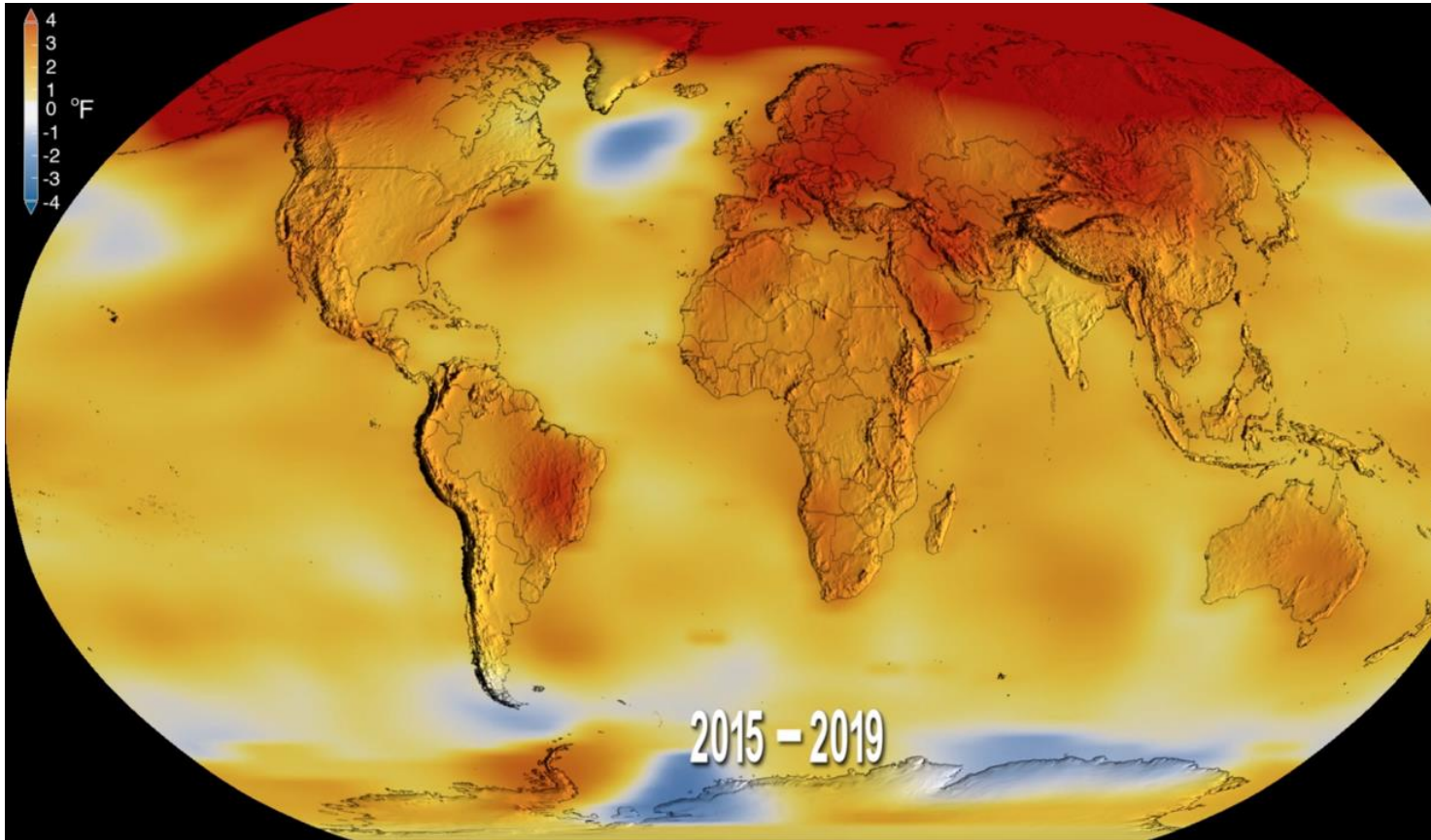


Evidence of Climate Change and Impacts on the Texas Coast

**Wendy Gordon, PhD
Climate Action Texas
January 22, 2020**

 **@ClimateActionTX**



[NEWS](#) | JANUARY 15, 2020
NASA, NOAA Analyses Reveal 2019
Second Warmest Year on Record

- Earth's average global surface temperature in **2019 was 2nd to 2016.**
- The **past 5 years** have been the warmest of the **last 140 years.**
- **Every decade** since the 1960s **has been warmer** than the one before.
- Average global surface temperature is now **more than 2 degrees F** above that of the 1880s.



What's Happening Here in Texas?

- Texas annual temperatures are increasing
- Every season has been warming since the 1950s
- Winter temperatures have warmed the most
- Cold spells are becoming less severe and less frequent



Climate at a Glance

- Climate Monitoring
- State of the Climate
- Temp, Precip, and Drought
- Climate at a Glance
- Extremes
- Societal Impacts
- Snow and Ice
- Teleconnections
- Monitoring References

- Global
- National
- Regional
- Statewide
- Divisional
- County
- City

- Mapping
- Time Series
- Rankings
- Haywood Plots
- Data Information
- Background

City Time Series

Choose from the options below and click "Plot" to create a time series graph.
Please note, Degree Days and Palmer Indices are not available for Cities.

Parameter: Average Temperature

Time Scale: 1-Month

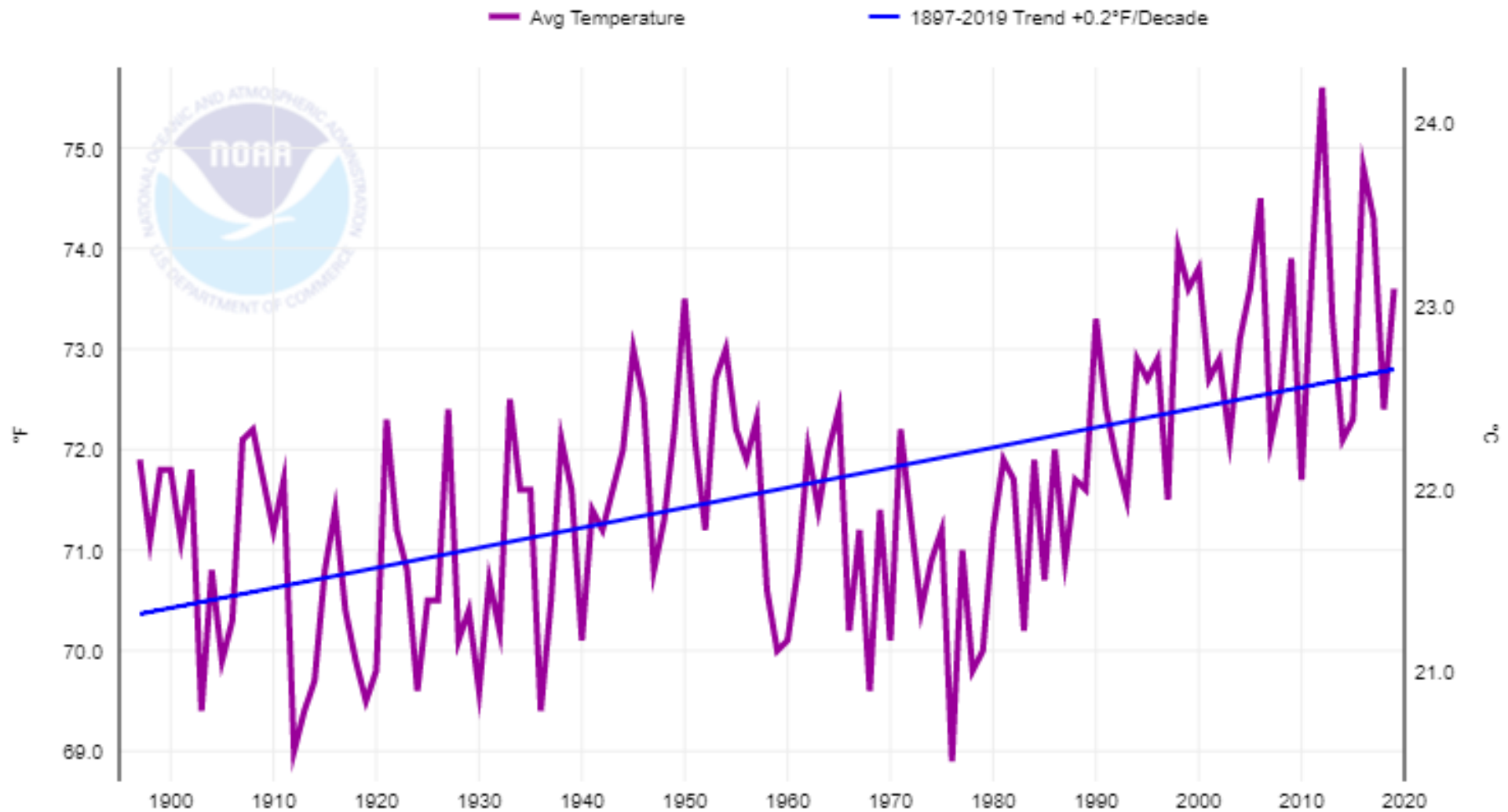
Month: December

Options

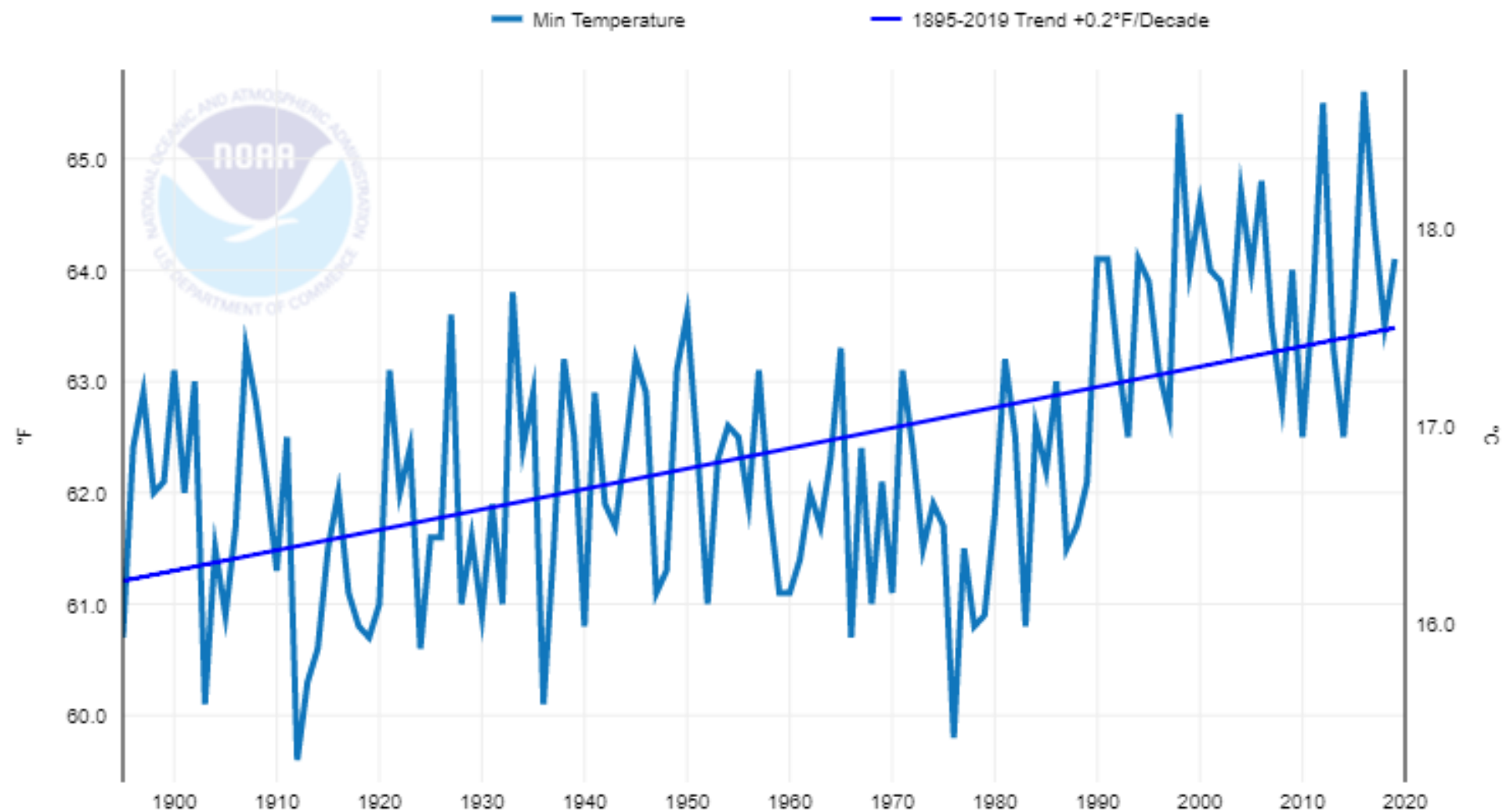
☒ Display Base Period

Start: 1901 End: 2000

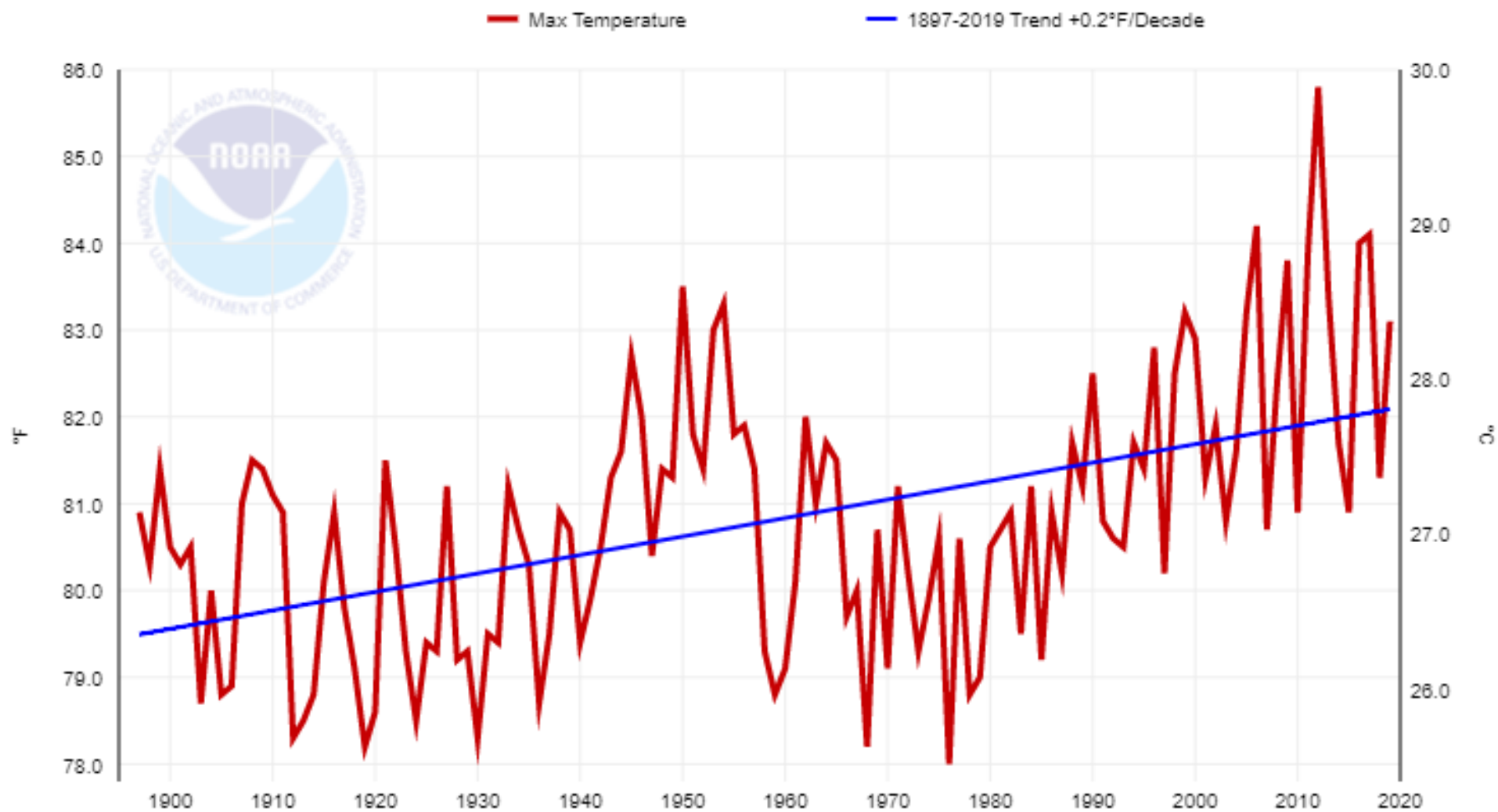
Corpus Christi, Texas, Average Temperature, January-December



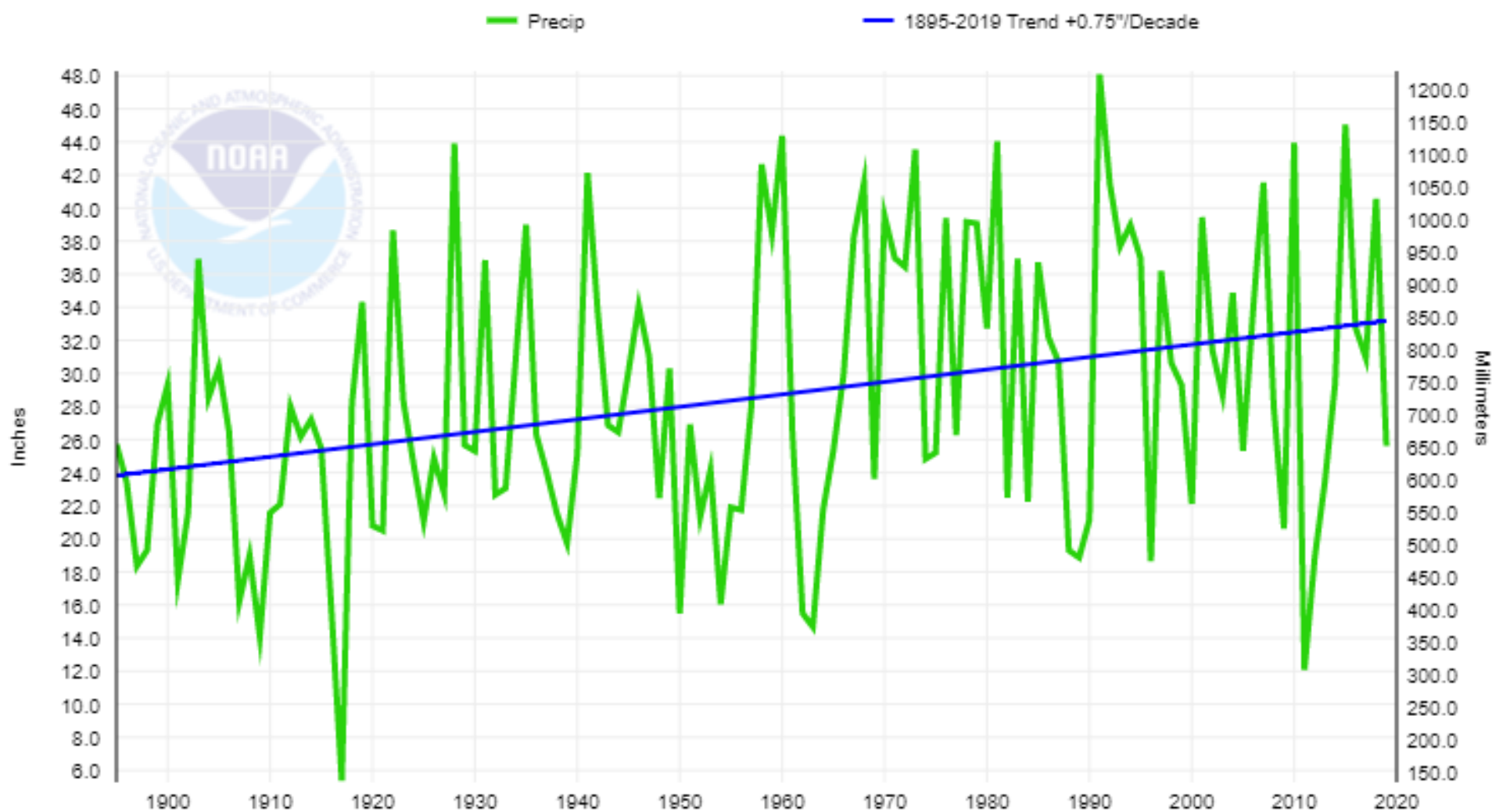
Corpus Christi, Texas, Minimum Temperature, January-December



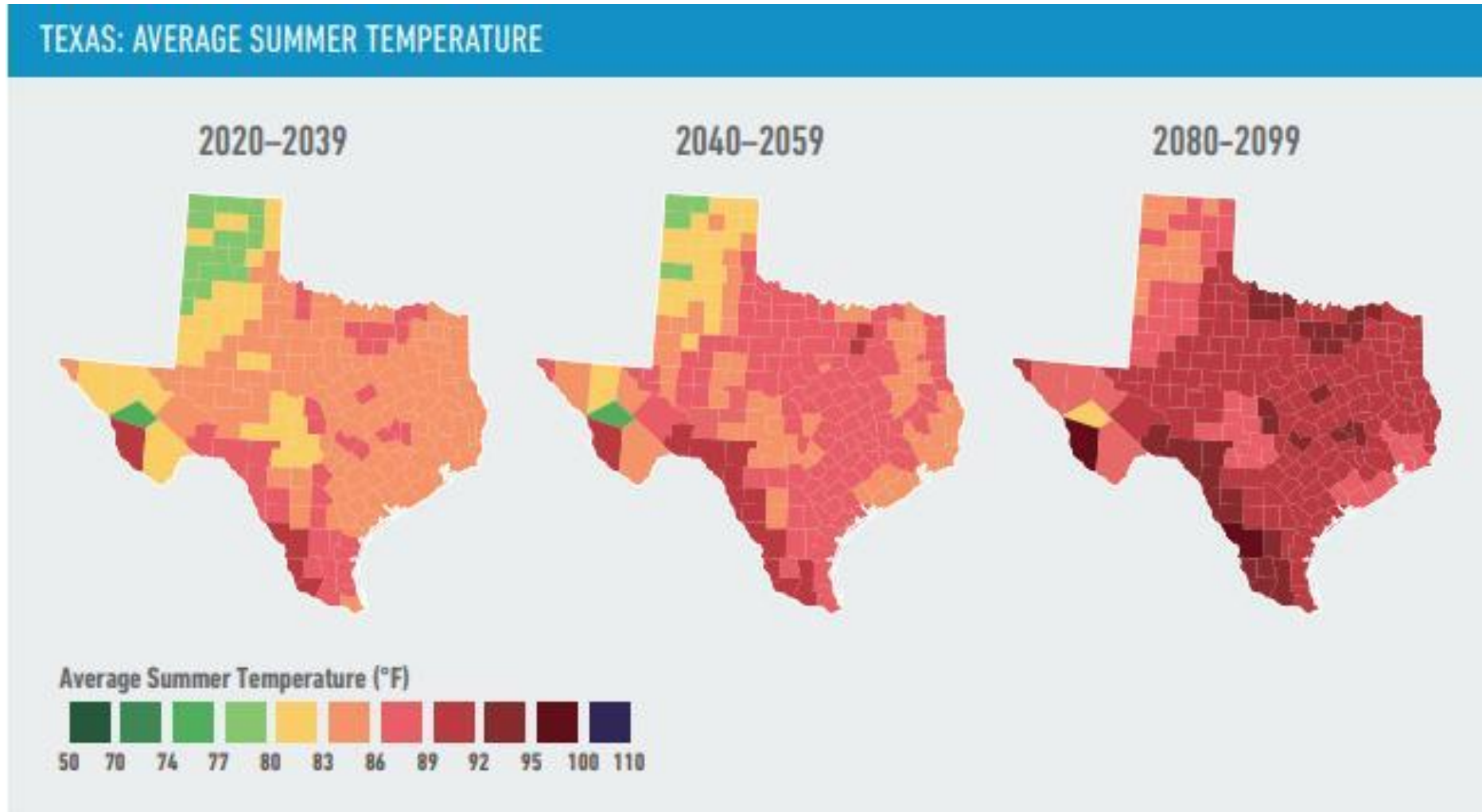
Corpus Christi, Texas, Maximum Temperature, January-December



Corpus Christi, Texas, Precipitation, January-December



Projected Summer Temperature



1978 - 2015

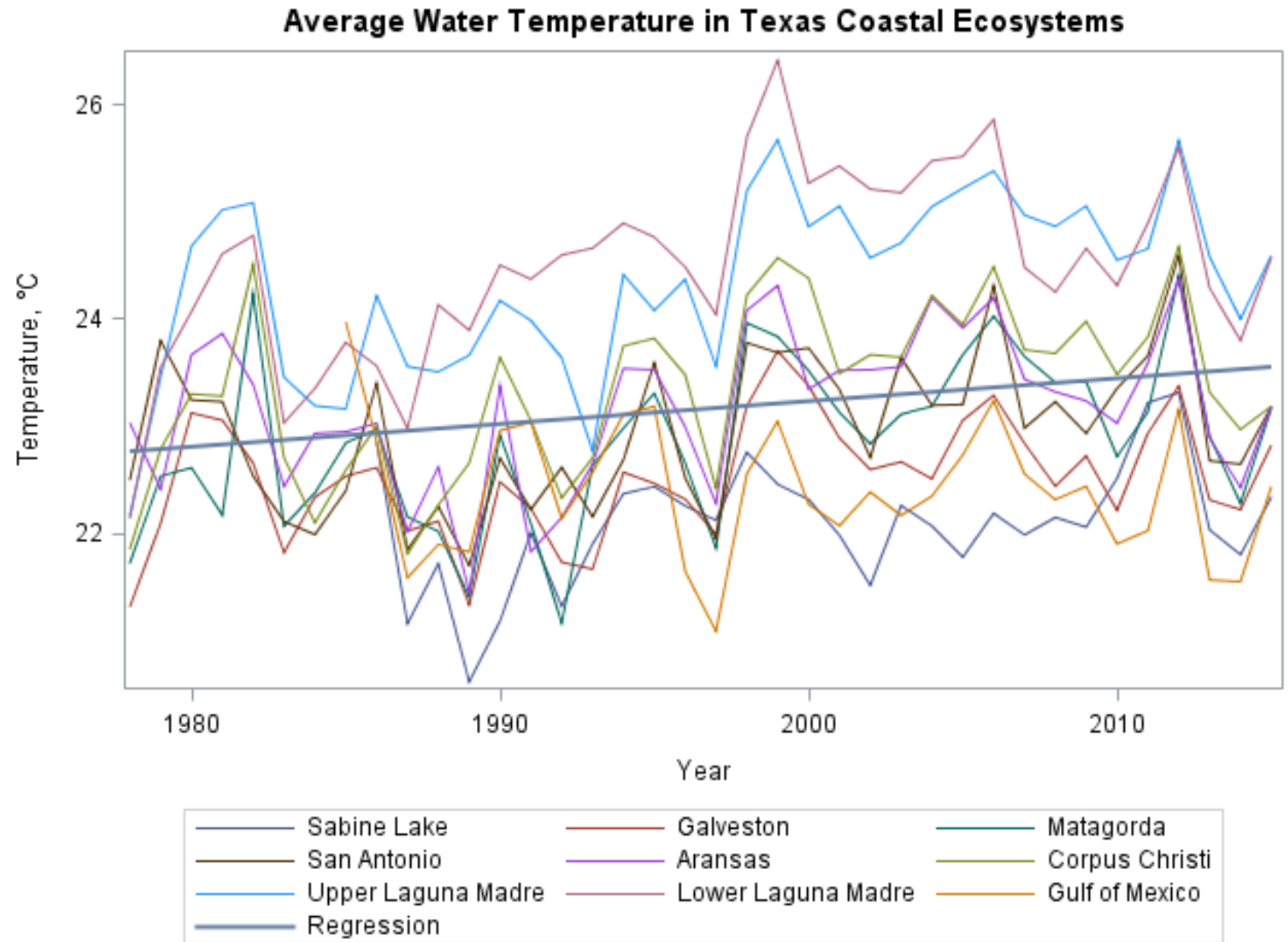


Figure courtesy of TPWD
Coastal Fisheries.



Texas Fish Species Moving North

Fat and common snook and tarpon have expanded their range northward into the upper coast bays. They cannot tolerate water temperatures below 50°F. Warmer winters have enabled them to move into bays that were previously too cold for them.



**While Some Species are
Struggling**

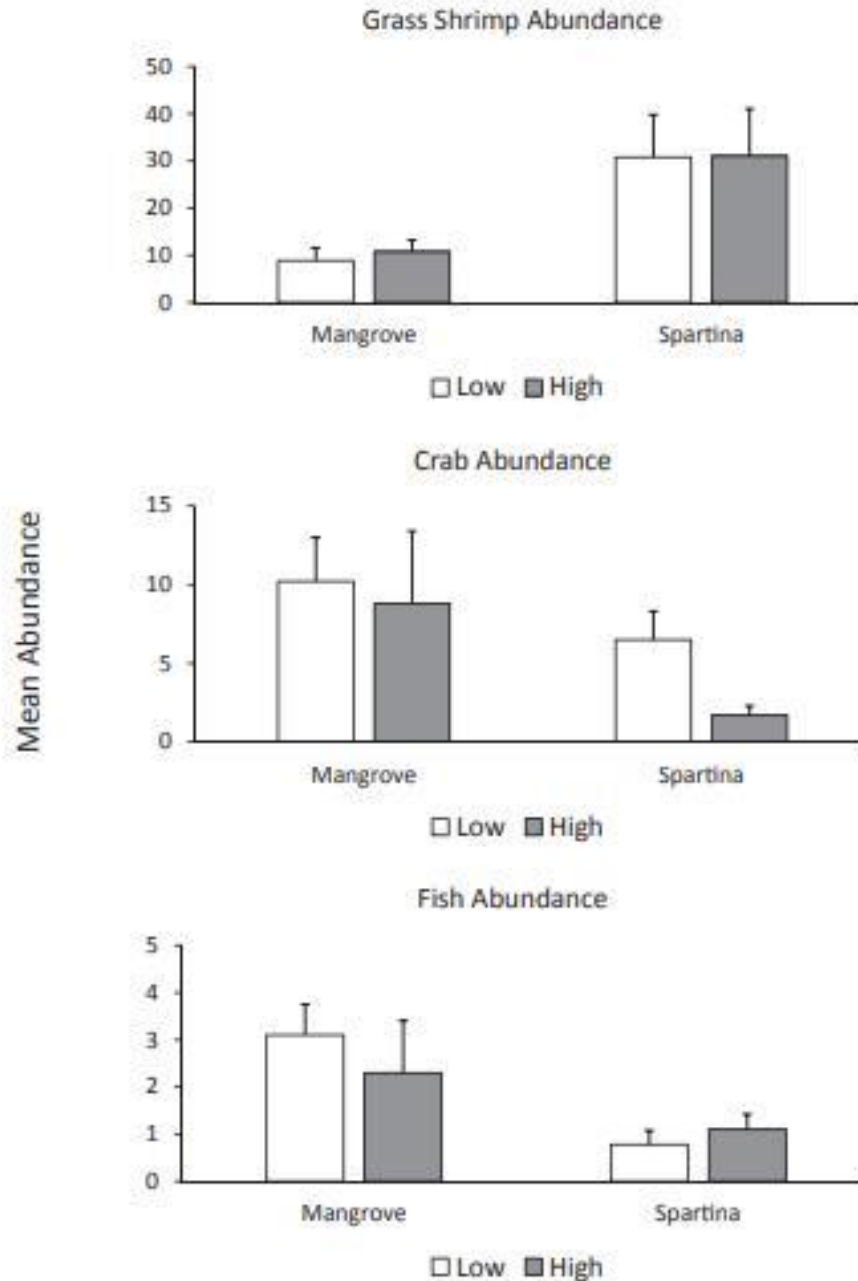
Warm winter temperatures in Texas Gulf inhibits reproduction of **southern flounder**. Of the eggs that do hatch, many turn out to be males if temperatures are high enough, thus lowering the overall reproductive capacity of the stock.



Black Mangrove Expansion

Black mangrove (top) is a tropical species that is expanding northward into *Spartina* (bottom) salt marshes in the absence of severe freezes that previously limited its range. Effects on other species are being studied at the Mission-Aransas National Estuarine Research Reserve near Rockport by TAMU Corpus Christi.





Mean \pm SE abundances of shrimp, crabs, and fish in samples from high and low tidal elevations from marshes with and without mangroves. Shaded bars are high tidal elevations.

Mangrove expansion into salt marshes alters associated faunal communities by Delbert L. Smee, James A. Sanchez , Meredith Diskin, Carl Trettin, *Estuarine, Coastal and Shelf Science* (2017).

**ON THE
MOVE:**

Texas Fish and Game in a Changing Climate

BY WENDY GORDON, PH.D.

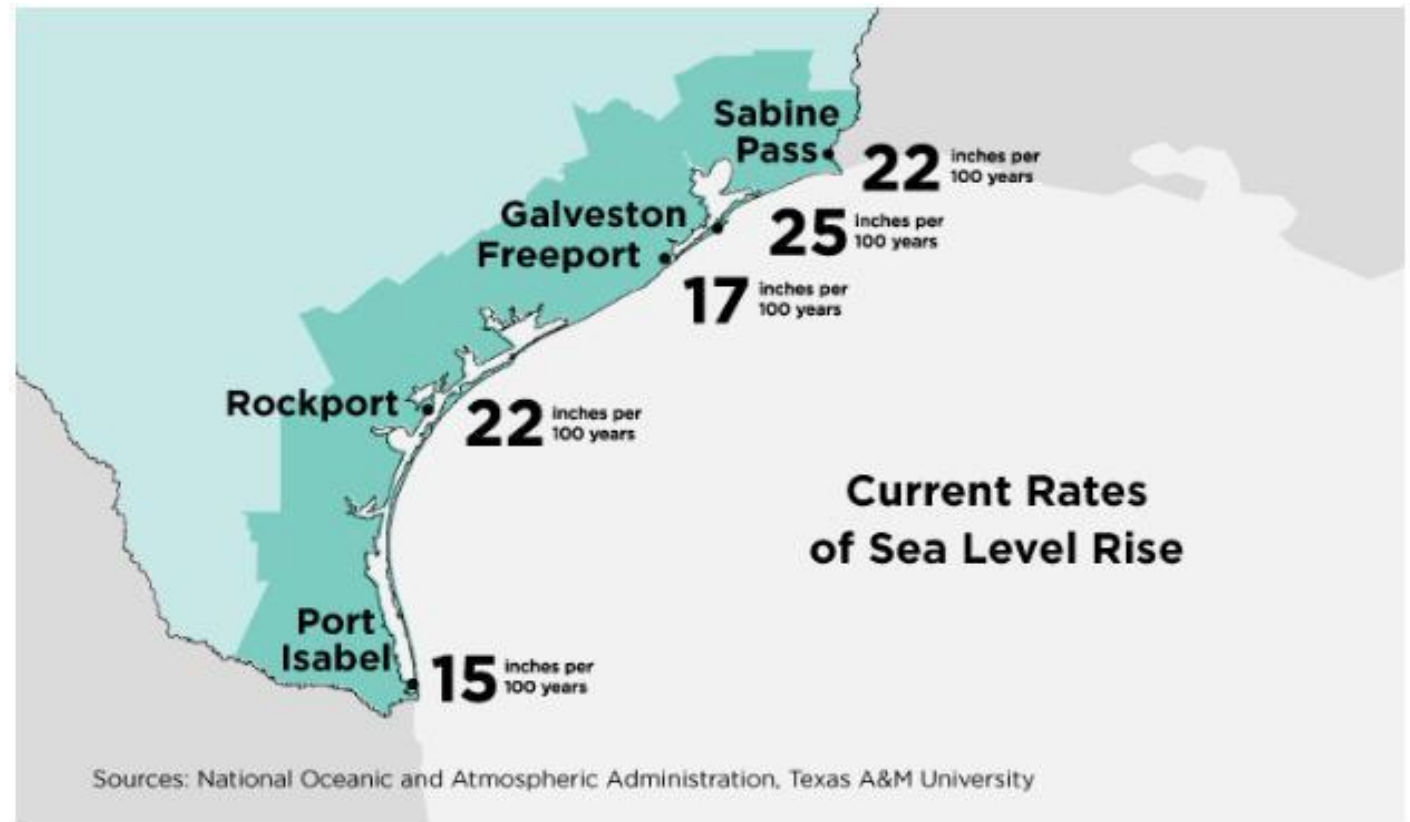


Texas has a rich natural heritage, which raises the stakes for risks from climate change. We do not know exactly how climate change is going to affect every species, but “winners” and “losers” are already emerging. As the Earth warms, species tend to shift to northern latitudes and higher altitudes as those areas offer more accommodating habitat conditions.

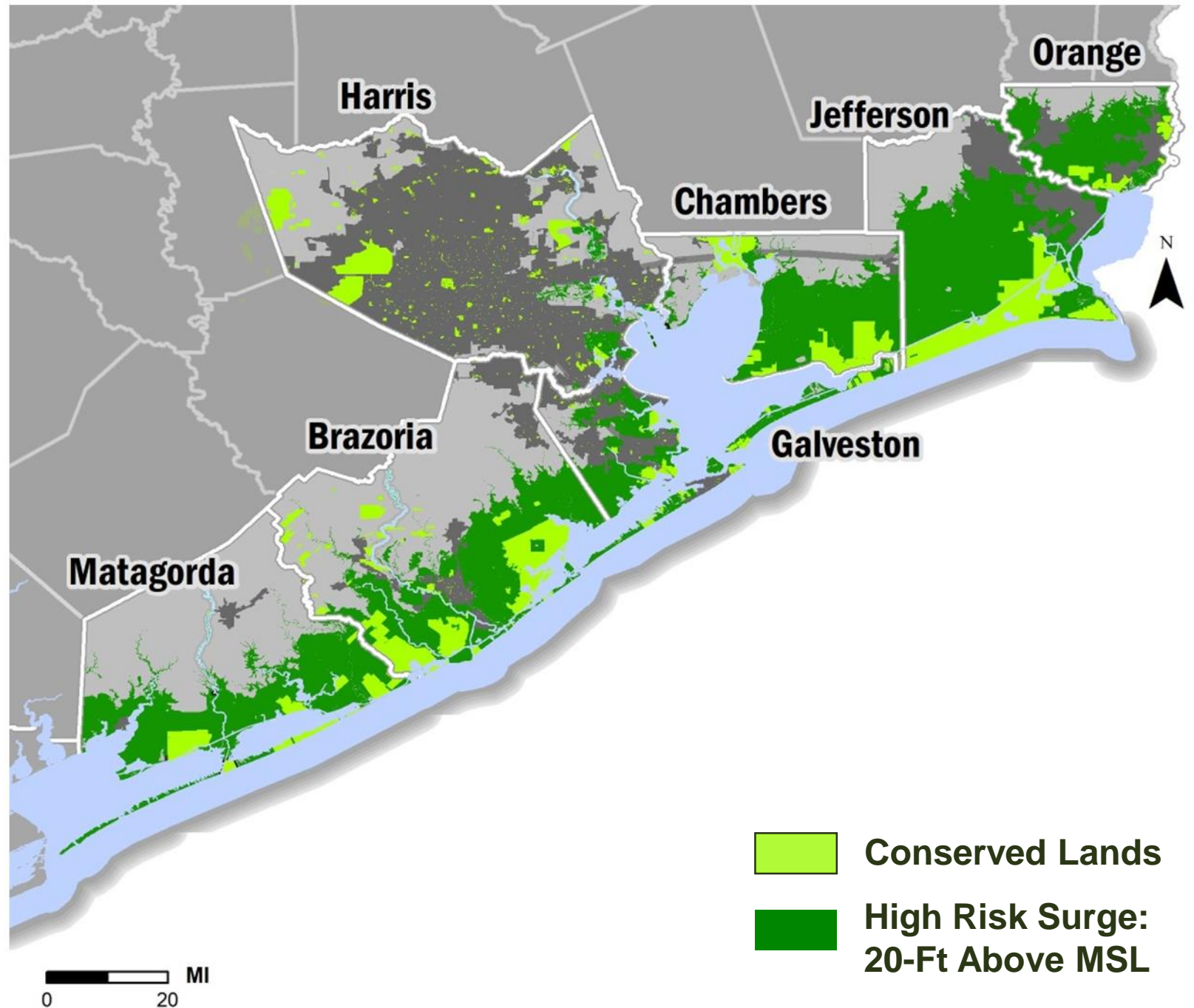
Birds are among the most mobile species on Earth, and changes in their habitats and habits are already appearing. Biologists have been tracking the northward expansion of white-winged doves for decades. Originally confined to the Lower Rio Grande Valley, by 2001 they were found as far north as Kansas. The U.S. breeding ground of another species, the migratory black-bellied whistling duck, had extended only as far north as Texas in the early 1990s, but more recently its breeding range has edged further north to

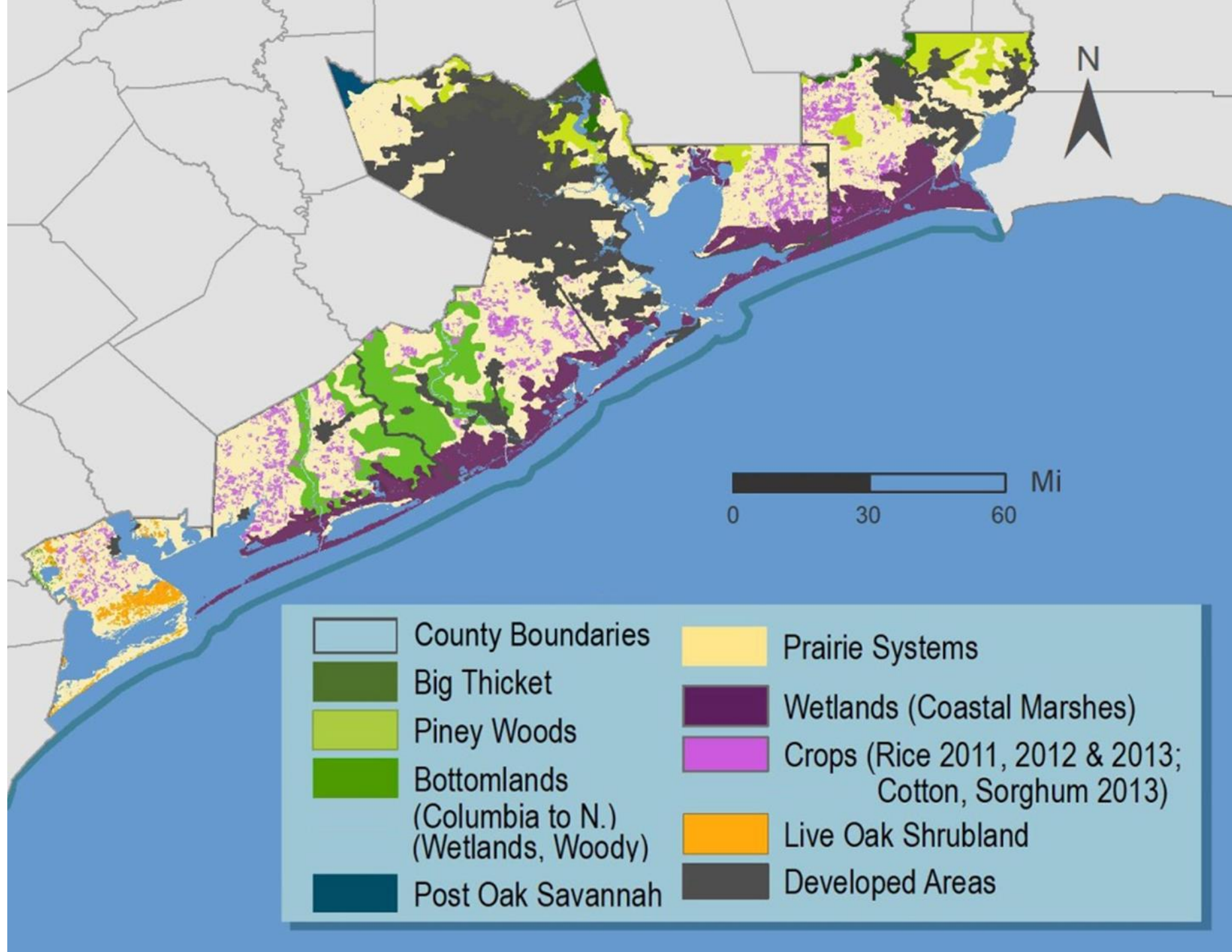
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Sea Level Rise in Texas Gulf

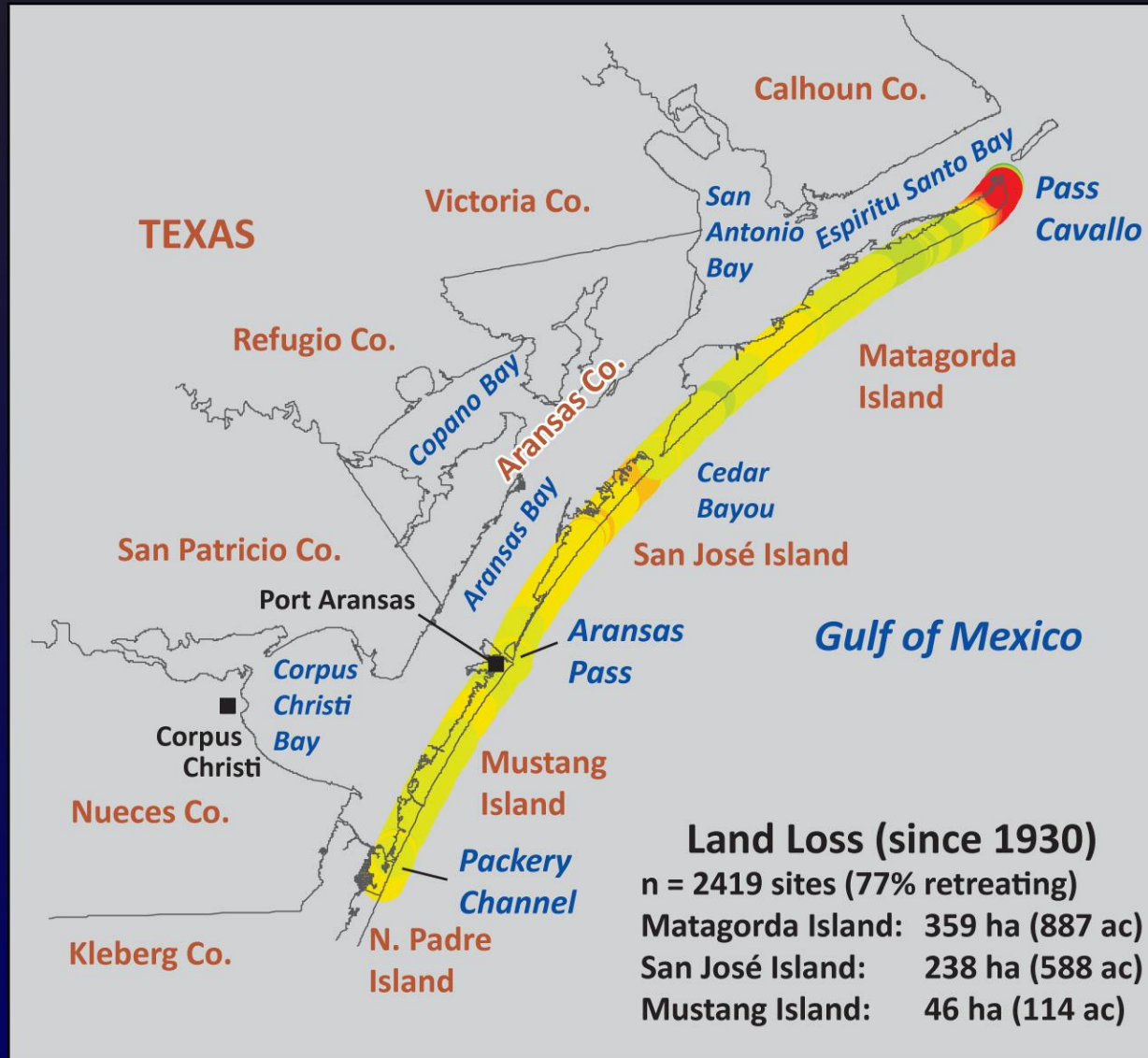


Two Million Coastal Acres Lying At Or Below 20 Feet Elevation





Shoreline Change, Central Coast



Change rate

ft/yr		m/yr
14.8 – 18	●	4.5 – 5.5
11.5 – 14.8	●	3.5 – 4.5
8.2 – 11.5	●	2.5 – 3.5
4.9 – 8.2	●	1.5 – 2.5
1.6 – 4.9	●	0.5 – 1.5
-1.6 – 1.6	●	-0.5 – 0.5
-4.9 – -1.6	●	-1.5 – -0.5
-8.2 – -4.9	●	-2.5 – -1.5
-11.5 – -8.2	●	-3.5 – -2.5
-14.8 – -11.5	●	-4.5 – -3.5
-18 – -14.8	●	-5.5 – -4.5
< -18	●	< -5.5





Ecosystem Benefits Provided by Natural Coastal Lands

- Storm surge protection
- Flood storage
- Carbon sequestration
- Water supply enhancement
- Fishery productivity
- Endangered species habitat
- Neo-tropical migrant bird habitat
- Waterfowl habitat

Resources

- www.climate.nasa.gov climate dashboard
- <https://nca2018.globalchange.gov/> 4th National Climate Assessment
- <https://www.ncdc.noaa.gov/climate-monitoring/> near real-time climate monitoring data
- [http://texasseagrant.org/assets/uploads/resources/16-306 Texas Fish and Game.pdf](http://texasseagrant.org/assets/uploads/resources/16-306_Texas_Fish_and_Game.pdf)