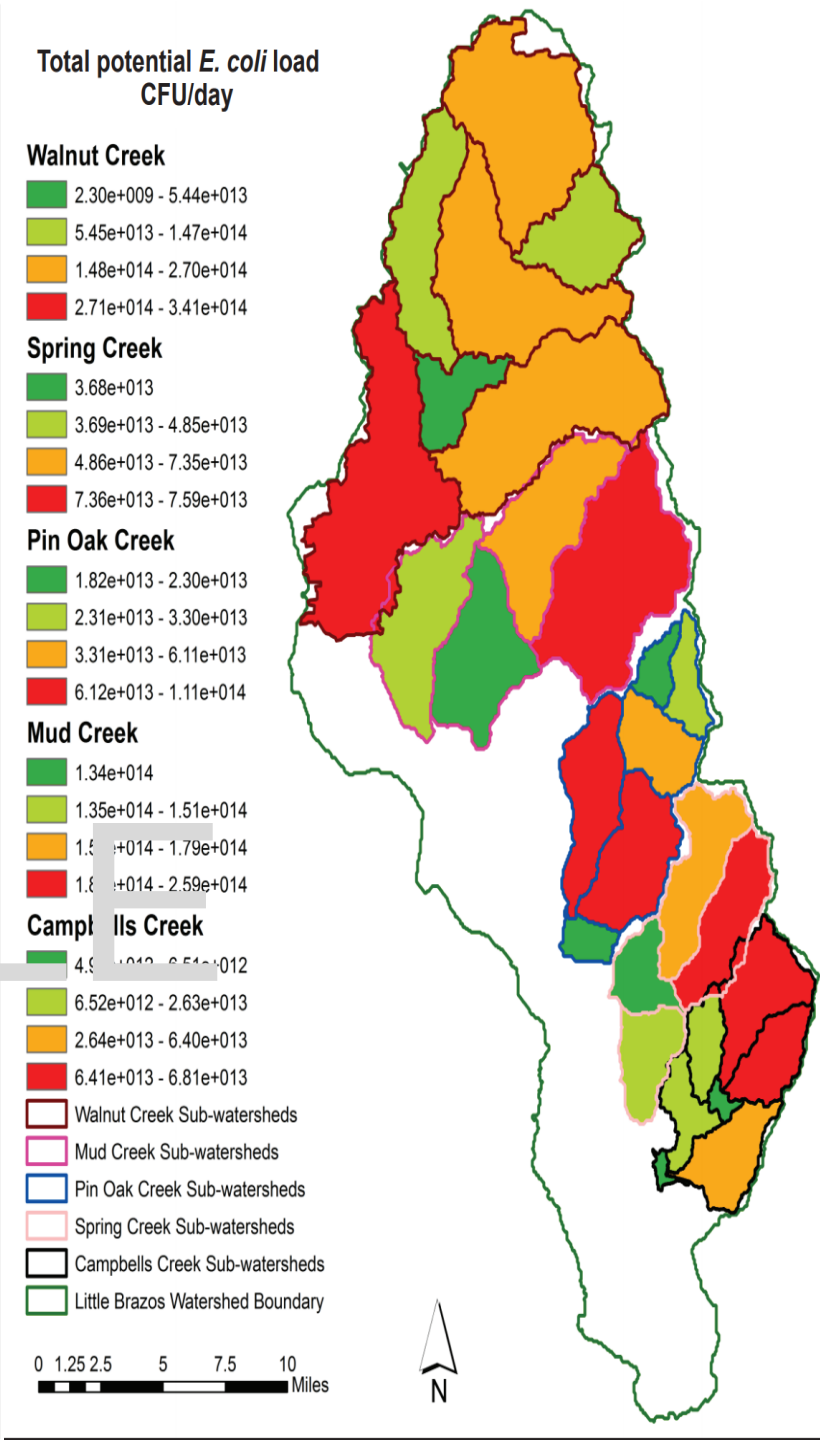


Load Duration Curves



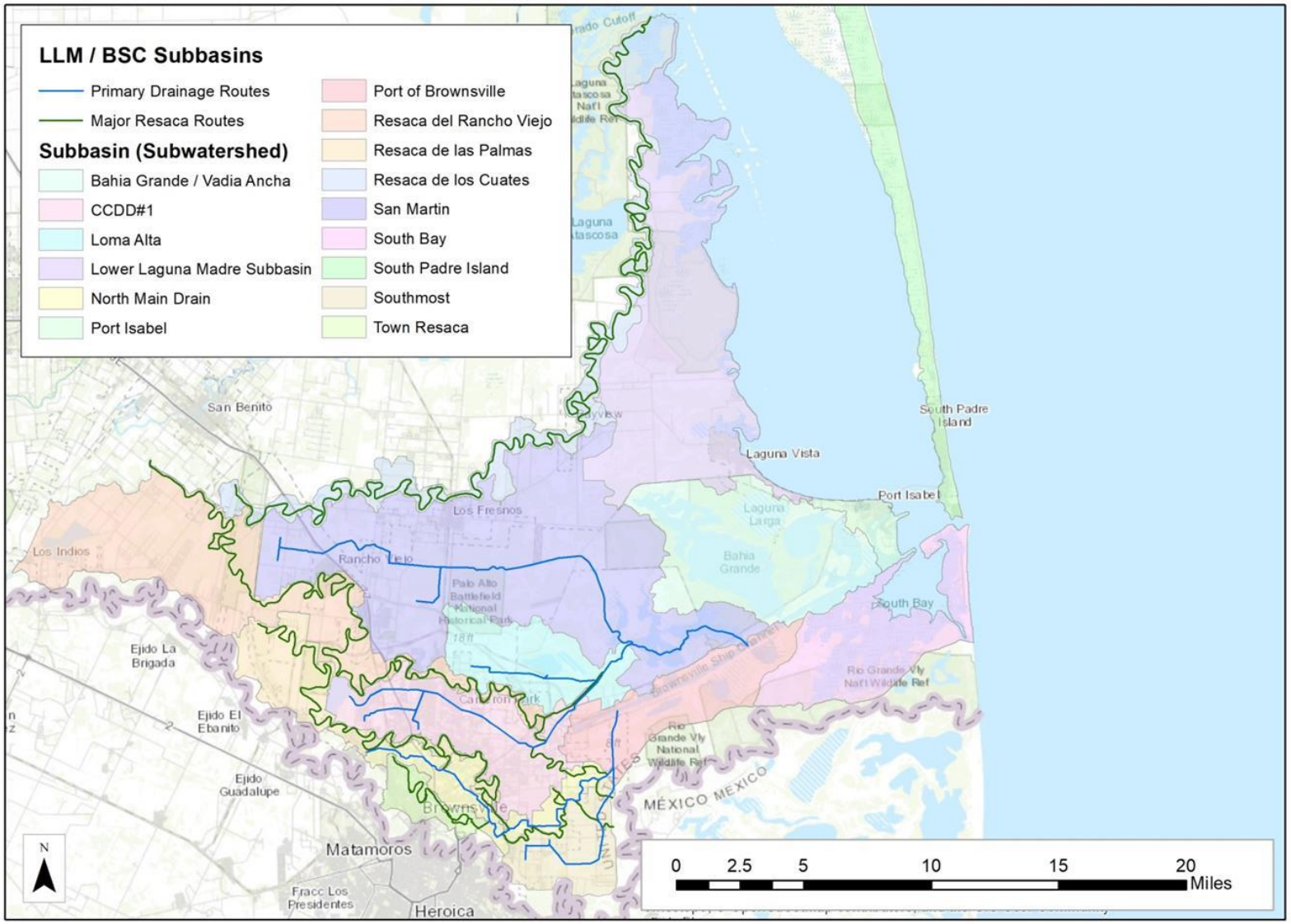
SELECT

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



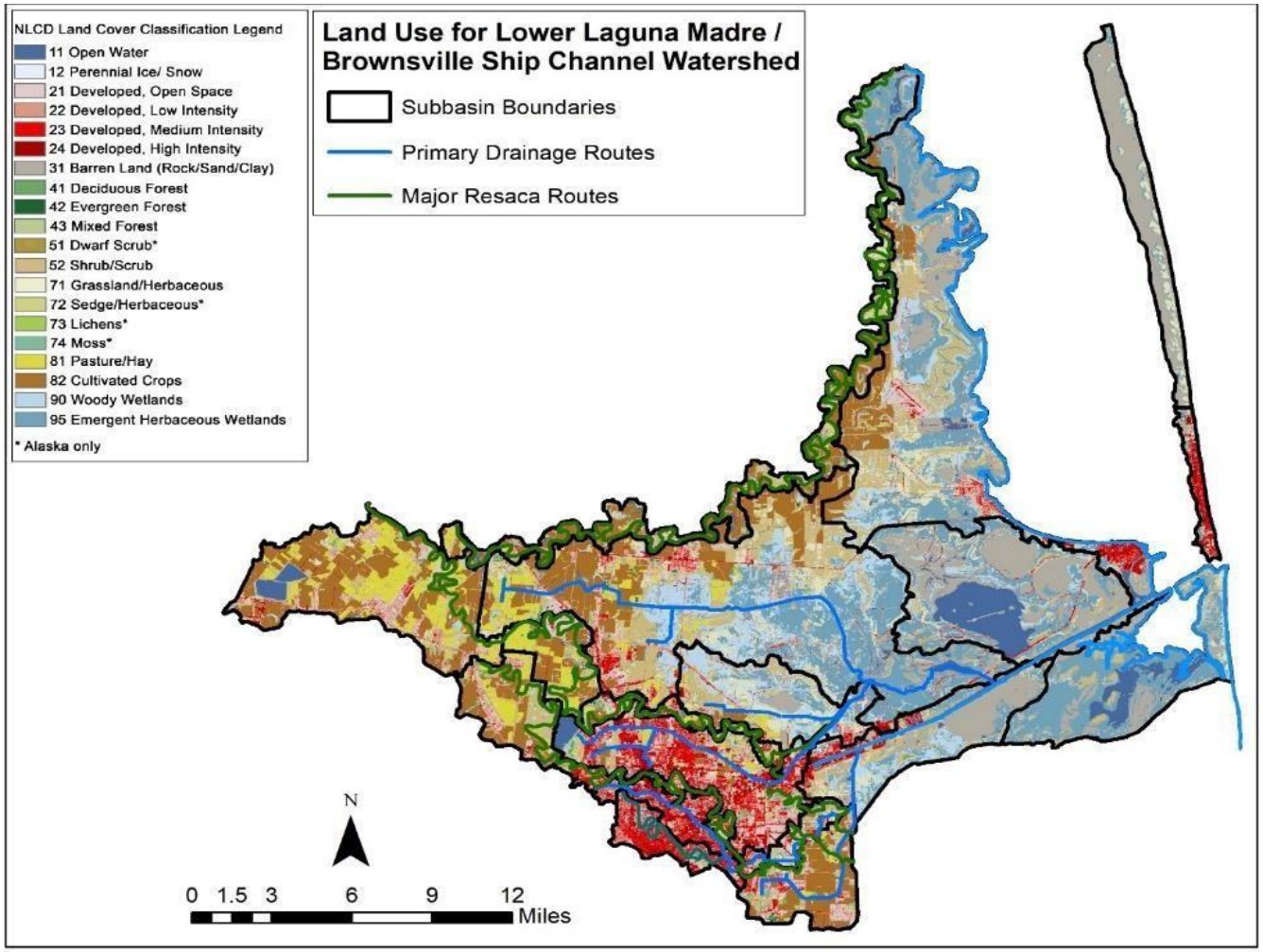
LLMBSC Existing Data

Subbasins (WC Report 2018)



Source: https://arroyocolorado.org/media/zqjpi1e0/llm_wc_102618_forstakeholderreview.pdf

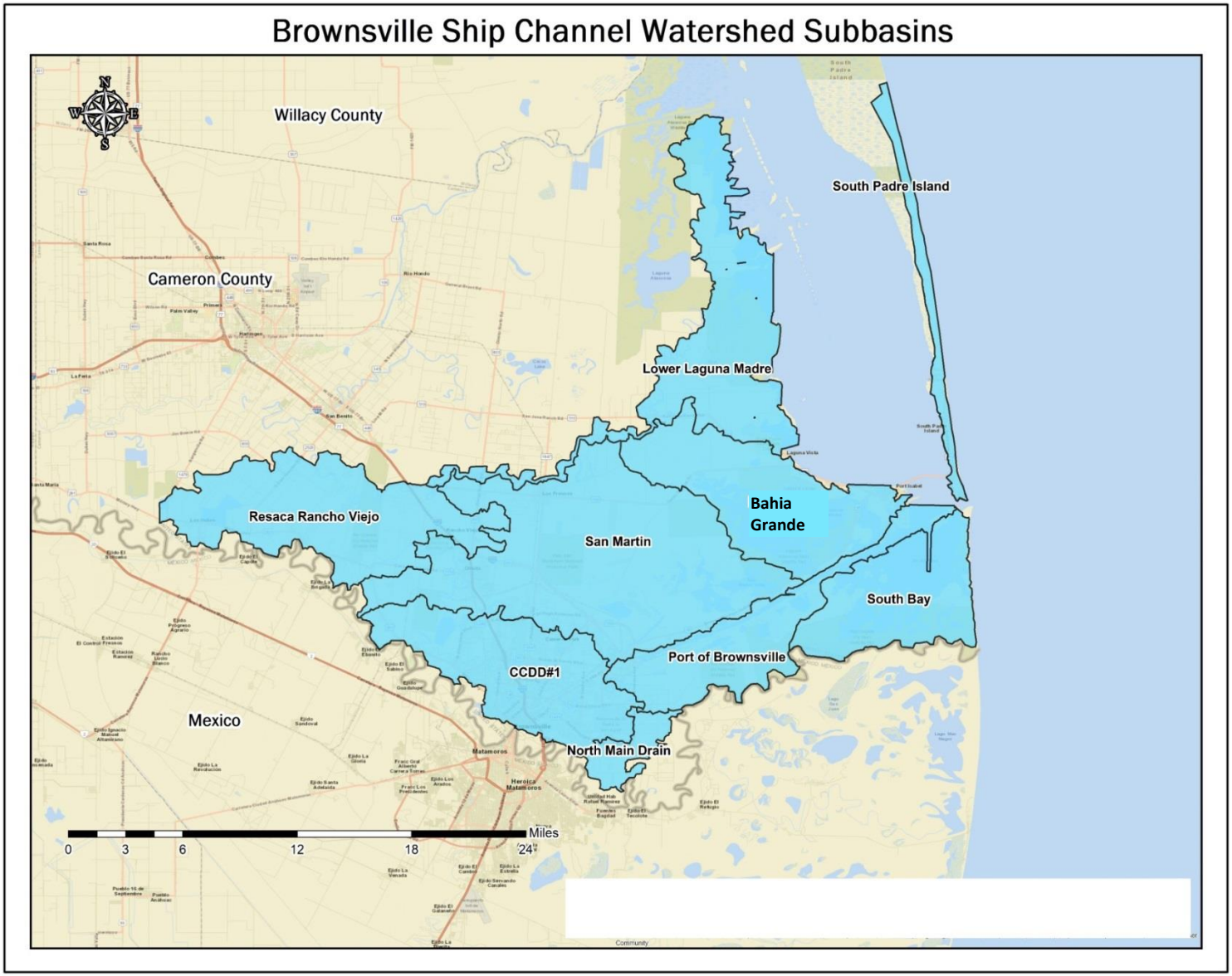
Land Cover (WC Report 2018)



National Land Cover Data (2011) for the various Subwatersheds in the LLM / BSC Watershed

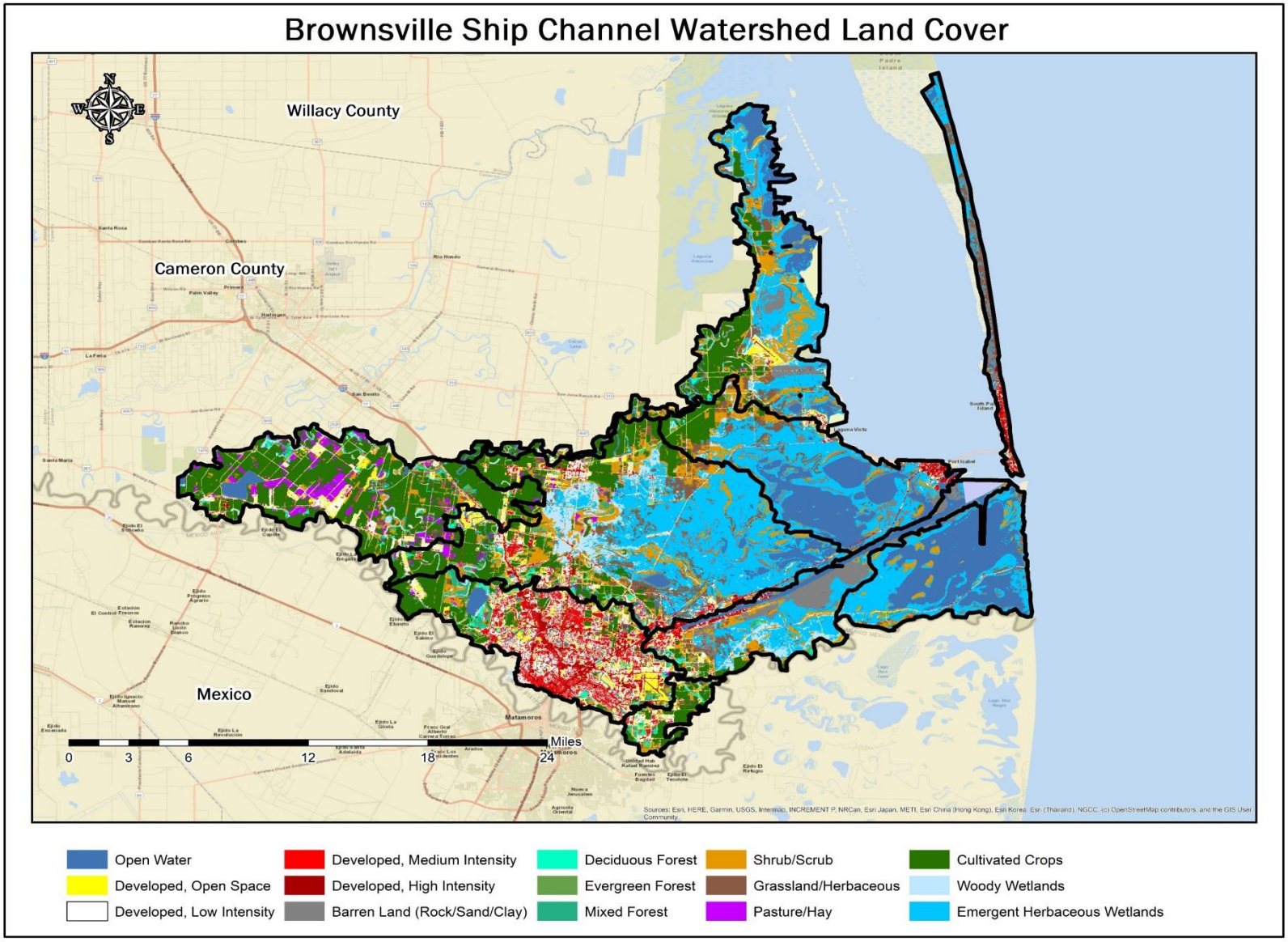
Source: https://arroyocolorado.org/media/zqjpi1e0/llm_wc_102618_forstakeholderreview.pdf

Subbasins

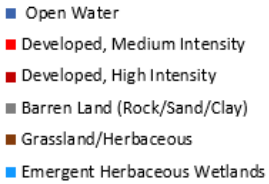


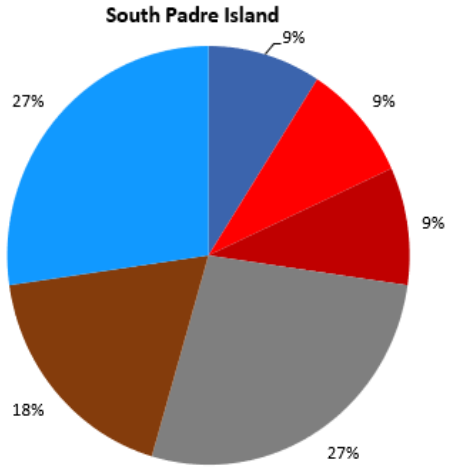
https://data.tnris.org/collection/6131ecdd-aa26-433e-9a24-97ac1afda7de

Land Cover

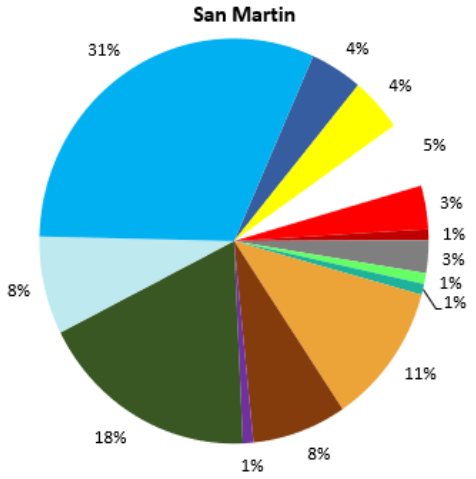

Brownsville Ship Channel Watershed Land Cover
Willacy County
Cameron County
Mexico
Matamoros
Miles
0
3
6
12
18
24
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land (Rock/Sand/Clay)
Deciduous Forest
Evergreen Forest
Mixed Forest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

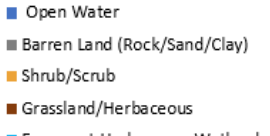
Subbasins

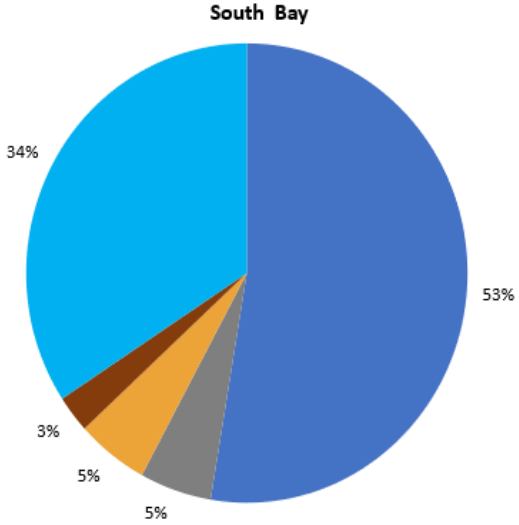

Open Water
Developed, Medium Intensity
Developed, High Intensity
Barren Land (Rock/Sand/Clay)
Grassland/Herbaceous
Emergent Herbaceous Wetlands


South Padre Island
9%
9%
9%
27%
18%
27%

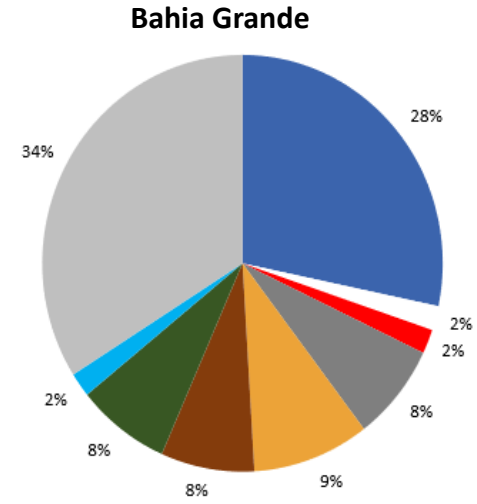

Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land (Rock/Sand/Clay)
Deciduous Forest
Mixed Forest
Shrub/Scrub
Grassland/Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands


San Martin
31%
4%
4%
5%
3%
1%
3%
1%
1%
8%
11%
18%
1%
8%

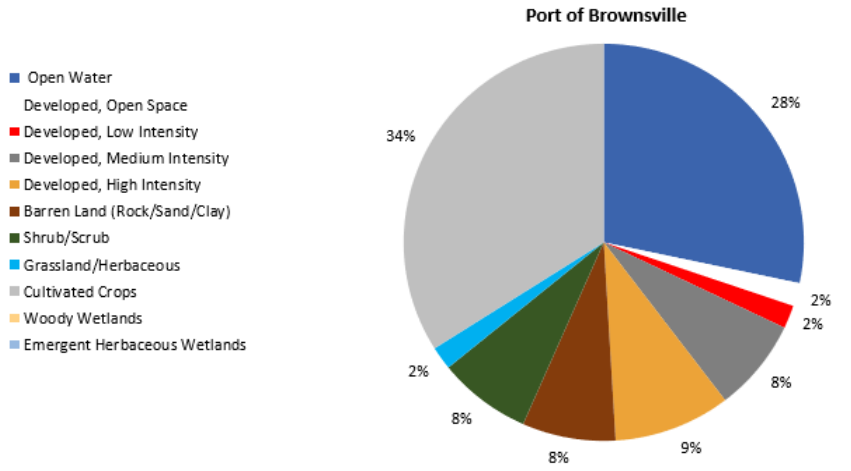

Open Water
Barren Land (Rock/Sand/Clay)
Shrub/Scrub
Grassland/Herbaceous
Emergent Herbaceous Wetlands

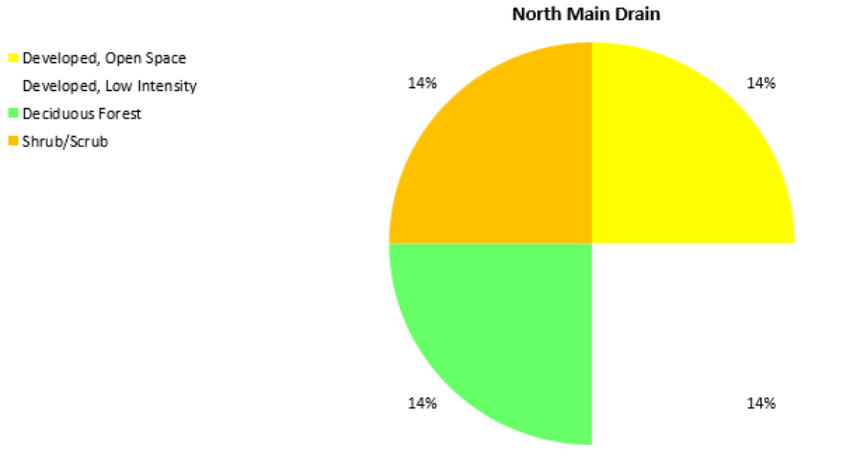

South Bay
34%
53%
3%
5%
5%

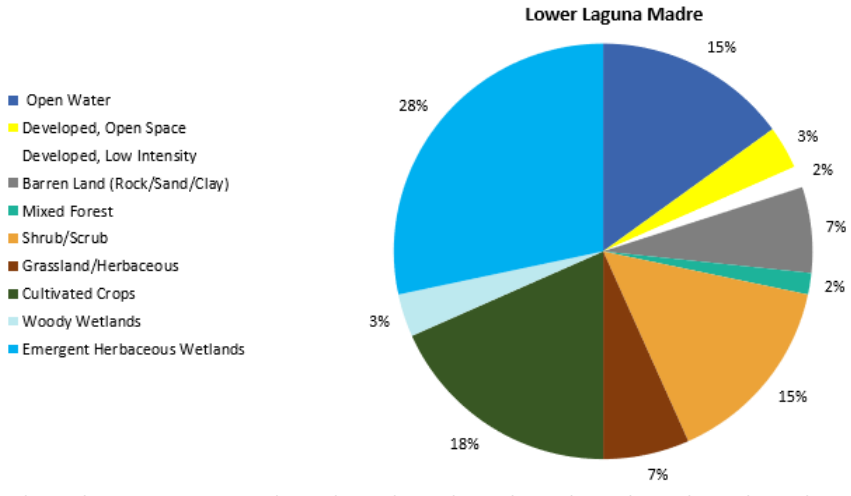

Open Water
Developed, Low Intensity
Developed, Medium Intensity
Barren Land (Rock/Sand/Clay)
Shrub/Scrub
Grassland/Herbaceous
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands

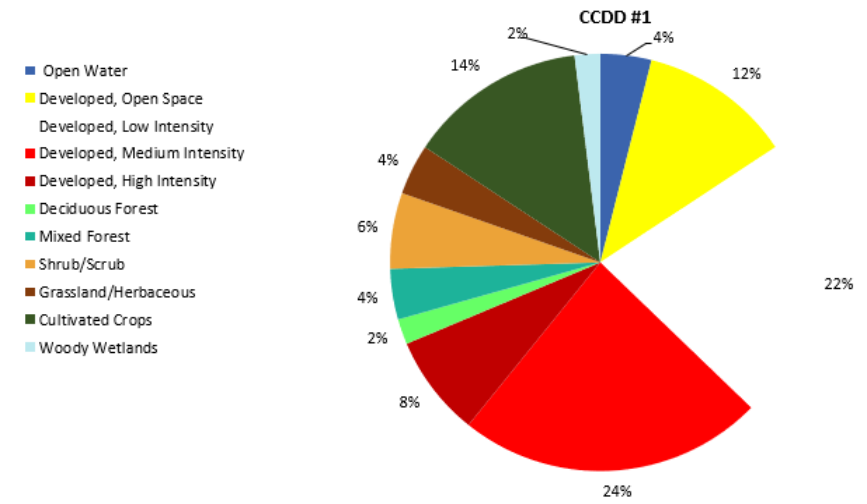

Bahia Grande
28%
34%
2%
2%
8%
2%
8%
8%
9%

Subbasins

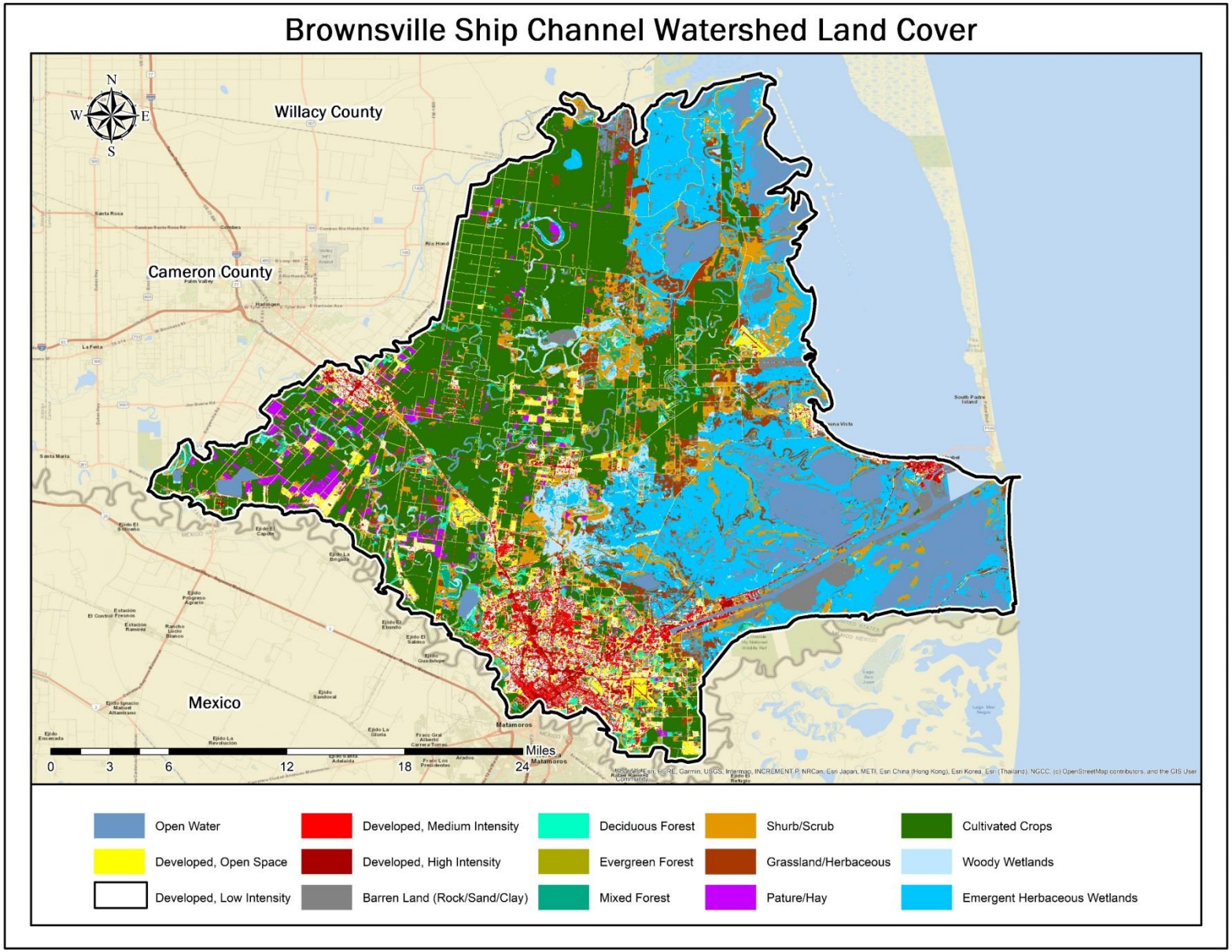

Port of Brownsville
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land (Rock/Sand/Clay)
Shrub/Scrub
Grassland/Herbaceous
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
28%
2%
2%
8%
9%
8%
8%
2%
34%


North Main Drain
Developed, Open Space
Developed, Low Intensity
Deciduous Forest
Shrub/Scrub
14%
14%
14%
14%

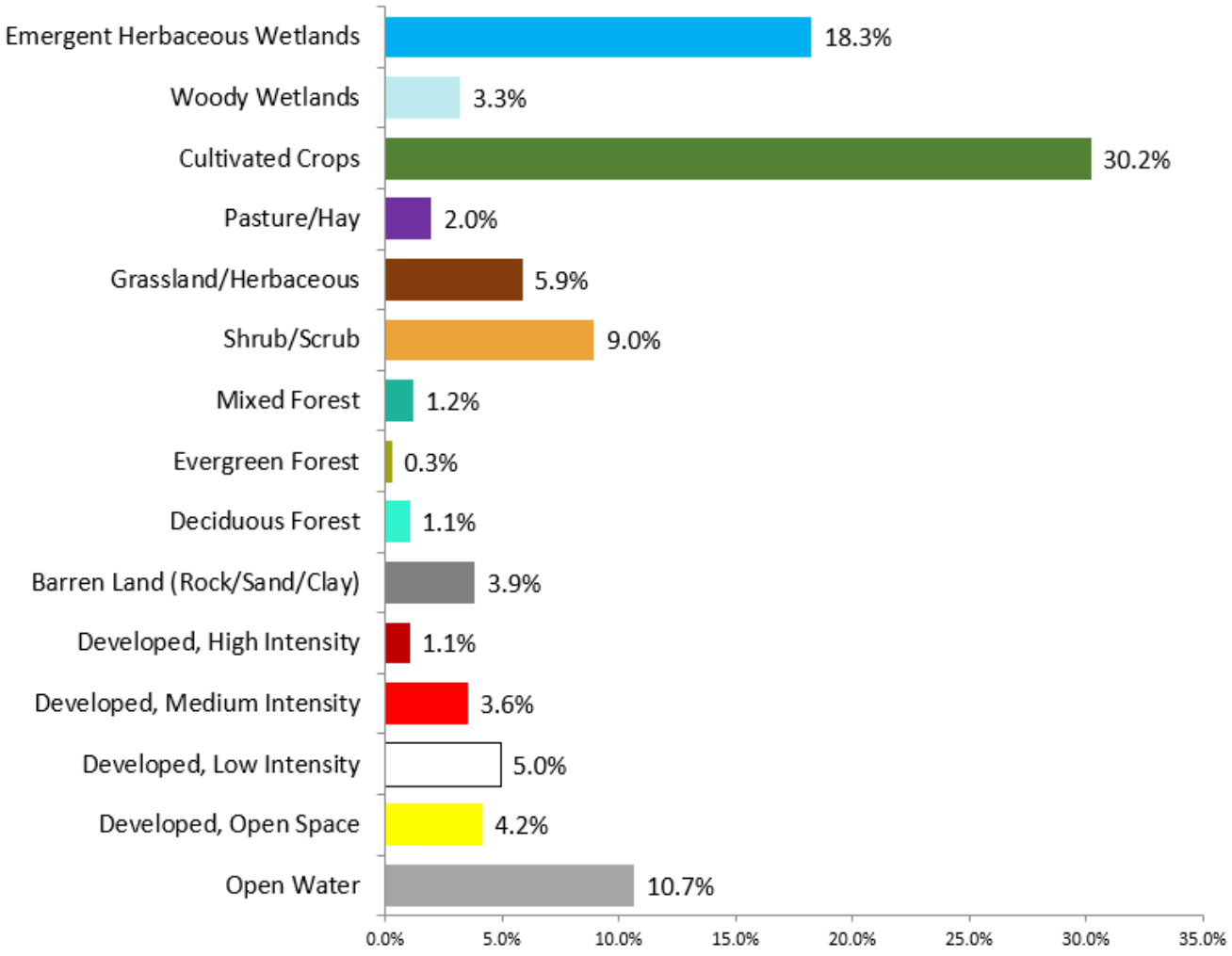

Lower Laguna Madre
Open Water
Developed, Open Space
Developed, Low Intensity
Barren Land (Rock/Sand/Clay)
Mixed Forest
Shrub/Scrub
Grassland/Herbaceous
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
15%
3%
2%
7%
2%
15%
7%
18%
3%
28%


CCDD #1
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Deciduous Forest
Mixed Forest
Shrub/Scrub
Grassland/Herbaceous
Cultivated Crops
Woody Wetlands
2%
4%
14%
12%
4%
6%
4%
2%
22%
8%
24%

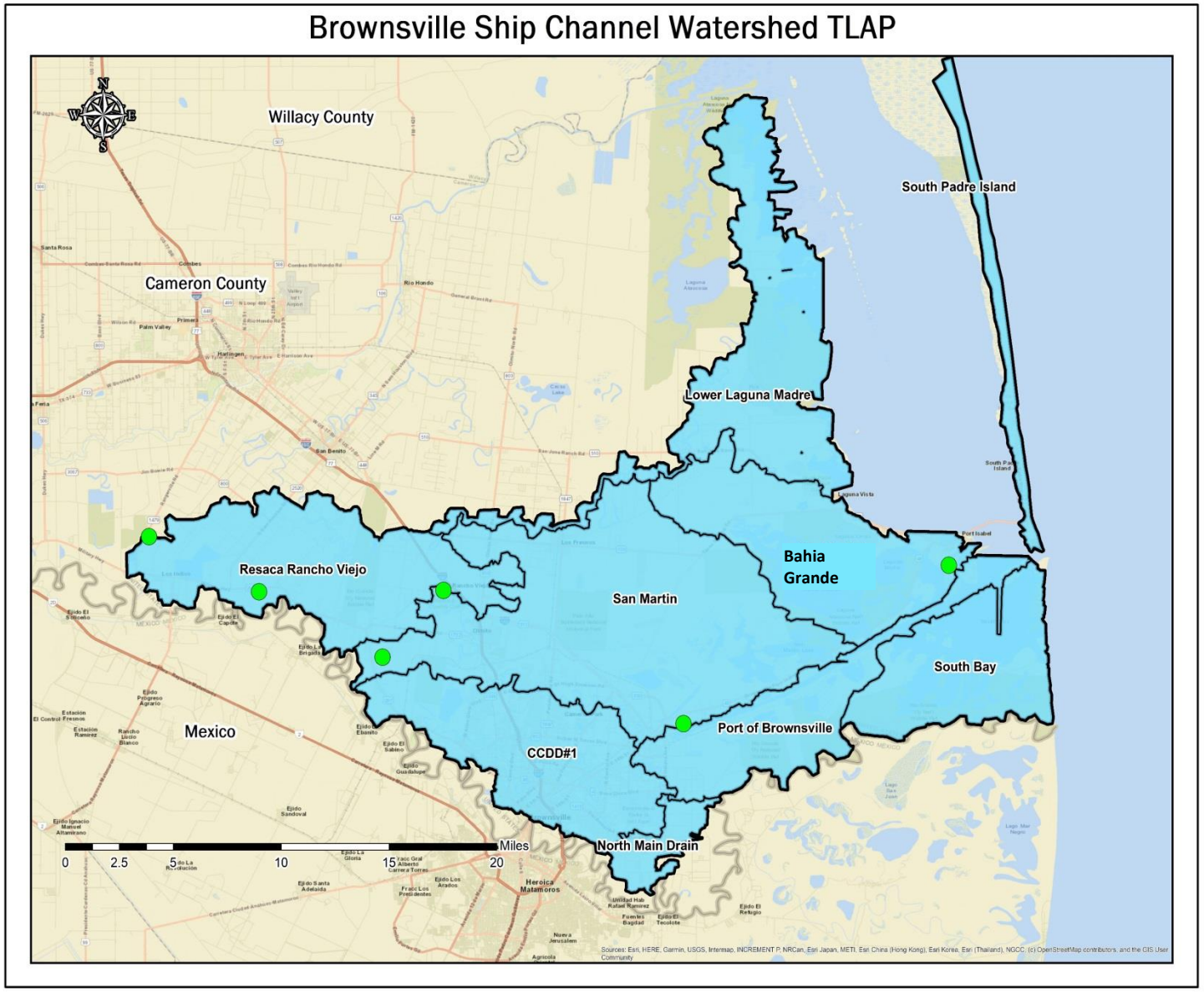
Landcover


Brownsville Ship Channel Watershed Land Cover
N
W
E
S
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

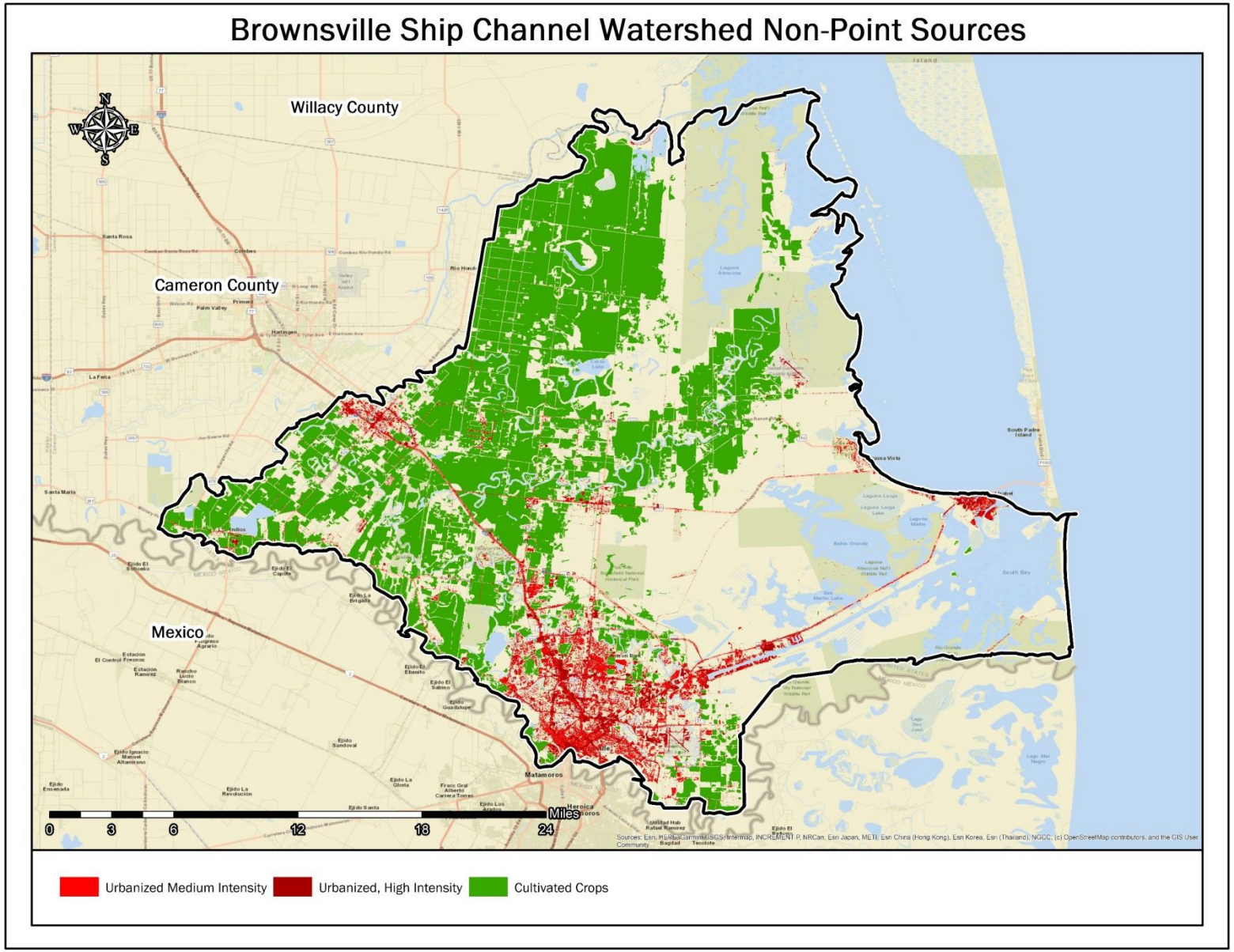
Land Cover


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%

Texas Land Application Permit



Nonpoint Source



Modeling Assumptions

Modeling Assumptions

- Crop Production (USDA, Stakeholders)
  - Crop Types and frequency
  - Changes in land use distribution (2011, 2016)

- Animal Farming Operation
  - Changes in land use distribution (2011, 2016)
  - Types of animals (confined?)

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

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