



TEXAS

PARKS &

WILDLIFE

Salinities of Lake Sabine And Associated Gulf Waters

**Terry D. Stelly
Ecosystem Biologist**

**Texas Parks and Wildlife Department – Coastal Fisheries
601 Channelview
Port Arthur, Texas 77640
409-983-1104 ext 224
Terry.Stelly@tpwd.state.tx.us**

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Prepared for: Drought Impact and Recovery in Texas Estuaries Workshop – Houston, Texas



Neches River

Bessie Heights Marsh

Sabine River

Bridge City

Nederland

73

Port Arthur

Sabine Lake

Sabine National Wildlife Refuge Louisiana

Keith Lake/Salt Bayou Marsh

Jefferson

Texas Point NWR
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McFaddinNWR

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
29°51'41.35" N 93°42'39.79" W elev 2 ft

Google earth

Eye alt 35.50 mi

Neches River

Bessie
Heights

Sabine River

Basin	Sq Miles	River Miles	Flow (Ac-ft/yr)
Neches River	9,937	416	4,323,000
Sabine River	9,756	360	5,864,000
Total	19,693	776	10,187,000

http://www.twdb.state.tx.us/surfacewater/rivers/river_basins/index.asp

Sabine Lake

Sabine
National
Wildlife
Refuge
Louisiana

Keith Lake/Salt
Bayou Marsh

Texas Point NWR

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Google earth

Eye alt 35.50 mi

Neches River

Bessie Heights

Sabine River

Mean Annual Inflows into Sabine Lake (1986 – 2012)

Basin	Sq Miles	(CFS/yr)	(Ac-ft/yr)
Sabine Lake	100	5,971,684	11,844,663

<http://waterdata.usgs.gov/nwis/> for stations 8030500, 8031000, 8041000, 8041700, 8041500

Sabine Lake

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Neches River

Bessie Heights

Sabine River

Mean Monthly Inflows into Sabine Lake (1986 – 2012)

Basin	Sq Miles	(CFS/Month)	(Ac-ft/Month)
Sabine Lake	100	497,640	987,055

<http://waterdata.usgs.gov/nwis/> for stations 8030500, 8031000, 8041000, 8041700, 8041500

Sabine Lake

Sabine
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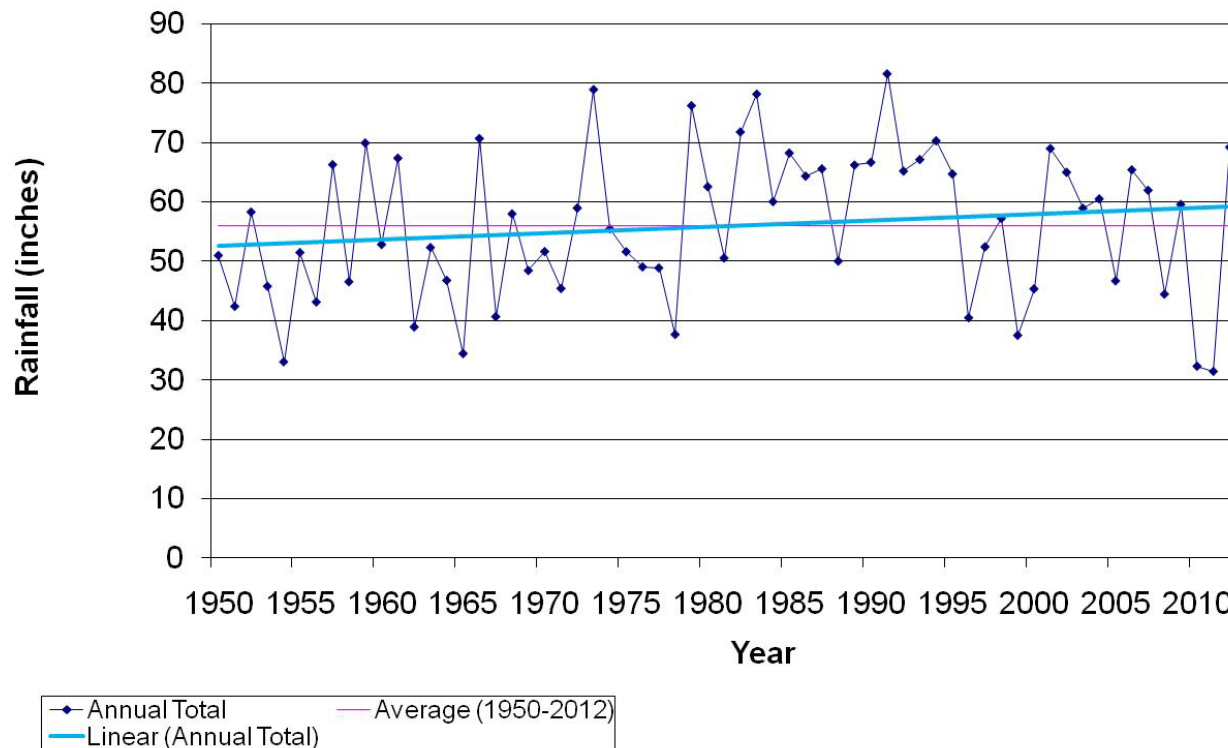
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

29°51'41.35" N 93°42'39.79" W elev 2 ft

Google earth

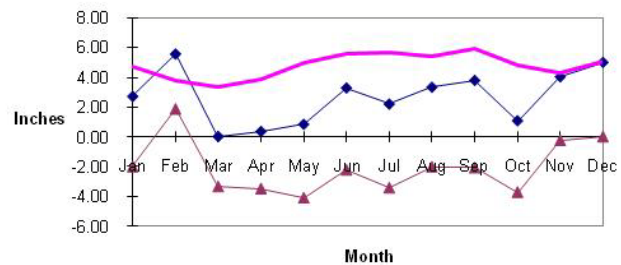
Eye alt 35.50 mi

Annual Rainfall at Jack Brooks Regional Airport (1950 - 2012) Beaumont - Port Arthur



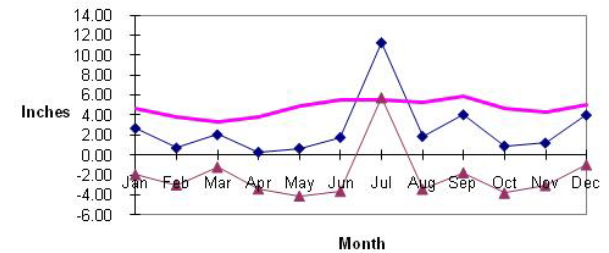


2010 Rainfall Summary for Southeast Texas Regional (Jefferson County) Airport



◆ 2010 — 1948/49-09 Average ▲ 2010 Diff. from Avg 1948/49-09

2011 Rainfall Summary for Jack Brooks Regional (Jefferson County) Airport

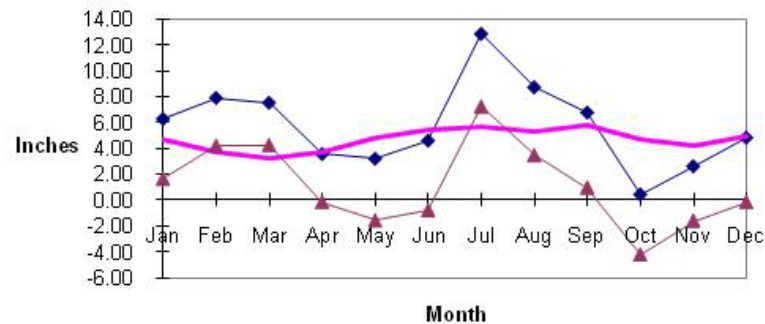


◆ 2011 — 1948/49-10 Average ▲ 2011 Diff. from Avg 1948/49-10

Source: <http://www.weather.gov/climate/index.php?wfo=lch>

Select Preliminary Monthly Climate Data (CF6) at Southeast Texas Regional Airport

2012 Monthly Rainfall Summary for Jack Brooks Regional (Jefferson County) Airport

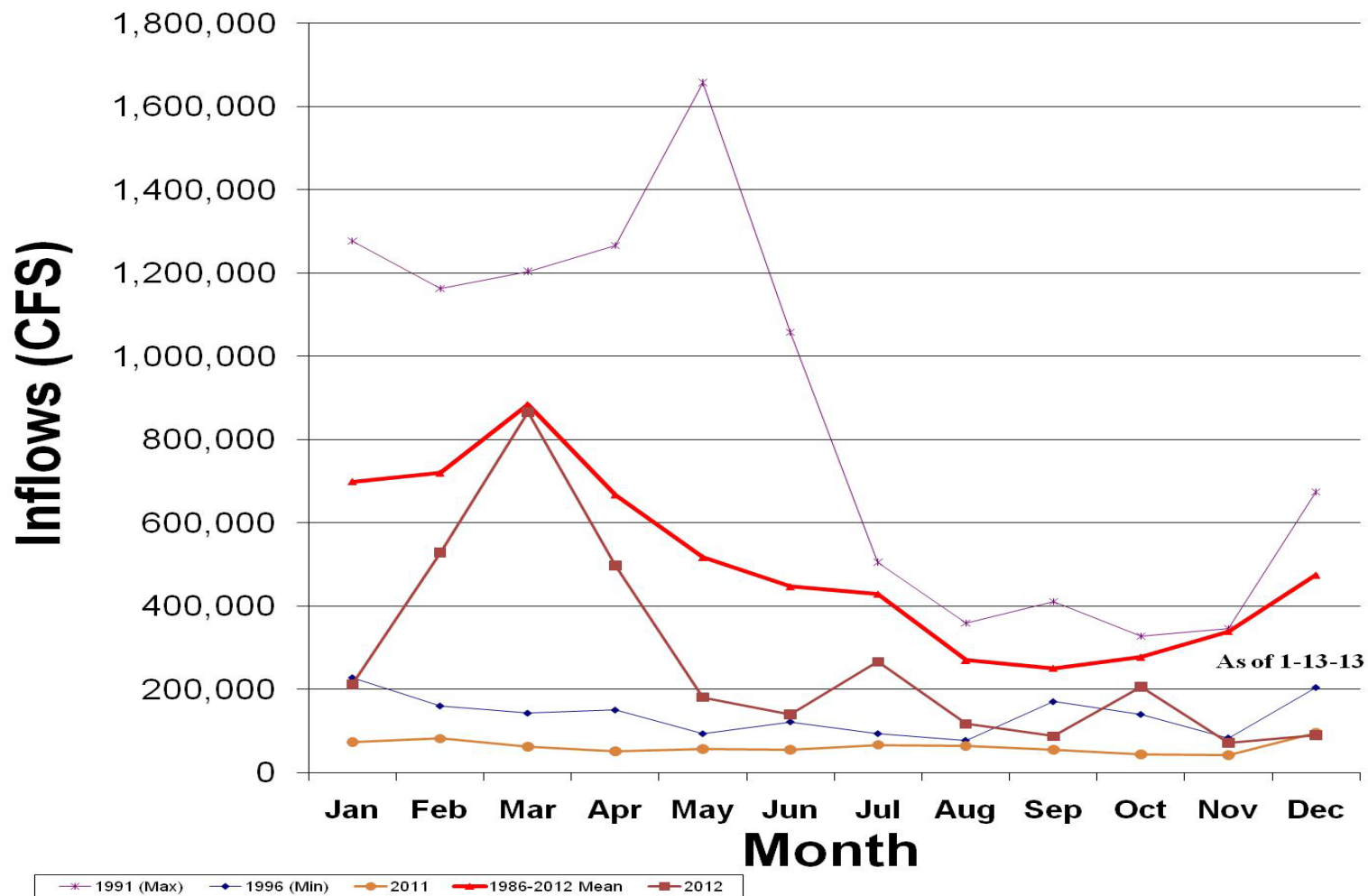


◆ 2012 — 1948/49-11 Average ▲ 2012 Diff. from Avg 1948/49-11

Source: <http://www.weather.gov/climate/index.php?wfo=lch>

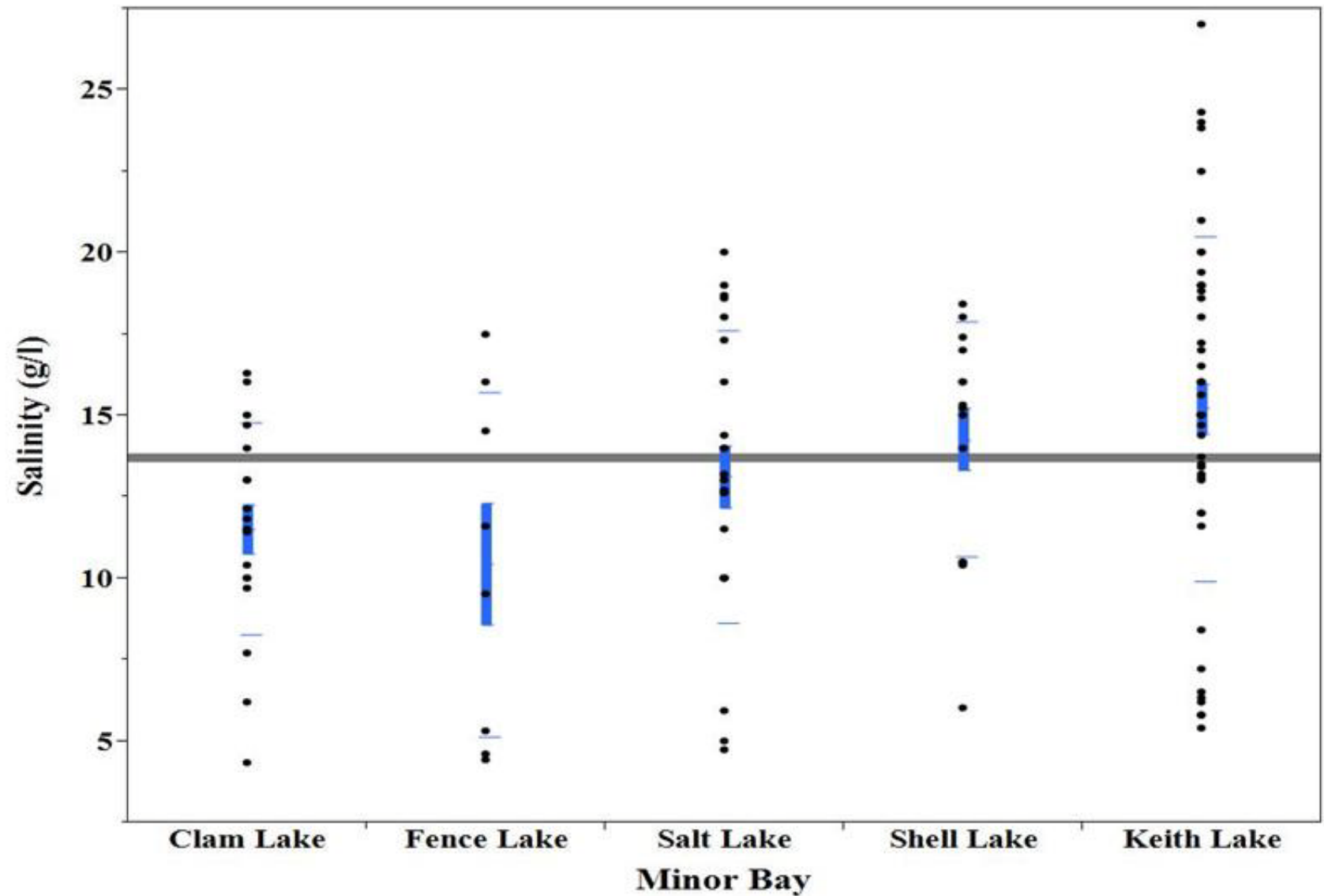
Select Preliminary Monthly Climate Data (CF6) at Southeast Texas Regional Airport

Sabine Lake Monthly Combine Inflows (Daily Means, USGS) 1986-2012
Flow Years: Mean, Min, Max, and Current Year
 (Sabine R., Cow Bayou, Neches R., Village Cr., Pine Island Bayou)

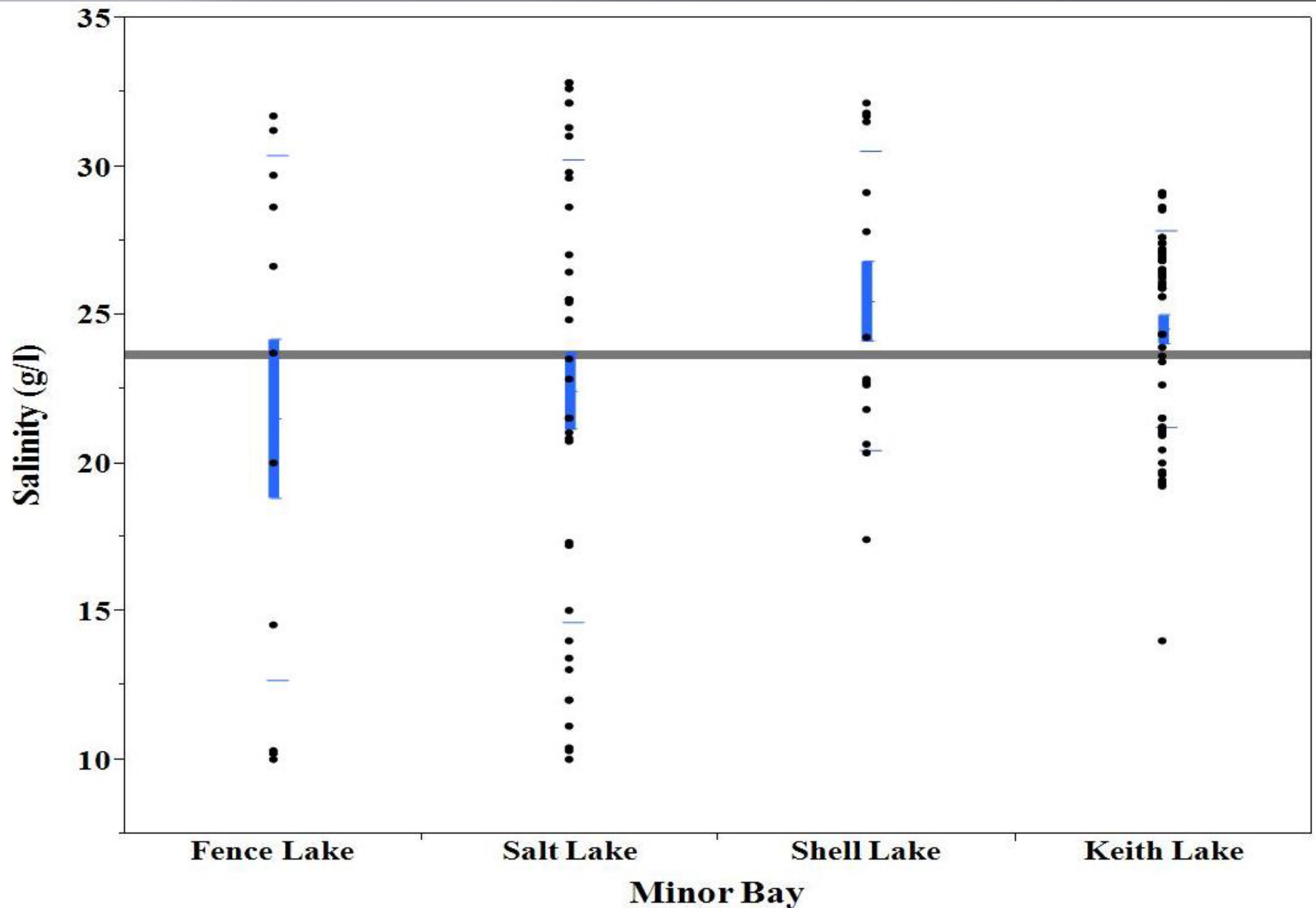


Source: Gage Site Numbers used 08030500, 08031000, 08041000, 08041500, 08041700
http://waterdata.usgs.gov/nwis/dv?cb_00060=on&cb_00065=on&format=rdb&begin_date=1900-01-01&end_date=2011-01-13&site_no=08030500&referred_module=sw

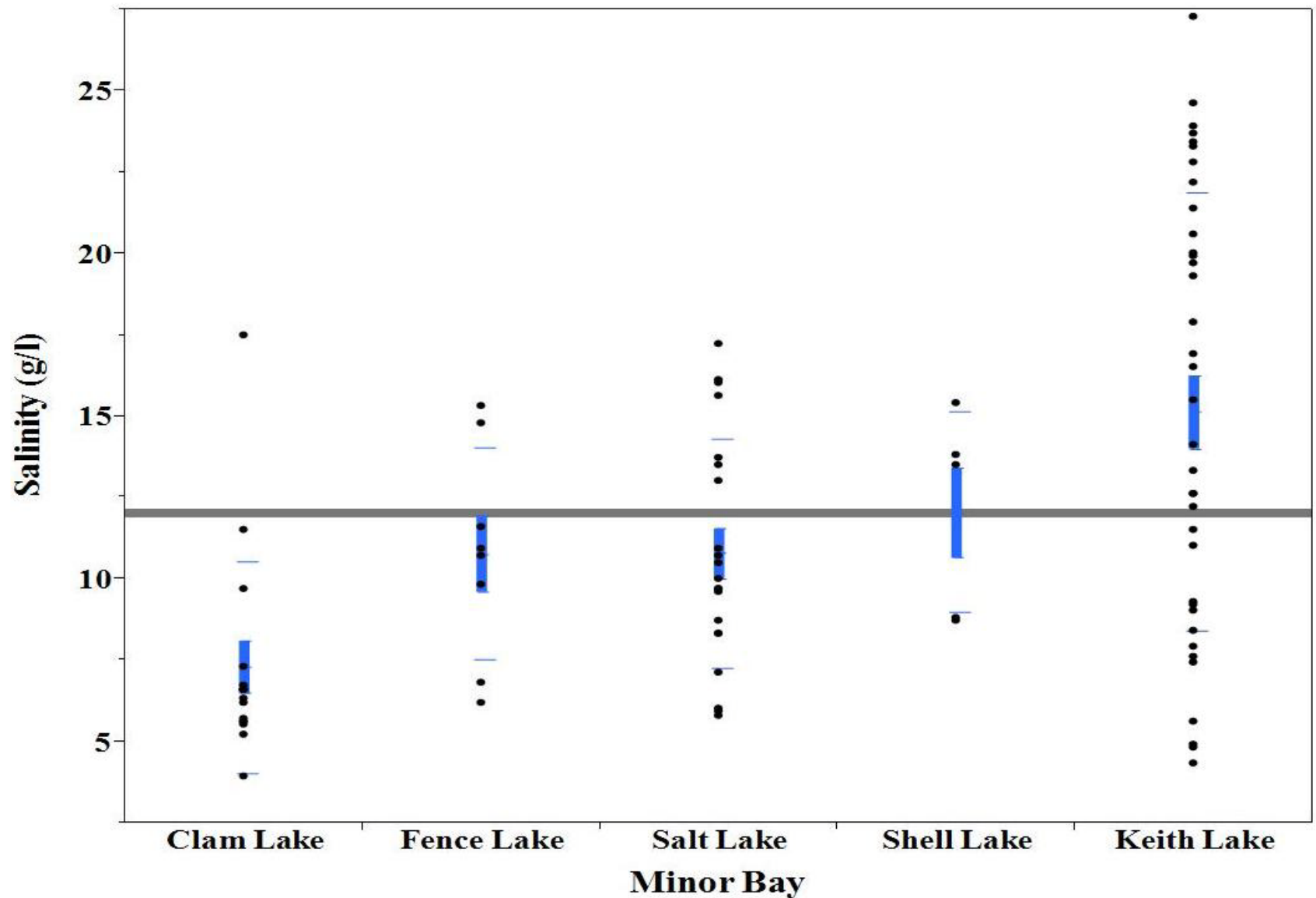
2010 Annual Salinities for the Keith Lake/Salt Bayou Marsh



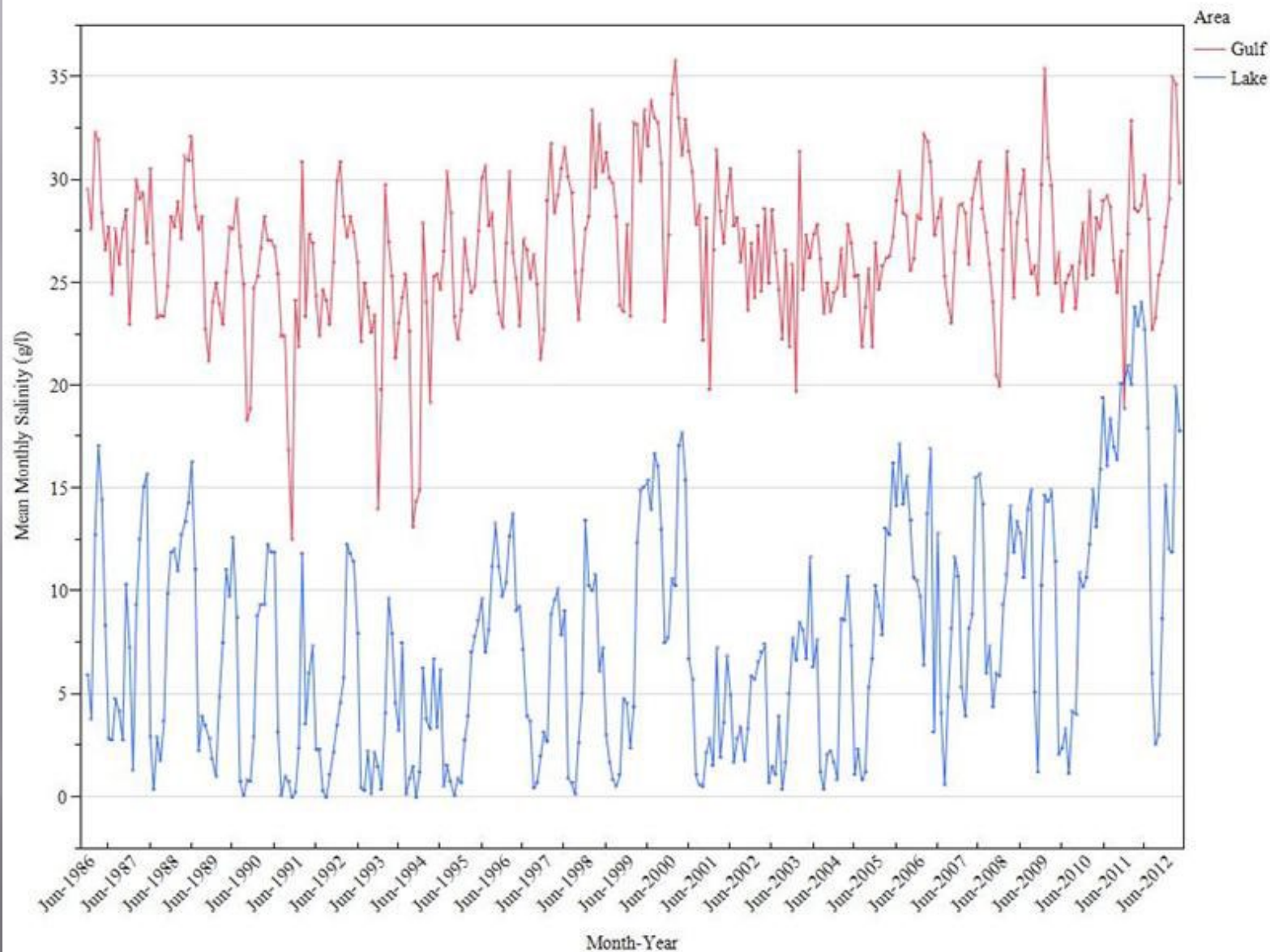
2011 Annual Salinities for the Keith Lake/Salt Bayou Marsh



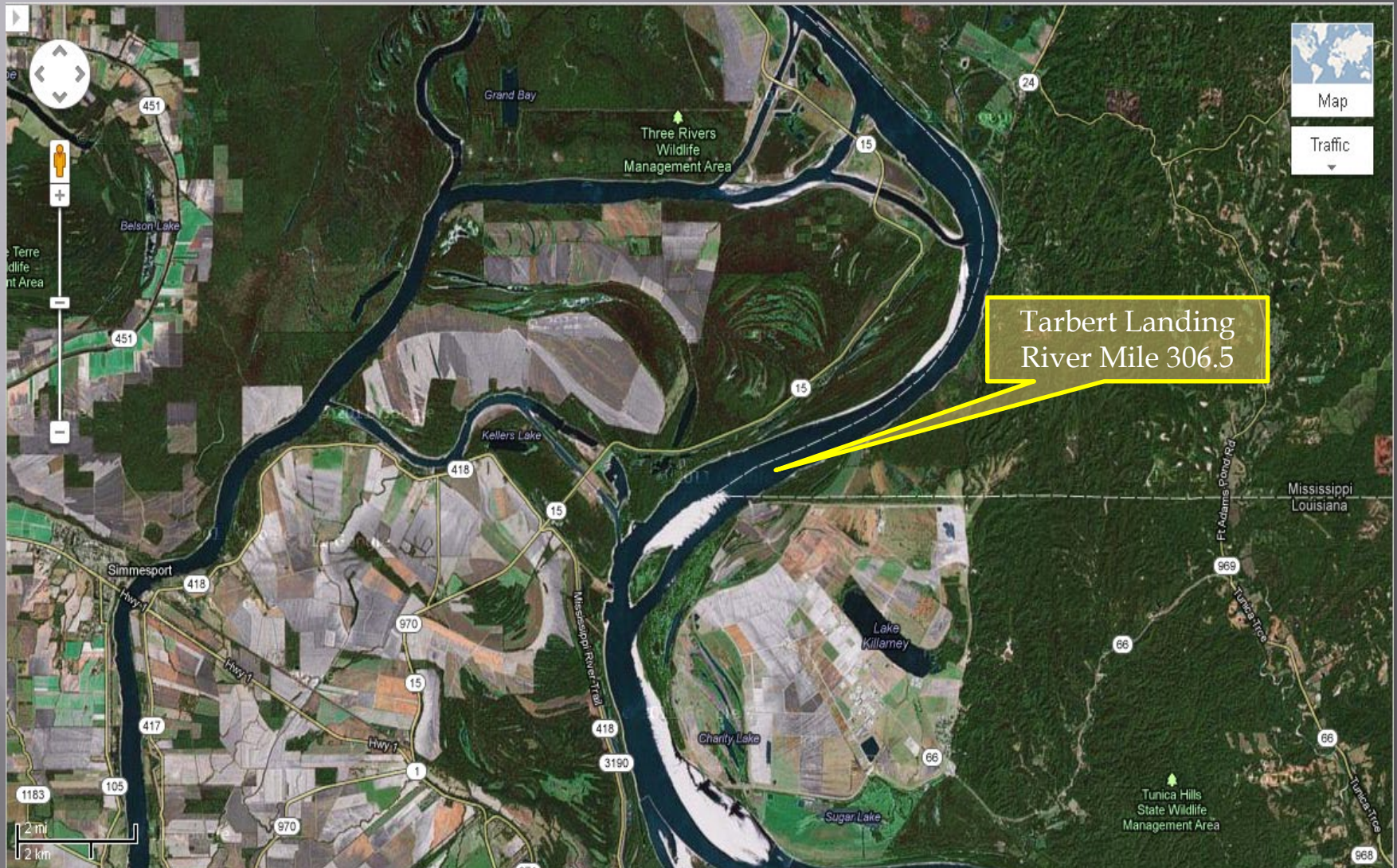
2012 Annual Salinities for the Keith Lake/Salt Bayou Marsh



Mean Monthly Salinities For Sabine Lake Bay and Gulf Trawl Samples (June 1986 – October 2012)

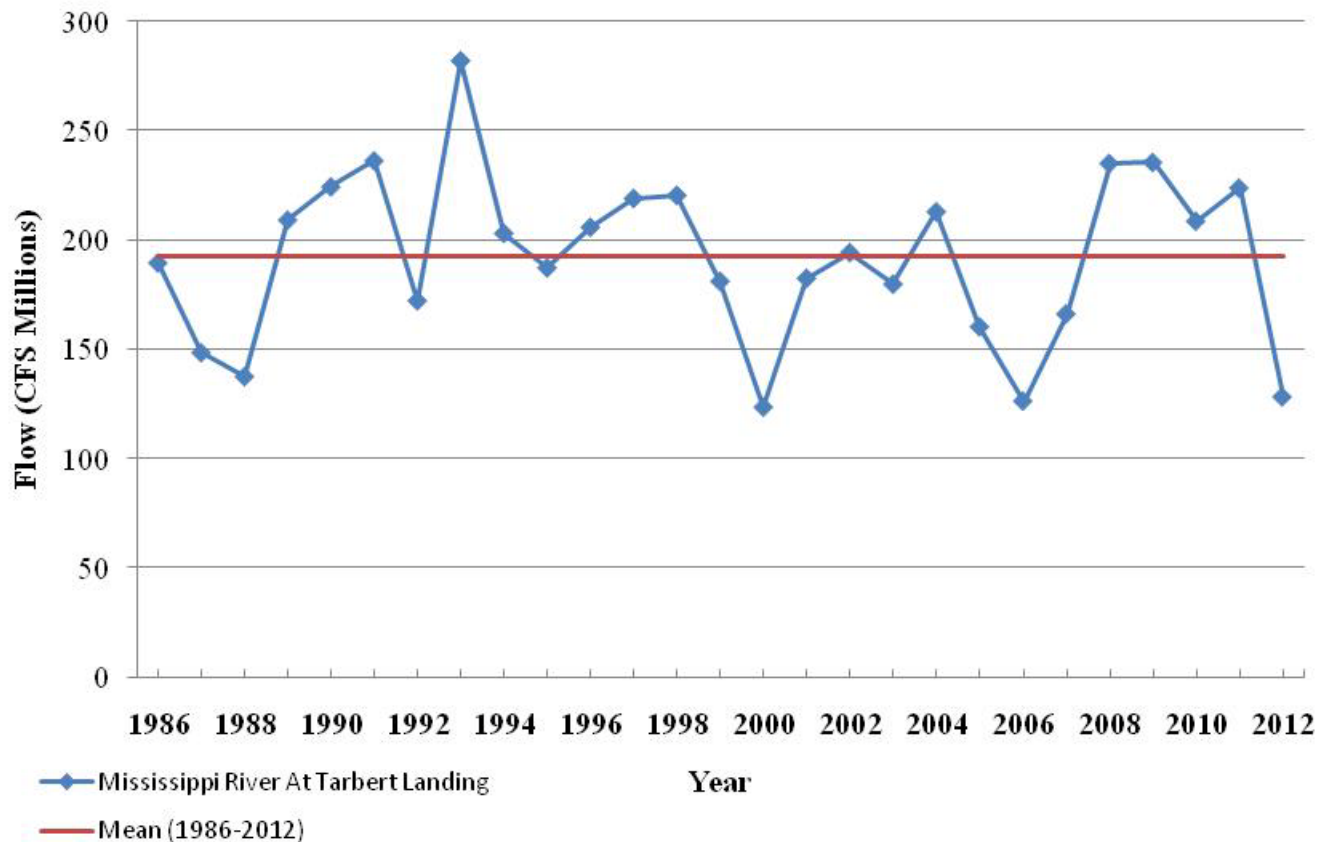


Mississippi River Annual Flows at Tarbert Landing, Mississippi

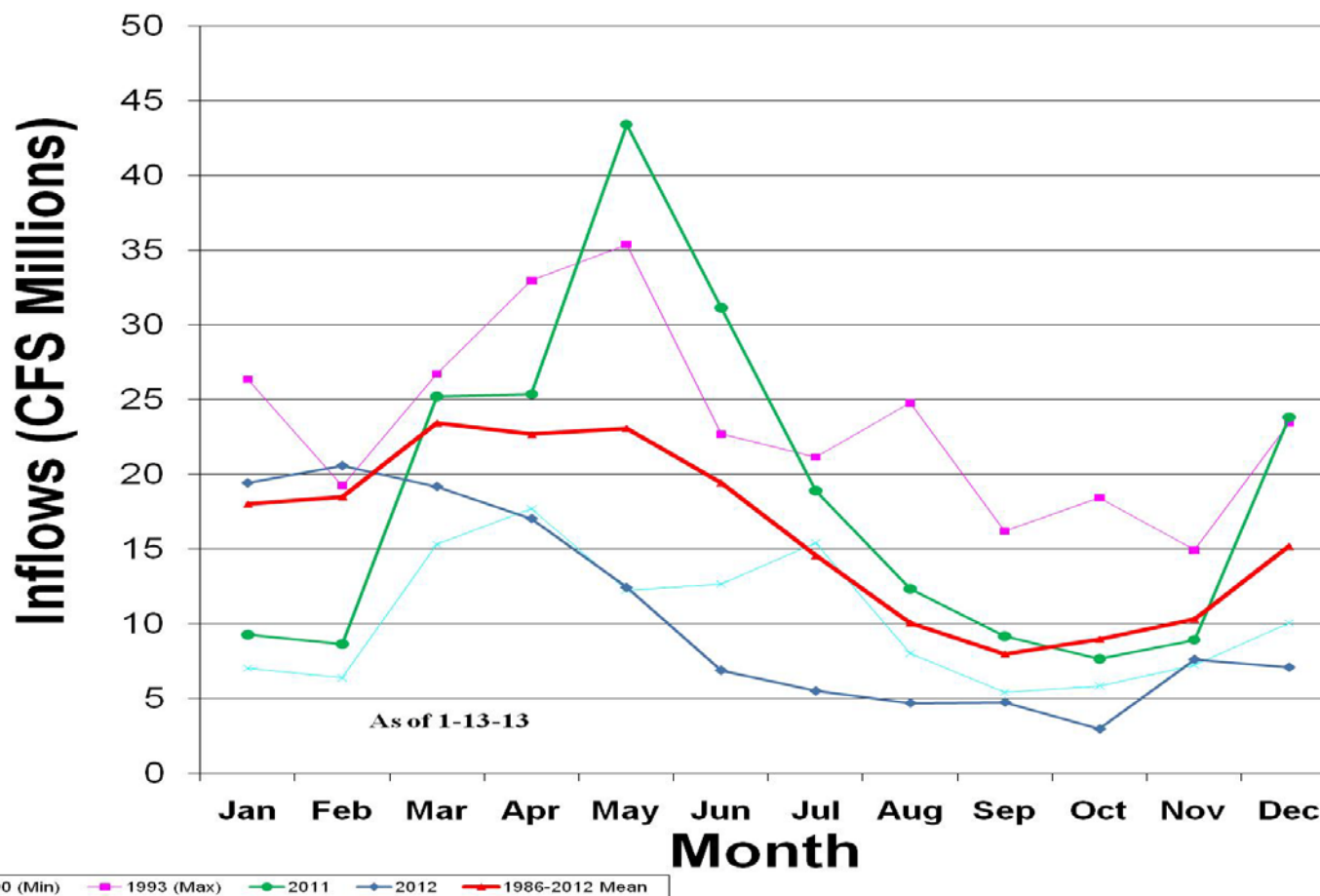


Mississippi River Annual Flows at Tarbert Landing, Mississippi

**Annual Flow for Mississippi River At
Tarbert Landing, Mississippi (1986- 2012)**



Mississippi River Monthly Inflows (Daily Means, USACOE 01100) 1986-2012
 Flow Years: Min, Max, Last Year
 (Mississippi River at Tarbert Landing, MS)

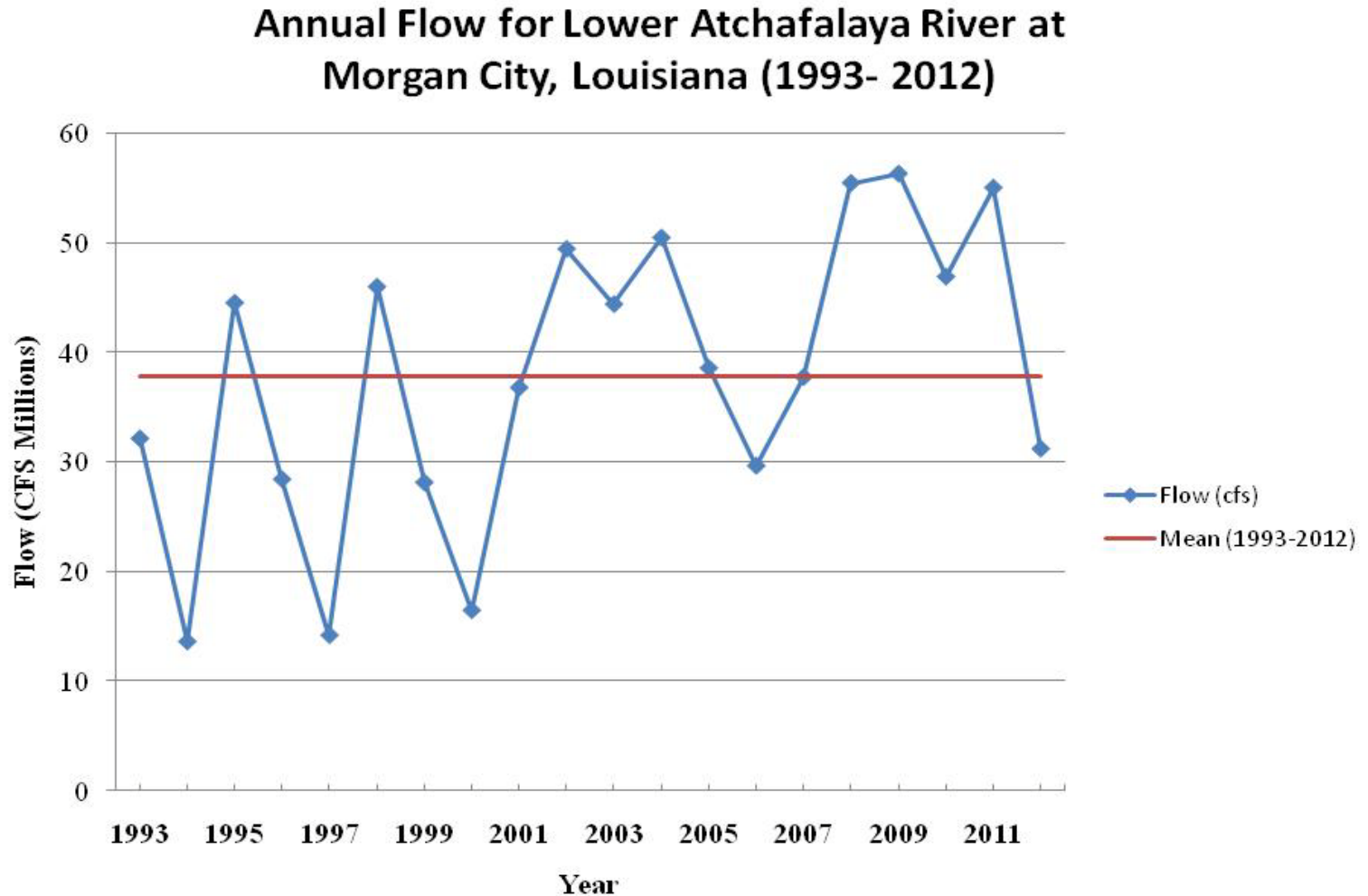


Source:
http://waterdata.usgs.gov/la/nwis/dv?cb_00065=on&cb_00060=on&format=rdb&begin_date=1993-06-05&end_date=2011-07-13&site_no=07381600&referred_module=sw

Atchafalaya River Annual Flows at Morgan City, Louisiana

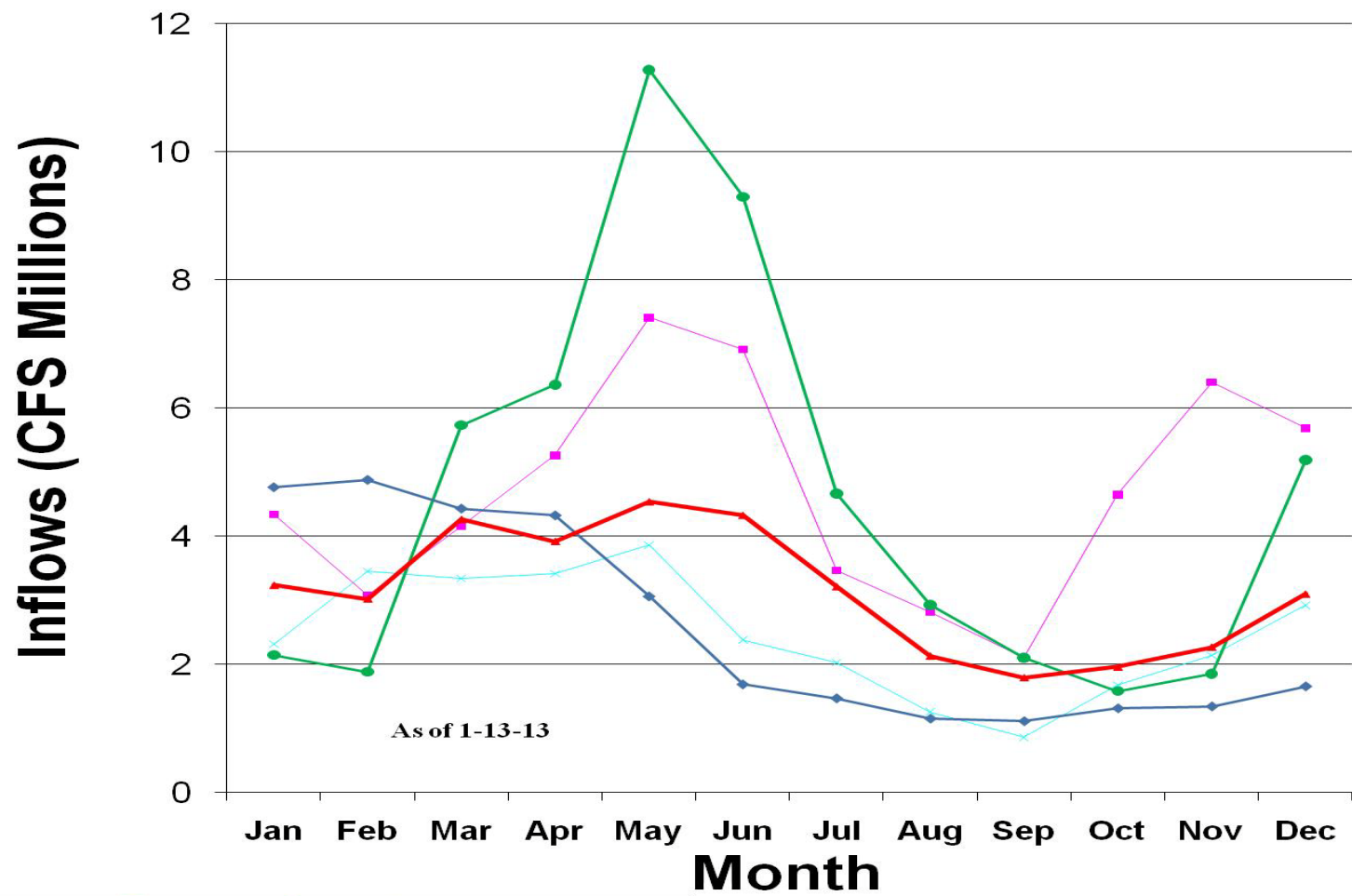


Atchafalaya River Annual Flows at Morgan City, Louisiana



Atchafalaya River Monthly Inflows (Daily Means, USGS 7381600) 1993-2012

Flow Years: Min, Max, Last Year
(Lower Atchafalaya River at Morgan City, LA)



Source:

http://waterdata.usgs.gov/la/nwis/dv?cb_00065=on&cb_00060=on&format=rdb&begin_date=1993-06-05&end_date=2011-07-13&site_no=07381600&referred_module=sw



In Summary

Low rainfall and inflows provide little control in flushing higher salinity water from the back marshes of the Sabine Lake system.

Drought conditions alone may not always lead to maintaining higher salinities.

Mississippi River's record spring freshwater inflows lowered Gulf salinities which appeared to maintain higher salinity waters in the Sabine Lake system during the extended drought conditions.

Conditions for maintaining the higher salinities appeared to remain for a relatively short period, a month or more.

Some estuarine dependent organisms may take advantage of the increased salinities.

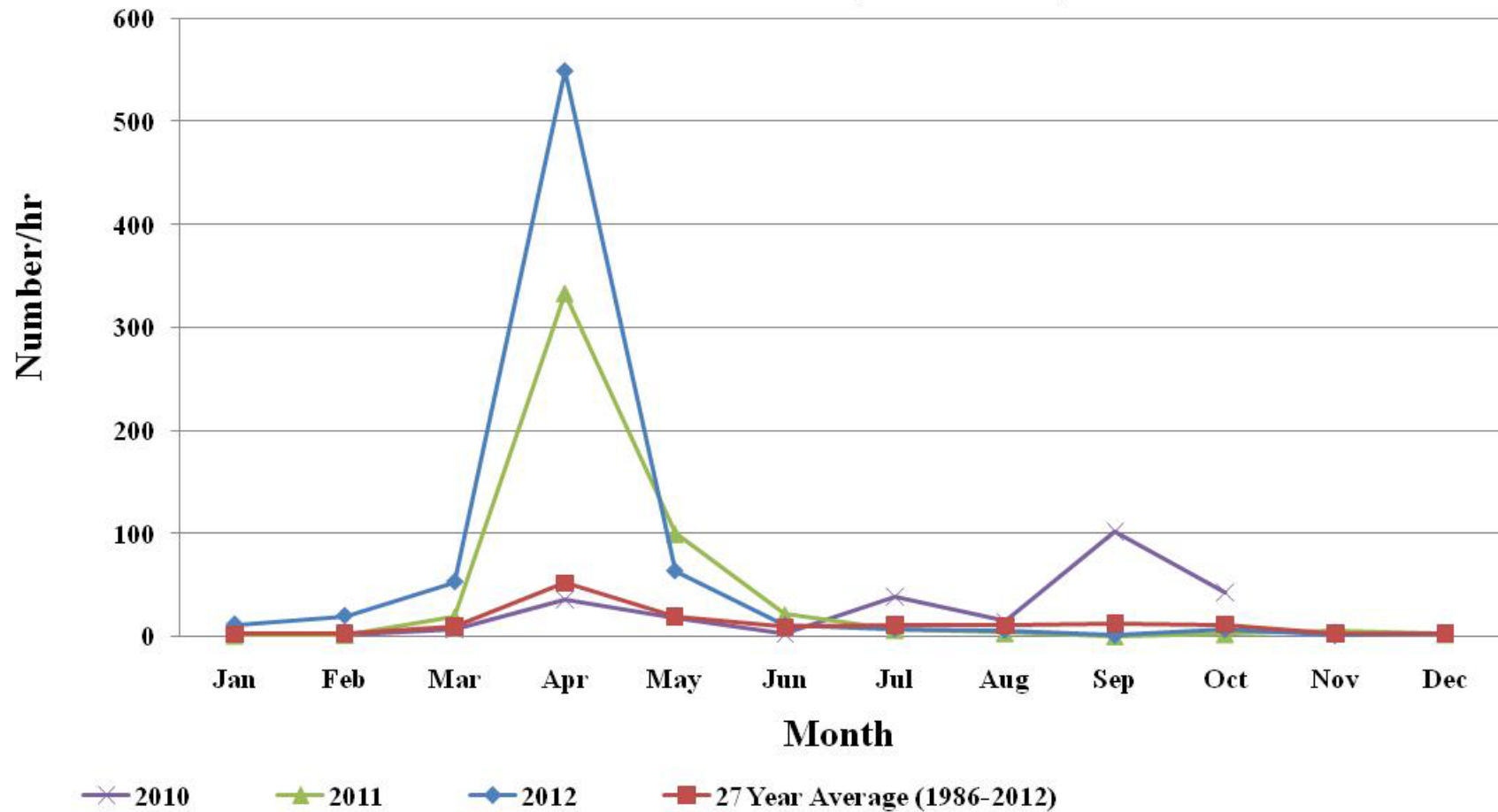
The logo for Texas Parks & Wildlife, featuring the words "TEXAS", "PARKS &", and "WILDLIFE" stacked vertically in white, bold, sans-serif capital letters. The text is enclosed within a green square with a white border.

TEXAS PARKS & WILDLIFE

After continuous rains for several days (weeks) water flows over plug across ditch receiving flow from Texas Bayou. Photo taken from road leading to old Pilot Station in Sabine Pass, Texas. 1-11-13

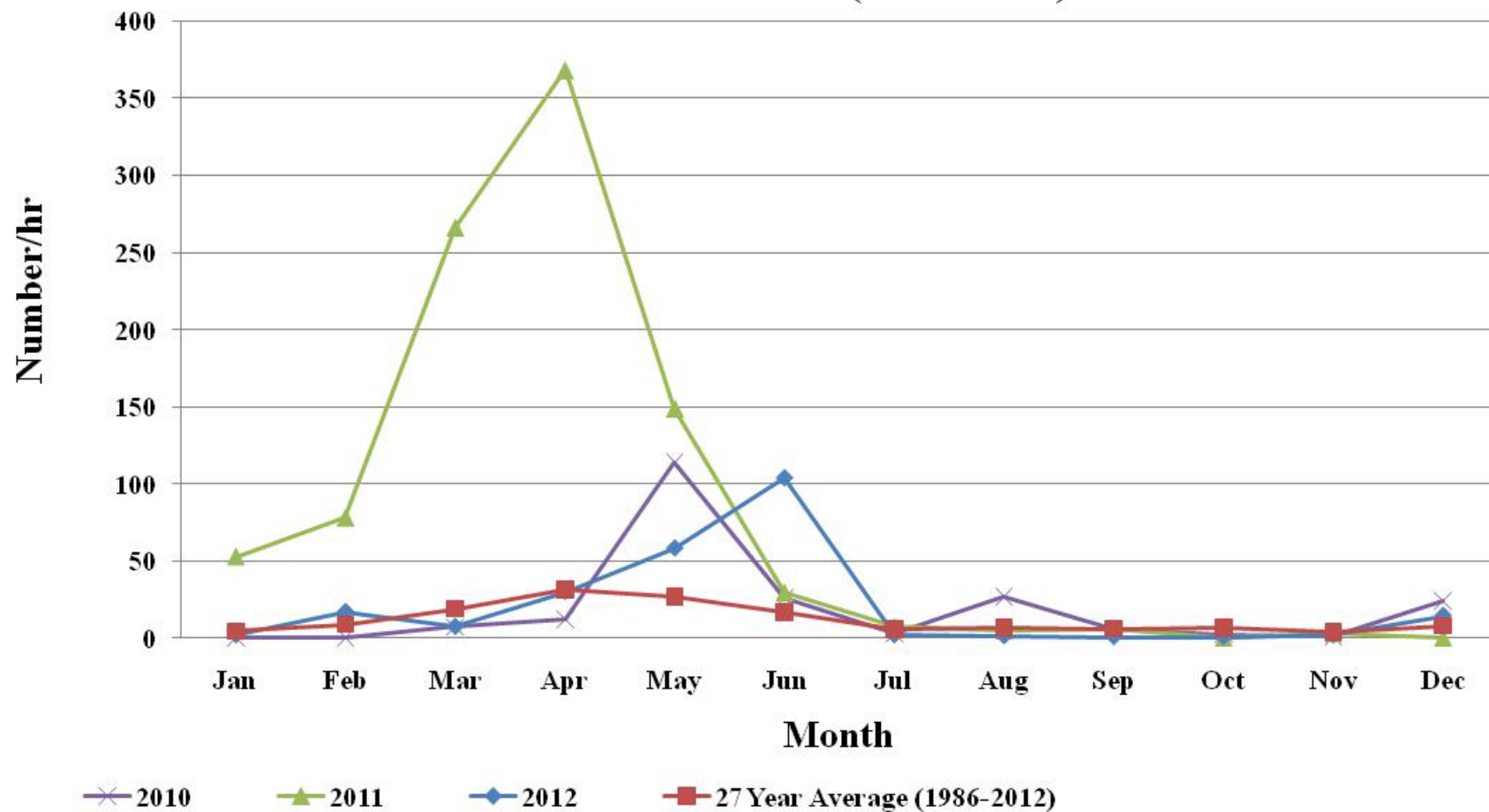


Sabine Lake Gulf Trawl Catch Rates Gulf Menhaden (1986 -2012)



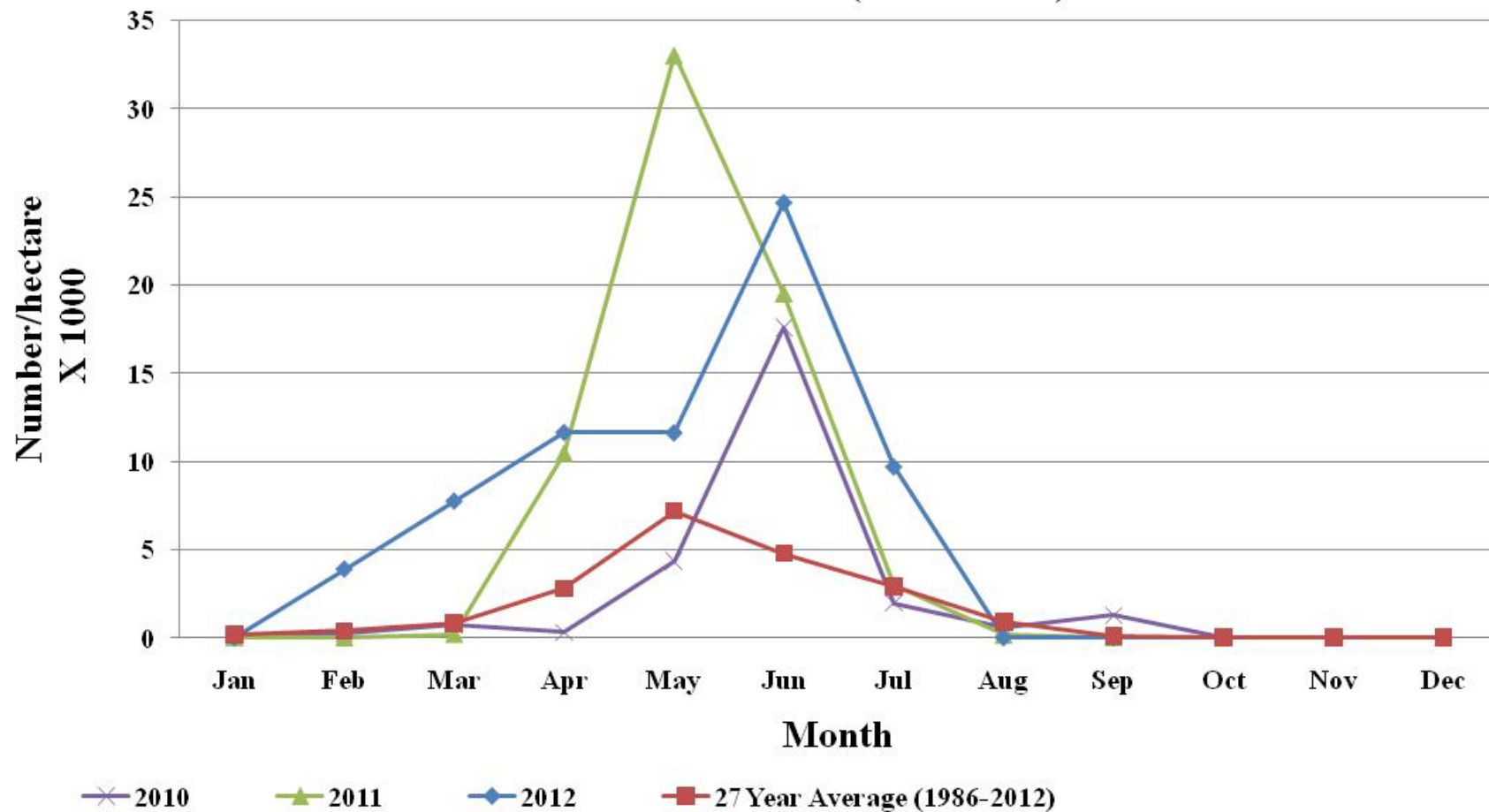


Sabine Lake Bay Trawl Catch Rates Gulf Menhaden (1986 -2012)



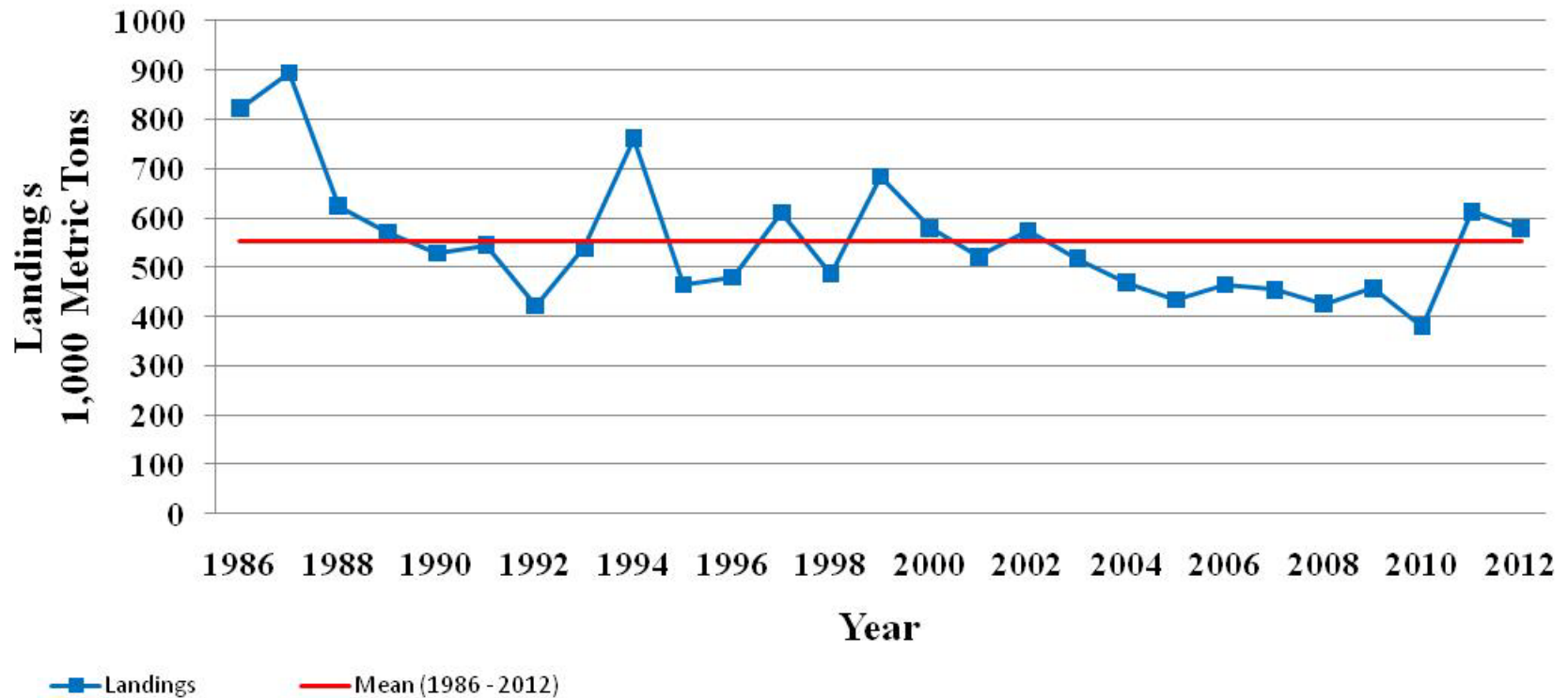


Sabine Lake Bag Seine Catch Rates Gulf Menhaden (1986 -2012)





Landings in the Gulf Menhaden Purse-Seine Fishery 1986-2012



NOAA Fisheries. 2012. Status of the gulf menhaden fishery - A report of the Gulf Menhaden Advisory Committee at Point Clear, AL, on October 16, 2012. Sustainable Fisheries Branch. Beaufort, North Carolina.

Smith, J. 2013. Status purse-seine landings of gulf and Atlantic Menhaden for the 2012 fishing season. NOAA Beaufort Laboratory. Beaufort, North Carolina. http://www.st.nmfs.noaa.gov/st1/market_news/doc77.txt

U.S. Drought Monitor

Texas

January 22, 2013

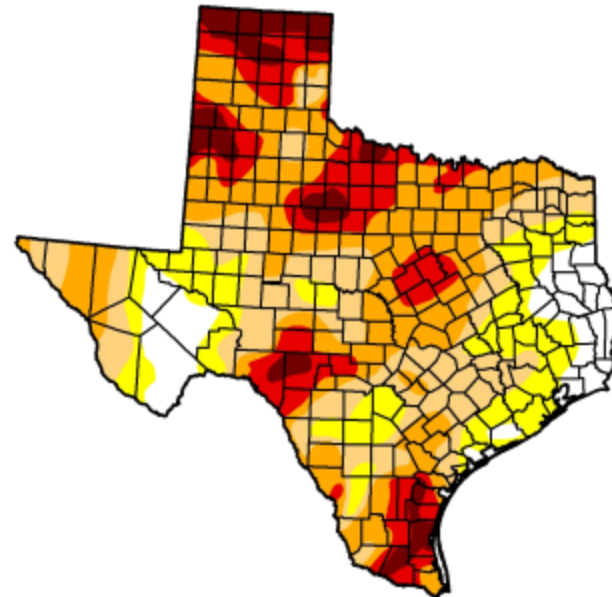
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	9.48	90.52	74.01	50.49	21.22	6.72
Last Week (01/15/2013 map)	9.48	90.52	74.01	50.49	20.84	6.72
3 Months Ago (10/23/2012 map)	14.09	85.91	61.57	31.27	15.70	3.20
Start of Calendar Year (01/01/2013 map)	3.04	96.96	87.00	65.39	35.03	11.96
Start of Water Year (09/25/2012 map)	9.13	90.87	78.73	57.41	24.91	5.18
One Year Ago (01/17/2012 map)	0.52	99.48	95.08	82.60	62.47	25.27

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional



The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements.

<http://droughtmonitor.unl.edu>



Released Thursday, January 24, 2013
Mark Svoboda, National Drought Mitigation Center

http://droughtmonitor.unl.edu/DM_state.htm?TX,S