

Franklin County	6/21/1992	11:35	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Franklin County	11/2/1992	04:20	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Franklin County	11/4/1992	16:35	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Apalachicola	3/31/1993	11:10	Thunderstorm Wind	0 kts.	0	0	0.50K	0.00K
Dog Island	4/15/1993	10:50	Thunderstorm Wind	54 kts.	0	0	0.00K	0.00K
St. Vincent Island	8/14/1993	10:30	Thunderstorm Wind	50 kts.	0	0	5K	0.00K
Carrabelle	8/19/1993	13:50	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Franklin County	10/2/1994	14:00	Thunderstorm Wind	51 kts.	0	0	0.00K	0.00K
Apalachicola	1/15/1998	14:45	Thunderstorm Wind	50 kts.	0	0	15K	0.00K
Eastpoint	2/22/1998	09:29	Thunderstorm Wind	64 kts.	0	0	0.00K	0.00K
Apalachicola	2/22/1998	09:35	Thunderstorm Wind		0	0	5K	0.00K
Countywide	6/4/1999	22:10	Thunderstorm Wind		0	0	25K	0.00K
Countywide	8/9/2000	21:15	Thunderstorm Wind		0	0	0.75K	0.00K
Countywide	3/12/2002	17:30	Thunderstorm Wind		0	0	150K	0.00K
Apalachicola	6/20/2002	22:57	Thunderstorm Wind		0	0	1K	0.00K
Carrabelle	7/3/2002	15:40	Thunderstorm Wind		0	0	3K	0.00K
Lanark Village	2/1/2007	17:30	Thunderstorm Wind	55 kts. EG	0	0	3K	0.00K
Apalachicola Airport	4/15/2007	01:45	Thunderstorm Wind	60 kts. EG	0	0	100K	0.00K
Apalachicola Airport	3/7/2008	06:20	Thunderstorm Wind	55 kts. EG	0	0	10K	0.00K
Apalachicola	4/5/2008	13:25	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
St. Teresa	4/5/2008	14:30	Thunderstorm Wind	63 kts. MG	0	0	0.00K	0.00K
Eastpoint	3/27/2009	10:10	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Eastpoint	4/2/2009	12:17	Thunderstorm Wind	55 kts. EG	0	0	25K	0.00K
Apalachicola Airport	6/4/2010	20:11	Thunderstorm Wind	56 kts. MG	0	0	0.00K	0.00K
Bay City	4/5/2011	02:25	Thunderstorm Wind	55 kts. EG	0	0	20K	0.00K

St. Teresa	4/5/2011	02:50	Thunderstorm Wind	50 kts. EG	0	0	3K	0.00K
Turkey Point	3/31/2012	13:30	Thunderstorm Wind	50 kts. EG	0	0	3K	0.00K
Bay City	1/30/2013	18:20	Thunderstorm Wind	45 kts. EG	0	0	0.50K	0.00K
Bay City	2/26/2013	04:24	Thunderstorm Wind	65 kts. EG	0	0	25K	0.00K
Apalachicola Airport	2/26/2013	04:24	Thunderstorm Wind	67 kts. MG	0	0	0.00K	0.00K
St. Teresa	7/3/2014	00:58	Thunderstorm Wind	50 kts. EG	0	0	2K	0.00K
Fort Gadsden	6/23/2015	13:35	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Thirteen Mile	1/15/2016	05:20	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Buck Siding	1/15/2016	05:35	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Carrabelle	1/15/2016	06:00	Thunderstorm Wind	50 kts. EG	0	0	1K	0.00K
Carrabelle	2/15/2016	22:55	Thunderstorm Wind	65 kts. EG	0	0	30K	0.00K
Lanark Village	2/15/2016	22:55	Thunderstorm Wind	65 kts. EG	0	0	0.00K	0.00K
Turkey Point	2/15/2016	23:02	Thunderstorm Wind	70 kts. MG	0	0	2K	0.00K
Buck Siding	5/20/2016	06:40	Thunderstorm Wind	50 kts. EG	0	0	2K	0.00K
Apalachicola	5/20/2016	06:43	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Green Point	5/20/2016	06:45	Thunderstorm Wind	50 kts. EG	0	0	2K	0.00K
Green Point	1/22/2017	15:00	Thunderstorm Wind	55 kts. EG	0	0	3K	0.00K
Eastpoint	5/4/2017	08:47	Thunderstorm Wind	43 kts. EG	0	0	1K	0.00K
Eastpoint	7/22/2018	22:40	Thunderstorm Wind	52 kts. MG	0	0	0.00K	0.00K
Apalachicola	4/19/2019	07:00	Thunderstorm Wind	50 kts. EG	0	0	3K	0.00K
Eleven Mile	4/25/2019	21:40	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
McIntyre	4/25/2019	22:30	Thunderstorm Wind	50 kts. EG	0	0	2K	0.00K
Apalachicola Airport	6/1/2019	14:38	Thunderstorm Wind	51 kts. MG	0	0	0.00K	0.00K
Apalachicola Airport	6/1/2019	14:49	Thunderstorm Wind	50 kts. EG	0	0	2K	0.00K
Royal Bluff	3/31/2020	15:15	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K

Totals	Property Damage \$312,750
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Source: <http://www.ncdc.noaa.gov/stormevents/listevents>

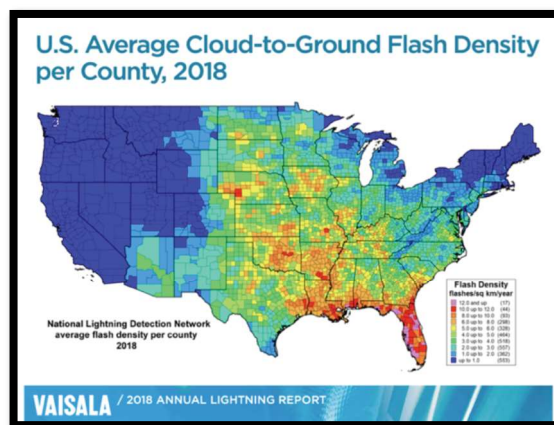
Hazard Event Narrative – Extent and Impact

1. 4/15/2007, Apalachicola – Straight-line winds downed numerous trees throughout the county. There was damage to several boats and businesses. The metal roof was peeled off a seafood house and piled along US Hwy 98. The winds capsized a shrimp boat at the Apalachicola City Dock. Windows were blown out of several homes. The estimated property damage was \$100,000.
2. 2/15/2016, Carrabelle – A tree was blown down onto a house near Carrabelle. Property damage was estimated at \$30,000.
3. 2/15/2016, Turkey Point – The magnitude was 70 knots, peak gust of 81 mph which was measured at the FSU Coastal and Marine Lab weather stem site on the Franklin Coast. There was also some tree damage in the area and light debris scattered such as metal siding. Minor damage also occurred to a greenhouse.

Lightning

Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt." This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches a temperature approaching 50,000 degrees Fahrenheit in a split second.

Figure 4.19 - Vaisala Cloud to Ground Flash Density Map Per County, 2018



Source: Vaisala https://www.vaisala.com/sites/default/files/documents/2018%20Annual%20Lightning%20Report_1.pdf

Lightning is the second most common storm-related killer in the United States. It causes several billion dollars in property damage each year and kills several dozen people. It is a frequent cause of wildfires and costs airlines billions of dollars per year in extra operating expenses.

Florida has the highest frequency of lightning in the United States. There, sea breezes from the Atlantic Ocean and Gulf of Mexico converge over solar-heated land. This lifts the moist air masses that host thunderstorms. Florida has the highest number of deaths from lightning strikes.

The following are facts about lightning:

- Lightning can heat its path through the air to five times hotter than the surface of the sun.
- Lightning strikes the U.S. about 25 million times each year.
- Lightning's unpredictability increases the risk to individuals and property. Most lightning deaths and injuries occur when people are caught outdoors in the summer months during the afternoon and evening and are in open areas or near a tree.
- Lightning often strikes outside of heavy rain and may occur as far as 10 miles away from any rainfall.
 - "Heat lightning" is actually lightning from a thunderstorm too far away for thunder to be heard, however, the storm may be moving in your direction.
 - Your chances of being struck by lightning are estimated to be 1 in 600,000 but could be reduced even further by following safety precautions.



Historical Lightning Occurrences

As recorded by the NCDC (1/1/1950 – 7/20/2020), there was 1 recorded lightning events in Franklin County resulting in one injury.

Table 4.34 – Lightning Occurrences in Franklin County (1/1/1950 – 7/20/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Carrabelle	10/14/2001	01:30	Lightning	0	1	5K	0.00K
Totals:	Property Damage \$5,000; 1 injury						

Source: <http://www.ncdc.noaa.gov/stormevents/listevents>

Hazard Event Narrative – Extent and Impact

1. 10/14/2001, Carrabelle - Lightning struck the Franklin County Jail and disabled the 911 dispatch telephone system for several hours. The Franklin County EOC was activated and utilized as a back-up 911 dispatch center until the communication system was repaired. One, employee, a 911 dispatcher, suffered minor injuries.

Fires caused by Lightning

As stated in Table 4.39 from the Florida Forest Service, Fires by Causes, data reveals that over the last 20 years lightning 20.09% of the total fires has been contributed to lightning, 90 fires, burning 3111.5 acres in Franklin County.

Hailstorms

Hail is precipitation in the form of lumps of ice produced by convective clouds and typically accompanies thunderstorms. They can grow by colliding with supercooled water drops, which will freeze on contact with ice crystals, frozen

raindrops, dust or some other nuclei. Thunderstorms that have a strong updraft keep lifting the hailstones up to the top of the cloud where they encounter more supercooled water and continue to grow. The hail falls when the thunderstorm's updraft can't support the weight of the ice or the updraft weakens and the stronger the updraft the larger the hailstone can grow. Hail can damage aircraft, homes and cars, and can be deadly to livestock and people.

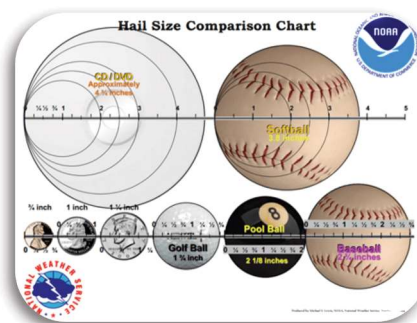


Image Source: NOAA

Historical Hailstorm Occurrences

According to the NCDC, from 1/1/1950 to 7/20/2020, there have been 11 hailstorm events documented in Franklin County with approximately 64% of the hail recorded of 1-inch or over in diameter, the size of a quarter or considered severe.

Table 4.35– Hailstorm Occurrences in Franklin County (1/1/1950 –3/31/2020)

Location or County	Date	Time	Type	Magnitude	Death	Injuries	Property Damage	Crop Damage
Franklin County	6/16/1989	16:45	Hail	.75 in.	0	0	0.00K	0.00K
Franklin County	7/9/1991	13:45	Hail	.75 in.	0	0	0.00K	0.00K
St. George Island	3/31/1993	10:50	Hail	1.00 in.	0	0	0.00K	0.00K
St. Teresa	2/16/1998	19:05	Hail	.88 in.	0	0	0.00K	0.00K
Carrabelle	5/4/1998	07:50	Hail	1.75 in.	0	0	0.00K	0.00K
Eastpoint	2/3/2006	18:05	Hail	1.75 in.	0	0	0.00K	0.00K
Carrabelle	4/22/2006	09:35	Hail	1.00 in.	0	0	0.00K	0.00K
Apalachicola	5/9/2006	01:30	Hail	.88 in.	0	0	0.00K	0.00K
Eastpoint	1/22/2008	15:05	Hail	1.00 in.	0	0	0.00K	0.00K
Eastpoint	4/14/2013	14:43	Hail	1.00 in.	0	0	0.00K	0.00K
Apalachicola	2/23/2014	06:15	Hail	1.50 in.	0	0	0.00K	0.00K
Totals:							Property Damage: N/A	

Source: <http://www.ncdc.noaa.gov/stormevents/listevents>

Hazard Event Narrative – Extent and Impact

1. 5/4/1998, Carrabelle and Eastpoint - Hail size 1.75 inch in magnitude (between dime to golf ball size) was recorded in Carrabelle, Eastpoint, Dog Island and Lanark Village.

According to NCDC, the last recorded hail occurrence was in 2014.

Risk and Vulnerability Assessment

A severe thunderstorm contains either hail one inch or greater and winds gusts in excess of 50 knots (57.5 mph). The thunderstorm/winds have the potential of causing power outages, destruction and damage to buildings and can result in loss of life. Flash flooding from rainfall and strong straight-line winds can knock down trees, and damage mobile

homes and roofs. According to the NCDC, there were more than 66+ thunderstorm/wind events over the last 70 years (data that was recorded). The magnitude was not identified on 9% of the thunderstorm/wind events, however, the occurrences that did have the magnitude of 50 kts or more was approximately 65%, which would categorize them as severe thunderstorms.

The vulnerability from a lightning occurrence can be disastrous for the county's agricultural land, the structures and to the population. Fires can spark and ignite from lightning and data from the Florida Forest Service over the last 20 years reveal that lightning has contributed to 90 fires that have burned 3,111.5 acres of land in the County. Severe thunderstorms and lightning events together are known to have cost Franklin County 1 injury and \$312,750 in property damages over the last 70 years.

Vulnerability for the Franklin County's Population

The vulnerability to thunderstorm/wind, lightning and hailstorm events can be defined as to the extent to which people will experience harm and property will be damaged from the natural hazard. The entire county population are at risk and vulnerable to thunderstorm/wind, lightning and hailstorm events, especially the residents that live in mobile homes, which accounts for approximately 16.4% of the residential inventory to severe thunderstorms and strong winds and possibly hailstorm disasters.

Vulnerability for Franklin County's Structures, Facilities, and Infrastructure

The entire County is vulnerable to severe thunderstorms, lightning and hailstorm events. Due to the unpredictable nature of the storms, and that severe storms are completely random, it is not possible to predict specific areas that are more susceptible to events over time. The risks and vulnerability for the City of Apalachicola and the City of Carrabelle are not substantially different from the risks to the unincorporated county. All buildings and facilities are considered to be uniformly exposed to this hazard and could potentially be impacted. In addition all buildings in the county are vulnerable to lightning and it is impossible to know when or where lightning will strike.

Summary details for thunderstorm, strong winds, lightning and hailstorms events:

Probability of Future Occurrences	The probability for severe thunderstorms with heavy rain and strong winds events is high (at least 1 occurrence every year). The probability for hailstorms or lightning events is considered medium (at least 1 occurrence every 3 years).
Geographic Area	<p>The entire planning area (the City of Apalachicola, the City of Carrabelle, and unincorporated areas of Franklin County) is at high risk to thunderstorm/wind and hailstorm events. The unincorporated areas of Franklin are more susceptible to lightning events resulting in wildfires.</p> <p>Each jurisdiction had documented severe thunderstorm/wind events with property damage (i.e. unincorporated Franklin, the City of Apalachicola, and the City of Carrabelle).</p>
Extent	<p>The worse-case scenario for Franklin County would be the following: The National Weather Service defines a severe thunderstorm as having large hail, at least 3/4 inches (0.75 inches) in diameter, and/or damaging winds, at least 58 mph, or 50 knots. Lightning, no matter how frequently it is striking, is not a criterion for determining whether a storm is severe by national weather service definitions.</p> <p>Extent on County data includes:</p> <p>Thunderstorms/Wind – On 2/15/2016, the magnitude extent for the thunderstorm/wind event was 70 kts, peak gusts of 81 mph which was measured at the FSU Coastal and Marine Lab</p>

	<p>weather stem site on the Franklin Coast. There was also some tree damage in the area and light debris scattered such as metal siding. Minor damage also occurred to a greenhouse.</p> <p>Lightning – According to the lightning flash density map, the extent would be 8.0 to 10.0 flashes/sq km/year for Franklin County.</p> <p>Hailstorms - The magnitude extent was 1.75 inches, a severe hailstorm, (an approximate size of a golf ball), which occurred on 5/4/1998 and was recorded in Carrabelle, Eastpoint, Dog Island and Lanark Village</p>
Impact	<p>The Franklin County community, the residents, structures, and critical facilities, can suffer from thunderstorm/wind, or lightning and/or hailstorm events. The impacts of severe thunderstorm/wind, lightning and hailstorms can be very destructive on the county residential, commercial, and public buildings.</p> <p>Thunderstorm/Wind - The highest property damage figure was recorded on 4/15/2007 in Apalachicola. Straight-line winds downed numerous trees throughout the county. There was damage to several boats and businesses. The metal roof was peeled off a seafood house and piled along US Hwy 98. The winds capsized a shrimp boat at the Apalachicola City Dock. Windows were blown out of several homes. The estimated property damage was \$100,000.</p> <p>Lightning – On 10/14/2001 in Carrabelle lightning struck the Franklin County Jail and disabled the 911 dispatch telephone system for several hours. The Franklin County EOC was activated and utilized as a back-up 911 dispatch center until the communication system was repaired. One, employee, a 911 dispatcher, suffered minor injuries.</p> <p>In addition, 90 fires have been a direct result from lightning events that have burned over 3,111.5 acres over the last 20 years.</p> <p>Hailstorms – The County has experienced over 11 hailstorms over the last 70 years with two events where they were golf ball size. Although no details were reported as to property damages from the hailstorms, these events can produce significant damage to the structures in the county.</p> <p>In addition, the economic effect or financial impact the effects could have a significant impact on agriculture from a devastating severe thunderstorm/wind, or lightning (resulting in wildfires) and/or hailstorm event on the County's 15 farms and market value of \$414,000 (recorded data from 2017) of the important crops harvested and livestock.</p>

Coastal and Riverine Erosion

Coastal Erosion

Coastal erosion is the landward displacement of the shoreline caused by the forces of wave and currents. The effects of coastal erosion can be from natural causes and/or human activities. The gradual process of coastal erosion results naturally from the very slow rise of the sea level.



Photo Image: WCTV

Severe coastal erosion can occur over a very short period of time the county's coast is impacted by hurricanes, tropical storms and other weather systems. Also, some coast erosion may be caused by poorly thought-out coastal development.

A critical coastal erosion area is a segment of the shoreline where natural processes or human activity have caused or contributed to erosion and recession of the beach or dune system to such a degree that upland development, recreational interests, wildlife habitat, or important cultural resources are threatened or lost. Critical erosion areas may also include peripheral segments or gaps between identified critical erosion areas which although they may be stable or slightly erosional now, their inclusion is necessary for continuity of management of the coastal system or for the design integrity of adjacent beach management projects.

Coastal Erosion (Beach and Dune) Occurrences *(summary data will be from two documents from the Florida Department of Environmental Protection (FDEP), Division of Water Resource Management pre and post-Hurricane Michael).*

1. Critically Eroded Beaches in Florida, December 2017
2. Hurricane Michael Post-Storm Beach Conditions and Coastal Impact Report, revised April 2019

There are six critically eroded beach areas (11.1 miles), nine non-critically eroded beach areas (19.7 miles), and one non-critically eroded inlet shoreline area (0.5 mile) in Franklin County. St. Vincent Island has a 3.2-mile long non-critically eroded area along its most gulfward protruding midsection. To the east, a 0.9-mile segment of St. Vincent Island is critically eroded into the maritime forest, which has resulted in the loss of beach wildlife habitat.

Severe erosion exists at Cape St. George on Little St. George Island, which has resulted in the loss of the historic pre-Civil War lighthouse. This critically eroded area extends along a 0.6-mile length of shoreline and is adjoined at both ends by a 0.7-mile non-critically eroded segment to the west and a 0.3-mile non-critically eroded segment to the east. The west end of the historical length of St. George Island west of Bob Sikes Cut is non-critically eroded for 3.3 miles. Both interior shorelines of Bob Sikes Cut also have non-critical erosion for 0.5 mile. East of Bob Sikes Cut, the St. George Island Plantation is designated non-critically eroded for 3.3 miles. After Hurricane Dennis (2005) severely impacted Dr. Julian G. Bruce St. George Island State Park, the entire developed stretch of the park was designated critically eroded for 4.5 miles due to the impact to recreational interests and park infrastructure. The undeveloped eastern 3.8 miles is considered non-critically eroded.

Most of Dog Island is eroded, including the western 2.6 miles which is non-critically eroded. To the east, a 3.6-mile segment is designated critically eroded. The undeveloped historic west end of Alligator Point is severely eroded for 0.4 mile and designated non-critically eroded. The eastern end of Alligator Peninsula between the Southwest Cape and Lighthouse Point is designated critically eroded for 1.1 miles, where past storms have destroyed and continue to threaten private development and a county road. The southeastern end of St. James Island is critically eroded, extending north from Lighthouse Point for 0.4 mile, threatening residential development. Further north from Lighthouse Point, a non-critically eroded area extends for 2.1 miles.

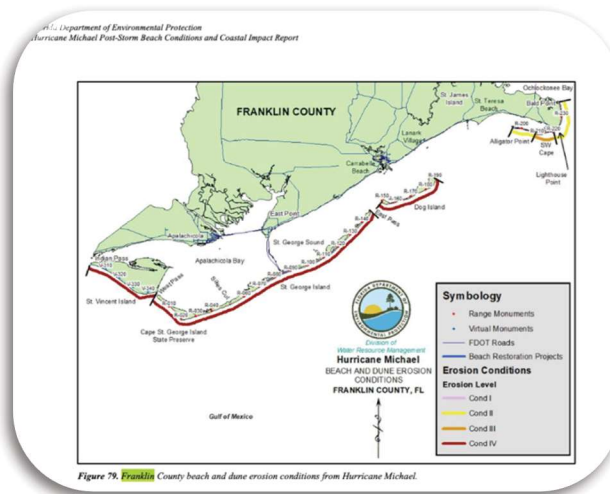


Figure 83. Major beach and dune erosion at Bob Sikes Cut at R52, St. George Island.



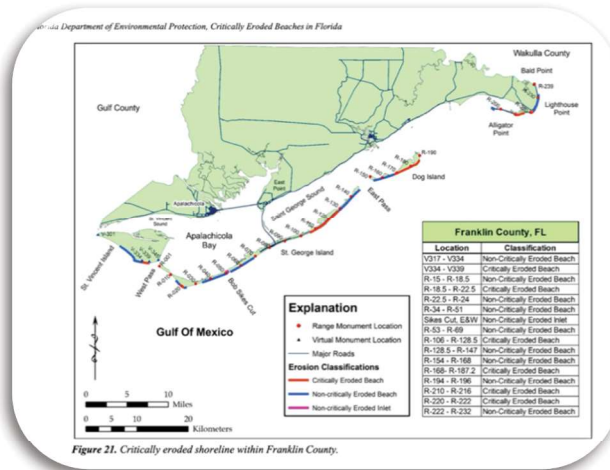
Figure 84. Major dune erosion at R72, St. George Island.

Figure 4.20 - FDEP, Critically Eroded Shoreline in Franklin County



Source: FDEP

Figure 4.21 – Hurricane Michael Post-Storm Beach Conditions and Coastal Impact Report



Source: FDEP

Storm Effects and Erosion Conditions

The storm tides of Hurricane Michael in Franklin County generally ranged from 8 to 12 feet above sea level. The storm surge caused extensive washover fans into the dune field and maritime forest of St. Vincent Island generally between DEP virtual stations. All along St. Vincent Island's gulf beach are storm tide runout channels that carried the ebbing flood waters back across the beach. A large developing cusped foreland at the southwestern point of St. Vincent Island experienced substantial growth, enclosing a now entrapped lagoon. This lagoon is the seventh and most seaward of a progression of coastal lakes formed in likely similar manner. Immediately offshore, two subaerial shoals have substantially eroded with only a fragment of one now exposed. The sediment of these shoals may have contributed to the avulsive growth of the cusped foreland.

The length of the St. George Island barrier complex experienced storm surge flooding and substantial overwash deposits. Extensive washover fans exist on Little St. George Island. As was seen along St. Vincent Island, the Cape St. George area has several storm tide runout channels that carried the ebbing flood waters back across the beach. Hurricane Michael's storm surge caused extensive washover fans across the island. The western jetty at the cut is separated from the island at high tide. Substantial shoaling appears to have occurred within the inlet, with substantial beach material having been removed from the St. George Plantation east of Sikes Cut. At Sikes Cut, the eastern jetty was breached, separating it from St. George Island. The eastern and western jetty breaches had previously occurred during Hurricanes Elena and Kate in 1985. Along St. Vincent Island, Little St. George Island, and St. George Island, major beach and dune erosion (Condition IV) was sustained. Severe dune erosion was sustained at Bob Sikes Cut . Along St. George Island Plantation), the dunes retreated as much as 50 feet (see bottom photo at the right).

Table 4.36 provides erosion volumes in cubic yards for Franklin County beaches fronting on the Gulf of Mexico. Four segments of shoreline are tabulated. The erosion volumes were obtained from a post-storm U.S. Army Corps of Engineers LIDAR survey compared to the latest pre-storm survey for all DEP monument locations above Mean Low Water (MLW). In much of Franklin County, the frontal dunes were essentially removed, and large amounts of eroded material were deposited upland. Therefore, calculations were made of the total volume eroded as well as the volume eroded with this upland deposition included, or the net erosion volume. Pre-storm data was not available for St. Vincent Island or Dog Island, but computations were made of the rest of the gulf front shoreline on the coastal barriers. Computations showed a total erosion volume of approximately two million cubic yards of beach and dune sand for the remainder of the county, of which approximately one-half were lost from the system, and therefore, a net erosion volume of approximately one million cubic yards was calculated above MLW.

Table 4.36 – Erosion Volumes above Mean Low Water

Table 6. Franklin County erosion volumes above Mean Low Water (MLW).

Location	DEP Monuments	Average Erosion cy/ft	Total Erosion Volume (cy)	Average Net cy/ft	Net Erosion
Little St. George Island	R1-R51	-11.9	-541,967	-4.7	-182,537
St. George Island	R52-R149	-13.5	-1,391,838	-9.3	-955,395
Alligator Pt. to Lighthouse Pt.	R194-R220	-4.6	-122,757	0.5	13,603
Lighthouse Pt. to Bald Pt.	R221-R239	-2.6	-48,031	3.6	72,015
Total	R1-R239		-2,104,594		-1,052,315

Source: FDEP

The erosion conditions moderated along the coastal barriers further to the east. Alligator Peninsula between Alligator Point and the Southwest Cape sustained minor beach and dune erosion. Along the barrier peninsula east of the Southwest Cape between and, moderate beach and dune erosion was sustained. From Lighthouse Point northward to Bald Point, minor beach and dune erosion was sustained. Portions of the Alligator Point to Bald Point barrier complex were completely inundated by the storm surge. Sand was sporadically deposited in washover fans between the dune and the road between Lighthouse Point and Bald Point. The dune was leveled, with sand being deposited on and across the road.

Impacts from Hurricane Michael

Table 4.37 – Major Structural Damage

County	# Single Family Dwellings Damaged	# Multi Family Dwellings (1) Damaged	# of Other Major Structures (2) Damaged	Total # Damaged (3)
Franklin	160	3	2	165

1. Multi-family dwellings include condominiums, townhouses, apartments, hotels, and motels.
2. Other major structures include: commercial buildings (restaurants, stores, beach bars, etc.), recreational buildings and non-habitable major structures (i.e., piers, pools, pavilions and parking lots).
3. Not included in this summary are: minor structures (i.e., walkways, decks, driveways, patios, etc.), coastal and shore protection structures (i.e., seawalls, revetments, sills, groins, jetties), minor damage to major structures, structures located inland of the coastal building zone, or structures with hydrostatic flooding damage caused by the storm surge or storm water runoff.

Table 4.38 - Coastal Armoring Damage

County	Armoring (1) Damage in Feet
Franklin	4,670

1. Coastal Armoring – includes seawalls, bulkheads, retaining walls, revetments, sills, or other rigid coastal protection structures.

Riverine Erosion



Riverine erosion is the long-term process whereby riverbanks and riverbeds are worn away. This process is best described as a river's tendency for constant course alteration, shape and depth change, and the balance between the water sediment transport capacity and the sediment supply. Riverine erosion has many consequences including land and development loss. When stormwater flows exceed channel capacity, water will overtop channel banks and spread out as floods.

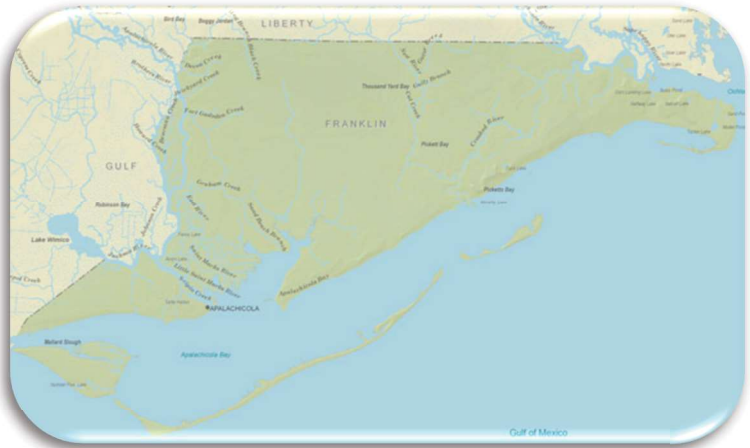
Photo source: <https://backshortly.com/2014/05/09/the-ochlockonee-river/>

The loss of soils due to riverine erosion under paved roads, bridge abutments and approaches, bridge pilings and other structural pilings, can cause structural failures that endanger public safety. Washouts of boat ramps can restrict access for emergency personnel. Riverine erosion can increase the debris flow of trees and structures like docks that can pile up against structures in the floodway, increasing stresses on the pilings and possibly contributing to failures.

The rivers in Franklin County are: the Apalachicola River, the New River, the Crooked River, the Ocklockonee River, the Brothers River, the East River, and the Jackson River as identified in the hydrography map to the right.

Apalachicola River

The Apalachicola River is an alluvial river characteristically has a variable seasonal flow with substantial annual flooding, and a heavy sediment load. The continuing erosion and depositional processes acting within the Apalachicola River causes the river channel to be in a constant state of change, even during low flow. The deposition and erosion of material in the river eventually creates meanders, which widen the river valley, decrease slope, slowing down the water velocity, allowing more sediments to be deposited, thereby continuing the movement of the river channel laterally. During high flow, the river not only erodes and deposits sediments on the floodplain but is capable of creating new channels by cutting off meanders or blocking the mouths of tributaries forcing them to create new channels. As the river adjusts and stabilizes, floodplain features are formed which can be discerned by topography and soil characteristic.



Apalachicola River and Bay Surface Water Improvement and Management Plan, NFWMD, November 2017

Riparian Buffers in the Apalachicola River

A riparian buffer zone is an overlay that protects an adjoining waterbody from effects of adjacent development, such as runoff, NPS pollution, **erosion**, and sedimentation. A buffer zone in this context refers to an area along the shoreline that is maintained in or restored to generally natural vegetation and habitat. In this condition, an intact buffer zone helps to simultaneously achieve three important goals: water quality protection, **shoreline stability**, and fish and wildlife habitat. Associated with these are other benefits, including aesthetic improvements and public access and recreation. These benefits are achievable for riparian areas along all types of waterbodies: stream/riverine, estuarine, lacustrine, and wetlands, and karst features.

New River, Crooked River, Ochlockonee River

The New River flows through Tate's Hell Swamp, a vast forested plain in Franklin County. The river is very darkly stained, making it one of the darkest and blackest of the blackwater streams. After its confluence with the Crooked River, the stream becomes wider and estuarine in character and is called the Carrabelle River. The Crooked River is a waterway that connects the tidal estuary of the Ochlockonee River to a junction with the tidal Carrabelle River.

Ochlockonee River and Bay Surface Water Improvement and Management Plan, NFWMD, November 2017

Riparian Buffers in the Ochlockonee River

A riparian buffer zone is an overlay that protects an adjoining waterbody from effects of adjacent development, such as runoff, NPS pollution, **erosion**, and sedimentation. A buffer zone in this context refers to an area along the shoreline that is maintained in or restored to generally natural vegetation and habitat. In this condition, an intact buffer zone helps to simultaneously achieve three important goals: water quality protection, **shoreline stability**, and fish and wildlife habitat. Associated with these are other benefits, including aesthetic improvements and public access and recreation. These benefits are achievable for riparian areas along all types of waterbodies: stream/riverine, estuarine, lacustrine, and wetlands, and karst features.

Historical Riverine Erosion Occurrences

Heavy rain events and erosion of slopes above the river is a significant threat especially in sensitive areas where sand and dirt enter the river. It is important to note that there is no history of any noteworthy riverine erosion events along

the rivers in the unincorporated areas within the County to any structures due to the setback requirements in the Franklin County COMP, Land Use Element, which states when the overall environmental impact of the development is lessened or mitigated and the average setback is at least 50 feet from wetlands or waters of the State, or when the setback is at least 50 feet from wetlands or waters of the State.

According to the International Journal of Environmental Sciences & Natural Resources, Long Term Hydrological Changes in the Apalachicola River, Volume 19 Issue 5, June 2019

The study pointed out that the lowest decline in the Apalachicola River stages of low flows could be observed at lowermost parts of the river very close to the Apalachicola Bay during drought conditions. They also deduced that water levels had declined more due to channel erosion (i.e. **the erosion process that occurs within the channel within both banks; the erosion can be either erosion on the bank or lowering of the stream bed**) as compared to reduced flows in the upstream parts of the river. Specifics on how many feet the river bank erosion has occurred was not noted in the study.

There are no recorded historical riverine erosion occurrence data from any of the local government departments, FDEP, NFWFMD or in any of the studies or reports,

Risk and Vulnerability Assessment

The vulnerability to coastal and riverine erosion events can be defined as to the extent to which people will experience harm and property will be damaged from the natural hazard.

Franklin County's coastline's is very vulnerable to coastal erosion as noted in Figure 4.21, the non-critical and critical eroded beach areas. The residents that live in close proximity to the six critically eroded beach areas (11.1 miles), nine non-critically eroded beach areas (19.7 miles), and one non-critically eroded inlet shoreline area (0.5 mile) in Franklin County. St. Vincent Island has a 3.2-mile long non-critically eroded area along its most gulfward protruding midsection. To the east, a 0.9-mile segment of St. Vincent Island is critically eroded into the maritime forest, which has resulted in the loss of beach wildlife habitat are at greatest risk.

There is some vulnerability to riverine erosion for the Apalachicola or Ochlockonee River(s) with continuing erosion and depositional processes acting within the rivers causing the river channel to be in a constant state of change, even during low flow.

Vulnerability for Franklin County's Population

The county population that lives along the coastal areas (i.e. Carrabelle, Eastpoint, Lanark Village, St. Teresa, Alligator Point, Apalachicola, and particularly the residents on St. George Island, and a few residents from Dog Island) can have some type of vulnerability to coastal erosion especially after a significant hurricane event like Hurricane Michael and the erosion impact from the storm surge, flood waters and high winds.

There is some vulnerability to the county's population in the unincorporated area of Franklin County that live near or close by the Apalachicola River, the Apalachicola Bay, or the Ochlockonee River, however, the percentage of the county population affected would be relatively small.

Vulnerability for Franklin County's Structures, Facilities, and Infrastructure

The vulnerability to risk to coastal erosion for the County's structures, facilities and infrastructure is considered high vulnerability especially due to the coastal storms that occur frequently in Franklin County.

The vulnerability risk to riverine erosion for the County's structures, facilities and infrastructure is considered low vulnerability. The vulnerability would increase for the homeowners that have property and structures located near the riverbeds and suffer from a historical river flooding elevation event that washes out the structures. Riverine erosion can increase the debris flow of trees and structures like docks that can pile up against structures in the floodway, increasing stress on the piling and possible contributing to failures.

Summary details for coastal and riverine erosion events:

Probability of Future Occurrences	The probability for coastal erosion is high (at least 1 occurrence every year). The probability for riverine erosion is low (at least 1 occurrence every 10 years).
Geographic Area	<p>Coastal Erosion</p> <p>The coastal areas (i.e. Carrabelle, Eastpoint, Lanark Village, St. Teresa, Alligator Point, Apalachicola, Cape St. George on little St. George Island, Dog Island, St. James Island and St. Vincent) would experience critical coastal erosion.</p> <p>Riverine Erosion</p> <p>The unincorporated areas along the Apalachicola River, the Apalachicola Bay, and the Ochlockonee River as identified in the hydrography map in this section would experience riverine erosion..</p>
Extent	<p>Coastal Erosion</p> <p>There are six critically eroded beach areas (11.1 miles), nine non-critically eroded beach areas (19.7 miles), and one non-critically eroded inlet shoreline area (0.5 mile) in Franklin County. St. Vincent Island has a 3.2-mile long non-critically eroded area along its most gulfward protruding midsection. To the east, a 0.9-mile segment of St. Vincent Island is critically eroded into the maritime forest, which has resulted in the loss of beach wildlife habitat. Severe erosion exists at Cape St. George on Little St. George Island, which has resulted in the loss of the historic pre-Civil War lighthouse. This critically eroded area extends along a 0.6-mile length of shoreline and is adjoined at both ends by a 0.7-mile non-critically eroded segment to the west and a 0.3-mile non-critically eroded segment to the east. Most of Dog Island is eroded to the east, a 3.6-mile segment is designated critically eroded. The undeveloped historic west end of Alligator Point is severely eroded for 0.4 mile. The eastern end of Alligator Peninsula between the Southwest Cape and Lighthouse Point is designated critically eroded for 1.1 miles, where past storms have destroyed and continue to threaten private development and a county road. The southeastern end of St. James Island is critically eroded, extending north from Lighthouse Point for 0.4 mile, threatening residential development.</p> <p>Riverine Erosion</p> <p>Although the details on riverine erosion statistics (feet of riverfront lost) in the past years are not disclosed for Franklin County, the risk is primarily concentrated along the Apalachicola River and Bay and the Ochlockonee River. One can determine that there was erosion occurring in previous years and the district recognized the need for springs and river protection and restoration activities. The estimation for normal extent for riverine erosion would be less than 1 foot per year. The assessment for destructive riverine erosion would be 2 feet + per year.</p>

	<p>Also it depends on the type of hazard event that has occurred and the year. A worst-case scenario would be an elevation in the river and the velocity compounded with heavy flooding from an extreme hurricane, tropical storm, or heavy rain event that could cause tree limbs, logs, a dock, a deck, a structure, vegetation, or obstruction to wash into the river possibly causing a bridge or road to erode and wash out.</p>
Impact	<p>Coastal Erosion</p> <p>Franklin County experienced significant impact from Hurricane Michael. The major structural damage included: 160 single family dwellings were damaged, 3 multi-family dwellings were damaged, and 2 other major structures – total damaged was 165 structures. See table 4.37 for further identification.</p> <p>Riverine Erosion</p> <p>The Franklin County communities living near the Apalachicola River or Bay, or the Ochlockonee River could be impacted if a bridge collapsed and residents were unable to use the bridge for transportation. The loss of soils due to riverine erosion under paved roads, bridge abutments and approaches, bridge pilings and other structural pilings, can cause structural failures that endanger public safety. Washouts of boat ramps can restrict access for emergency personnel.</p> <p>Riverine erosion can increase the debris flow of trees and structures like docks that can pile up against structures in the floodway, increasing stresses on the pilings and possibly contributing to failures. The impact from riverine erosion would affect the unincorporated area of the county and residents that live close by and could potentially cause considerable damage.</p>

Wildfires

A wildfire is any uncontrolled fire in combustible vegetation that occurs in the countryside or a wilderness area. Other names such as brush fire, bushfire, forest fire, grass fire, hill fire, peat fire, vegetation fire, veldfire and wildland fire may be used to describe the same phenomenon depending on the type of vegetation being burned.



Wildfires differ from other fires by its extensive size, the speed at which it can spread out from its original source, its potential to change direction unexpectedly, and its ability to jump gaps such as roads, rivers and firebreaks. Wildfires are characterized in terms of the cause of ignition, their physical properties such as speed of propagation, the combustible material present, and the effect of weather on the fire.

Photo source: USA Today, Fire in Eastpoint, FL

Florida's ecosystems are dependent on natural fire. These low intensity fires re-nourish soil, thin abundant vegetation, and provide proper conditions for reproduction and forage. However, since the early 1950's when Floridians actively began to suppress all fires to protect newly planted forest areas and keep newly built dwellings safe, vegetative fuel has become dense and thick. Natural fires have given way to dangerous wildfires, which often damage rather than benefit natural surroundings.

The growing number of people relocating to Florida adds to the wildfire problem as nearly 1,000 people move to Florida each day. Additionally, Floridians who are tired of big-city life are moving to rural areas to "get back to nature". Many of them choose to live in areas where natural vegetation meets homes and communities. These areas are called the Wildland-Urban Interface, and many of these new residents are unaware of the natural role of fire in Florida and therefore are unprepared.

Wildland-Urban Interface fires are fast moving fires that often require many pieces of fire-fighting equipment, and suppression is a difficult and time-consuming operation. Wildfire suppression must also take on the challenge of home protection during almost every fire that is detected. The cost of these operations grows proportionally with their complexity.

Historical Data Occurrences of Fires by Causes, Florida Forest Service (1/1/2000 – 7/27/2000)

Table 4.39 reports statistics from the Florida Forest Service, Fires by Causes, over the last 20 years reveals that 448 fires occurred burning over 20,454.8 acres In Franklin County.

Table 4.39 – Fires by Causes, Franklin County (1/1/2000 – 7/27/2020)

Cause	Fires	Percent	Acres	Percent
Campfire	18	4.02	140.1	0.68
Children	25	5.58	35.2	0.17
Debris Burn *	28	6.25	6198.4	30.30
Debris Burn – Authorized Broadcast/Acreage	24	5.36	3433.8	16.79
Debris Burn – Authorized – Piles	4	0.89	0.6	0.00
Debris Burn – Authorized – Yard Trash	2	0.45	0.2	0.00
Debris Burn – Non-Authorized Broadcast/Acreage	6	1.34	5.2	0.03
Debris Burn – Non-Authorized – Piles	11	2.46	79	0.04
Debris Burn – Non-Authorized – Yard Trash	17	3.79	88.0	0.43
Equipment Use *	9	2.01	171.6	0.84
Equipment – Agriculture	2	0.45	0.3	0.00
Equipment – Logging	6	1.34	9.5	0.05
Equipment – Recreation	3	0.67	18.2	0.09
Equipment – Transportation	3	0.67	24.6	0.12
Incendiary	64	14.29	2937.3	14.36
Lightning	90	20.09	3111.5	15.21
Misc. – Breakout	2	0.45	95.0	0.46
Misc. – Electric Fence	0	0	0.00	0.00
Misc. – Fireworks	4	0.89	7.0	0.03
Misc. - Power Lines	26	5.80	56.9	0.28
Misc. – Structure	3	0.67	0.4	0.00

Misc. – Other	19	4.24	655.3	3.20
Railroad	0	0	0.0	0.00
Smoking	7	1.56	21.5	0.11
Unknown	75	16.74	3436.3	16.80
Total	448		20,454.8	

Source Florida Forest Service: <https://fireinfo.fdacs.gov/fmis.publicReports/FiresByCause.aspx>

* Fire cause no longer used

Historical Wildfire Occurrences from NCDC

According to the NCDC, 1/1/1950 – 7/20/2020 there was 3 wildfire occurrence reported in Franklin County with location, date, time, the type of event, if there were any deaths or injuries, and the property and crop damage estimates.

Table 4.40 – Franklin County Wildfire (1/1/1950 –7/20/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Apalachicola Airport	6/20/1998	11:30	Wildfire	0	0	0.00K	0.00K
Carrabelle	7/1/1998	14:00	Wildfire	0	0	0.00K	0.00K
Coastal Franklin Zone	6/24/2018	17:30	Wildfire	0	0	800K	0.00K
Total	Property Damage: \$800,000						

Source: <http://www.ncdc.noaa.gov/stormevents/listevents>

Hazard Event Narrative – Extent and Impact

1. 6/20/1998, Apalachicola Airport – A 60+ acre wildfire erupted at the intersection of Gibson and Airport road near the Apalachicola Airport. The fire was contained with a few hot spots remaining and no homes were threatened. There was no property damage recorded.
2. 7/1/1998, Carrabelle – A 100+ acre wildfire erupted 12 miles north of Carrabelle off SR 67. There was no property damage recorded.
3. 6/24/2018, Eastpoint – A wildfire developed in the Eastpoint area during the late afternoon of June 24th. It quickly spread from the woods to nearby homes as strong northerly outflow from a thunderstorm to the north moved through the area with wind gusts of 25-30 mph. The fire destroyed 36 homes with an additional 4 homes sustaining minor damage. There were 184 people who requested assistance through the Red Cross. The fire grew to more than 950 acres and the loss of property damage was estimated to be at least \$800,000. In addition, it was noted that this wildfire was a result of a prescribed burn conducted.



Photo Image: Tallahassee Democrat

Additional Wildfire Occurrences (Disaster Declarations)

Table 4.41 - Disaster Declarations for Franklin County Due to Fires

IA, PA or both	Date – Incident Period	Disaster Event and Incident Type	Declaration #
IA, PA	May 25, - July 22, 1998	Fires	1223
PA	April 15 – May 25, 1999	Fires	3139

Note: Throughout the State of Florida, 1998 was significant year for wildfires due to severe drought conditions. The first wildfire to break out was on May 25, 1998 in the Apalachicola National Forest in Liberty County, a neighboring county for Franklin. Although specific details on wildfires for Franklin County seemed relatively low, the county did experience wildfire events and requested IA and PA assistance.

Consequences of a Wildfire

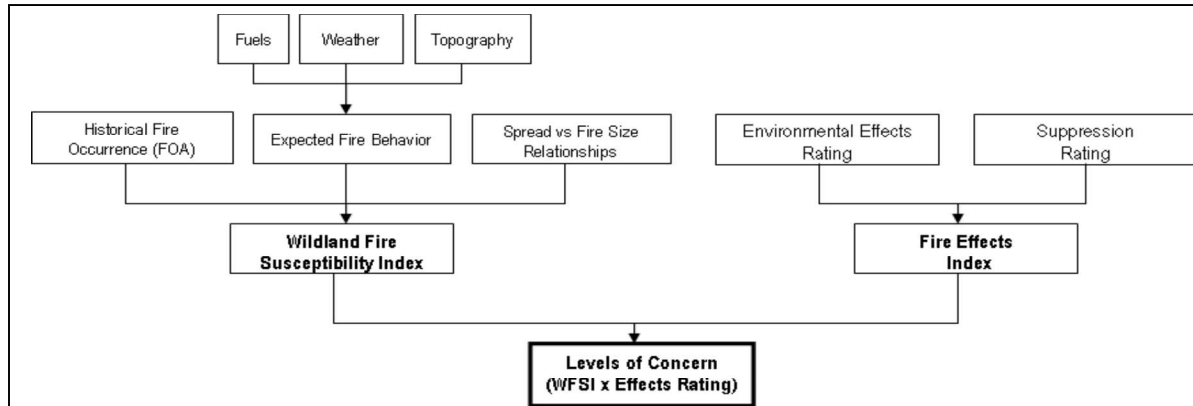
There are many types of causes that can start a wildfire, from lightning, to incendiary, to smoking in forested areas or improperly extinguishing campfires, etc. Prevention efforts include working not only educating people on forested areas, but also working with the Florida Forest Service and having the community citizens become a firewise community for preventative measures in protection from a wildfire. Consequences for a wildfire can be the following, see Table 4.42.

Table 4.42 - Consequences of Wildfire

Infrastructure	Environmental	Human	Vegetative	Economic
power outages	erosion	smoke inhalation	crop damage	business disruption
water/gas/communication lines disrupted	wildlife destruction	personal injury	timber damage	property loss
road closures	habitat loss	human evacuation	species endangered	economic loss
roadway destruction	species endangered	animal evacuation	invasive species increased	suppression cost

The Florida Forest Service levels of concern (LOC) measures wildland fire risk, Figure 4.23. The level of concern is calculated from the probability or likelihood of an acre burning (Wildland Fire Susceptibility Index), and the expected effects of the fire (Fire Effects Index). The Fire Response Accessibility (FRA) Index is a measure of the initial attack response time to a cell from existing initial dispatch locations for fire protection resources. Taken as a pair, these two indices (LOC and FRA) define a cell's accessibility and its vulnerability to wildland fire occurrence and effects. As a result, non-burnable areas and 9 LOC categories ranging from low concern to high concern were assigned. The LOC results can be used to identify areas where mitigation options may be of value.

Figure 4.23 - Wildfire Level of Concern Variables



Source: Florida Forest Service, Managing Wildland Fire Risk in Florida;
https://www.fs.fed.us/pnw/pubs/gtr802/Vol2/pnw_gtr802vol2_brenner.pdf

Prevention



The Florida Forest Service encourages all Florida residents to become involved in their program areas of prevention addressing the wildfire issues in the state.



- ✓ The Fire Prevention Awareness Program – Smokey Bear remains an active part of our overall prevention message with visits to the schools in Franklin County to promote wildfire safety and the benefits of fire prevention.
- ✓ The Firewise Communities Program educates homeowners and community professionals about creating defensible space around their homes, helping to protect them from the dangers of wildfire.
 - The program is based upon two principles:
 - Homeowners must take responsibility for home fire safety and become “partners” with the fire protection agencies, and
 - Homes (neighborhood and communities) can be designed, built and maintained to withstand a wildland fire without the intervention of a fire department.
- ✓ Franklin County addresses issues relating to firewise communities in the Community Wildfire Protection Plan (CWPP).
- ✓ Materials are distributed on fire prevention to the Franklin County residents.

Risk and Vulnerability Assessment

The wildfires that burned in Florida over the last 25 years are examples of the increasing wildfire threat which results from the Wildland Urban Interface (WUI). The Wildland Urban interface is defined as the area where structures and other human development meet with undeveloped wildland or vegetative fuels (FEMA). As residential areas expand into relatively untouched wildlands, people living in these communities are increasingly threatened by forest fires.

Structures in the wildland urban interface zone are vulnerable to ignition by three different ways: radiation, convection, and firebrands (National Wildland Urban Interface Fire Protection Program). Radiating heat from a wildfire can cause ignition by exposure to the structure. The chances of ignition increase as the size of the flames increases, surface area exposed to flames increases, length of exposure time increases, and distance between the structure and the flames decreases.

Details from the Franklin County CWPP state that only 20% of Franklin County would be considered WUI. However, there are areas that have serious fuel loading issues. They are as follows:

- ✓ Bald Point State Park (included small community)
- ✓ St. Teresa Beach
- ✓ East Lanark and St. James Bay Community
- ✓ Kendrick Road
- ✓ Hickory Hammock
- ✓ Carrabelle Beach and Lighthouse Point Estates
- ✓ North Bay Shore Drive in Eastpoint
- ✓ Bay City Road and Old Breakaway Lodge Road

The Wildland Urban Interface (WUI) Risk Index layer is a rating of the potential impact of a wildfire on people and their homes. The key input, WUI, reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the Wildland Urban Interface and rural areas is key information for defining potential wildfire impacts to people and homes.

In calculating the WUI Risk Rating, the WUI housing density data is combined with flame length data and response functions to define the potential impacts to homes and people and likely to take place. Fire intensity data is modeled to incorporate penetration into urban fringe areas so that outputs better reflect real world conditions for fire spread and impact in fringe urban interface areas. With this enhancement, houses in urban areas adjacent to wildland fuels are incorporated into the WUI risk modeling.

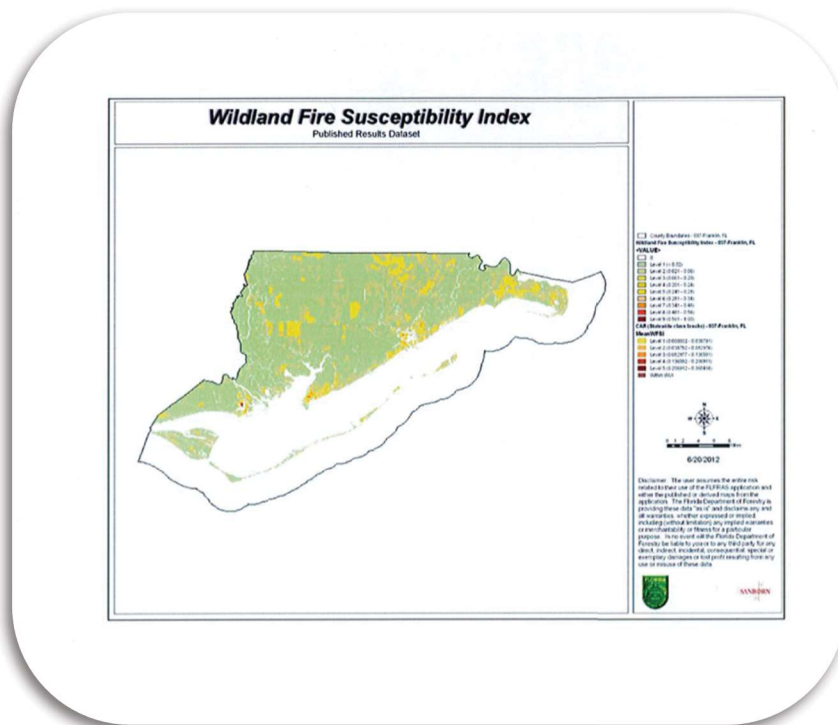
Table 4.43 - Communities at Risk in Franklin County

High Risk	Bald Point Eastpoint St. Teresa
Medium Risk	Bay City Carrabelle Beach Carrabelle Lighthouse Chason Place Franklin Green Point Lanark Village Two Mile Yent Place

Low Risk	Apalachicola Bloody Bluff Brickyard Landing Carrabelle Creels Eleven Mile Hays Place McIntyre Nine Mile Pine Log Rock Landing Tilton Tuckers Place Wright Landing

Source: CWPP, Franklin County

Figure 4.24 – Franklin County Wildland Fire Susceptibility Index



Source: CWPP, Franklin County

Vulnerability for the Franklin County's Population

Franklin County had a 6.3% growth rate from 2010 to 2019 with population total in 2019 of 12,273. The % projected assessment for the population growth from 2019 to 2020 is -0.5%, or an estimated population total of 12,213. The 2020 – 2025 population projection is expected to increase 2.7% to 12,541 in 2025. The population at risk and vulnerable to wildfires is noted in Table 4.44.

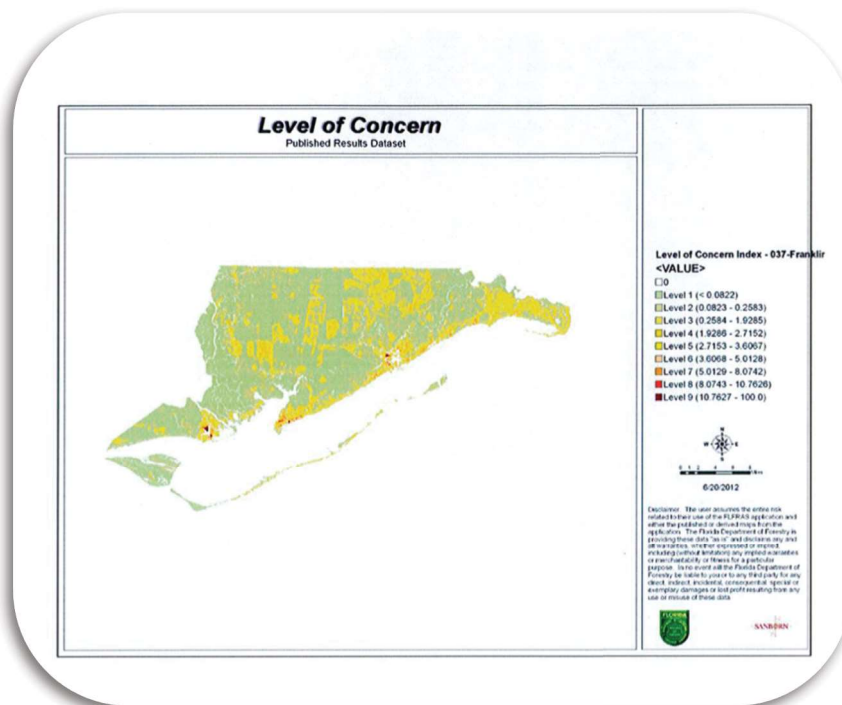
Table 4.44 - Wildfire Population by Level of Concern Category

County	LOC 1	LOC 2	LOC 3	LOC 4	LOC 5	LOC 6	LOC 7	LOC 8	LOC 9
Franklin	338	333	2742	465	321	308	381	143	25

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Specifics from Table 4.44, the highest vulnerability for the population would be the level of concern: 3 with 2,742 residents at risk within the population. The topmost risk areas for the population are in the unincorporated areas of the county due to the concentration of residents in rural wooded areas, additional threats to life and property exist, therefore, requiring increased mitigation efforts. This segment of the population could include the mobile home residents which accounts for 16.4% of the residential structures, the poor, the sick, the elderly, the children, and a segment of the single-family home population living in the unincorporated area of the county.

Figure 4.25 – Franklin County Level of Concern



Source: CWPP, Franklin County

Vulnerability for Franklin County's Structures and Facilities

Franklin County's buildings, infrastructure and critical facilities are considered vulnerable to damage caused by wildfires. According to the CWPP, there is 1 structure at medium risk in the City of Apalachicola, 5 structures are low risk in the City of Carrabelle, and 50 at low risk, 87 at medium risk, and 197 at high risk in the unincorporated areas of Franklin County.

Summary details for wildfire events:

Probability of Future Occurrences	The probability for wildfire events is high (at least 1 occurrence every year) particularly during drought cycles and very dry conditions. Florida's dry season usually begins in November and continues through May or June, with the driest months being March through May or June. The drought monitor should be watched for the county especially during the Springtime on a daily basis.
Geographic Area	<p>The entire County (the City of Apalachicola, the City of Carrabelle, and unincorporated areas of Franklin County) is highly susceptible to wildland fires based on the heavily forested composition of the county.</p> <p>There are different levels of risk for Franklin County as noted in Table 4.44 and discussion on the county's structures and facilities vulnerability details from the CWPP.</p>
Extent	<p>Data recorded from FEMA states that disaster declarations occurred two times (5/25 – 7/22/1998 and 4/15 – 5/25/1999) in Franklin County requiring PA or both IA and PA. Specifics on the fire size or damages were not available.</p> <p>Data from the CWPP and the Florida Forest Service Wildfires can occur in any month of the year from any cause. Lightning, arson, and debris burning are three evident causes, and their incidence can fluctuate annually. Fuels on the Refuge are highly volatile and contribute to ultimate fire size. The size can vary greatly from 1 to 1,500 acres, with a ten-year Refuge average size of 40 acres. Large, disastrous fires can, and do, occur in the local fuel types. Further complicating large fires is the state of drought, which may all duff to burn extensively.</p> <p>Over the last 20 years, in 2000 the Apalachicola Forest in Franklin County experienced 27 wildfires burning 4,167.10 acres, the worst-case scenario for the County.</p> <p>In addition, based on the data recorded from the Florida Forest Service, wildfires can be severe for the homes, buildings, structures and agriculture. The data reveals that over the last 20 years 448 fires were recorded with total acreage burned was 20,454.8 acres. Continued education and guidance for the county citizens is necessary for the overall safety for the residents.</p>
Impact	<p>The Franklin County community, the residents, structures, and critical facilities could be impacted from a wildfire event. Although the county is located on the gulf coast, there is considerable forestry land area in the county and this could present some impact to road closures due to smoke and visibility resulting in evacuations for some of the unincorporated county residents.</p> <p>On 6/24/2018 a wildfire developed in the Eastpoint area during the late afternoon of June 24th. It quickly spread from the woods to nearby homes as strong northerly outflow from a thunderstorm to the north moved through the area with wind gusts of 25-30 mph. The fire destroyed 36 homes with an additional 4 homes sustaining minor damage. There were 184</p>

	people who requested assistance through the Red Cross. The fire grew to more than 950 acres and the loss of property damage was estimated to be at least \$800,000. In addition, it was noted that this wildfire was a result of a prescribed burn conducted.
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Community Wildfire Protection Plan (CWPP)

As stated by the Forests and Rangelands... “The Healthy Forests Restoration Act (HFRA) provided communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands. A Community Wildfire Protection Plan (CWPP) is the most effective way to take advantage of this opportunity. Additionally, communities with Community Wildfire Protection Plans in place will be given priority for funding of hazardous fuels reduction projects carried out under the auspices of the HFRA.”

In 2013 Franklin County established their CWPP. Located in Appendix G, the plan provides the planning process, vulnerability assessment, the current wildfire protection activities, the CWPP goals and objectives, the action plan, and the implementation and maintenance for the plan. Updating the CWPP is on the current LMS Project List.

The CWPP can consolidate knowledge and serve as a single resource for wildland fire risk and hazard mitigation information. As populations’ increase and development continues to push into the rural wildland areas, it will be necessary to take active steps to reduce the wildfire risk to Franklin County residents. Through the approved CWPP, development regulations, vegetative fuel reduction, and on-going public education programs in high-risk areas, the potential for loss of human life and property from wildfire can be greatly reduced.

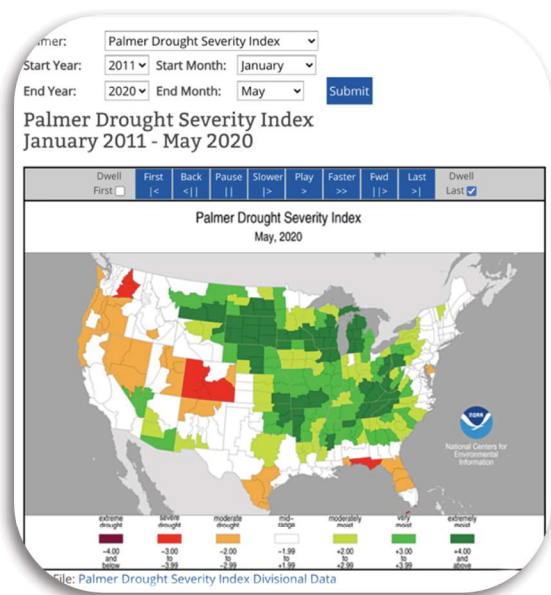
Drought and Heat Wave (Extreme Heat)

Drought

Drought can be defined based on rainfall amount over some period of time, vegetation conditions, agricultural productivity, soil moisture, levels in reservoirs and stream flow, or economic impacts. In basic terms, a drought is a significant deficit in moisture availability due to lower than normal rainfall. This deficiency results in a water shortage for some activity, group or environmental sector. Excessively dry and hot conditions can provoke dust storms and low visibility. Droughts occur when a long period passes without substantial rainfall. A heat wave combined with a drought is a very dangerous situation.

The drought data noted in Table 4.45 was derived from the Palmer Drought Severity Index from NOAA, Climate Monitoring. The Palmer Drought Severity Index (PDSI) is an indicator of the relative dryness or wetness effecting water

Figure 4.26 – Palmer Drought Severity Index



sensitive economies. The PDSI indicates the prolonged and abnormal moisture deficiency or excess. This indicator is of general conditions and not local variations caused by isolated rain. Calculation of the PDSI is made for 350 climatic divisions in the United States and Puerto Rico. The data collected for the calculations include the weekly precipitation total and average temperature, division constants (water capacity of the soil, etc.) and previous history of the indices.

The PDSI is an important climatological tool for evaluating the scope, severity, and frequency of prolonged periods of abnormally dry or wet weather. It can be used to help delineate disaster areas and indicate the availability of irrigation water supplies, reservoir levels, range conditions, amount of stock water, and potential intensity of forest fires.

Source: <https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/psi/201101-202005>

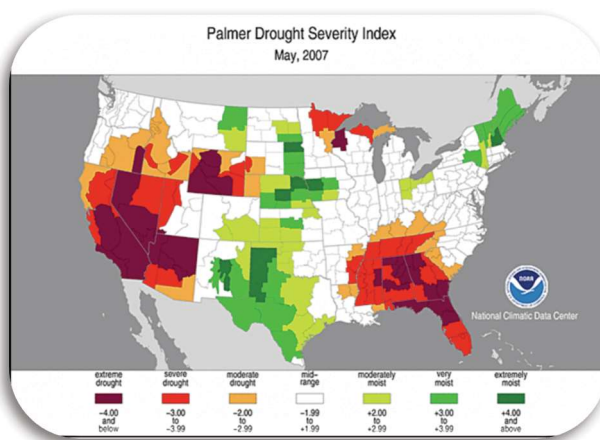
Historical Drought Occurrences

According to the Florida Climate Center, *Historic Drought in Florida...* “Because drought is defined on so many different levels, has differing impacts, and can happen on short or long time scales, it is hard to compare one drought to another. An examination of weather records since 1900 reveals that in every decade there has been at least one severe and widespread drought somewhere within Florida. Droughts that began in 1906, 1927, 1945, 1950, 1955, 1961, 1968, 1980, 1984, 1998, and 2006 were the most severe.”

Extreme Drought Occurrences (2006 – 2008)

Since 2000, the longest duration of drought (D1 – D4) in Florida lasted 124 weeks beginning on April 11, 2006 and ending on August 19, 2008.

Figure 4.27 – Palmer Drought Severity Index, May 2007



In 2007, it was ranked the lowest annual Palmer Drought Severity Index (PDSI) value since established records in 1895.

Source: <https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/>

Palmer Drought Severity Index (PDSI) Drought Occurrences

The PDSI data for Franklin County on years (January 2011 – June 2020) are as follows:

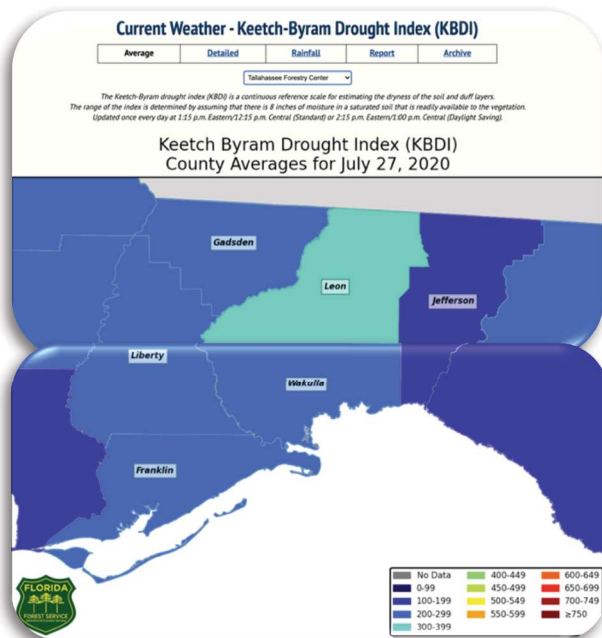
Table 4.45 - Palmer Drought Severity Index January 2011 – June 2020 for Franklin County

Years	Data on Drought
2011	There was a recorded period of time in the months of January, February, and March with periods of moderate drought. In April and May there was severe drought for the area. And in June, July, August, September, October, November and December there was extreme drought.
2012	There was a recorded period of time in the months of January, February, March, April and May each experienced extreme drought.
2013	There was no drought data recorded in 2013.
2014	There was moderate drought in September and October in 2014.
2015	There was a recorded period of time in the months in July, August, September and October in 2015 with moderate drought.
2016	There was moderate drought in November 2016.
2017	There was moderate drought in April 2017.
2018	There was no drought data recorded in 2018.
2019	There was a recorded period of time in the months of May, July, August and December with moderate drought. There was severe drought in the months of September, October and November.
January – June 2020	There was a recorded period of time in the months of January, February, and June that experienced moderate drought. There was severe drought in March, April and May of this year.

Source: <https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/psi/201101-202006>

Keetch Byram Drought Index (KBDI)

Figure 4.28 – KBDI, Florida Forest Service



In addition to the drought monitor and PDSI, the county utilizes KBDI, which is updated each day by the Florida Forest Service Weather Service, see Figure 4.26. KBDI is a good indicator of the drought/moisture conditions for agricultural purposes, and it also provides a planning tool for the risks of wildfire. This index provides a numerical scale of 100 through 750, with 750 being the driest and 100 being wettest.

Source http://fireweather.fdacs.gov/wx/kbdi_index.html

Historical Drought Occurrences from NCDC

According to the NCDC, 1/1/1950 – 7/20/2020 there was 22 drought occurrences reported in Franklin County with location, date, time, the type of event, if there were any deaths or injuries, and the property and crop damage estimates.

Table 4.46 – Franklin County Drought (1/1/1950 –7/20/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Coastal Franklin Zone	5/24/2011	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	5/24/2011	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	6/1/2011	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	6/1/2011	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	7/1/2011	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	7/1/2011	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	8/1/2011	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	8/1/2011	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	9/1/2011	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	9/1/2011	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	10/4/2011	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	10/4/2011	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	4/1/2012	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	4/1/2012	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	5/1/2012	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	5/1/2012	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	6/1/2012	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	6/1/2012	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	1/9/2018	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	1/9/2018	0:00	Drought	0	0	0.00K	0.00K

Coastal Franklin Zone	2/1/2018	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	2/1/2018	0:00	Drought	0	0	0.00K	0.00K
Total	Property Damage: N/A						

Source: <http://www.ncdc.noaa.gov/stormevents/listevents>

Details on the Oyster Fisheries in Franklin County

In the previous LMS plan, a report from the University of Florida, UF report: Collapse of Oyster Industry Due to Drought, Salinity, April 26, 2013 was inserted revealing that drought, insufficient rainfall and salinity in the Apalachicola Bay helped cause a dramatic fall in the oyster population.

Oyster Fishery, July 2020

The Oyster Fishery is one of the most vulnerable assets for Franklin County. On July 22, 2020, the Florida Fish and Wildlife Conservation Commission voted to shut down the Apalachicola oyster fishery for up to 5 years after years of drought and other pressures that have devastated the wild oyster beds, effective date: August 1, 2020.

The pressure has been mounting for oyster harvesters in Franklin County due to droughts, the BP oil disaster, Hurricane Michael, and lack of fresh water from the rivers upstream. The Florida fisheries regulators say a moratorium on oyster harvesting for up to five years will give wild oyster reefs time to regenerate.

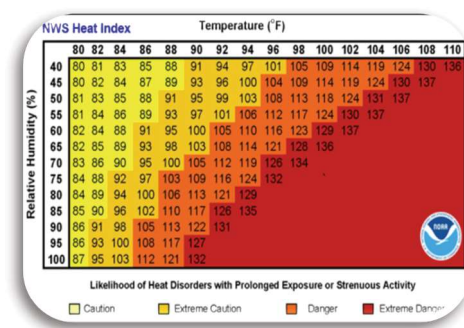
At the height in 2012, the dockside value of the fishery was just over \$9 million. Since the 2012 federal fisheries disaster declaration, several state and federal projects have sought to restore the bay but with little lasting success. The annual oyster harvest has dropped from more than 3 million pounds to less than 21,000 pounds. The dockside dollar value of that catch declined 98% over that time period which has presented a significant impact to the County.

Grant

An \$8 million grant from the Triumph board was given to Florida State University Marine Lab to develop a full-scale plan of action for restoring the Apalachicola Bay ecosystem and its oyster reefs.

Heat Wave/Extreme Heat

Figure 4.29 - Heat Index Chart



Temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks are defined as extreme heat, or those prolonged excessive heat/humidity episodes. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air nears the ground.

According to the NWS, the "Heat Index" (HI), is sometimes referred to as the "apparent temperature". The HI, given in degrees F, is an accurate measure of how hot it really feels when relative humidity (RH) is added to the actual air temperature.

To find the HI, look at the Heat Index Chart, Figure 4.29. As an example, if the air temperature is 98°F (found on the top of the table) and the RH is 50% (found at the left of the table), the HI or how hot it really feels - is 113°F.

HI values were devised for shady, light wind conditions, exposure to full sunshine can increase HI values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous. Note on the HI chart the shaded zone above 105°F. This corresponds to a level of HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

Franklin County's hot season are the months of June to September with an average temperature range 88.9°F in June, 90°F in July, 90°F in August and 87°F in the month of July. Heat wave events occurring in the hot season would be in the 100°F plus temperature range. From researched resources (i.e. NWS), *the hottest temperature recorded in Carrabelle was 104°F on September 26, 1899, and 98°F for the City of Apalachicola in 2015.* Although the relative humidity data was not available, the county is located in a humid subtropical climate zone and at the time, the humidity was probably high. To determine what the Heat Index might have been for this record temperature of 104°F, if the RH was only 45%, the HI would have been 124°F based on the Heat Index Chart.

The heat can kill by taxing the human body beyond its abilities. In a normal year, about 175 Americans die to the demands of summer heat. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the disastrous heat wave of 1980, more than 1,250 people died. Elderly persons, small children, chronic invalids, and those on certain medications or drugs, are particularly susceptible to heat reactions, especially during heat waves in areas where a moderate climate usually prevails.

Small children are incredibly susceptible to heat, especially in a vehicle as it only takes approximately 10 minutes to heat up 19 degrees, so that it can reach lethal temperatures quickly. A child is more susceptible than adults to heat as their bodies heat up 3 to 5 times quicker and can suffer a heat stroke.

Although no data is recorded on any historical heat related death occurrences in the County, it was stated in the extreme-heat-factsheet from Florida Health 1998, there were at least 8 heat-related deaths from April to August in the State of Florida. Due to the fact that the City of Carrabelle had a record high heat of 104°F, there probably were some heat-related incidents reported on June 18 - 19, 1998 timeframe.

Heat Related Occurrence

As reported by the International Journal of Environmental Research and Public Health, A Comprehensive Evaluation of the Burden of Heat-Related Illness and Death within the Florida Population, June 2016, among Florida residents, during the Florida warm season (May–October) for 2005–2012, there were 23,981 non-work-related HRI cases treated in the ED, 4816 HRI hospitalizations, and 139 HRI deaths. These cases accounted for 0.10% of all-cause warm season non-work-related ED visits, 0.05% of non-work-related hospitalizations, and 0.02% of non-work-related deaths. Among work-related HRI cases, there were 2979 cases treated in the ED, 415 hospitalizations, and 23 deaths. The work-related HRI cases accounted for 0.66%, 0.98%, and 2.3% of all-cause work-related ED visits, hospitalizations, and deaths during the warm season.

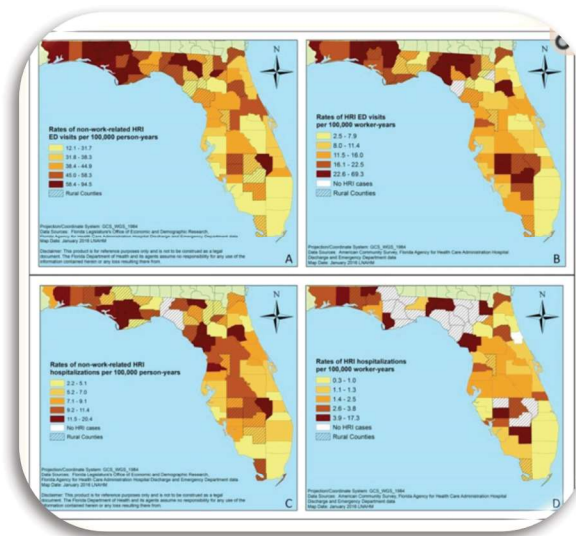


Figure 4.30 demonstrates that Franklin County details are as follows:

- Box A -Rates of non-work related HRI ED visits per 100,000 person-years (45 - 58.3 for Franklin); the 2nd highest category
- Box B - Rates of HRI ED visits per 100,000 worker-years (16.1 – 22.5 for Franklin); the 2nd highest category
- Box C – Rates of non-work related HRI hospitalization per 100,000 person-years (2.2 – 5.1 for Franklin); lowest category
- Box D – Rates of HRI hospitalizations per 100,000 worker-years (No HRI cases for Franklin)

Figure 4.30 – Statistics on Heat-Related Incident Rates for the Florida Counties

(Box A to the left – top; Box B to the right – top)



(Box C to the left- bottom; Box D to the right- bottom)

Source: International Journal of Environmental Research and Public Health; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4924008/>

According to the Florida Department of Health in Franklin County, data as to exact number of residents to ED related incidents for HRI is not recorded for the county.

Historical Heat Related Occurrences from NCDC

According to the NCDC, 1/1/1950 – 7/20/2020 there was 3 heat and excessive heat occurrences reported in Franklin County.

Table 4.47 – Franklin County Heat Wave and Excessive Heat (1/1/1950 –7/20/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Coastal Franklin Zone	7/29/2010	15:00	Heat	0	0	0.00K	0.00K