TEXAS PARKS & WILDLIFE

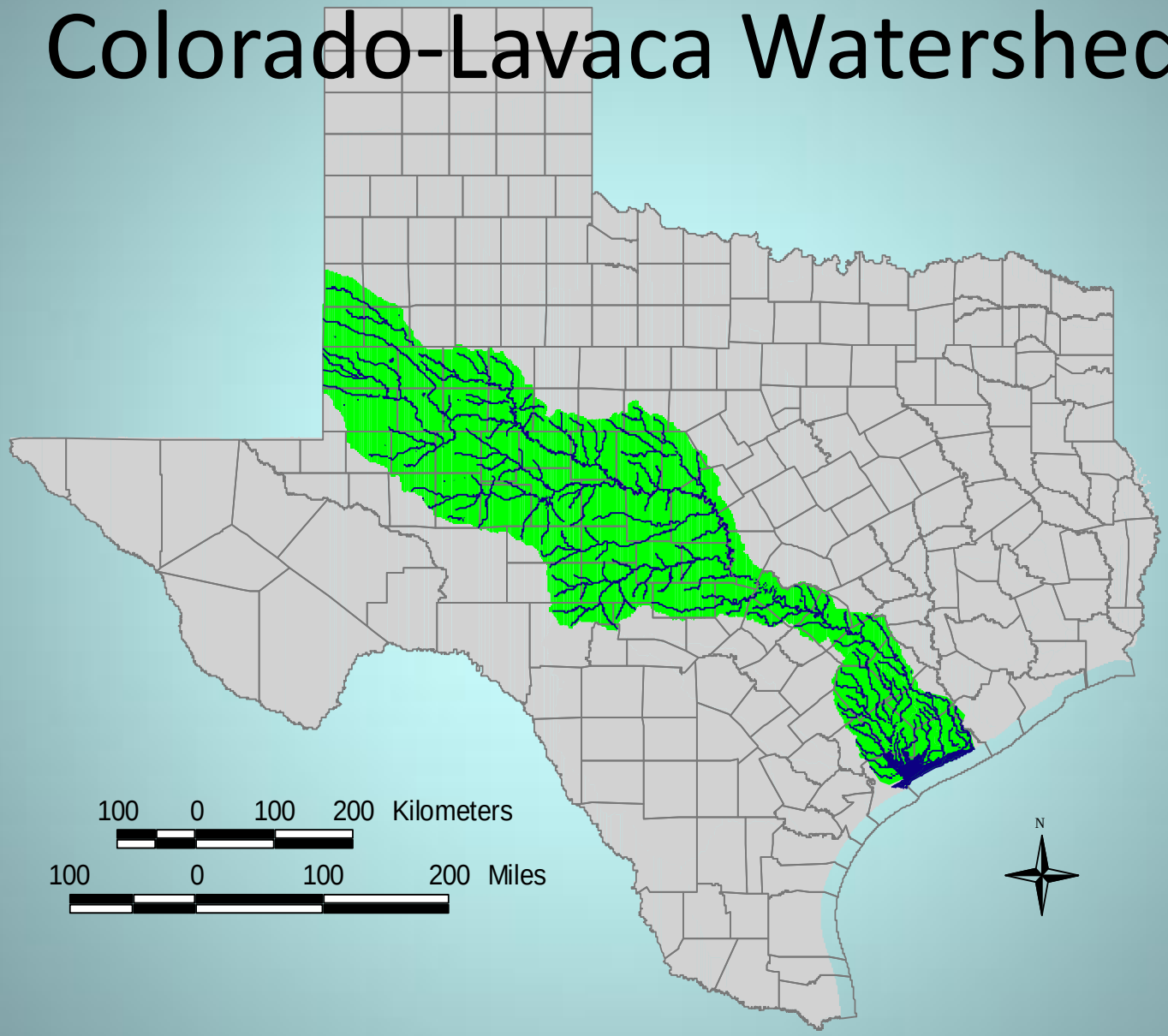
Matagorda Bay

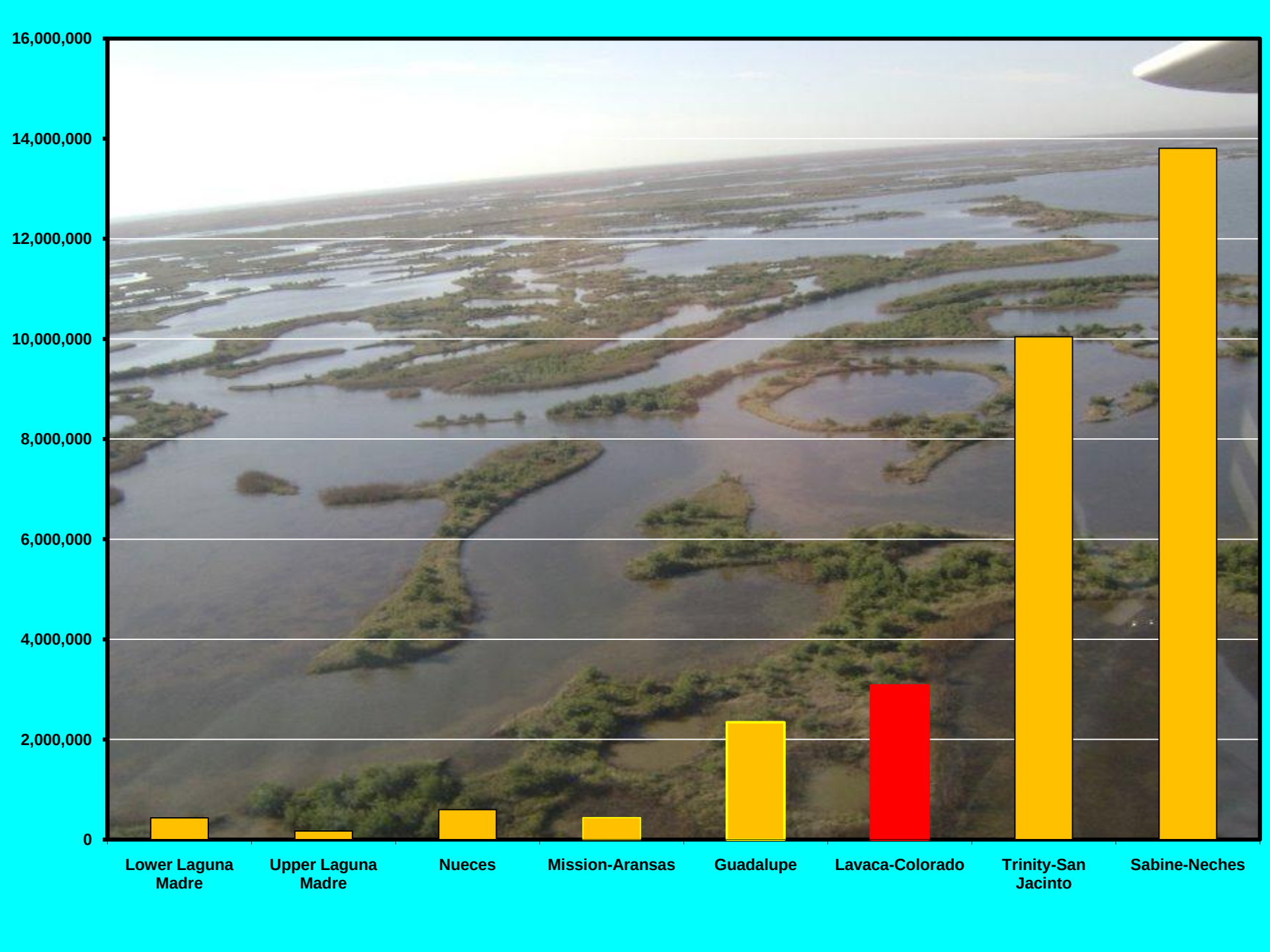
Leslie D. Hartman

Matagorda Bay

QUICK REFRESHER

Colorado-Lavaca Watershed




16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
Lower Laguna Madre
Upper Laguna Madre
Nueces
Mission-Aransas
Guadalupe
Lavaca-Colorado
Trinity-San Jacinto
Sabine-Neches

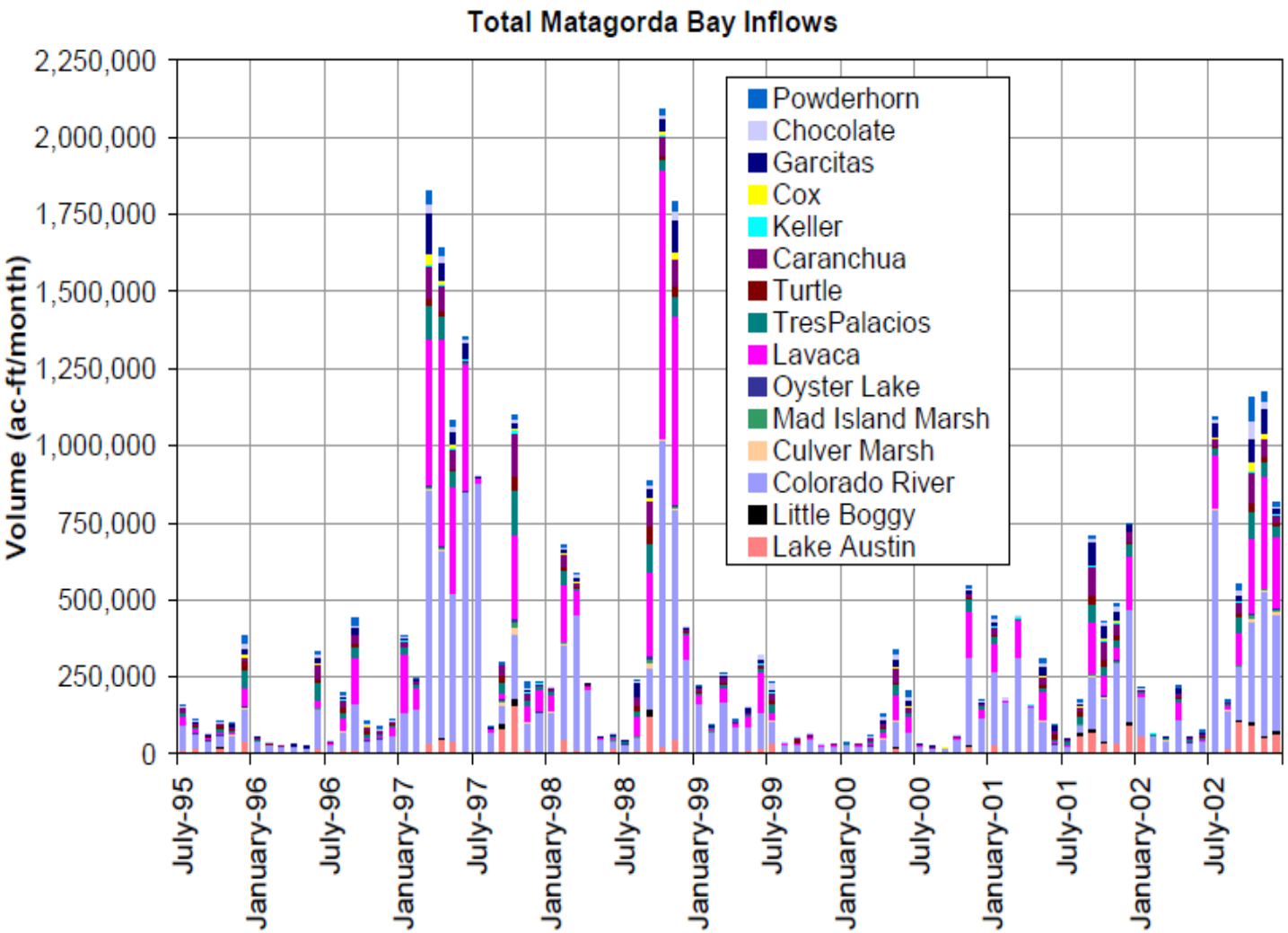
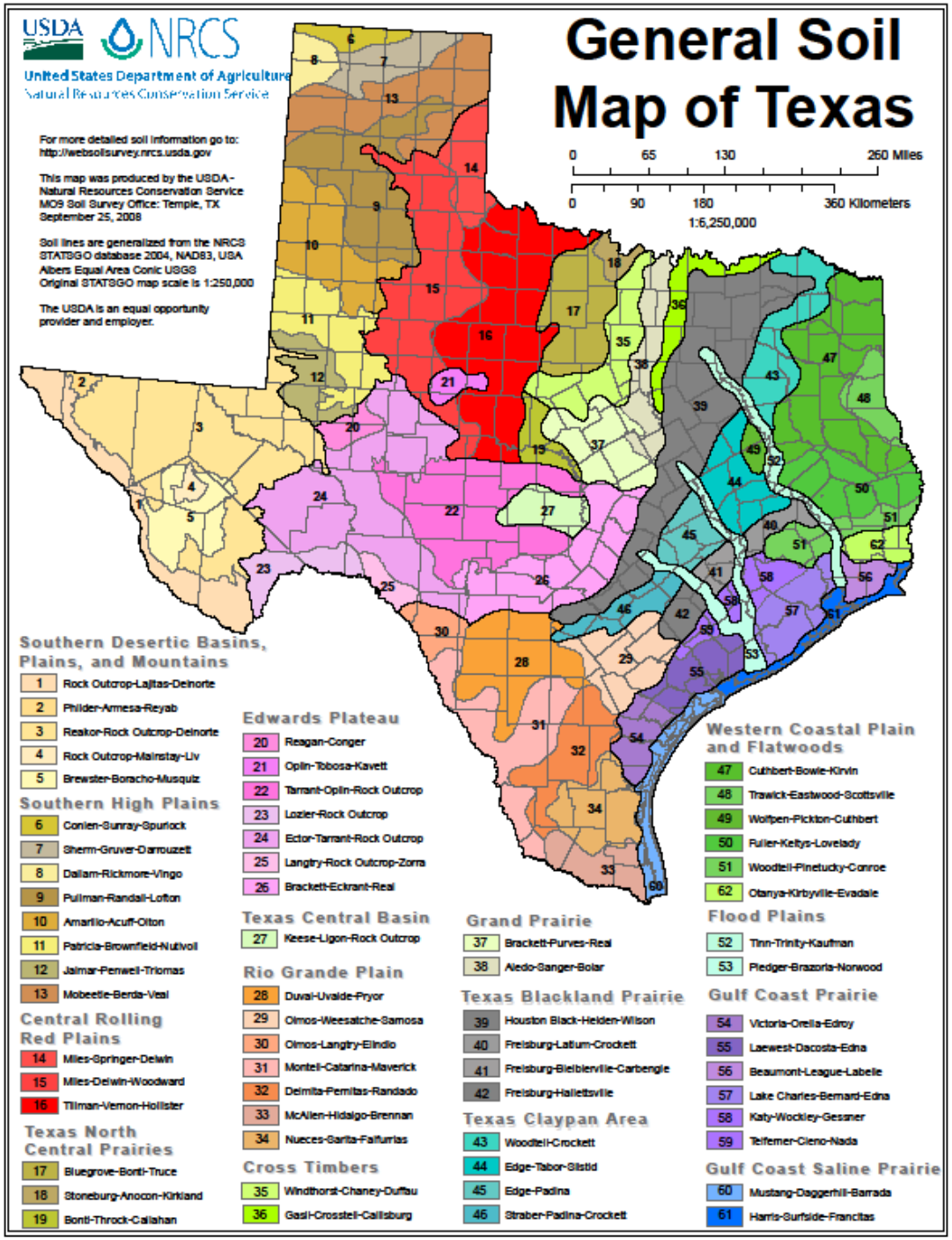
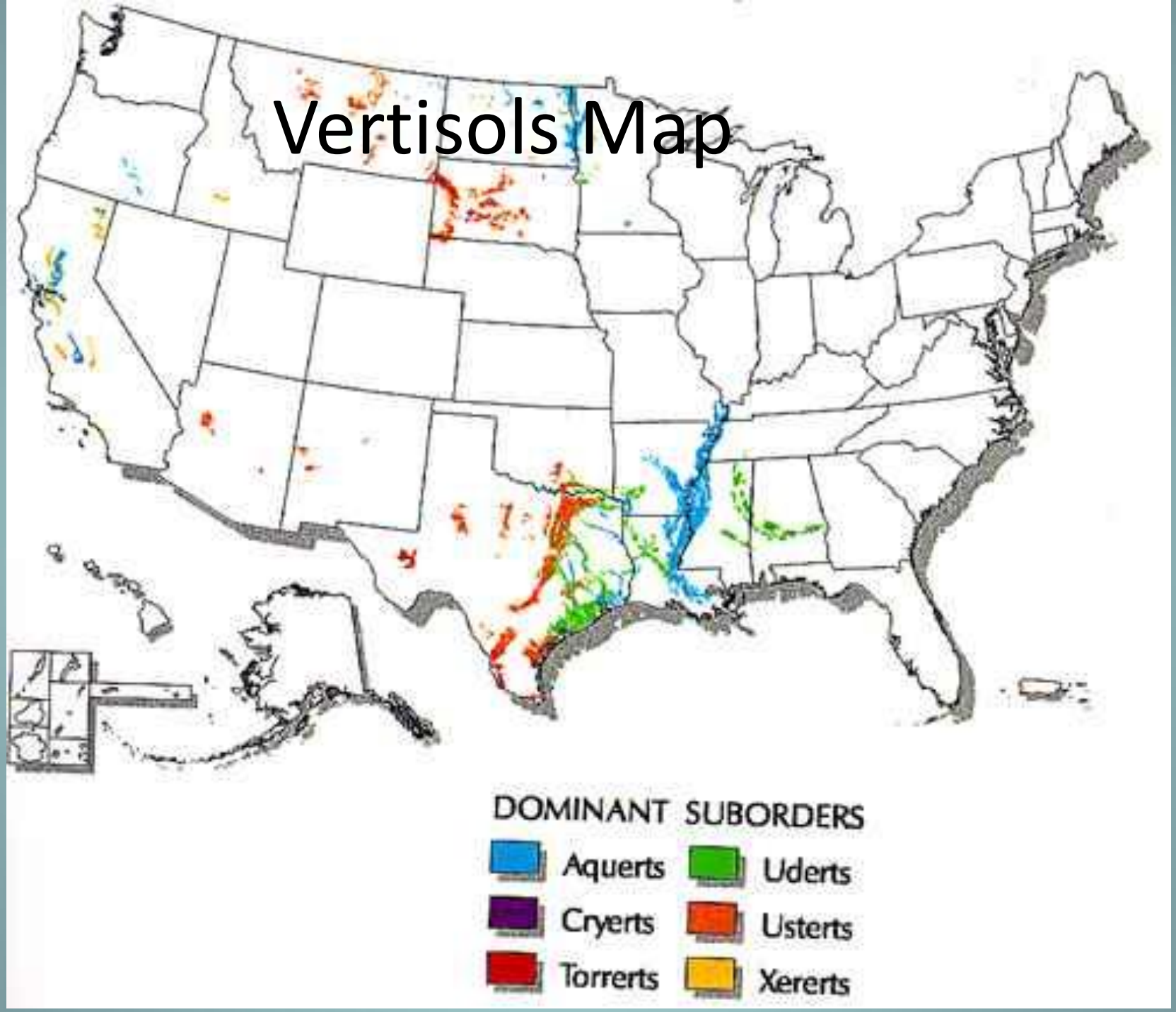
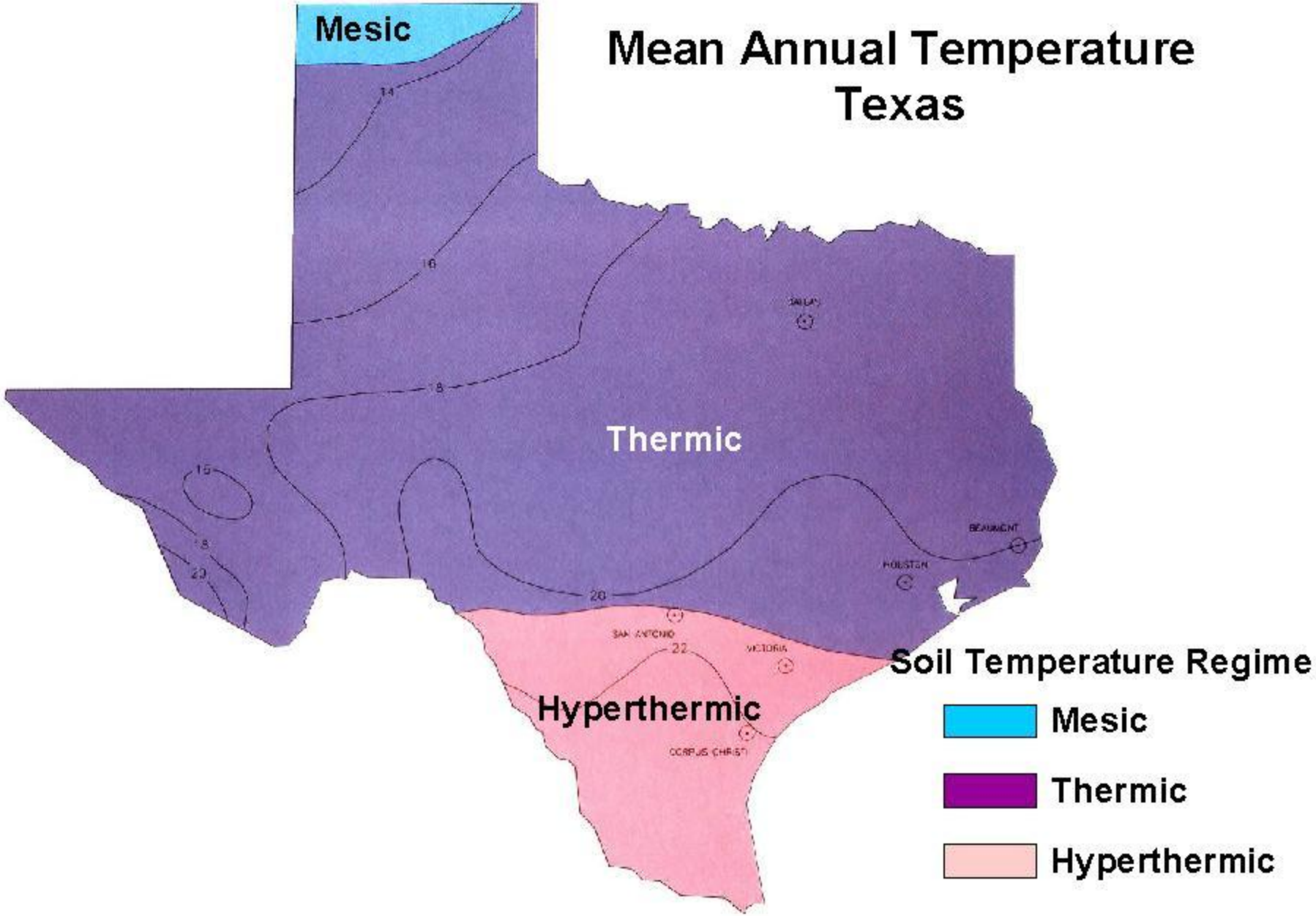


Figure 6.1 – Distribution of monthly inflows to the Matagorda Bay system, based on the input to the RMA-2 hydrodynamic model.


USDA
NRCS
United States Department of Agriculture
Natural Resources Conservation Service
General Soil Map of Texas
For more detailed soil information go to: http://websoilsurvey.nrcs.usda.gov
This map was produced by the USDA - Natural Resources Conservation Service MO9 Soil Survey Office: Temple, TX September 25, 2008
Soil lines are generalized from the NRCS STATSGO database 2004, NAD83, USA Albers Equal Area Conic USGS Original STATSGO map scale is 1:250,000
The USDA is an equal opportunity provider and employer.
0 65 130 260 Miles
0 90 180 360 Kilometers
1:6,250,000
Southern Desertic Basins, Plains, and Mountains
1 Rock Outcrop-Lajitas-Deinorte
2 Philder-Armesa-Reyab
3 Reakor-Rock Outcrop-Deinorte
4 Rock Outcrop-Mainstay-Liv
5 Brewster-Boracho-Musquiz
Southern High Plains
6 Conlen-Sunray-Spurlock
7 Sherm-Gruver-Darrouzett
8 Dallam-Rickmore-Vingo
9 Pullman-Randall-Lofton
10 Amarillo-Acuff-Olton
11 Patricia-Brownfield-Nutivoli
12 Jalmar-Penwell-Triomas
13 Mobeetie-Berda-Veal
Central Rolling Red Plains
14 Miles-Springer-Delwin
15 Miles-Delwin-Woodward
16 Tillman-Vernon-Hollister
Texas North Central Prairies
17 Bluegrove-Bonti-Truce
18 Stoneburg-Anocon-Kirkland
19 Bonti-Throck-Callahan
Edwards Plateau
20 Reagan-Conger
21 Oplin-Tobosa-Kavett
22 Tarrant-Oplin-Rock Outcrop
23 Lozier-Rock Outcrop
24 Ector-Tarrant-Rock Outcrop
25 Langtry-Rock Outcrop-Zorra
26 Brackett-Eckrant-Real
Texas Central Basin
27 Keese-Ligon-Rock Outcrop
Rio Grande Plain
28 Duval-Uvalde-Pryor
29 Olmos-Weesatche-Samosa
30 Olmos-Langtry-Elindio
31 Montell-Catarina-Maverick
32 Delmita-Pernitas-Randado
33 McAllen-Hidalgo-Brennan
34 Nueces-Garita-Falfurrias
Cross Timbers
35 Windthorst-Chaney-Duffau
36 Gasil-Crosstell-Callisburg
Grand Prairie
37 Brackett-Purves-Real
38 Aledo-Sanger-Bolar
Texas Blackland Prairie
39 Houston Black-Helden-Wilson
40 Freisburg-Latium-Crockett
41 Freisburg-Bielblerville-Carbengle
42 Freisburg-Hallettsville
Texas Claypan Area
43 Woodtell-Crockett
44 Edge-Tabor-Silstid
45 Edge-Padina
46 Straber-Padina-Crockett
Western Coastal Plain and Flatwoods
47 Cuthbert-Bowie-Kirvin
48 Trawick-Eastwood-Scottsville
49 Wolfpen-Pickton-Cuthbert
50 Fuller-Kellys-Lovelady
51 Woodtell-Pinetucky-Conroe
62 Otanya-Kirbyville-Evadale
Flood Plains
52 Tinn-Trinity-Kaufman
53 Pledger-Brazoria-Norwood
Gulf Coast Prairie
54 Victoria-Orella-Edroy
55 Laewest-Dacosta-Edna
56 Beaumont-League-Labelle
57 Lake Charles-Bernard-Edna
58 Katy-Wockley-Gessner
59 Telferner-Cleno-Nada
Gulf Coast Saline Prairie
60 Mustang-Daggerhill-Barrada
61 Harris-Surfside-Francitas

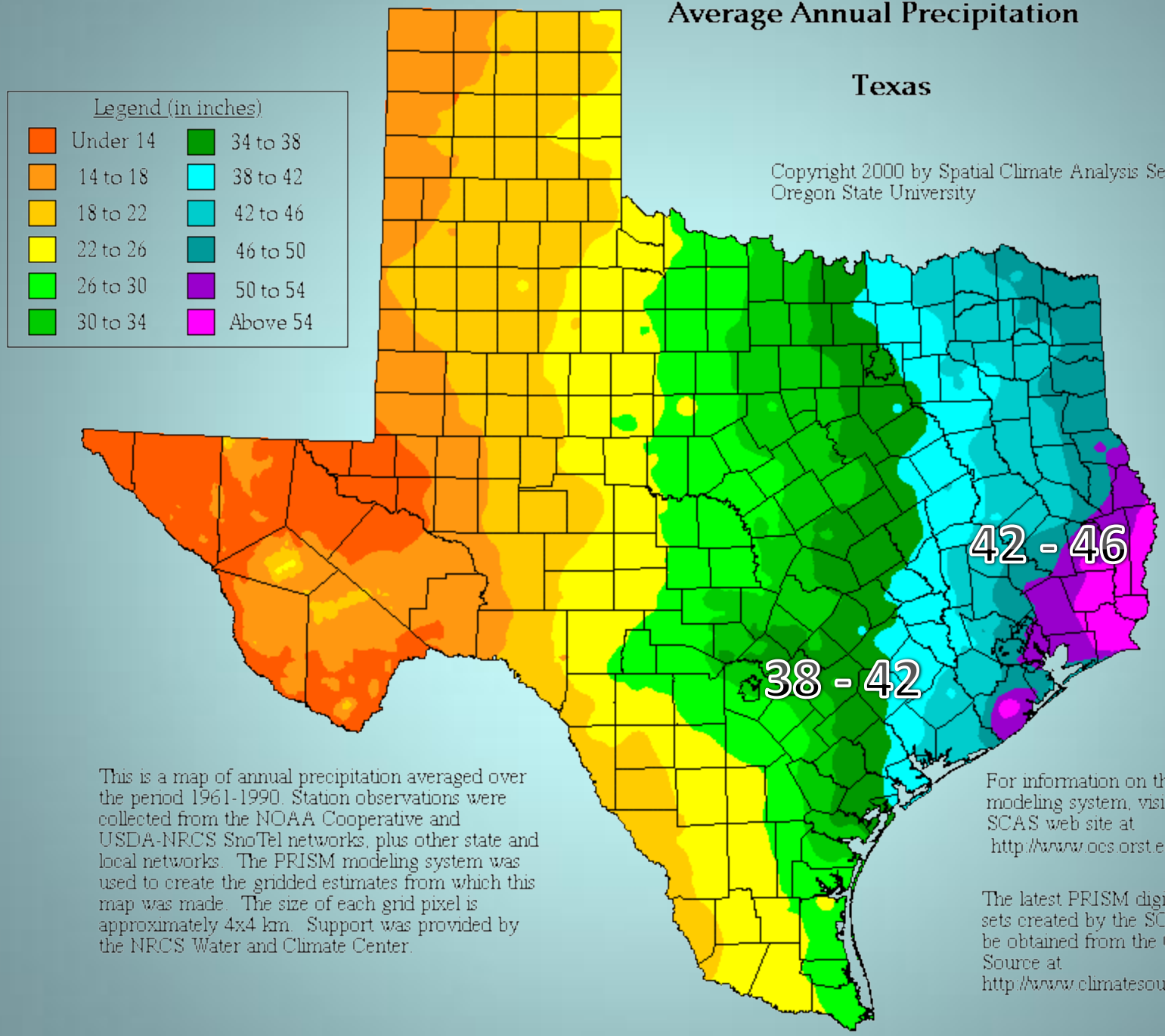
Vertisols Map




Mean Annual Temperature
Texas
Mesic
Thermic
Hyperthermic
14
16
18
20
22
BEAUMONT
HOUSTON
SAN ANTONIO
VICTORIA
CORPUS CHRISTI
Soil Temperature Regime
Mesic
Thermic
Hyperthermic

Average Annual Precipitation

Texas



Copyright 2000 by Spatial Climate Analysis Service, Oregon State University

This is a map of annual precipitation averaged over the period 1961-1990. Station observations were collected from the NOAA Cooperative and USDA-NRCS SnoTel networks, plus other state and local networks. The PRISM modeling system was used to create the gridded estimates from which this map was made. The size of each grid pixel is approximately 4x4 km. Support was provided by the NRCS Water and Climate Center.

For information on the PRISM modeling system, visit the SCAS web site at http://www.ocs.orst.edu/prism

The latest PRISM digital data sets created by the SCAS can be obtained from the Climate Source at http://www.climatesource.com

u.s. climate data

Temperature - Precipitation - Sunshine

	Bay City	Matagorda	Palacios	Point Comfort
Average High	80.6	77.5	77.2	79.7
Average Low	61.2	61.8	61.1	62.3
Average rain (inches)	48	43.7	45.4	43.9

- California
- Florida
- Georgia
- Illinois
- Michigan
- Massachusetts
- New Jersey
- New York
- North Carolina
- Ohio
- Pennsylvania
- Texas
- Other States

BOOKMARK

Climate - Palacios - Texas

Temperature - Precipitation

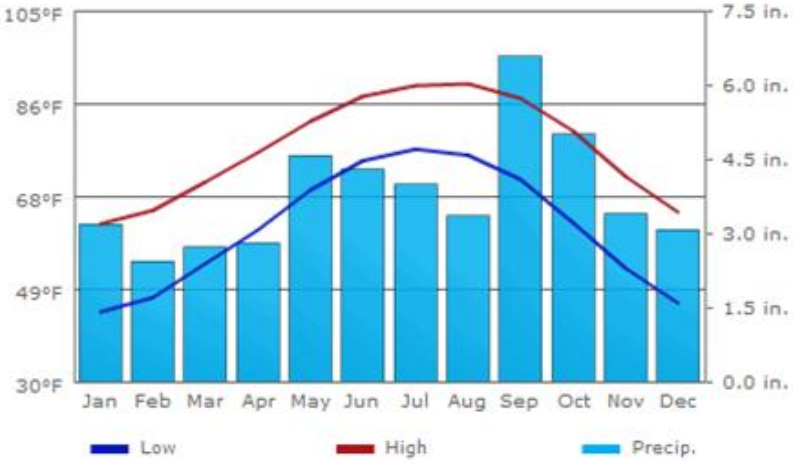
C | F

	Jan	Feb	March	April	May	June
Average high in °F	62	65	70	76	83	88
Average low in °F	44	47	54	61	69	75
Av. precipitation - inch	3.19	2.44	2.72	2.8	4.57	4.29

	July	Aug	Sep	Oct	Nov	Dec
Average high in °F	90	90	87	81	71	64
Average low in °F	77	76	71	62	53	46
Av. precipitation - inch	3.98	3.35	6.57	5	3.39	3.07

Free climate chart on your website

Palacios Climate Graph - Texas Climate Chart

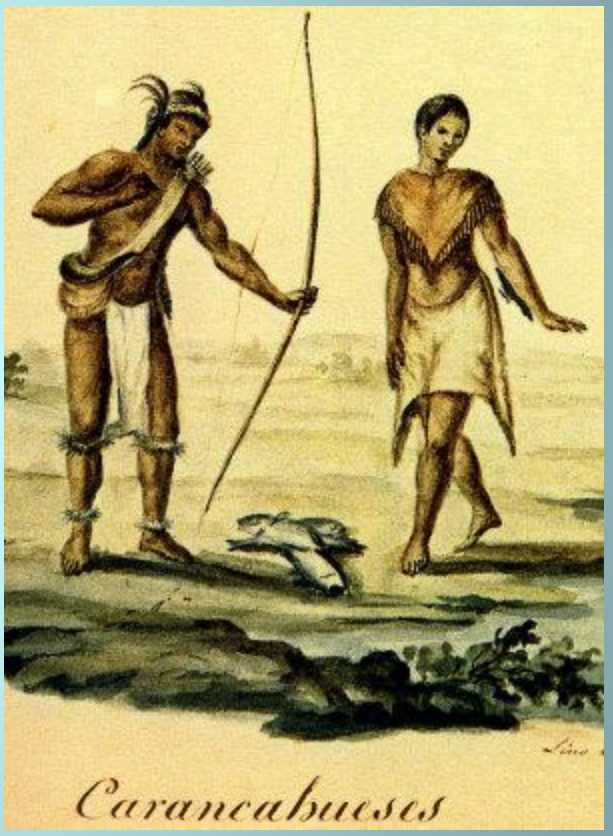


Matagorda Bay

HUMAN HISTORY

Karankawa

- Several tribes stretching from Galveston Bay to Corpus Christi Bay
- Nomadic, living off coastal resources but not sea-faring
- Cooperative with Europeans in early interactions, but became hostile after La Salle
- Introduced epidemics and war with settlers and other tribes decimated population
- Considered extinct by 1860



La Salle

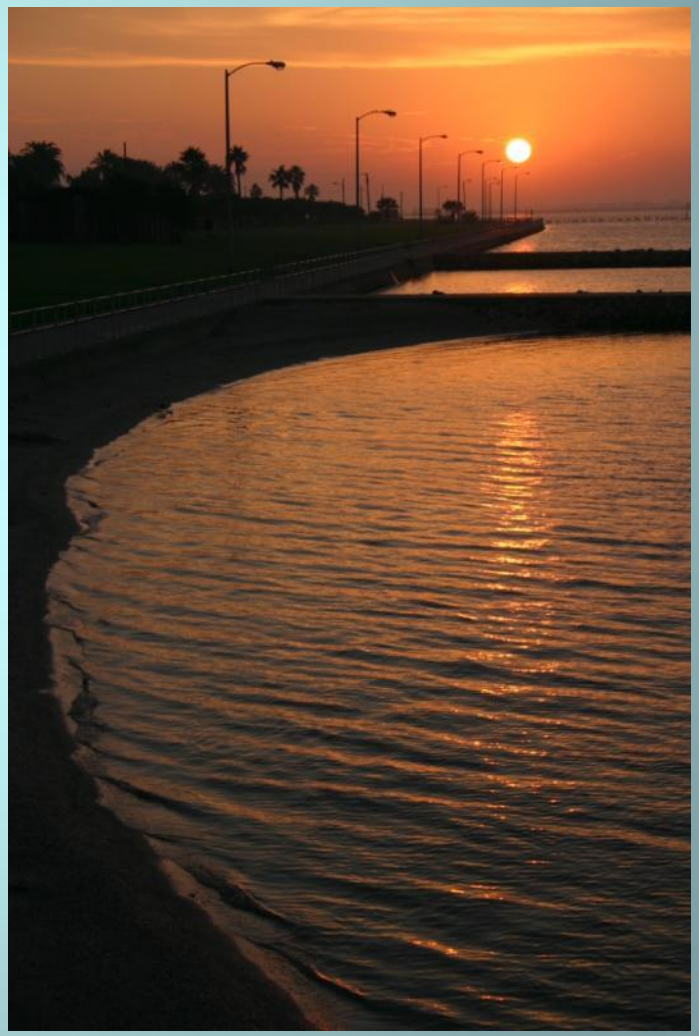
- Rene Robert Cavalier, Sieur De La Salle expedition landed in 1685 looking for the mouth of the Mississippi River
- Built first European settlement on the Texas coast along Garcitas Creek
- La Salle was killed by his own people and the Karankawa soon after wiped out the settlement with only a few children surviving
- Wreck of La Salle's ship *La Belle* was found in Matagorda Bay in 1995 and excavated in 1996

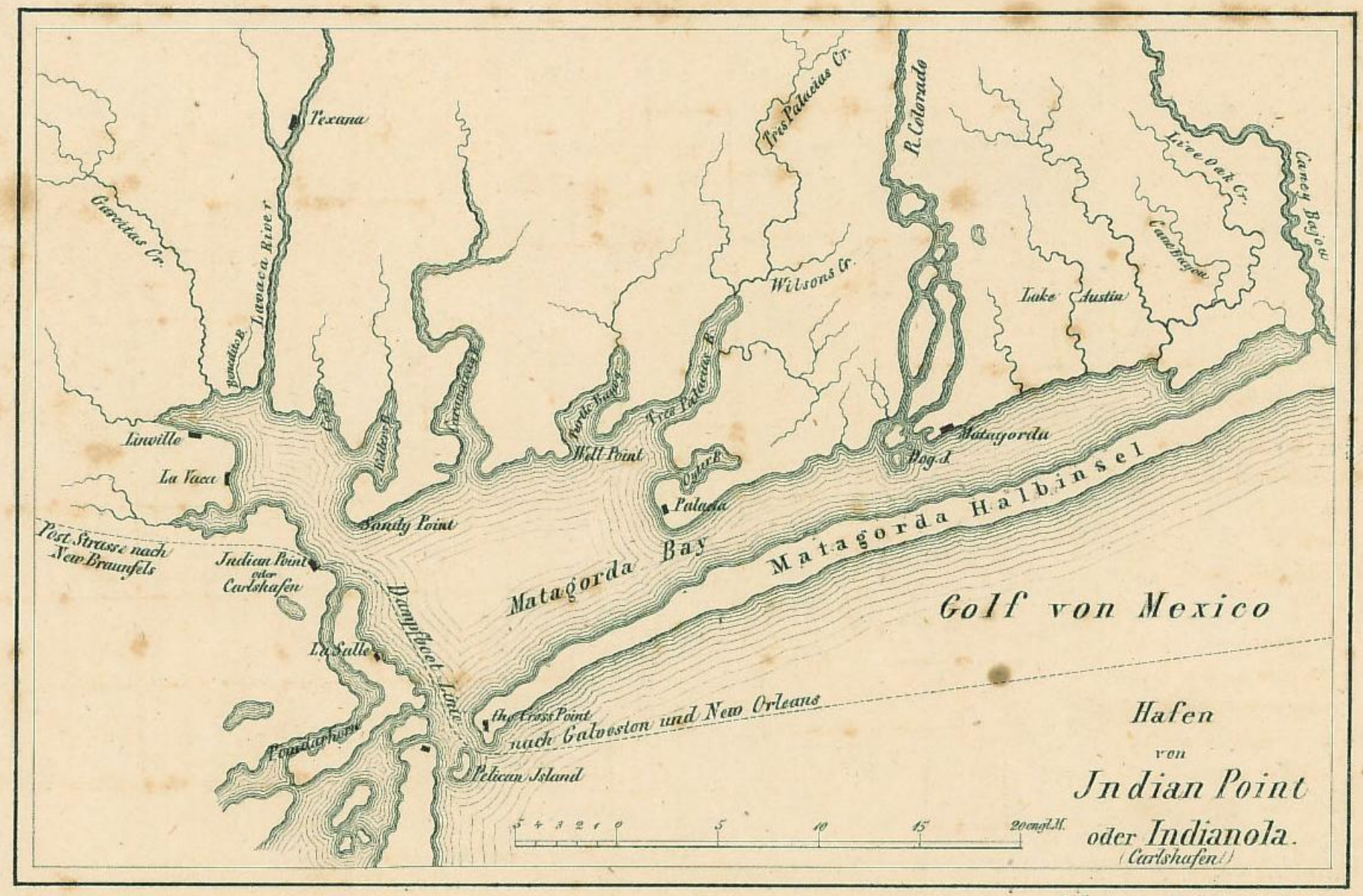
Port Lavaca

- Founded in 1841 after Comanches burned out Linville
- Lost business to Indianola due to proximity to the Gulf and sandbars at the mouth of Lavaca Bay
- Began to grow and became county seat after 1886 storm wiped out Indianola second time
- Connected to Matagorda Co. by causeway in 1931, rebuilt in 1960's

Palacios

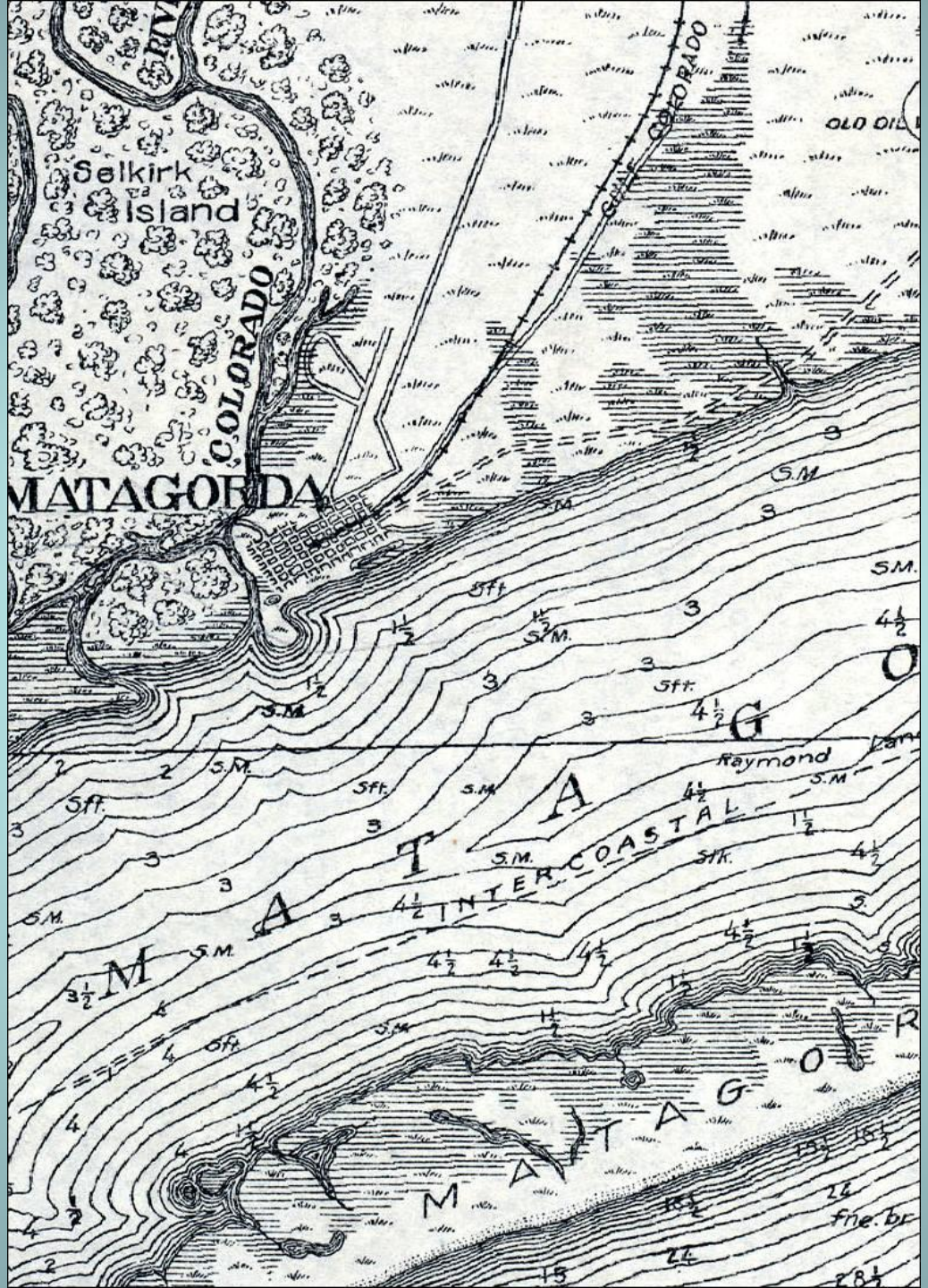
- Named for Jose Felix Trespalacios
- Surveyed from Shanghai Pierce's bull pasture in 1902
- Became tourist town with pavilion in 1904 and Baptist Encampment in 1906

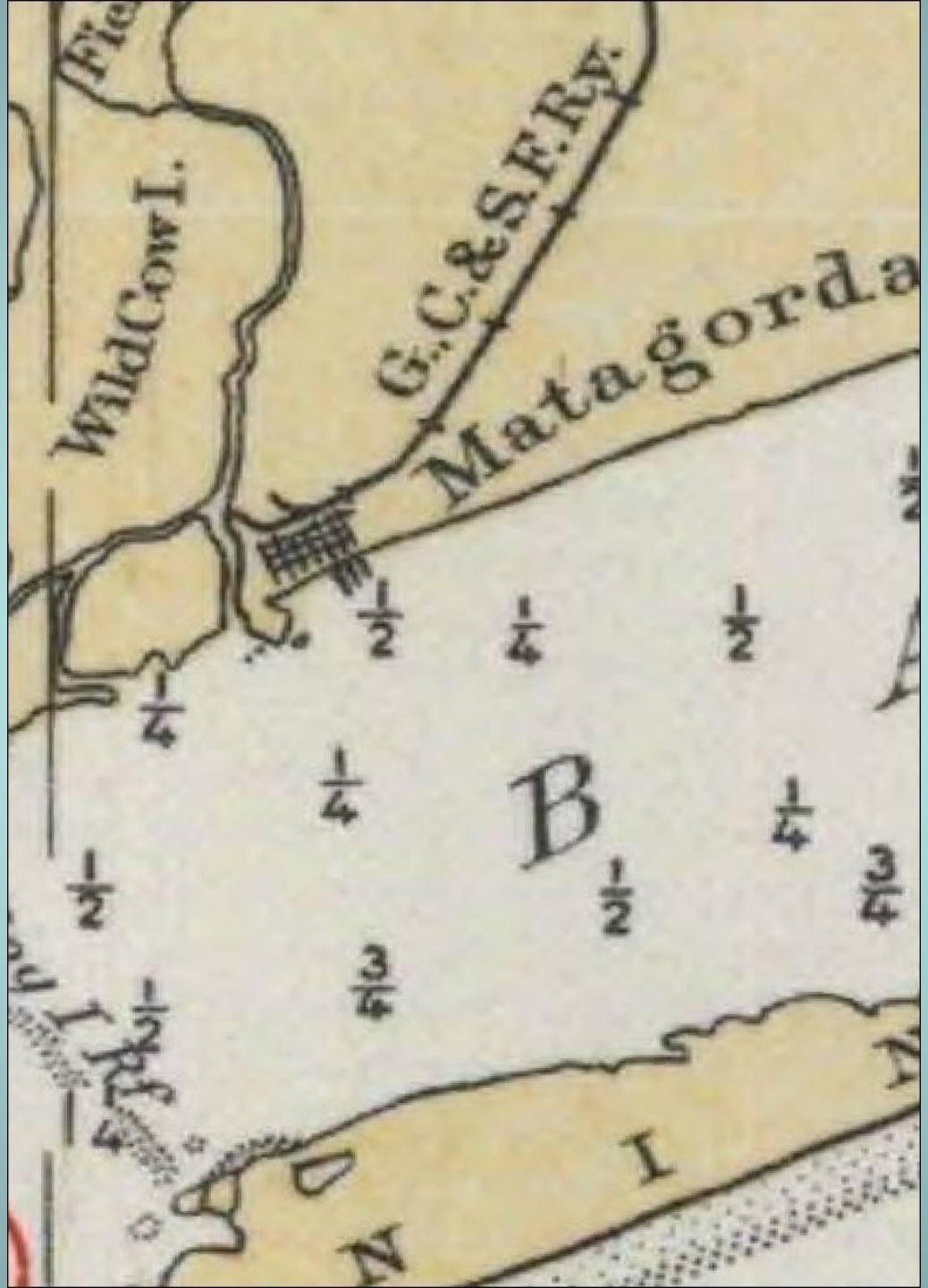


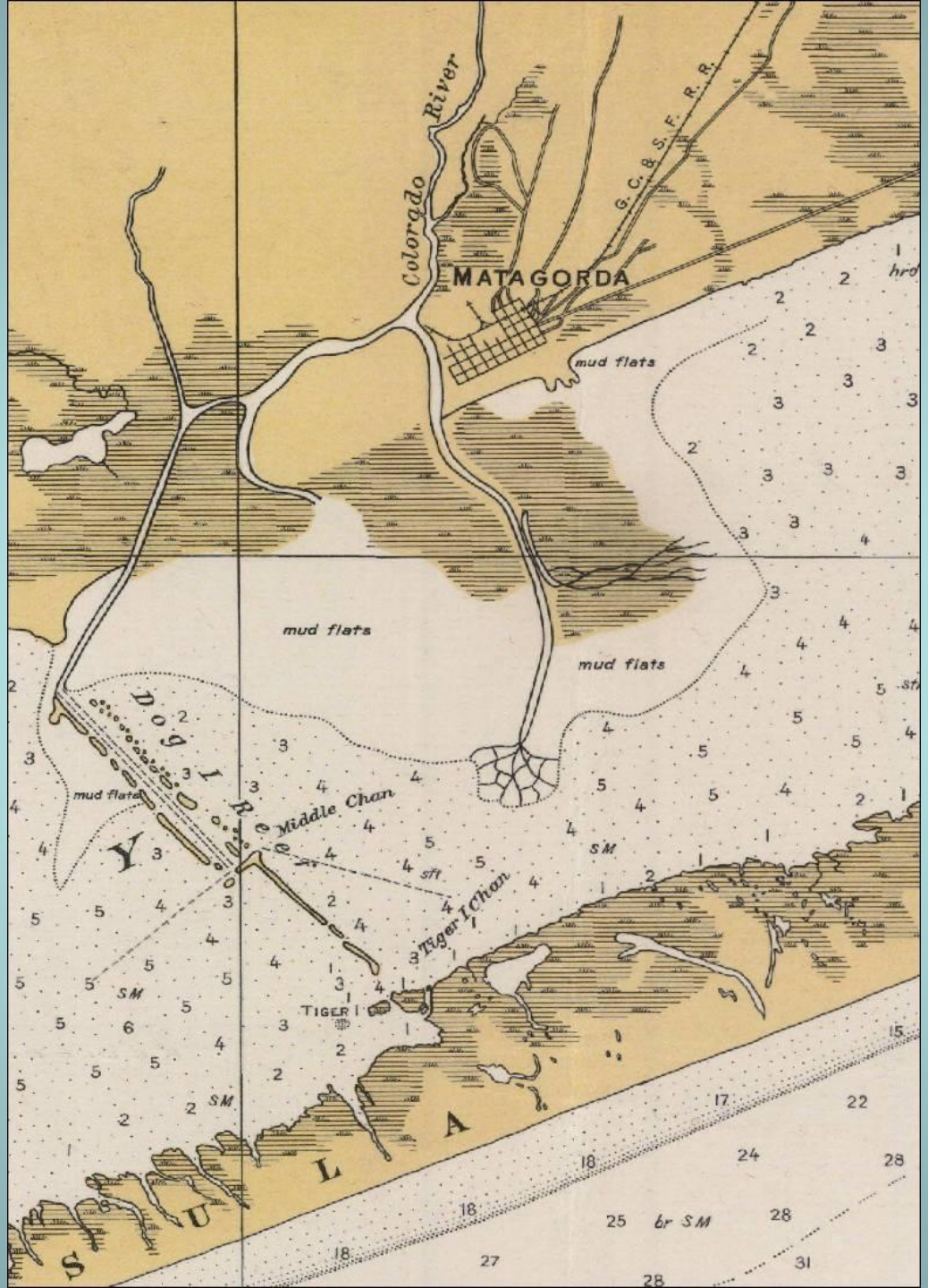


Lith. Anst. v. H. Delius in Berlin.

Wie ersichtlich sind diese Pläne nach verschiedenen Maasstaabe aufgenommen.


Selkirk Island
COLORADO
MATAGORDA
COLORADO
OLD OIL
Raymond
INTERCOASTAL
M A T A G O R
M A T A G O R
S.M.
Sft.
Slk.
fne. br


Wild Cow I.
G.C.&S.F.Ry.
Matagorda
B
I
N



Colorado River
MATAGORDA
G. C. & S. F. R. R.
mud flats
mud flats
mud flats
mud flats
Dog I Reef
Middle Chan
Tiger I Chan
TIGER I
Y
S U L A
SM
SM
SM
br SM

Alcoa Aluminum

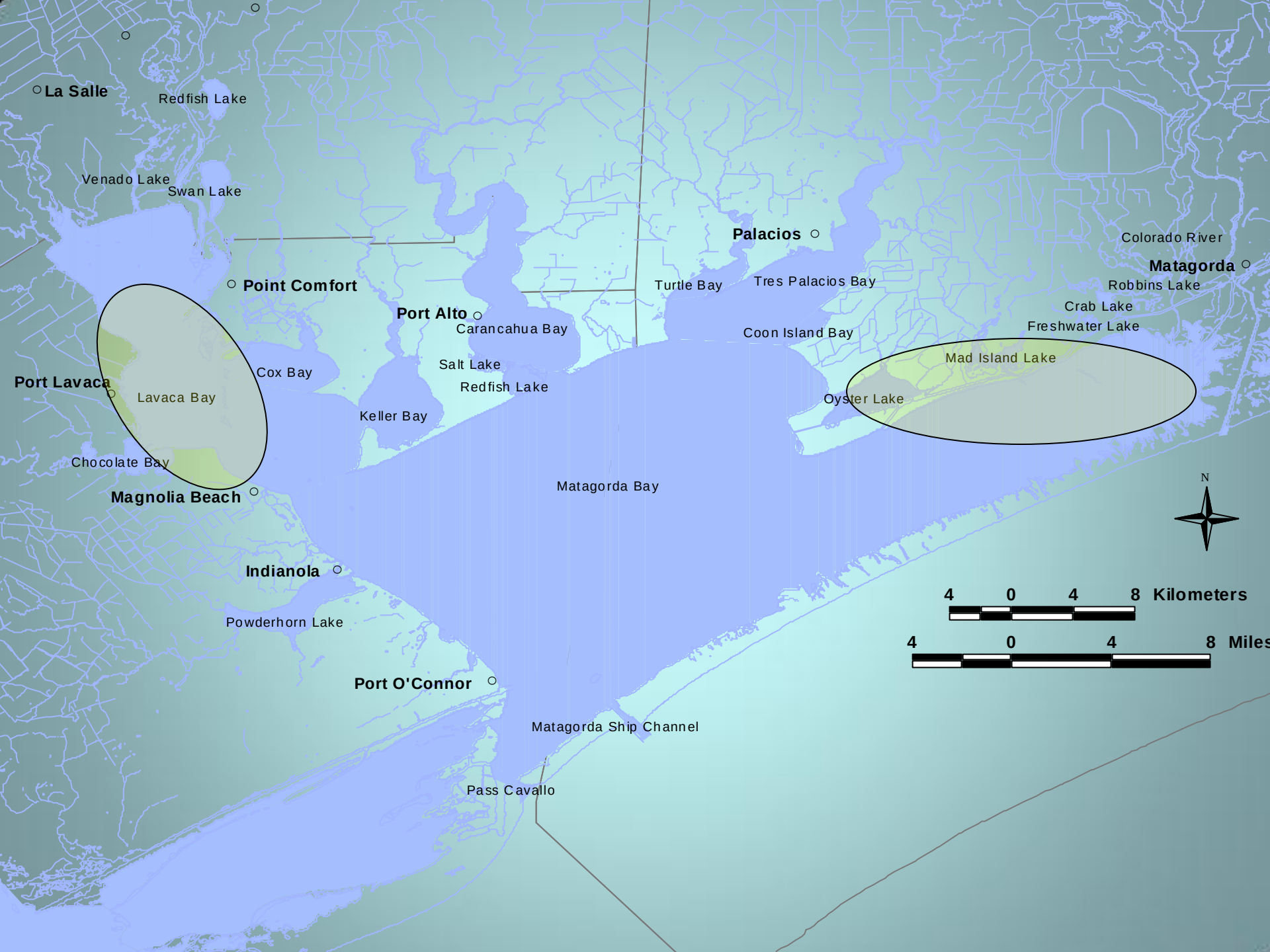
- Opened in 1947
- Discharged wastewater laden with mercury into Lavaca Bay
- Areas closed to seafood harvest in 1988
- Declared a Superfund in 1994

FISHERIES

COMMERCIAL

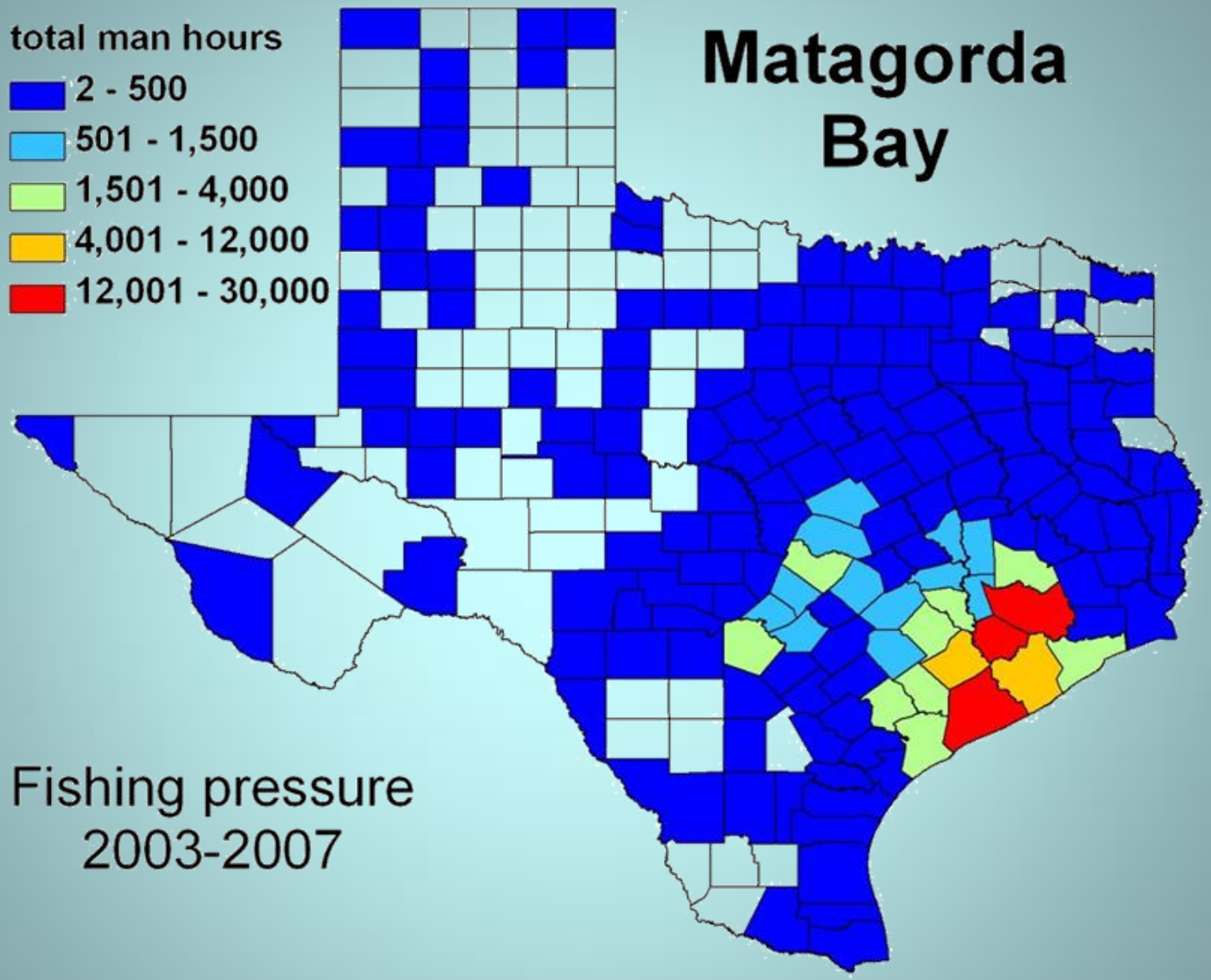
NMFS National Port Data by $

	2009			2008			2007			2006			2005			2000			1999		
Port	**Rank**	**Millions of Pounds**	**Millions of Dollars**	**Rank**	**Millions of Pounds**	**Millions of Dollars**	**Rank**	**Millions of Pounds**	**Millions of Dollars**	**Rank**	**Millions of Pounds**	**Millions of Dollars**	**Rank**	**Millions of Pounds**	**Millions of Dollars**	**Rank**	**Millions of Pounds**	**Millions of Dollars**	**Rank**	**Millions of Pounds**	**Millions of Dollars**
Brownsville-Port Isabel, TX	14	27	41	11	20.4	49.3	12	23.2	49.7	7	30.5	52	12	20.1	45	4	29.2	88.6	4	23.3	67.3
Galveston, TX	16	22	35	15	14.9	39	18	19.2	40.1	13	25	42.8	19	17.8	36.2	19	17.4	40.8	21	18	33.1
Port Arthur, TX	29	16	27	20	13.1	33	19	17.4	39	17	22	40.7	23	15.1	32.3	10	17	49.3	34	8.9	22.4
Palacios, TX	**30**	20	27	**22**	13.6	32.1	**32**	12.6	25.2	**28**	22.3	32.6	**27**	14.5	29.3	**17**	14.8	41.8	**18**	12.8	35.9
Freeport, TX																34	7.5	22.8	44	5.9	16.6
Aransas Pass-Rockport, TX																42	6.7	17.8	47	6.4	15


La Salle
Redfish Lake
Venado Lake
Swan Lake
Point Comfort
Port Alto
Carancahua Bay
Palacios
Turtle Bay
Tres Palacios Bay
Colorado River
Matagorda
Robbins Lake
Crab Lake
Freshwater Lake
Coon Island Bay
Mad Island Lake
Oyster Lake
Salt Lake
Redfish Lake
Cox Bay
Port Lavaca
Lavaca Bay
Keller Bay
Chocolate Bay
Magnolia Beach
Matagorda Bay
Indianola
Powderhorn Lake
Port O'Connor
Matagorda Ship Channel
Pass Cavallo
N
4 0 4 8 Kilometers
4 0 4 8 Miles

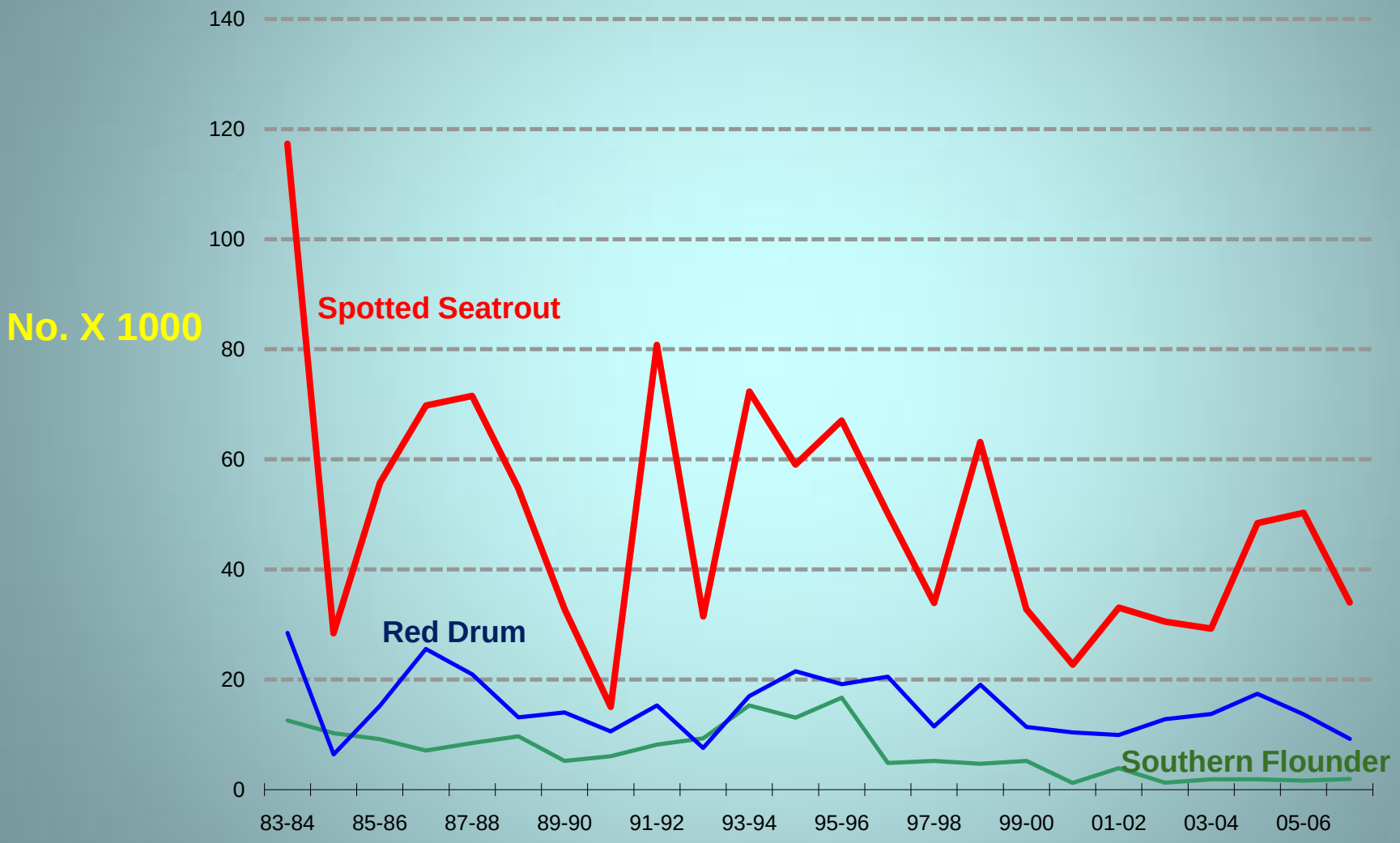
FISHERIES

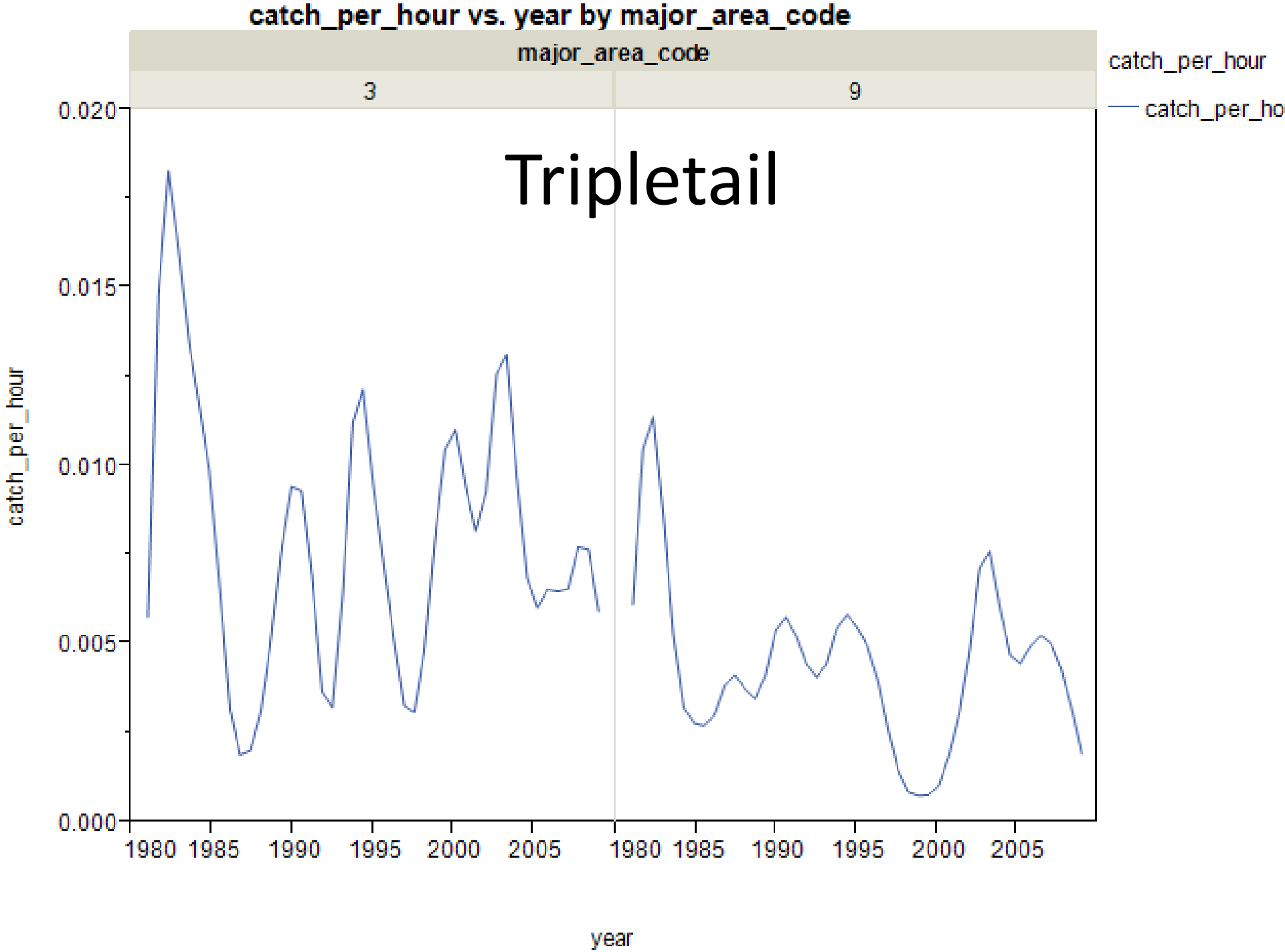
RECREATIONAL



Fishing pressure
2003-2007

West Matagorda Bay
Private Boat Landings



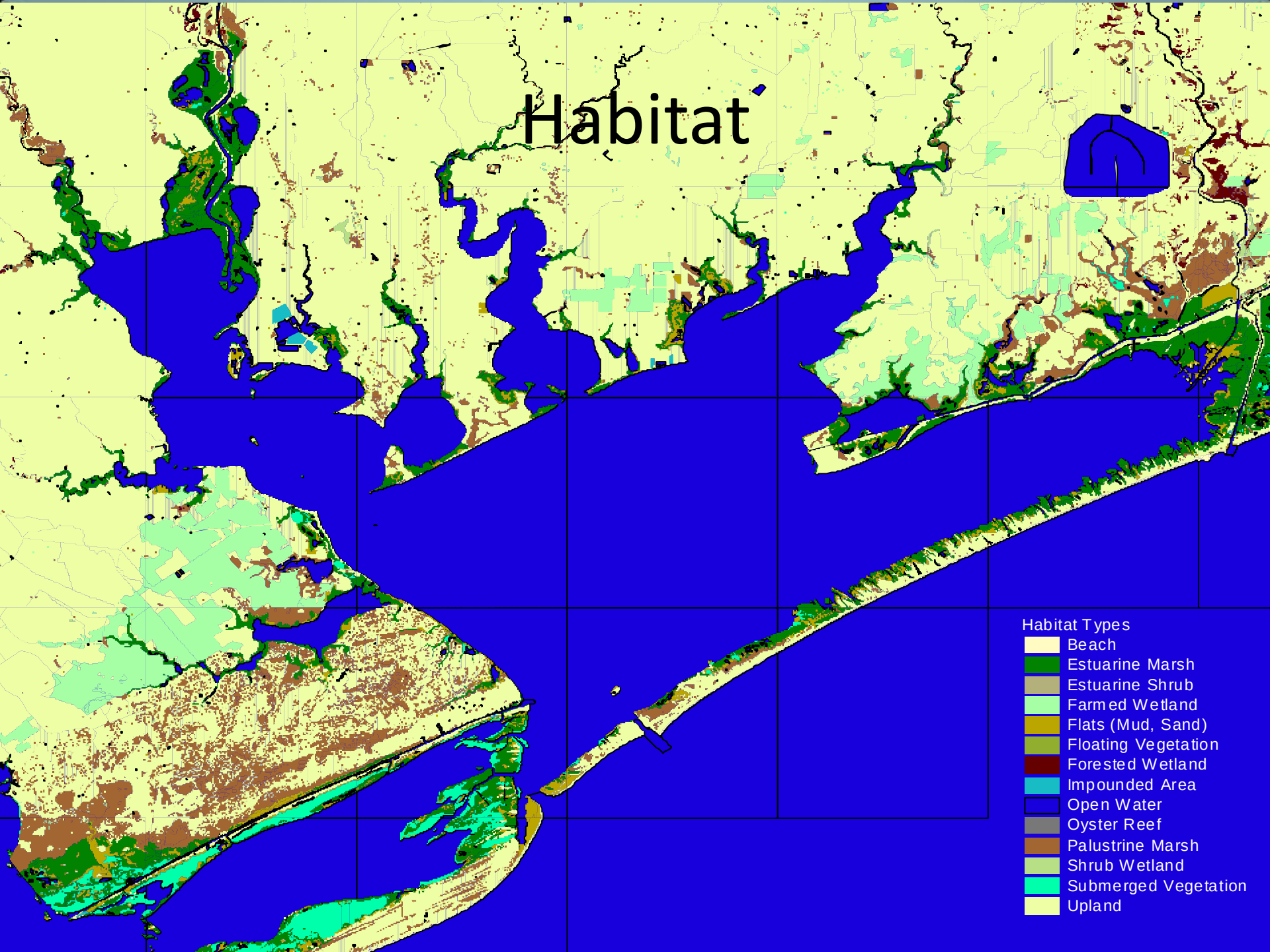

catch_per_hour vs. year by major_area_code
major_area_code
3
9
catch_per_hour
catch_per_ho
Tripletail
0.020
0.015
0.010
0.005
0.000
catch_per_hour
1980
1985
1990
1995
2000
2005
year

Tres Palacios Bay

WHAT WE WILL SEE

N28°46'12"
N28°45'
W 96°18'36"
W 96°17'24"
W 96°16'12"
W 96°15'
W 96°13'48"
W 96°12'36"
N28°43'48"
W 96°10'12"
W 96°09'
Henderson Ave
1st St
35
N28°42'36"
Main St
N28°41'24"
© 2011 Google
Texas Orthoimagery Program
N28°40'12"
Imagery Dates: Dec 31, 2008 - Jan 1, 2009
28°43'51.45" N 96°11'33.21" W elev -3 ft

Habitat


Habitat Types
Beach
Estuarine Marsh
Estuarine Shrub
Farmed Wetland
Flats (Mud, Sand)
Floating Vegetation
Forested Wetland
Impounded Area
Open Water
Oyster Reef
Palustrine Marsh
Shrub Wetland
Submerged Vegetation
Upland

River Cover

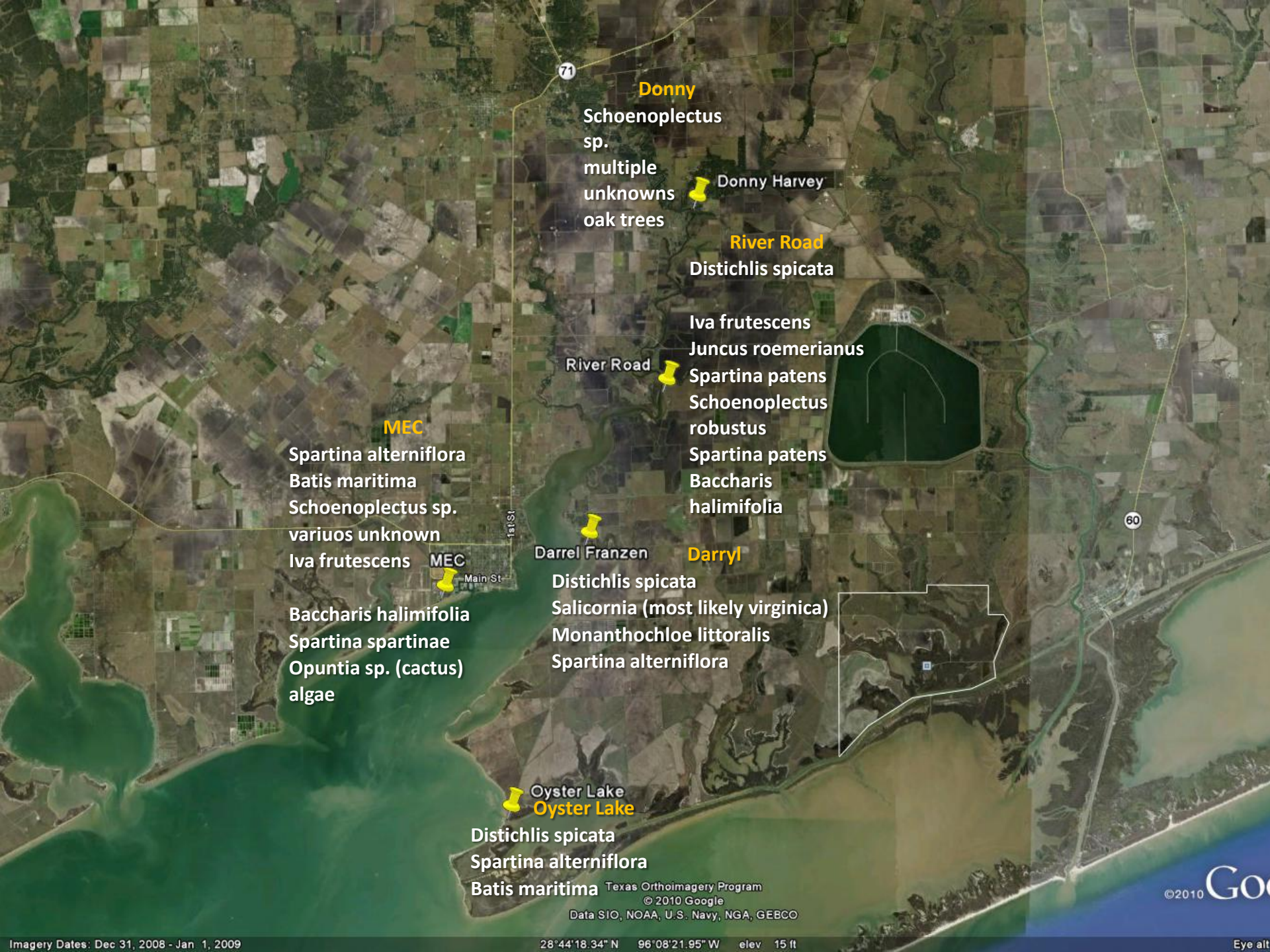
Table 17. Carancahua Creek and Tres Palacios River – Complete Watershed.

Class names	Carancahua Creek		Tres Palacios River		% Change
	Hectares	% Cover	Hectares	% Cover	Car-TP**
Agriculture	8343.0	37.9	32376.2	50.3	(12.3)
Evergreen	1864.1	8.5	8847.6	13.7	(5.3)
Grassland	4013.6	18.3	15007.6	23.3	(5.0)
Mesic Cold	13.8	0.1	530.2	0.8	(0.8)
Grass Farm	184.1	0.8	1020.7	1.6	(0.7)
Salt Prairie	110.4	0.5	443.6	0.7	(0.2)
Exposed Land	175.3	0.8	228.5	0.4	0.5
Marsh	263.5	1.2	364.0	0.6	0.6
Urban / Roads	175.8	0.8	56.5	0.1	0.7
Mixed Cold CD-EG*	631.9	2.9	1103.3	1.7	1.2
Open Water	1012.3	4.6	1405.6	2.2	2.4
Cold-deciduous	2088.2	9.5	149.1	0.2	9.3
Live Oak Forest	3115.0	14.2	2901.8	4.5	9.7
Total	21990.8		64434.4		

*Mixed Cold Deciduous – Ever Green

Tres Palacios Marsh Vegetation (February)

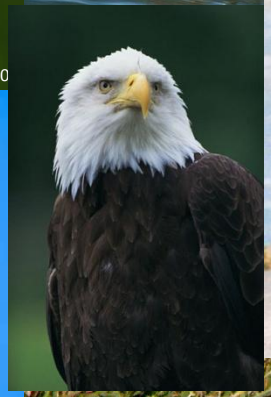
MEC	Donny	River Road	Darryl	Oyster Lake
		Distichlis spicata	Distichlis spicata	Distichlis spicata
			Salicornia (most likely virginica)	
			Monanthochloe littoralis	
Spartina alterniflora			Spartina alterniflora	Spartina alterniflora
Batis maritima				Batis maritima
Schoenoplectus sp.	Schoenoplectus sp.			
variuos unknown	multiple unknowns			
Iva frutescens		Iva frutescens		
		Juncus roemerianus		
		Spartina patens		
		Schoenoplectus robustus		
		Spartina patens		
Baccharis halimifolia		Baccharis halimifolia		
Spartina spartinae				
Opuntia sp. (cactus)				
algae				
	oak tree?			

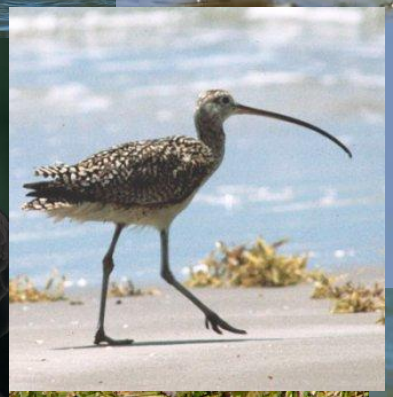

71
Donny
Schoenoplectus sp.
multiple unknowns
oak trees
Donny Harvey
River Road
Distichlis spicata
Iva frutescens
Juncus roemerianus
Spartina patens
Schoenoplectus robustus
Spartina patens
Baccharis halimifolia
River Road
MEC
Spartina alterniflora
Batis maritima
Schoenoplectus sp.
variuos unknown
Iva frutescens
1st St
MEC
Main St
Baccharis halimifolia
Spartina spartinae
Opuntia sp. (cactus)
algae
Darrel Franzen
Darryl
Distichlis spicata
Salicornia (most likely virginica)
Monanthochloe littoralis
Spartina alterniflora
60
Oyster Lake
Oyster Lake
Distichlis spicata
Spartina alterniflora
Batis maritima
Texas Orthoimagery Program
© 2010 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
©2010 Google
Imagery Dates: Dec 31, 2008 - Jan 1, 2009
28°44'18.34" N 96°08'21.95" W elev 15 ft
Eye alt

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Imagery Dates: Dec 31, 2008 - Jan 1, 2009
28°44'18.34" N 96°08'21.95" W elev 15 ft
Eye alt

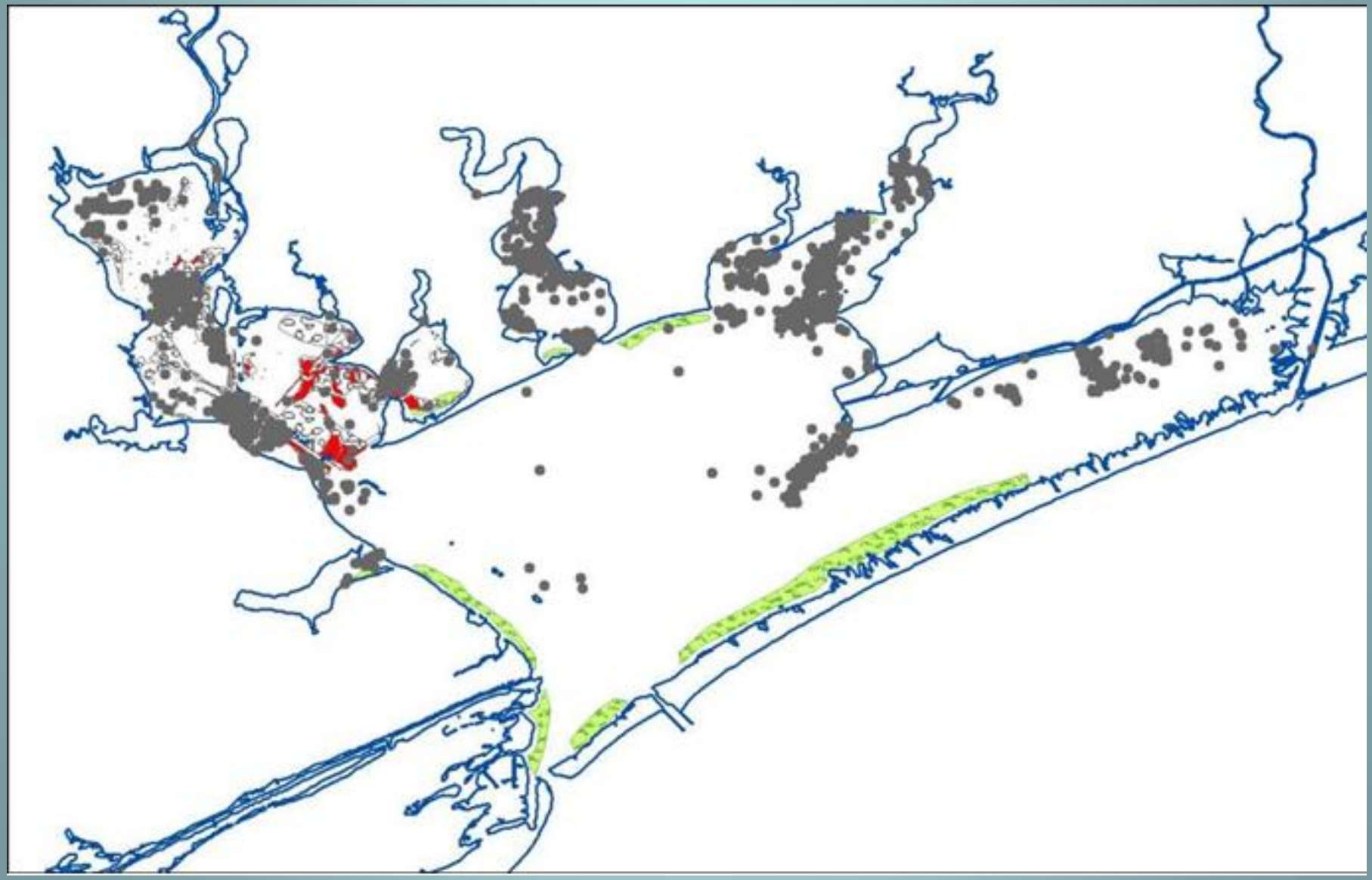
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Imagery Dates: Dec 31, 2008 - Jan 1, 2009
28°44'18.34" N 96°08'21.95" W elev 15 ft
Eye alt

http://www.dcnr.state.al.us/watchable-wildlife/images/Roseate%20Spoonbill%20



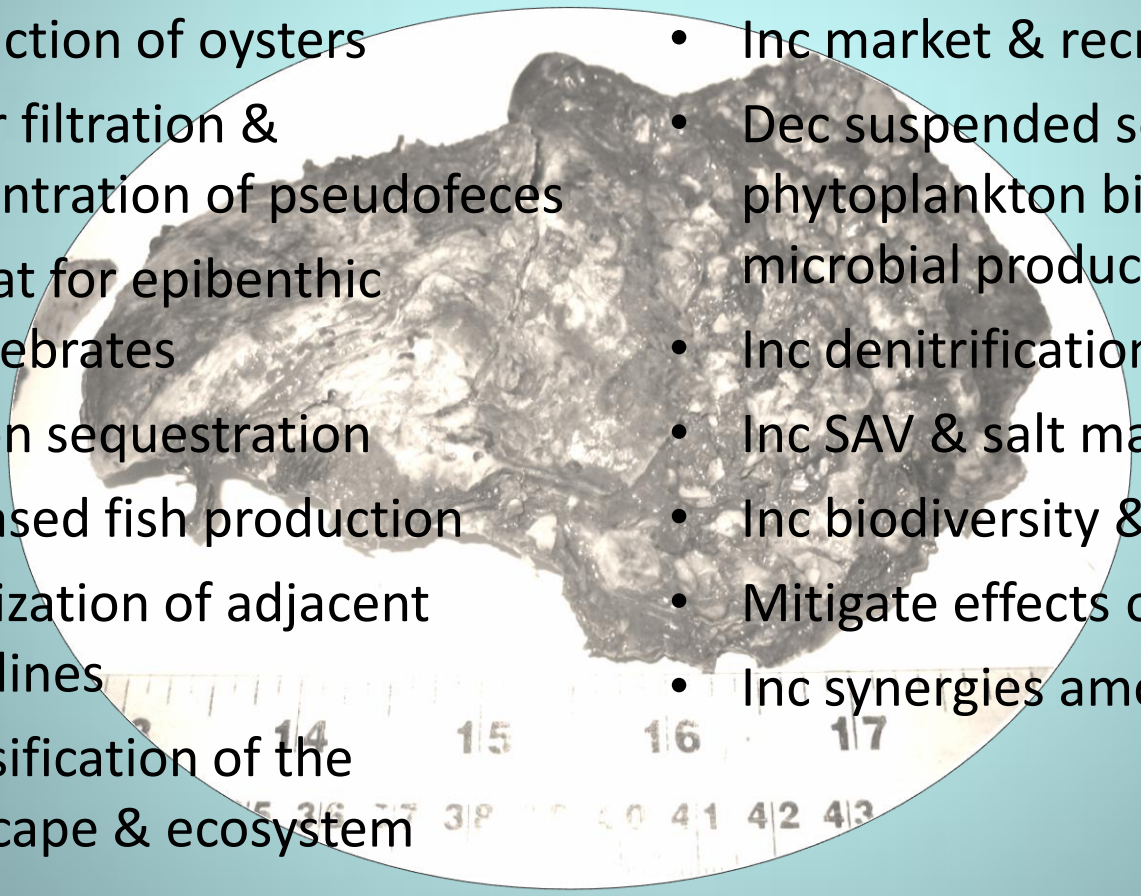


… more Habitat



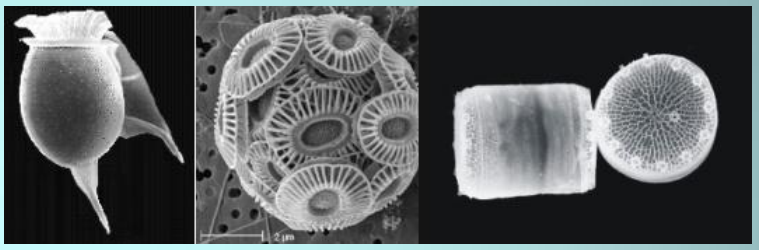
Ecological Services of Oyster Reefs

Ecosystem Services	Benefit / Value
• Production of oysters	• Inc market & recreational value
• Water filtration & concentration of pseudofeces	• Dec suspended solids, turbidity, phytoplankton biomass & microbial production
• Habitat for epibenthic invertebrates	• Inc denitrification
• Carbon sequestration	• Inc SAV & salt marsh habitat
• Increased fish production	• Inc biodiversity & production
• Stabilization of adjacent shorelines	• Mitigate effects of sea-level rise
• Diversification of the landscape & ecosystem	• Inc synergies among habitats



Eat or be Eaten

- Eat
  - Suspension filter feeders
    - Microscopic algae
    - Naked flagellates

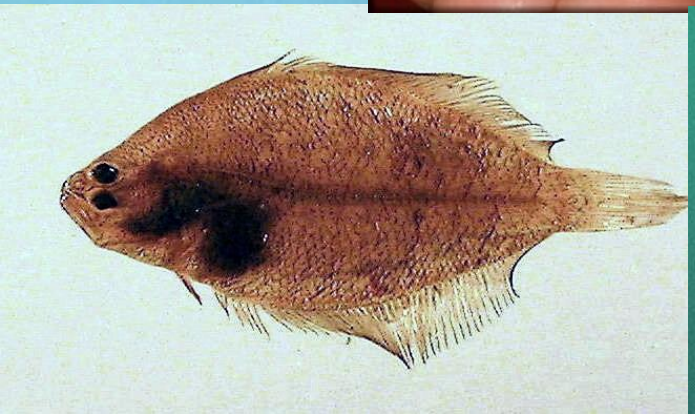


  - Filter approximately 1500 times the volume of the oysters body / day
- Eaten
  - Sheepshead, black drum, cownose ray, croaker, burrfish etc
  - Man
  - Rocksnails, lightning whelk, mud / stone crabs

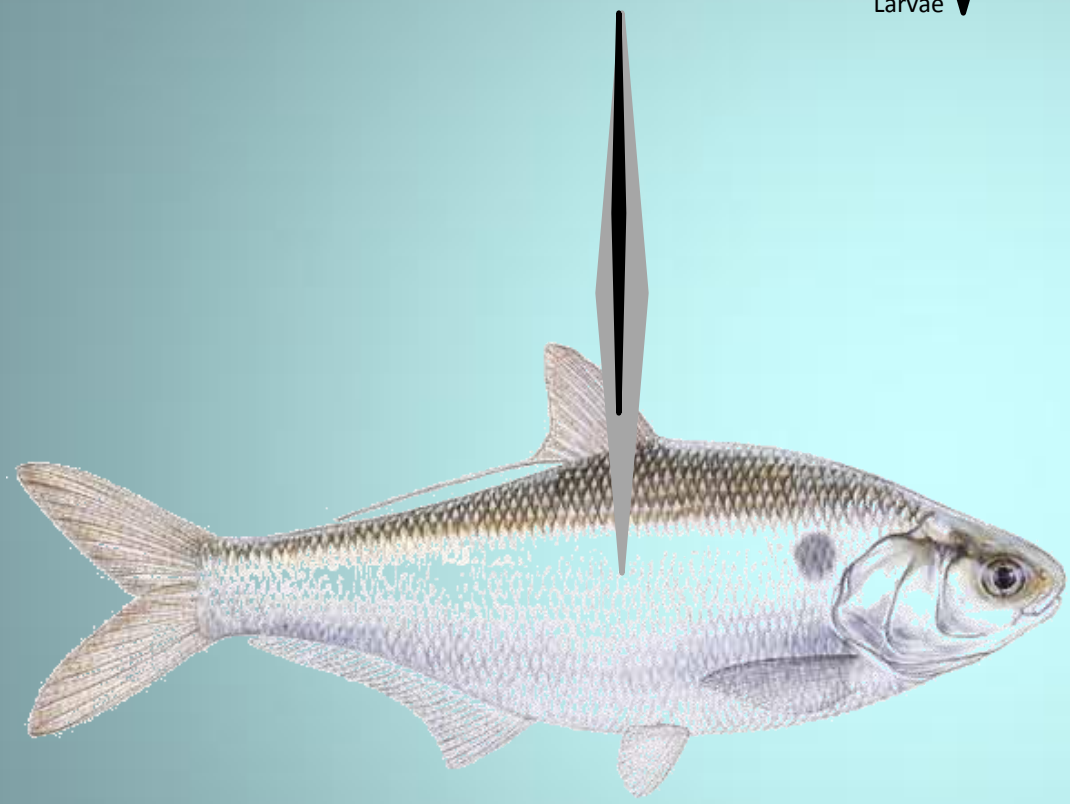
Freshwater Inflow

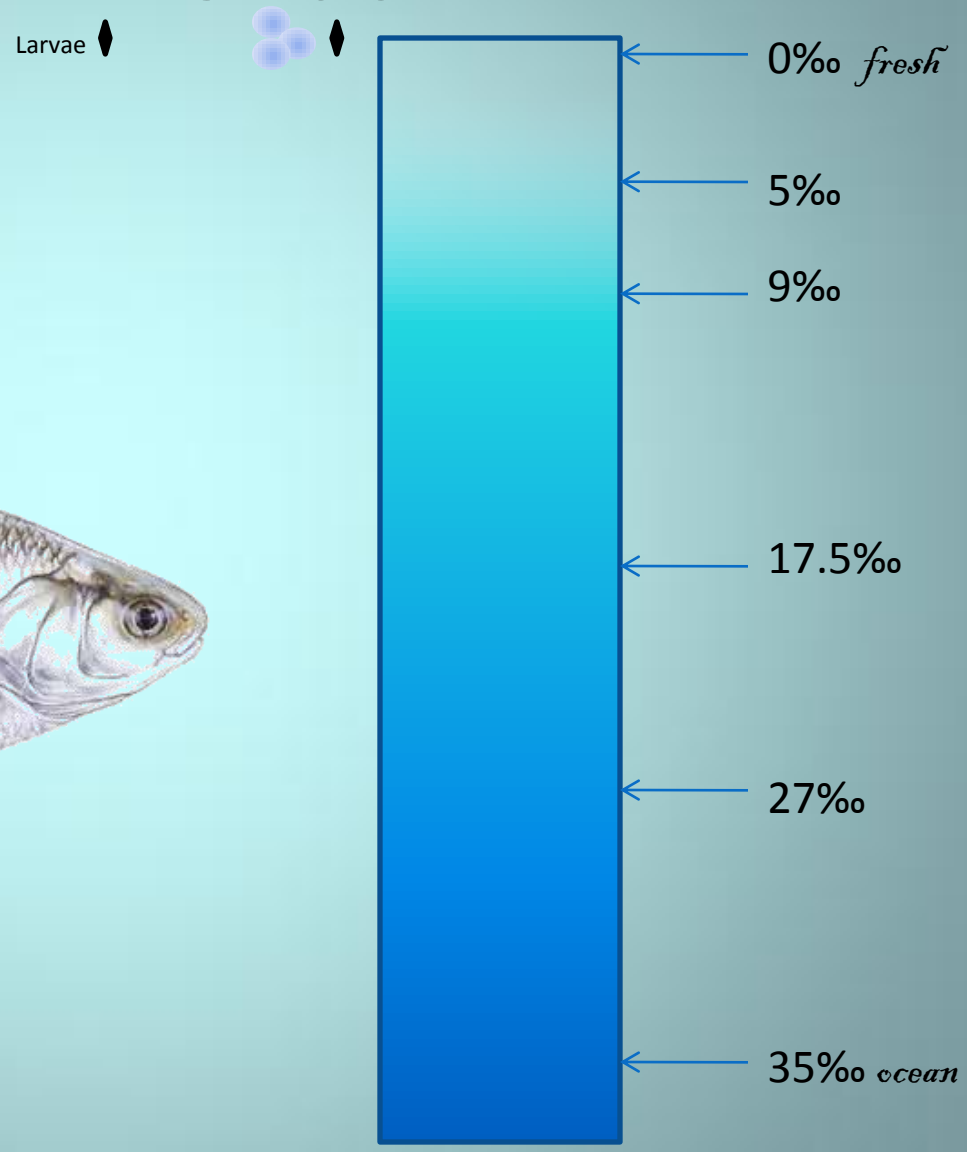
- Oysters have no legs
- High salinity → increased dermo & oyster drills
- Low salinities → reduced feeding
- Short term extremes healthy
- Narrow ‘happy’ band

perch *(Bairdiella chrysoura)*

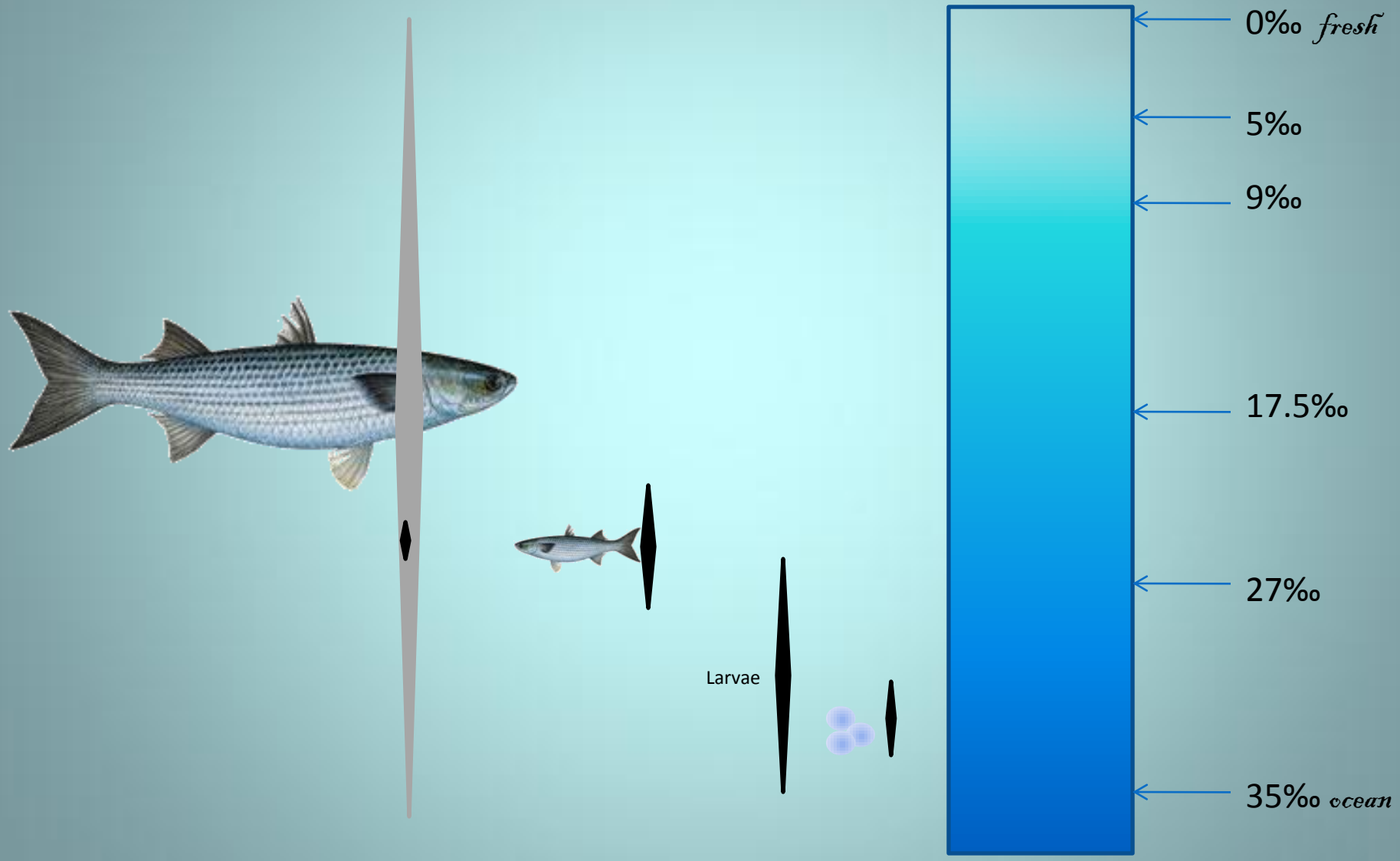


Theadfin Shad

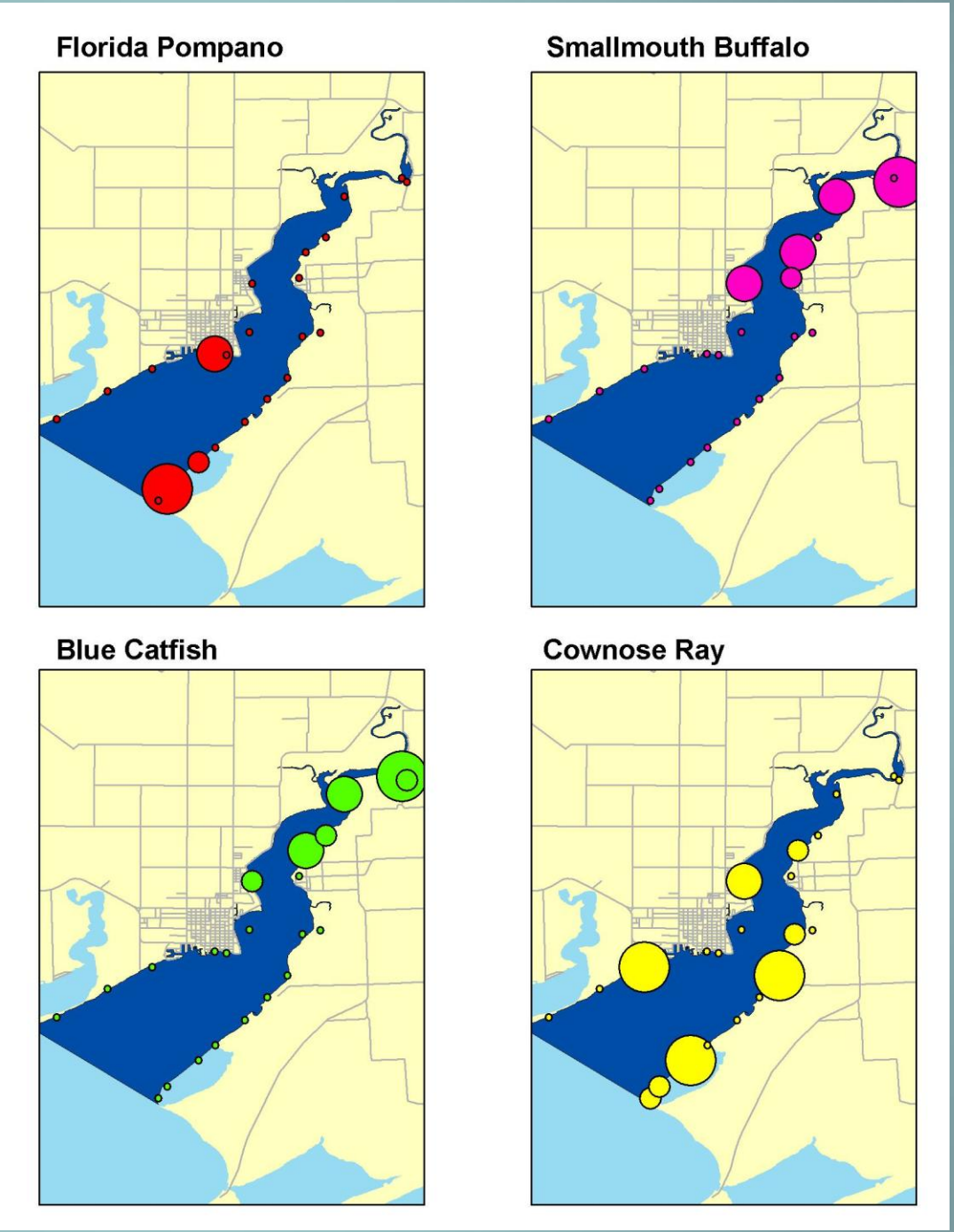




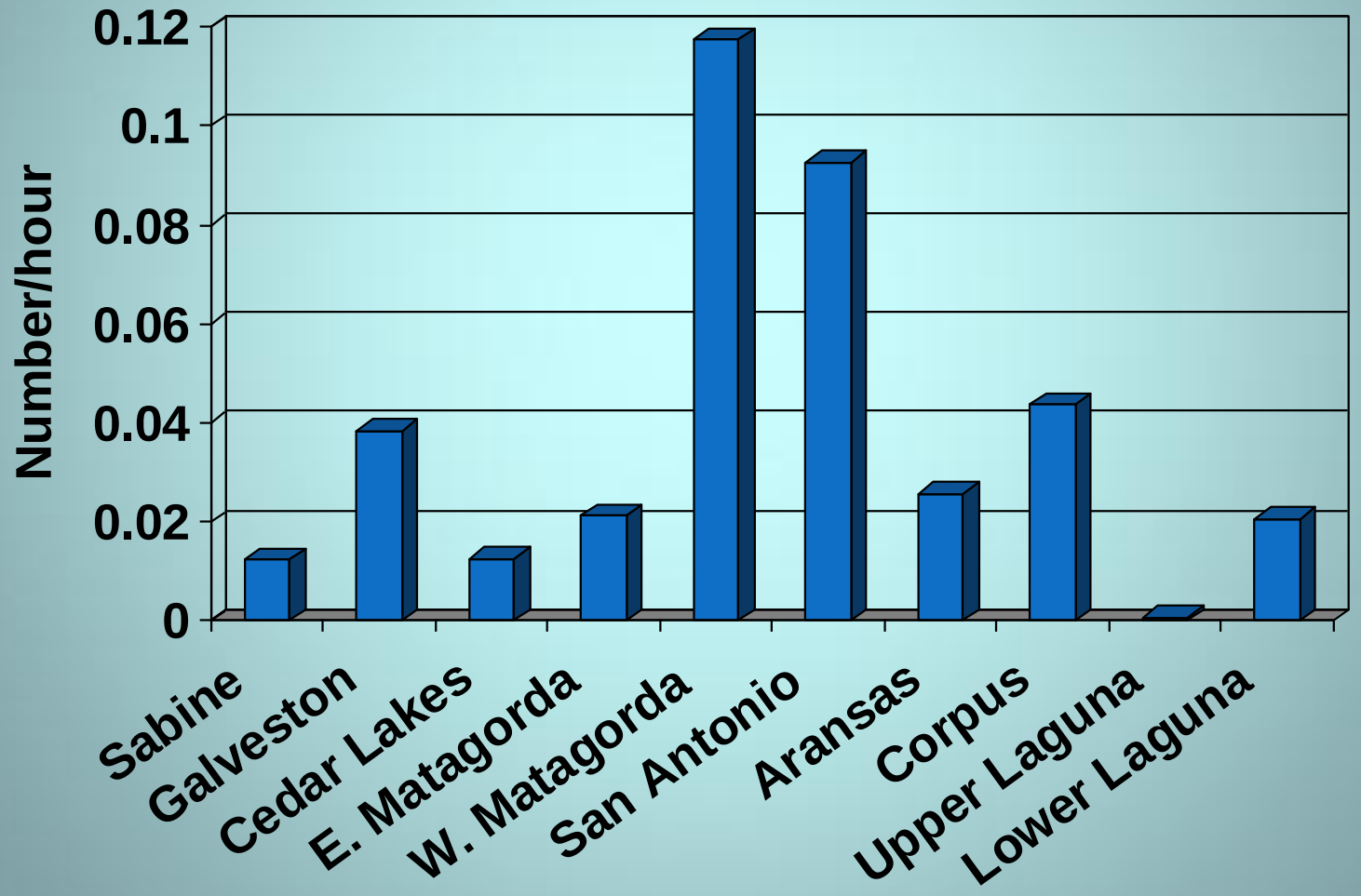
Striped Mullet



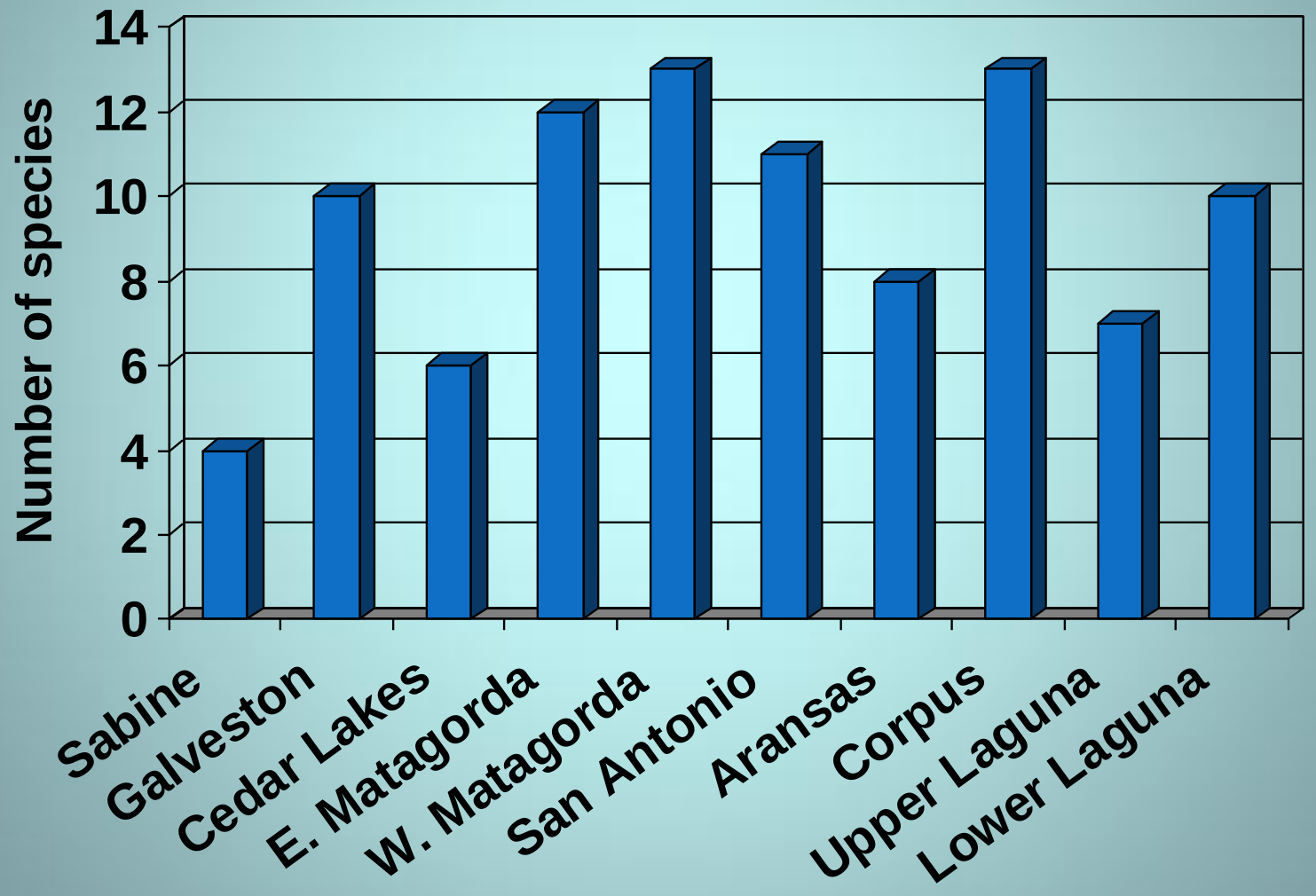
Species Distributions vs Salinity



Overall Shark CPUE by Bay System 1975-2006



Shark Species by Bay System



Matagorda Bay

- Physiological transition zone
- Historically interesting
- Most bird species in the national Christmas Bird Count
- Most sharks of any Texas Bay
- Imperiled

- The BEST Bay in Texas