


1972

# WJXT Weather Guide, 1822-1972 : a Weather Handbook

George Winterling

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WJXT

PRICE \$1.00

# WEATHER GUIDE

1822-1972

Sesquicentennial  
Edition



Ref  
QC  
984  
.W5F5

ATHER  
BOOK  
ed by  
meteorologist  
George Winterling

TR2P  
QC984  
.W5 F5



## A day in the life of a T.V. weatherman...

**As the first rays** of daylight break through the trees, George hears the call to hot chocolate and toast for his two teenagers, Frank and Steve. Peering out the window, he notes the movement of the fragmented cumulus clouds, checking for any changes that may have developed from yesterday's pattern. A half hour later, nine-year-old Wendy Gale joins him and his wife, Virginia, for breakfast. Steve is checking the sports page for the Atlanta Braves' score while Frank finishes combing his hair. Shortly, Wendy and the boys have left for school, Virginia relates her rounds for the day, and George picks up some packets of weather maps for the fifth-grade classes he will address this morning.

**A little over** an hour later, George films a pine tree that was blown over a garage in last night's thunderstorm. Arriving at the TV station, he proceeds to clear the weather machines of a dozen weather maps and a few thousand weather reports that came in during the night. He tries to answer the phone calls from people wanting to know the weather, but he has less than two hours to analyze the maps and reports, paint and draw his weather maps, prepare his film, make a forecast slide, and coordinate his weather with the rest of the Midday program.

**After Midday**, a new set of maps and research and filming go into the production of the six o'clock weathercast.

**Finally home** for supper, George learns from Virginia that Frank pitched for 13 innings today in a 15-inning game. Wendy is in her room watching "I Dream of Jeannie" while Steve's cornet blares "Superstar" from the back bedroom. A few hours later when homework is done and most lights are out, George scans the weather journals, watches Win Jervis' 11 o'clock weather report, and finally, places one more day in the weather history of Jacksonville.

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## WEATHER GUIDE

Jacksonville Sesquicentennial  
Edition



# Jacksonville's Weather

is not known for its severity, abrupt changes, or extremes. While other sections of the country are noted for blizzards, ice storms, tornadoes, and floods, Jacksonville's history has been one of moderation . . . so much so, that noteworthy weather for this city is common or unnoticed in other places.

**HURRICANES** are among the greatest threats, since nearby tropical oceans provide fuel sufficient to propel winds of 150 m.p.h. or higher. Steering currents and geographical position, however, favor Jacksonville with the distinction of experiencing fewer hurricanes over the centuries than any other coastal Florida city.

**TORNADOES** occasionally dip from either menacing summer thundershowers or a brisk winter or early spring squall line. Again, Jacksonville is favored with experiencing an inferior breed of twisters, so that most substantial structures are not leveled as in places a few hundred miles to the west or northwest.

**FLOODS** can hit low areas or sections with poor drainage when fronts, thunderstorms, or northeasters drop torrents of water in a matter of a few hours; but northeast Florida terrain and the St. Johns River are situated so that flood waters here are considered minor when compared with those in more mountainous places.

**FREEZES** are infrequent, but threaten subtropical plants and trees that survive the milder winters. The moderating effect of the Atlantic ocean makes most freezes of short duration.

History of noteworthy weather events around Jacksonville can be found on pages 24-36.

## Four hundred years ago,

Jacksonville's sky and wind belonged to a people described as a "tall, well-made people, almost entirely naked, except for a breech-cloth, their bodies covered with elaborate tattooing."

This was the land of the TIMUQUAN INDIANS. The river, now known as St. Johns, was the source of their fish and oysters; the forests, their game; the fields, their wild fruits and 'coonti', a root from a fern-like plant from which they made bread.

**In the 1560's**, the French under Jean Ribault settled on the banks of the St. Johns River at Fort Caroline. An attack on the Spanish near St. Augustine turned to disaster for the French because of a storm, possibly a hurricane; thus, early Florida history was Spanish, instead of French, because of north-east Florida weather.

**The word, HURRICANE**, is attributed to the Indians which the Spaniards encountered in Cuba. Their name for the violent windstorms that swept their land and flooded their fields was "huracán".

**AFTER 1700**, Spanish power declined and native Indians dwindled as the Creeks and Seminoles came to Florida. In 1740, the Spanish built a fort at a river crossing where Jacksonville is located. This part of the river was called "Wacca Pilatka" by the Indians, meaning "cows crossing over".

**The settlement, Cowford**, was developed under British ownership around the time of the American Revolution. A freak snowstorm<sup>1</sup> was reported to have extended over most of Florida about this time (1774) of which there is very little recorded.

**JACKSONVILLE** was named in 1822.

**FIRST TEMPERATURE RECORDS** were made by Judge F. Bethune from June 1829 through August 1833 at a plantation about five miles south of the city. Dr. A. S. Baldwin recorded Jacksonville weather for 34 years beginning in January 1838, except for interruptions during the Indian Wars (1841-43) and the Civil War (1862-66). Jacksonville's **FIRST RAINFALL RECORDS** were started by Dr. Baldwin in 1851.

**The ARMY SIGNAL SERVICE** started making official weather reports for Jacksonville in 1871. Twenty years later, the Weather Bureau was established under the Department of Agriculture.

**In April 1895**, A. J. MITCHELL took over the Jacksonville Weather Bureau, a job he kept until 1932 when a government economy move made retirement compulsory. His career spanned some of Jacksonville's most memorable weather.

**In 1899**, Mitchell predicted snow for Jacksonville on February 13. He said afterward, "but I didn't expect three inches of it. It fell during the night and was all over town the next morning."

**Eight years later** he predicted afternoon showers, but something extra was added. "The hailstones were as big as hen's eggs," said Mitchell. "I saw them . . . and I felt two or three bounce off my head. Pelted horses ran away. Hail stood on the street for 24 hours. For days it was banked in shady places."

**About this time (1907)**, Jacksonville historian and climatologist, T. FREDERICK DAVIS, was compiling "Climatology of Jacksonville and Vicinity". This book has helped preserve records of weather during Jacksonville's earliest days. Davis was the grandfather of WJXT's Meteorologist WIN JERVIS.

1. From a paper read by Major George R. Fairbanks before the Florida State Horticultural Society, May 8, 1895.

2. Weather Records were started in 1870 by the Signal Service in Lake City.

**In 1932**, WALTER J. BENNETT became Chief of the Jacksonville Weather Bureau. Bennett, father of Congressman Charles E. Bennett, compiled "The Story of Weather, Jacksonville, Florida". This account of Jacksonville's weather history included facts from the Davis research, other data from early records, and added accounts of later happenings through 1951. This covered the active "hurricane years" of the 1930's and 1940's.

**A separate Weather Bureau** office was opened in 1930 at Imeson Airport with ROLAND L. ANDERSON in charge. Anderson later took over the downtown office after Bennett's retirement in 1949.

**With the closing** of the city office in 1956, the Weather Bureau Airport Station, under ROGER G. PLASTER since 1946, became the center of weather activity, not only for Jacksonville, but for parts of other southeastern states. This was an Aviation Weather Forecast Center and an Upper Air (Radiosonde) station.

**In 1957**, GEORGE WINTERLING began five years of service at Imeson airport; while three years later, WIN JERVIS joined the Weather Bureau staff.

**The Radiosonde** activities moved to Waycross, Georgia in 1967, where a new 250 mile range radar installation was built. DOW E. BOYKIN, formerly with the Jacksonville office, was placed in charge.

**The same year** saw BILL HILLIG leave the Weather Bureau to work for WFGA (Channel 12), while WIN JERVIS returned from Navy duty to join GEORGE WINTERLING at WJXT.

## George Winterling.

**Originally** from New Jersey, has lived in Jacksonville since he was ten years old. A graduate of Robert E. Lee High School, he attended Jacksonville University and received his Bachelor of Science degree in meteorology from Florida State University.

**He served** four years in the United States Air Force, where he led his class at the Weather Observers course at Chanute Field, Illinois; and he was second from the top in the Intermediate Meteorological School at Oklahoma State University. He was assigned as a weather forecaster in the Aleutian Islands.

**After serving** with the Weather Bureau for five years, one of which as Quality Control Officer for weather briefings at Federal Aviation Administration stations from Florida to South Carolina, George joined WJXT in 1962.

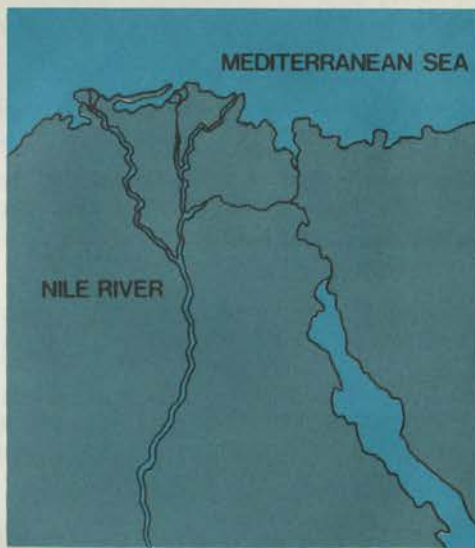
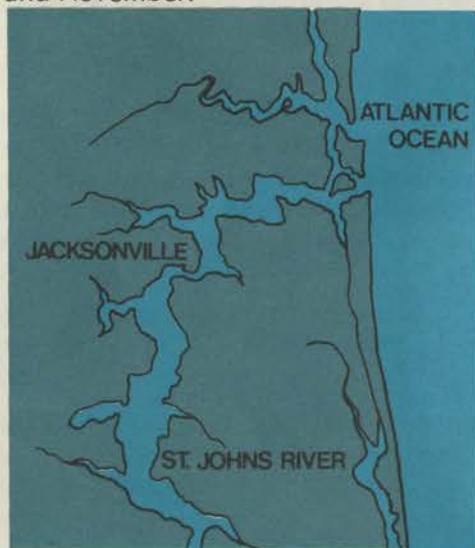
**He was granted** the American Meteorological Society Seal of Approval for his weathercasts, as judged by a national Board for informational content, educational value, audience interest, and professional qualities. He has served as Director of the Jacksonville Weather Watchers, President of the Northeast Florida Branch of the American Meteorological Society, and was appointed to the Board of Radio and Television Weathercasting in 1969.



**E**veryone talks about the weather; man has tried to understand it for centuries. Most of his cities have been built near water; thus, man has wondered how the water affects his weather.

## THE RIVER AND THE WEATHER

The northward flowing St. Johns River and its relation to the Atlantic ocean has a counterpart in Egypt. As early as 600 B.C., the effect of the weather on the Nile was a subject of much discussion. Thales, one of the Seven Wise Men of Greece, described how northerly winds at certain seasons hindered the outflow of the river into the Mediterranean, causing it to spill beyond its banks. Jacksonville's St. Johns River experiences a similar annual high tide, though not as extreme, with northeast winds between September and November.

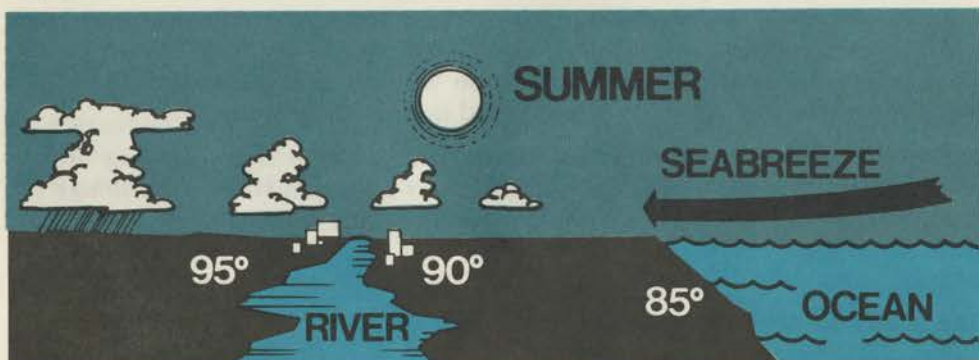


About 150 years after Thales, Democritus described how vapors in the atmosphere after the winter snows had melted, were carried by winds upstream where they produced rains. These rains added water to the Nile, whose outflow was reduced by the north winds.

Rainfall plays a part in the rising of the St. Johns, too. Tributaries of the St. Johns, such as Black Creek and Cedar Creek, experience higher waters when heavy rains combine with northeast winds to raise the level of the water by several feet.

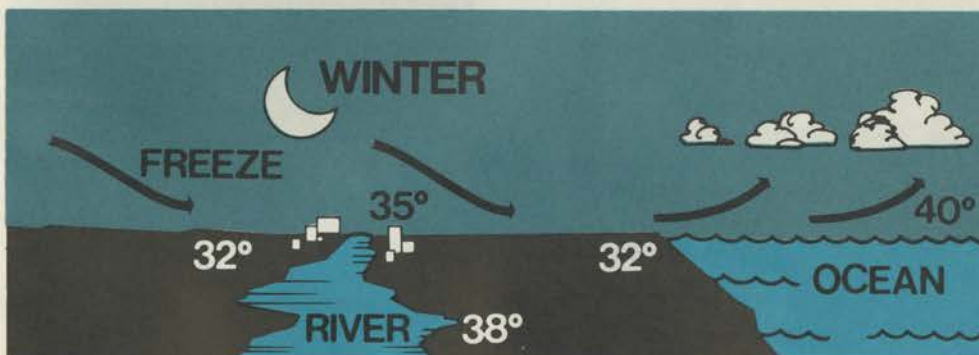
Through the years, many residents have believed the St. Johns directs the path of summer showers or thundershowers, and in one instance a hurricane. Hurricanes are so large that the atmospheric environment, the Atlantic ocean, and the continental land mass are the main factors controlling their movements.

Showers or thundershowers may respond slightly to the river, since it sometimes contributes a modified thermal, moisture, or wind pattern to towering clouds in its vicinity. The fact that showers are by nature a very transient part of cloud development makes it very difficult to ascertain whether changes near the river are caused by the river, or are part of the normal variations in cloud development and dissipation.



The distance of the river from the ocean gives it the appearance of being responsible for a different weather regime on the west side than to the east. This is because on days with a summer seabreeze, there are many times when the ocean air does not pass over enough heated land to develop showers until it has reached a point 15 or 20 miles inland from the coast; thus, showers fall mainly west of the river (city).

It is the summer seabreeze that causes the beaches to often go for weeks without rain, while west Jacksonville never seems to go dry. The beaches do get rain when upper winds blow from the west, causing the inland showers or thundershowers to spread to the coast.



In winter, a local effect of the river is the addition of heat to the air during cold outbreaks. The side of the river experiencing the warming effect depends on the direction of the wind. Since most cold waves arrive on northwest winds, the orange-producing Mandarin section is benefited by the addition of a few degrees to the icy wind. When the wind is north to north-east, riverfronts at places such as Ortega and Orange Park receive these few extra degrees.

This heating of the air, however, is limited to the immediate vicinity of the river, since cold waves extend thousands of feet into the atmosphere. The severity of the cold wave returns a mile or so away from the river.

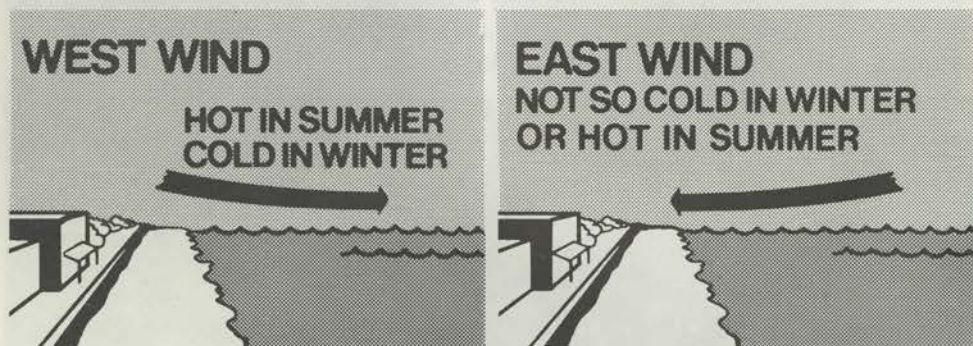
Another source of heat to the winter atmosphere is that from buildings, industry, and other energy-producing sources of the city. This is responsible for a local weather pattern known as the "urban heat island". This is an area of relatively warmer air in the city surrounded by the general cold winter environment. Since this "heat island" is merely "air", wind directions in the lower atmosphere determine whether it remains over the central city, or whether it is displaced toward one or more suburbs.

While this air may be as much as five degrees warmer than outlying areas, it also contains a higher concentration of air pollution from such things as chimneys, smoke stacks, and engine exhausts. Since most cold air sweeps in from a northerly direction, northern sections of the city will have cleaner air; but being upwind of the "heat island" will have colder temperatures.

### THE BEACHES AND THE OCEAN

Weather at the beaches is often about the same as that in the city . . . but there are times when it is quite different. It is the wind direction that usually determines the difference.

With a WEST WIND (offshore wind), temperatures and weather are basically the same as in the city. Of course, a local thunderstorm can cause weather to differ anywhere. But as a rule, summer days will be as hot as, maybe a degree or two hotter than, the city; and winter temperatures will be about as warm or cold at the beaches as it is inland.



A difference in weather can occur with an EAST WIND (onshore wind). The effect of the ocean is a moderating one, so that summer days will not be as hot as in the city, and winter nights won't be as cold as in town. Winter days can be five to 10 degrees colder at the beach, since the winter sun cannot heat the ocean like it warms the city.

Once in a while, the ocean wind can cause a foggy or rainy day at the beaches while ten miles inland the weather is clear. On the other hand, the seabreeze causes many clear summer days at the beach at the same time the city may be cloudy with afternoon showers or thundershowers.

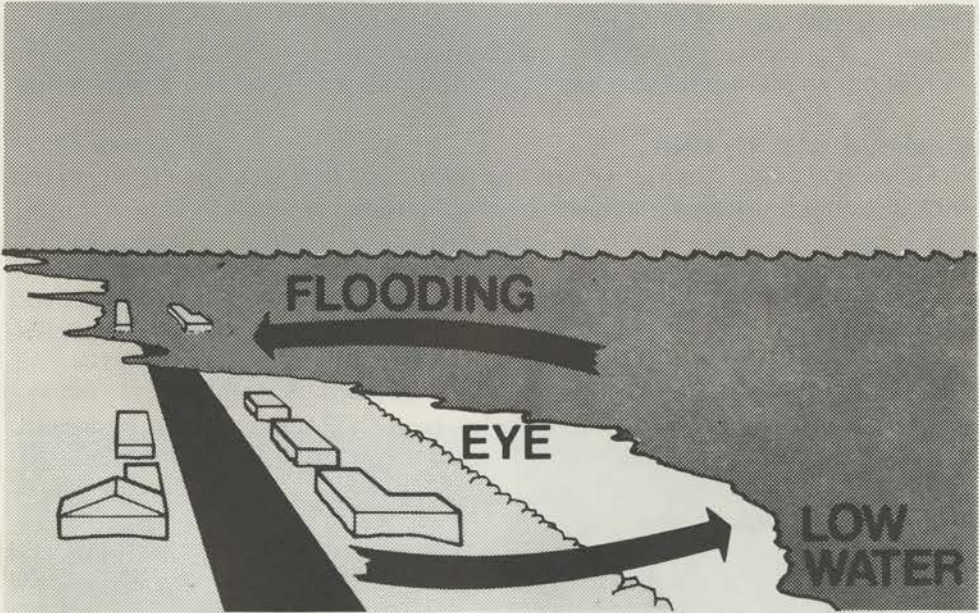
## WATERSPOUTS

When the air is muggy and the wind light with showers developing, a phenomenon called a **WATERSPOUT** may develop over coastal (or even inland) waters. This has the appearance of a tornado; it has winds spinning as high as 150 to 200 miles per hour. If the clouds are drifting toward shore, the whirlwind may cross the beach; however, most dissipate within a few hundred yards inland.

## HURRICANES

The greatest weather hazard to the beaches is the hurricane. The fact that northeast Florida usually experiences glancing blows from storms passing offshore, or is hit by less than full force hurricanes that have weakened downstate is no reason to assume the beaches cannot experience a severe storm.

Since most people killed by hurricanes die by drowning, it is most important that low-lying and coastal areas be evacuated before any severe hurricane strikes. To gamble that a storm will miss is to **BET YOUR LIFE**. Wind driven tides can surge more than 10 feet above normal, undermining sand dunes and many structures that line our shore.



While one side of a hurricane causes abnormally high tides, the other side of the storm blows offshore, causing a drop in the water level. Hurricane forecasting is not yet precise enough to pinpoint which ocean communities will have the disastrous high water and which will have low water. For this reason, it is best to assume that any severe hurricane whose eye is predicted to pass within 100 miles can cause these deadly tides, and prepare accordingly.

# Jacksonville's worst hurricane

Hurricane Dora, was the first full force hurricane to strike the north-east Florida coast since weather records began in 1871. This is how WJXT weather reports prepared the area for the storm which followed another hurricane, Cleo, by only ten days.



## **Friday, August 28, 1964**

The eye of a former hurricane named Cleo passed over Jacksonville Beach with winds of 50 m.p.h., one day after hitting Miami with 135 m.p.h. gusts.

## **Monday, August 31, 1964**

WJXT Meteorologist George Winterling points out that Jacksonville's greatest danger would be from a hurricane coming in from the east.

## **Tuesday, September 1, 1964**

A storm named DORA is spawned in the tropical Atlantic heading toward Bermuda.

## **Monday, September 7, 1964**

Another hurricane, named ETHEL, helps turn DORA toward the mainland. WJXT predicts winds could reach 100 m.p.h. in Jacksonville Wednesday.

## **Tuesday, September 8, 1964**

WJXT interrupts regular programming to broadcast hurricane bulletins and other information. George Winterling reports the storm is on a track toward St. Augustine.

## **Wednesday, September 9, 1964**

DORA turns toward St. Augustine, but slows down to give coastal residents a few more hours of preparation. After making a feeble attempt to remain over warm Gulf stream waters offshore, DORA moves across the coast under cover of darkness.

WEATHER  
  
**Jacksonville Journal**  
 INDEX  
 Edition: Morning  
 Price: 10¢  
 Telephone: 2-1111  
 Telegram: JOURNAL  
 Cable: JOURNAL  
 Second-class postage paid at Jacksonville, Florida  
 Vol. 77—Number 212  
 Two Dollars—21 Days  
 Jacksonville, Florida, Wednesday, September 10, 1964  
 Published by THE JACKSONVILLE JOURNAL COMPANY, Inc.  
**HURRICANE DORA RIPS INTO  
 DUVAL COUNTY**



Street Edition  
**The St. Augustine Record**  
 10¢  
 SERVING ST. AUGUSTINE AND ST. JOHNS COUNTY—FOUNDED IN 1868—THE NATION'S OLDEST CITY  
 Vol. LXXV, No. 4  
 ST. AUGUSTINE, FLORIDA, LEADER OF REPUTATION ESTABLISHED IN 1565  
**Hurricane Dora Deals City Severe Blow**

**Damage Heavy  
 from 100 Mile  
 Winds and Tides**  
 Heavy Losses  
 Severe Blow

**T**HE storm also killed six people who were being taken to the hospital by a private ambulance. The ambulance was overturned by the high winds and the ambulance driver was killed. The ambulance driver was killed. The ambulance driver was killed.



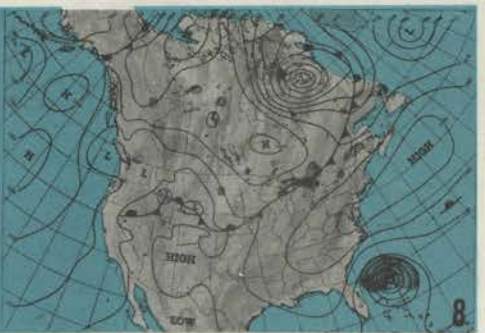
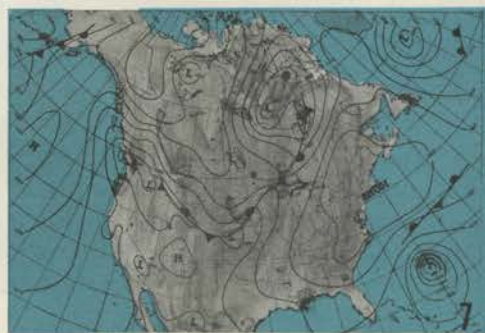
The storm was a direct result of the storm system which was moving westward from the east. The storm was a direct result of the storm system which was moving westward from the east. The storm was a direct result of the storm system which was moving westward from the east.

**Thousands Wait  
 It Out In Shelters**

Thousands of people are waiting in shelters in St. Augustine. The shelters are being used for the purpose of sheltering the people who are in the city. The shelters are being used for the purpose of sheltering the people who are in the city.

**DATA ON DORA**

DORA was steered by an unusual persistence of tropical easterly winds at a latitude usually occupied by the Bermuda high. At the surface, a large high over the middle Atlantic coast blocked any northward trend, while in the upper atmosphere the prevailing westerlies, which could have turned the storm out to sea, flowed along the Canadian border. The easterly current prevailed for an exceptional duration of four days to steer DORA on a course perpendicular to the tracks of most storms in this latitude.



September 7, 1964

September 8, 1964

SEPTEMBER 8-12, 1964

Station	Lowest Pressure	Fastest Wind	Highest Gust	Rainfall Total
Jacksonville Arpt	29.05	N 82	85*	8.67
Jacksonville NAS	28.87	N 53	81	—
Jacksonville Cecil Fld	28.91	NE 44	71	—
Fernandina Beach	29.28	N 100	115	—
Mayport	29.03	NNE 74	101	—
St. Augustine	28.52	SW 125*	—	7.10
Marineland	28.80	NW 60+	—	5.85
Gainesville	29.08	—	—	—
Live Oak	—	—	—	18.62
Mayo	—	—	—	23.73
Brunswick	29.40	—	NE 90*	6.23
Jesup	—	—	E 50	5.81

\* Estimated

## Hurricane hunters.

There was adequate preparation for DORA in northeast Florida and southeast Georgia because of years of planning and preparation for such a disaster. Among those involved were the Weather Bureau, Civil Defense, American Red Cross, officials of many cities and counties including Jacksonville and Duval, the news media and many broadcasters, and many others.

Among those to whom we are indebted are those who flew out to "look the monster in the eye". While Weather Bureau and Air Force planes also monitor tropical blows over nearby waters, the men of the Navy's Early Warning Squadron VW-4, better known as the "Hurricane Hunters," have earned a special place in the history of Jacksonville.

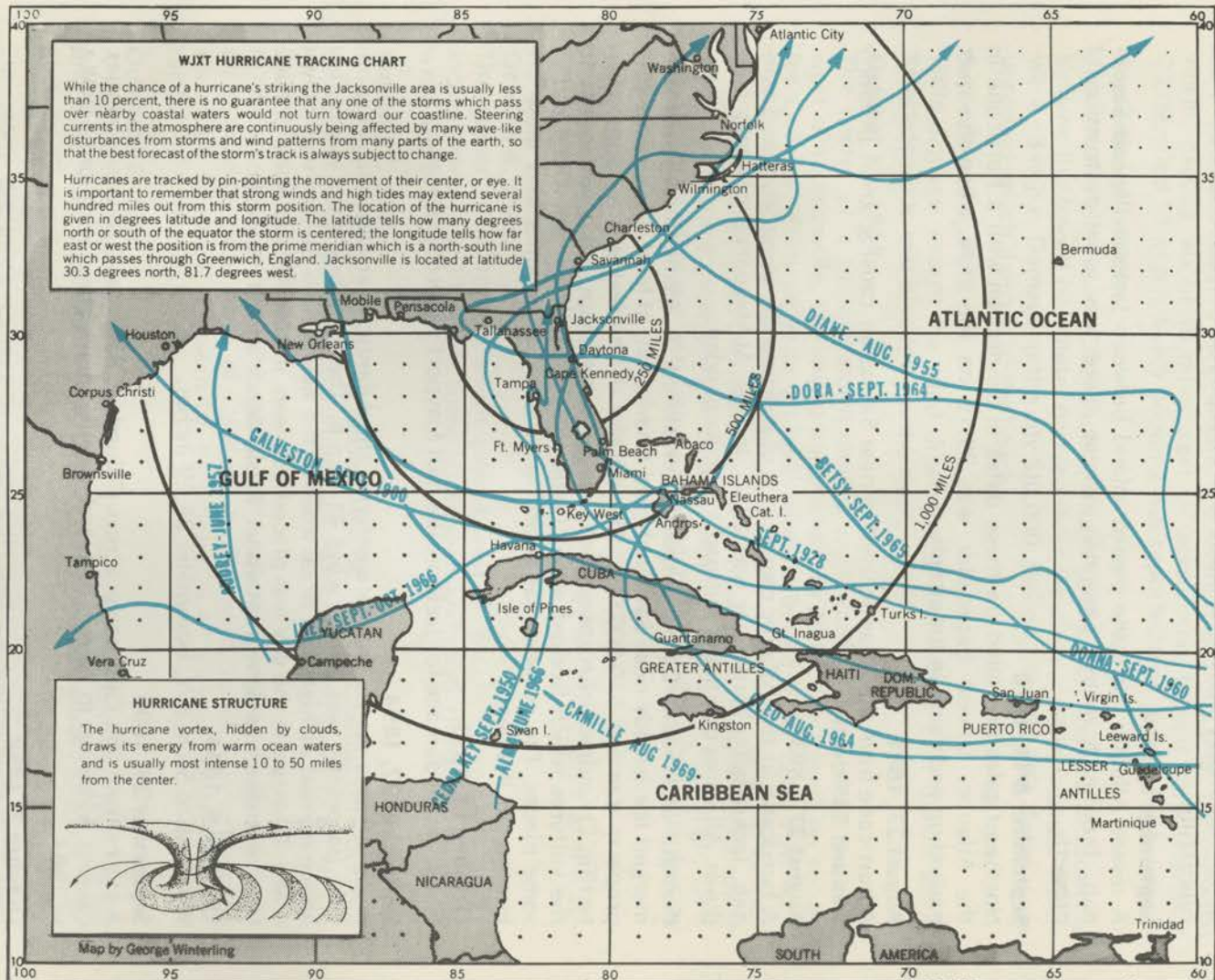
Many "Connies", bulging with equipment, have come and gone from Jacksonville Naval Air Station; for those who track hurricanes, they "tell it like it is."

## Hurricanes affecting northeast Florida

It may be misleading to call this a "hurricane history" since by definition a "hurricane" is a tropical cyclone with sustained winds of 74 m.p.h. or higher. While many storms hitting Jacksonville were of hurricane force in some other section of the state, most are less than a hurricane by the time they reach northeast Florida.

### September 10, 1565

The French Captain, Jean Ribault, attempted to take St. Augustine from the Spanish who had just settled there. Waiting for high tide to permit his ships





to enter the harbor, he was driven southward by a strong north northeast wind and heavy seas. His ships were wrecked on the coast below St. Augustine.

**September 8, 1854**

A severe Atlantic hurricane passed inland between Jacksonville and Savannah, but much nearer Savannah, where there was great destruction of property.

**September 8-11, 1878**

Northeast gales prevailed on these dates in connection with a hurricane in the Atlantic. Lowest barometer was 29.19 on the 11th, when the river backed up and came in the streets.

**August 27, 1881**

A hurricane from the Atlantic went in near Savannah causing great property loss and 335 deaths.

**August 27, 1893**

A hurricane in the Atlantic passed east of Jacksonville going in near Savannah. Jacksonville barometer was 29.04 inches. At Mayport 9 cottages blew down. All wires down and railroad traffic suspended.

Georgia and South Carolina coasts devastated. A tremendous wave submerged the islands near Savannah and Charleston; at least 1,000 lives lost; property damage \$10,000,000. The ravage at Charleston was reported as terrific, "Hundreds of corpses were strewn among farms, unknown except to the vultures which flocked about them. Whole families were wiped out in some places. The coroner has sworn in an army of deputies and these are hunting for the dead."

**October 12, 1893**

Not so much damage for Jacksonville, but Mayport suffered severely.

**September 22, 1894**

A storm came across the state entering the Atlantic near Daytona. Jacksonville barometer was 29.27, wind 41 m.p.h. The St. Johns River was 3 feet above normal at high tide. Brick work at the new Union Station was blown down. Damage in the city was placed between 30 and 40 thousand dollars. Great damage was done at Mayport, Pablo Beach and St. Augustine.

**October 9, 1894**

Winds up to 56 m.p.h.; barometer 29.29 inches.

**September 29, 1896**

A storm from the Gulf came across Columbia, Baker and Nassau counties, causing winds up to 76 m.p.h. in Jacksonville, the highest wind until DORA in 1964.

**October 2, 1898**

Hurricane center went inland near Brunswick. Ten million dollars damage; 179 drowned in Georgia. Fernandina tide was 10.8 feet.

**October 19, 1910**

This hurricane made a loop around the western end of Cuba, then headed north, passing about 30 miles west of Jacksonville. Lowest barometer was 29.09, wind 51 m.p.h. Much flooding was reported from a very high tide.

**September 18, 1928**

The great Palm Beach-Okeechobee storm passed just west of Jacksonville causing the lowest barometer on record for the city . . . 28.90 inches. Winds were 48 m.p.h. Damage to the city \$10,000; the county \$25,000. Trees were uprooted; much damage at the beach.

**September 4-5, 1933**

Little damage, except the wind drove the St. Johns River over bulkheads in Riverside up to two blocks from the river.

**October 19, 1944**

The center of a tropical storm moving northward passed a short distance west of Jacksonville. The lowest barometer was 28.94, the lowest on record for October. Forty-six mile an hour winds subsided from 12:30 P.M. to 4 P.M. due to a large eye which extended from near Jacksonville to Gainesville. Many large trees and branches were blown down; WJHP radio tower went down; some plate glass windows blown in. Tides were very high. Jacksonville area damage set between \$100-200,000. One life was lost by electrocution.

**September 18, 1945**

A tropical storm passed east of the city. Barometer 29.41; gusts at the airport to 60 m.p.h.; rainfall total 6.74 inches.

**October 8, 1946**

The center of a tropical storm passed west of the city. Barometer 29.21 inches; wind only 33 m.p.h. Some houseboats and small riverfront buildings were demolished.

**August 27, 1949**

A tropical storm from the Gulf passed west of the city causing considerable damage to trees, wires, etc. Barometer 29.58 inches; wind gusts to 85 m.p.h.

**September 6-7, 1950**

A tropical storm entered the coast near Cedar Key, moved south southeast on a curving path north of Lakeland to Clermont, Eustis, Camp Blanding and Glen St. Mary. Jacksonville barometer-29.47 inches; wind-52 m.p.h., rainfall-10.17 inches.

**October 18, 1950**

A hurricane which entered the coast at Miami passed between Jacksonville and Lake City. Jacksonville barometer-29.43 inches; wind-72 m.p.h. with gusts to 85 m.p.h.

This storm did more damage to Jacksonville and the surrounding area than any previous storm. Damage to Duval county placed at well over a million dollars, of which half a million was for the Beach municipalities. Public

utilities, telephone and electric wires suffered severely, many streets were washed out, much damage to trees and roofing.

### **September 10-11, 1960**

Hurricane DONNA came up the state moving into the Atlantic between Daytona Beach and St. Augustine. The center passed 45 miles southeast of Jacksonville about 8:20 A.M. Several large oaks were blown down in St. Augustine. Damage in Jacksonville mostly limited to billboards, poles, wires, and trees. There were four roofs reported lost by homes in the city. Approximately 100 homes showed minor damage. Highest winds were 67 m.p.h. at Jacksonville airport, 75 m.p.h. at Jacksonville Beach.

### **August 27-28, 1964**

Hurricane CLEO hit Miami with wind gusts to 135 m.p.h. causing millions of dollars of damage. This was the first hurricane to hit Miami since 1950.

CLEO moved up the state with the center remaining a few miles inland, causing the storm to lose most of her force before reaching northeast Florida. The eye passed over Jacksonville Beach shortly after noon of the 28th. Highest winds were 50 m.p.h. in gusts at Jacksonville Beach, 43 m.p.h. at Jacksonville airport.

### **September 9-10, 1964**

JACKSONVILLE'S FIRST FULL FORCE HURRICANE moved in from the Atlantic on the night of September 9. The eye passed over St. Augustine shortly after midnight followed by winds up to 125 m.p.h. from the southwest. The tide at Anastasia Island was 12 ft. above normal . . . 4 ft. higher than any others known. Jacksonville's highest sustained wind was 82 m.p.h. with gusts estimated to 85 m.p.h. Squall damage in some parts of the city gave evidence of 100 m.p.h. winds. The St. Johns River rose about 5 feet above normal, flooding many low sections of the city.

Damage to northeast Florida was estimated about 200 million dollars. The storm caused over 90% of the city to be without power, some sections going without electricity for over a week.

### **June 6, 1968**

Rainfall from tropical storm ABBY was 6.02 inches. Jacksonville Beach had a wind gust of 71 m.p.h. as the storm moved up the coast from Melbourne to southeast Georgia.

### **October 18-19, 1968**

Jacksonville Beach had a wind to 74 m.p.h. and a barometer of 29.34 inches as hurricane GLADYS crossed the Florida peninsula through Ocala and St. Augustine into the Atlantic.





## Questions about hurricanes

### **WHAT CAUSES HURRICANES?**

While all of the factors are not fully understood, heat and moisture, most abundant over tropical oceans between June and November, contribute most to the development of hurricanes. A failure of sufficient wind currents to carry the earth's surplus heat away from the tropical regions, causes a heat built-up which, when combined with a cyclonic inflow topped with an upper level outflow or "chimney effect", results in a hurricane.

### **WHY DO HURRICANES WEAKEN OVER LAND?**

As long as a hurricane is over warm ocean waters, heat is being added to the storm. Over land the rains produce a cool surface, and the lack of heat energy causes the storm to diminish.

### **WHAT IS THE DIFFERENCE BETWEEN A HURRICANE AND A TORNADO?**

A hurricane is an immense storm covering hundreds of miles and often lasting more than a week. A tornado is a small, localized windstorm, often only a few hundred yards wide, very destructive where it hits, but usually lasting less than an hour. Tornadoes have accompanied hurricanes when they pass over land.

### **WHAT MAKES HURRICANES SO UNPREDICTABLE?**

The hurricane "floats" in the atmosphere where there are many currents and cross-currents. In addition, there are varying forces changing or attempting to change these wind currents by the hour. Even weather disturbances on the other side of the world may affect the track of the storm, depending on their relation to the world-wide circulation pattern.

### **HOW MANY HURRICANES NORMALLY DEVELOP EACH YEAR?**

The average number of hurricanes in the Atlantic is eight a year. The Pacific Ocean averages twenty-eight. During the past 75 years, the most Atlantic storms in one year was 21 in 1933.

### **HOW SMALL CAN A HURRICANE BE?**

The severe hurricane which hit Miami in October 1950 had destructive winds in an area only 14 miles wide. One of the most violent hurricanes on record, the Labor Day storm of 1935, had fierce winds in an area only 40 miles in diameter. It killed 408 people in Florida.

### **WHAT IS THE HIGHEST WIND FROM A HURRICANE?**

The highest measured wind is 186 m.p.h. in the New England hurricane of 1938. Hurricane Camille's winds were estimated near 200 m.p.h. on the Mississippi coast in 1969.

### **WHAT IS THE LOWEST BAROMETER READING RECORDED?**

On September 2, 1935, the pressure dropped to 26.35 inches at Long Key, Florida. In the western Pacific, it dropped to 25.91 during hurricane Ida. For every inch drop in pressure, the atmosphere releases a force of 70 pounds off of each square foot of surface. The level of the ocean rises one foot for each inch drop in atmospheric pressure.

### **HOW FAST DOES A HURRICANE MOVE ALONG ITS TRACK?**

The forward progress of a hurricane may change at any time, causing a storm to sometimes hit several hours earlier than expected, or it may slow or stall so as to pose a threat for many hours or even days. The average speed of a hurricane is 12 m.p.h. This speed often increases as the storm moves out of tropical waters.

### **HOW MUCH RAINFALL ACCOMPANIES A HURRICANE?**

An average hurricane will drop from three to six inches of rain, but amounts may be much higher than these, depending on the forward progress of the storm. A slow moving or stationary storm may cause phenomenal rains.

### **DO HURRICANES PRODUCE TIDAL WAVES?**

The force of hurricane winds over large bodies of water, such as the ocean and lakes or rivers, causes changes in water level that are as sudden and devastating as a tidal wave. People who boast of remaining on the coastal property have rarely seen it; most of those who have, are not alive to relate it. The Gulf of Mexico rose 24.6 feet at Pass Christian, Mississippi with hurricane Camille with a death toll of only 143, due to timely warnings. In less fortunate years, 1,836 were killed in 1928 when Lake Okeechobee was swept over land; in 1900, 6,000 died when Galveston was submerged in the storm surge.

### **HOW CAN I KNOW WHERE THE CENTER OF THE STORM IS?**

Weather bulletins and advisories give the latest official word on the storms. When electrical power fails, battery powered radios are an essential. Official reports are constantly being up-dated as the progress of the storm is reported. Weather enthusiasts can tell something of the eye position by noting the wind direction and velocity and by observing the barometer. By remembering that winds blow counterclockwise around the eye of the storm and that the lowest barometer reading is in the eye, observation of these conditions give a clue to the latest position of the center of the storm.

### **HOW CAN I TELL IF I AM IN THE EYE OF A HURRICANE?**

High winds will subside to 10 m.p.h. or less and rains will cease. The air will be warm and muggy and the sky will brighten in the daytime, or stars may be seen at night. Within the next hour or so, and possibly within minutes, the full fury of the storm will return from another direction.

### **DOES A RISING BAROMETER MEAN THE STORM IS MOVING AWAY?**

Yes, but it may take many hours for winds to subside, depending on the size of the storm and other weather factors that may affect your area. A slow moving storm could double back, although this is usually unlikely.

### **WHAT CAUSES HURRICANES TO TURN AND MISS FLORIDA AND GEORGIA?**

Wind currents and atmospheric pressures are always changing- These changes affect the track of the hurricane, particularly when it reaches the western edge of the Bermuda high, just off the Florida east coast. If there is a front with an associated low pressure trough over the eastern U.S., the hurricane will tend to turn northward away from Florida.

### **WHY DO HURRICANES STALL OR BECOME ERRATIC?**

When hurricanes move into the region between the easterlies to the south and the westerlies to the north, they are easily blocked by large high pressure areas which settle off the middle Atlantic coast. The area between latitudes 25° and 32° is normally a region of high pressure with weak or variable steering currents.

### **WHY DO SOME HURRICANES MOVE SOUTHWARD?**

When a large high pressure area which blocks the northward movement intensifies, the hurricane can be forced southward, such as Betsy in the Bahamas in 1965. In 1969, five storms were forced southward during part of their track, three of which were dissipated by the cooler/drier air injected by the high pressure system.

### **CAN HURRICANES BE CONTROLLED BY SEEDING?**

This is a complex experiment being undertaken by Project Stormfury. An experiment with hurricane Debbie in 1969 showed a decrease of wind speed by 15 to 31% after seeding. If further repetition of this experiment achieves similar results, a major breakthrough in weather modification has been achieved.

### **HOW LONG DOES A HURRICANE LAST?**

As long as the storm remains over warm tropical waters, it may last for weeks. The average duration is nine days with a track of 3,000 miles. Some hurricanes have lasted for three weeks and traveled 10,000 miles. Hurricane Inga is the longest lived storm of record spending 25 days, from September 20 to October 14, 1969, inside a relatively small area with a radius of less than 700 miles.

### **ARE THERE HURRICANE CYCLES?**

Each hurricane season is different and depends largely on weather patterns and energy levels affecting the earth and atmosphere for that season. Looking at the averages over five to ten year periods, however, hurricanes were on the decrease from 1900 to 1920, followed by an increasing number of storms in the 1930's and 1940's. A decrease during the late 1950's was followed by a sharp increase in 1964 and again in 1969.

# Why the weather.

The cause of such things as wind, rain, warm and cold weather can be traced to the sun. The varying degrees of heat and its distribution around the globe causes the atmosphere to behave in such a way that some changes can be predicted. This is why we can usually forecast the weather.

## AIR MASSES

When air remains over a certain portion of the earth for a period of time, it acquires characteristics of that region; thus, a mass of air over polar or arctic areas becomes a COLD AIR MASS. Likewise, air over the sun-drenched tropics becomes a WARM AIR MASS.

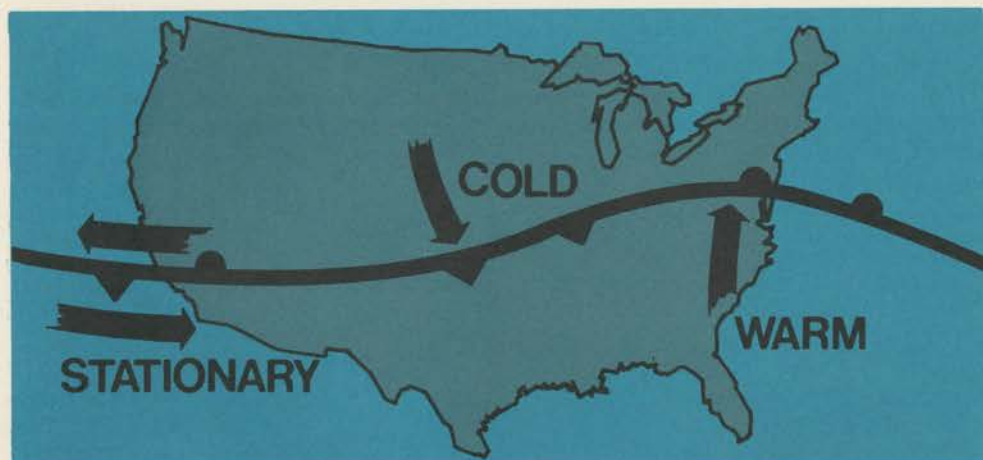


## JET STREAM

Where these air masses move is determined largely by a belt of winds which circles the earth at temperate latitudes called the "prevailing westerlies". In these westerlies are belts of high wind known as JET STREAMS. The jet stream is like a swift channel in a broad flowing river. These winds are often up to 200 m.p.h. and usually occur between 20,000 and 40,000 feet high.

The jet stream is strongest over the northern hemisphere in winter; in summer, it is farther north with lesser velocities. The temperature differential between the polar cold and the tropical heat is the force behind the jet stream.

When the prevailing westerlies dip southward, they usually cause cold outbreaks to occur; when they shift northward, a warm spell or heat wave may prevail.



## FRONTS

The line which separates cold air from warm air is called a FRONT. If the cold air is advancing, it is a COLD FRONT; if the warm air is advancing, it is a WARM FRONT; if neither air mass is moving, it is a STATIONARY FRONT.



## FOG

Fog is simply a cloud resting on the ground. It forms when the air cools down to its condensation temperature or DEW POINT. When this is caused by nighttime cooling, under clear skies with little or no wind, it is called RADIATION FOG because it is formed by radiational cooling. If it is only a few feet deep or in layers resting on the ground, this radiation fog is called GROUND FOG.

Fog also can form when warm moist air is cooled by passing over colder land or water. Since this is caused by movement of air, it is called ADVECTION FOG. When nearby coastal waters are colder than the dew point, a SEA FOG can drift in from the coast, sometimes during the afternoon.

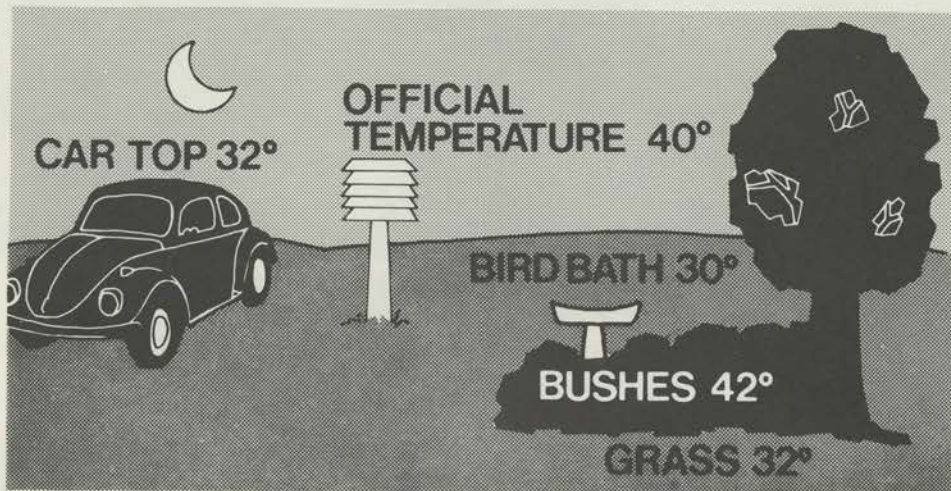
Many of our fogs are a combination of daytime seabreeze and nighttime cooling; thus, they are called ADVECTION-RADIATION FOGS.

Rain can sometimes cause fog by adding so much moisture to the air that it becomes saturated.



## FROST

Frost is formed when water vapor in the air freezes on objects, usually grass or vegetation. The temperature of the air (given in weather reports) may be above freezing, even as high as 40 degrees; but the object on which the frost forms is 32 degrees or colder.



Jacksonville has never had a winter without frost, as the following shows:

### FIRST FROST

Earliest date — October 17, 1901  
Average date — December 8  
Latest date — January 10, 1932

### LAST FROST

Earliest date — February 2, 1948  
Average date — February 16  
Latest date — April 10, 1916

## SNOW

Snow is similar to frost, except it forms in the air well above the freezing level. The snowflakes begin to melt if they fall below this level.

Snow is rare in north Florida and south Georgia because when snow is formed in the upper atmosphere, the lower atmosphere is usually too warm for the snow to reach the ground without melting. When temperatures in the lower atmosphere are cold enough, the upper atmosphere is usually clear and dry; thus, no snow.

Jacksonville has had snow covering the ground twice in the past 100 years. On February 13, 1899 nearly 2 inches (1.9) were on the ground; on the same date, February 13, in 1958 it was up to one and a half inches deep.

St. Augustine and the Crescent City area were blanketed with a two inch snowfall on February 2-3, 1951.

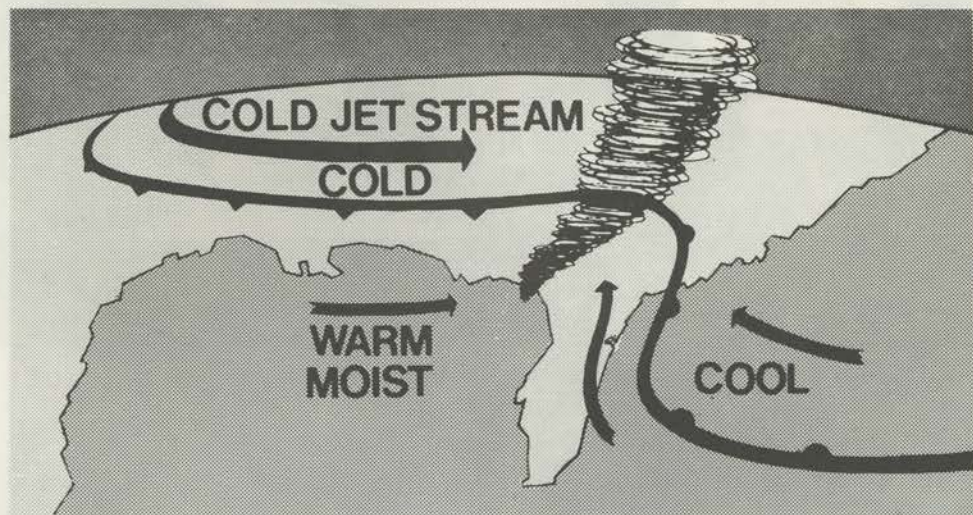
The heaviest snow ever measured in Florida was five inches on January 11, 1800 by surveyor Andrew Ellicott along the St. Marys River on the Georgia-Florida border.

A freak of nature caused a SNOWSTORM to extend over most of Florida in 1774, of which there is very little recorded. The inhabitants long afterwards spoke of it as an "extraordinary white rain."



## TORNADOES

Tornadoes are the most violent and destructive phenomena produced by the atmosphere. Winds have been estimated from 200 to 500 m.p.h. in these vicious whirlwinds. An extremely low pressure in the center of the tornado causes an explosive effect on buildings in its path.



Tornadoes sometimes develop in association with thunderstorms in the warm, humid air in advance of a cold front. There is often a high level jet stream shooting cold air into a region which has been dominated by warm air.

A TORNADO WATCH is issued when atmospheric conditions are such that a tornado can develop.

A TORNADO WARNING is put out when a tornado has been sighted.

Tornadoes are so isolated and strike so suddenly, often the first warning is a loud roaring of the wind, usually with thunder or lightning in the area. Since most Florida buildings don't have basements, the interior of a building, in a hall or under heavy furniture are places for cover should one strike.

Many are reported to hit mobile homes, but a number of these strikes are 50 to 100 m.p.h. wind squalls from thunderstorms that leave a trail of destruction similar to that of a tornado.

## SHOWERS AND THUNDERSHOWERS

Showers and thundershowers develop under certain conditions when warm, moist air is lifted in an atmospheric environment which is either "unstable" or "conditionally unstable".

When air is lifted, whether by daytime heating, or by the lifting action of converging winds or a front, heat is released when invisible water vapor condenses into visible water droplets we see as clouds. If this air continues to rise, and sufficient moisture is present, the cloud can extend high enough into the atmosphere to produce rain drops.



Rain drops are formed, in most cases, well above the freezing level where ice crystals begin to form. The super-cooled water droplets are attracted to the ice crystals, forming rain drops.

Over ocean waters, particularly in tropical regions, rain drops are formed without ice crystals. It is believed that salt, or some other particles, like dust, play a part in rain drop formation here.

High above the freezing level in larger showers or thundershowers, snow may be produced; but this usually melts long before reaching the ground as rain. In thundershowers that have intense updrafts, the mixture of rain and ice crystals (or snow) is carried upward and refrozen several times. When this "ice" becomes too heavy to remain aloft, it falls as HAIL.

## THUNDER

Thunder is the sound produced when a large spark of electricity ignites in the atmosphere. The flash that is seen is called LIGHTNING. Electricity within large shower clouds, between clouds, and between the ground and clouds will discharge when moisture in the insulating air and/or the difference in charges reach a point where the charges can no longer stay apart. The resulting spark, lightning, is seen almost instantly, but it takes five seconds for the sound, thunder, to travel one mile.

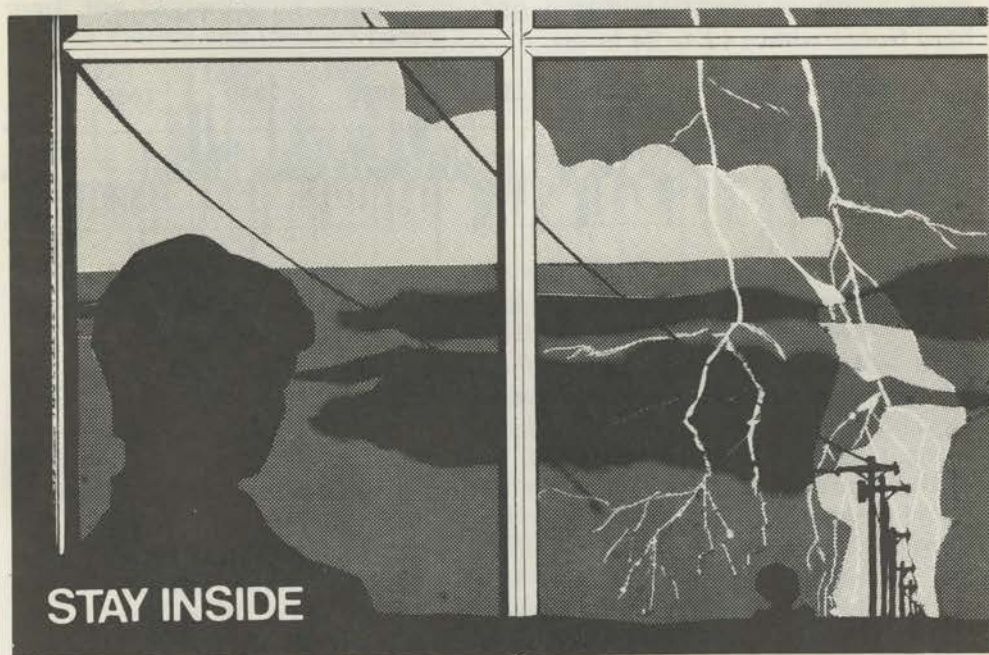
If thunder is heard 15 seconds after the lightning is seen, you know that the lightning struck three miles away.

More people are killed each year by lightning than by hurricanes and tornadoes. This is partly because lightning is much more common. It is also due to the fact that when a thundershower approaches, some people violate one of the following rules:

### WHEN LIGHTNING IS FLASHING—

1. Don't stand in an open field or on a golf course.
2. Don't stand under lone trees or on the edge of a group of trees.
3. Stay away from clothes lines, metal fences and small isolated buildings.
4. Get out of the water (pools, lakes, beaches).

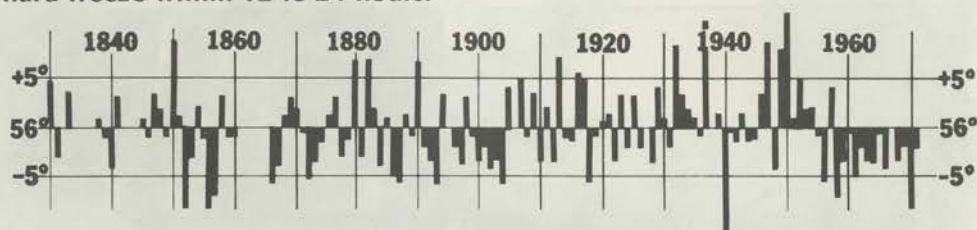
Inside a house or building, but not near electric appliances, is about as safe a place to be during a thunderstorm. Also, there is no record of ever being struck by lightning in a car.



# Weather events

are often used to identify periods of time, such as "after the flood", "the year of the big freeze", and "before the hurricane". Some local events, like ice storms, are so unusual they occur once in a lifetime. For this reason, many individuals are responsible for the following history of unusual weather. George Winterling continues the records which were started in the last century by T. Frederick Davis and were continued through the first half of the twentieth century by Walter J. Bennett.

**JANUARY** is often the coldest month of the year, although in mild winters it may resemble an early spring month. The hazard of a sudden freeze is great, as the arrival of blustery westerly winds may be the forerunner of a hard freeze within 12 to 24 hours.

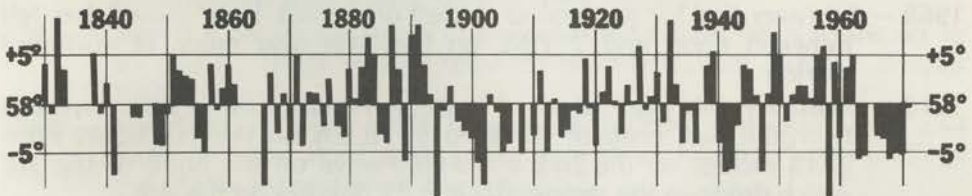


- 1800 — **January 11.** The heaviest Florida snow fell on this date. Five inches were measured along the St. Marys River.
- 1852 — **January 13.** Snow fell all morning accumulating a depth of one-half inch. Lowest temperature was 20 degrees.
- 1857 — **January 19.** Low temperature of 16 degrees was the coldest since 1835. On the 20th, a low of 18 formed ice up to 2 inches thick on ponds and along the margin of the river. Some people tried to skate.
- 1879 — **January 4.** The first ice storm in the history of Jacksonville. Sleet began at 7 P.M., turned to rain at 8:30 P.M., freezing as it fell. Freezing rain continued until 9:30 A.M. of the 5th as trees, wires, shrubs, etc. were covered with a thick coat of ice.
- 1915 — **January 3.** The Weather Bureau office in the Dyal-Upchurch Building (southeast corner of Bay and Main) burned. All of the instru-

ments and some of the records were lost.

- 1924 — January 6.** Jacksonville's highest barometer . . . 30.67 inches.
- 1935 — January 23.** A considerable amount of snow fell from 7:56 A.M. to 9:05 A.M. The air was full of snow, but it melted as it fell. Unquestionably the heaviest snow since February 1899.
- 1958 — January 8.** Today's high was only 35 degrees.
- 1959 — January 17.** A low of 23 degrees was followed by a high of 37.
- 1960 — January 21-26.** Six consecutive days with temperatures dropping to freezing or lower.
- 1962 — January 11-12.** Nearly 16 hours of freezing rain produced the city's worst glaze storm. Traffic was halted as bridges and overpasses iced over. Electrical power was disrupted in many places as wires snapped and transformers were shorted due to the ice.
- 1966 — January 30.** A low of 20 degrees was followed by a high of 33.
- 1970 — January 7-11.** Freezing temperatures 62-1/2 hours in a four-day period. Lows of 21 on the 8th, 19 on the 9th, and 21 on the 10th. The high of the 9th was only 35 degrees, as the temperature was above freezing only from 2 P.M. to 6 P.M. The citrus trees surprisingly not hard hit.

**FEBRUARY** has the distinction of being Jacksonville's "snowiest" month, and also the month in which the coldest temperature of the year was recorded. It is during this month that the occasional advance of tropical air from the south may clash with the wintery air masses over the continent, resulting in Gulf disturbances that on rare occasion develop snow, but more frequently mark the beginning of windstorms and possible tornado conditions over parts of Florida and the Gulf coast.



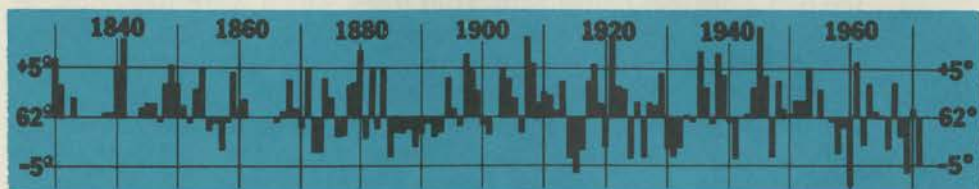
- 1835 — February 8.** A most severe freeze in Florida. Fort King (near Ocala) reported 11 degrees with snow. Jacksonville had 8 degrees. The St. Johns River froze several yards from shore. All fruit trees were killed to the ground, and many never started again.
- 1895 — February 7-10.** A severe freeze with a low of 14 on the 8th and 19 on the 9th. Ice formed in the St. Johns River 8 feet from shore.
- 1899 — February 12-15.** This was the "Big Freeze". The low of 10 degrees in Jacksonville on the 13th is the coldest day since 1835. Tallahassee had 2 degrees below zero. Fruit trees, which were beginning to recover from the freeze of 1895, were killed. This freeze marked the end of growing citrus on the commercial scale in Jacksonville, except where protected to the north and west by the river.

On the 13th, the temperature was below freezing all day with a high of only 27 degrees. Rain on the evening of the 12th changed to sleet, then snow, ceasing before sunrise on the 13th. At 7 A.M.

the ground had a 1.9 inch cover of snow, the heaviest ever recorded for Jacksonville. In some places it remained for days.

- 1903 — February 16.** Wind gust of 76 m.p.h. was the highest wind outside of the hurricane season.
- 1920 — February 1-2.** A heavy 4.16 inch rain flooded streets and caused much damage to the northeast Florida potato crop.
- 1943 — February 6.** A small tornado downed trees and fences along with an open air theatre in a business section five miles east southeast of downtown Jacksonville.
- 1951 — February 2-3.** Two inch snowfall in the St. Augustine-Crescent City area.
- 1958 — February** was a bitter month with 13 days of minimum temperatures of freezing or below, seven of them consecutively. Six days did not have a reading above 45 degrees.  
On the 13th, one and a half inches of snow fell on the anniversary of the 1899 snow.
- 1960 — February 25.** A tornado struck near Lake City, another north of Jacksonville. Seven or eight homes were damaged northeast of Imeson airport as the tornado skipped along a path three miles long.
- 1963 — February 3-5.** Damage of about one million dollars to northeast Florida beaches by a northeaster.
- 1964 — February** combined with January makes the wettest winter on record. Rainfall 17.44 inches. The New Orleans Sugar Bowl had snow on the ground.
- 1967 — February 26.** Coldest outbreak of the winter. Low of 22 degrees was the coldest so late in the season.
- 1968 — February** tied for the second coldest on record. Light snowflakes fell between noon and 2 P.M. on the 24th over much of northeast Florida.
- 1970 — February 1-4.** High winds—Flooding—Freeze. Low pressure systems from the Gulf brought winds to 54 m.p.h. on the 1st, heavy rains (6.15 inches) on the 2nd, and a cold wave on the night of the 3rd which dropped the temperature to 23 degrees on the 4th.

**MARCH** is the month of changeable weather. Rapid moving masses of warm and cold air, the shifting, development, or dissipation of weather systems with sudden changes between rising and sinking currents of air make this month's weather among the most unpredictable of the year. For the fisherman, the winds are a problem; and for the farmer, there may be no more freezing temperatures . . . but the danger still exists until the end of the month. Damaging windstorms and a few tornadoes have struck on occasion during one of this month's more violent changes.



- 1872 — March 10.** Shortly after midnight, a violent wind and rain storm passed over the city, accompanied by a tornado whose path varied from three quarters of a mile to a mile in width and whose length extended from a point near Panama Road to the St. Johns River. Buildings were demolished and some stock was killed.
- 1907 — March 21-24.** Unseasonably warm weather with temperatures reaching 90 degrees or higher for four consecutive days saw a high of 91 on the 24th for the highest March temperature on record for Jacksonville.
- 1924 — March 19-20.** A heavy rain of 3.25 inches in 16 hours caused heavy damage to local bridges and streets.
- 1926 — March 14.** The minimum of 28 degrees on this date was the lowest for the whole year, causing heavy damage to tender vegetation and corn, melons, strawberries, peas, etc.
- 1927 — March 24.** The beginning of a 72-day dry spell of only .37 inches of rain from March 24 to June 4.
- 1931 — March 28.** Winds up to 65 m.p.h. blew the yacht, Beryl, from moorings against the docks, demolishing the docks, boat slips, and the yacht.
- 1932 — March 6.** Winds of over 50 m.p.h. blew two large freighters aground at Commodore Point. The barometer of 29.05 inches is the lowest for Jacksonville outside of the hurricane season.  
**March 10.** Low temperature of 26 was the coldest reading for the year and for the winter of 1931-32.
- 1939 — March 30.** A small tornado struck Dinsmore. The path of the tornado was 11 miles long and 100 yards wide at the widest point. Four persons were killed; several were injured.
- 1943 — March 6.** A severe squall line crossed the county with winds up to 65 m.p.h. Thirty people required hospitalization; damage around \$500,000.
- 1948 — March 31.** A heavy squall hit parts of the city, damaging roofs and toppling trees along a two-mile path three hundred yards wide in the southwest section of the city.
- 1964 — March 31.** Thirty-two degree temperature was the latest freezing temperature on record for Jacksonville. The sudden change killed many viburnum bushes.
- 1967 — March 10-15.** A six-day heat wave, just two weeks after a hard freeze, brought 4 daily record high temperatures. The hottest was 91 on the 12th.
- 1970 — March 7.** Total solar eclipse passed within 40 miles northwest of Jacksonville. The city's 98 percent eclipse was mostly obscured by thickening clouds.

**APRIL is not the month of "April showers" in this part of the country. This is the time of rising temperatures, longer days, and less frequent rains which often cause dry spells. When the rains do come, however, they may be extremely heavy, sometimes accompanied by high winds and hail. While occasional cool snaps of April may cause chilly nights, the strong sunshine causes most days to be rather mild.**

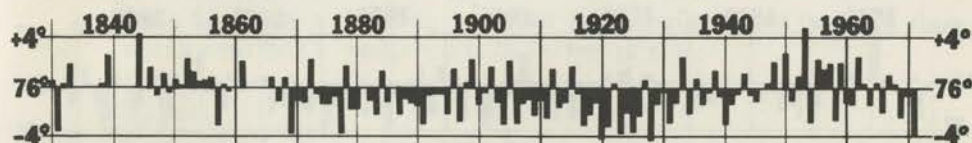




- 1828 — **April 6.** Heavy frost. The temperature at Picolata on the St. Johns (23 miles south of Jacksonville) was 28 degrees. The Army post at St. Augustine had 30.
- 1884 — **April 2.** High winds blew the river steamer, Seminole, ashore at Grassy Point. Considerable damage to roofing around Jacksonville.
- 1907 — **April 18.** A heavy hail storm dropped stones of varied shapes and sizes, ranging from 1/2 to 1 inch. The hail accumulated several inches deep with drifts as high as 6 inches. Hundreds of window panes were broken, foliage whipped to shreds. Persons exposed to the storm suffered lacerated faces, heads, and hands. A tugboat was sunk, the captain drowned; a man was blown from a pile driver and drowned. On the Southside, the storm seemed tornadic.
- 1916 — **April 10.** Morton's farm, a few miles west of the city reported a low of 32 with a killing frost.
- 1918 — **April 2.** Hailstones up to 1/2 inch in diameter piled as high as three inches deep in a few places.
- 1929 — **April 15.** During high winds up to 54 m.p.h., the Methodist church in Murray Hill was razed; damage—\$6,500.
- 1935 — **April 12.** One of the duststorms of the '30's reduced Jacksonville visibility to one and a half miles.
- 1958 — **April 10.** Heavy rain, accompanied by hail, dumped 3.83 inches of rain during early morning.
- 1961 — **April 9.** Sunday afternoon thunderstorms swept over Duval County, spawning a tornado over the lower Jacksonville Beach area. Damage was confined to mostly trees, fences, and a few homes.
- 1967 — **Hot April.** Four record high temperatures. Highest temperature 94 degrees on the 18th. This month tied with April 1947 for the hottest April since 1908.
- 1968 — **Second** consecutive hot April. Ties with April 1967 and April 1947 for the hottest April since 1908. Highest temperature 95 degrees on the 21st.
- 1969 — **Driest April** since 1942. Rainfall only .35 inches.
- 1971 — **April 30.** The day that night fell at 10:30 A.M. A front near the city and thunderstorms with hail one to two inches in diameter in north Jacksonville plunged the city into such darkness that street lights, signs, and inside lights all had to be turned on. A tornado warning was placed in effect as radar indicated a possible twister northwest of the city. There was no tornado, no high wind . . . as daylight slowly returned about thirty minutes later.

**MAY** is the month which begins to see some hot days in the 90's. The sea-breeze along the coast provides a pleasant relief on the hotter days, since the coastal waters still retain much of the coolness of the preceding months.

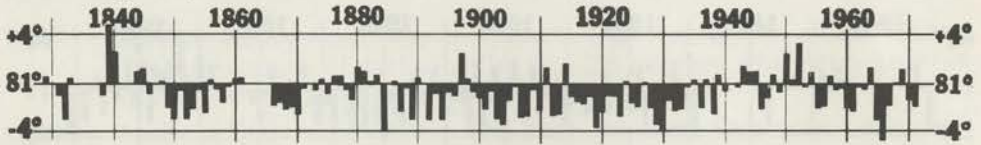
Showers are about as infrequent as in April, and the higher temperatures increase the evaporation from the soil, often causing plants and grass to suffer great stress. On the other hand, May has sometimes brought very heavy rains, with most of the month's rainfall deposited on but two or three days.



- 1901 — **May 3.** This was the date of the great fire which destroyed nearly the whole city. The Astor Building, in which the Weather Bureau was located, was one of the few buildings to escape the fire.
- 1903 — **May 12-13.** Nine inches of rain flooded all low places in the city. From Broad Street to the Union Depot and throughout the railroad yards was a lake, caused by the overflow of McCoys Creek. Springfield Park, the Waterworks and Electric Plant were flooded.
- 1906 — **May 21-25.** During these five days, 12.90 inches of rain fell.
- 1929 — **May 2.** A severe windstorm seemed tornadic in the Jacksonville Heights-Ortega section. Several houses were unroofed; large oaks were uprooted. One man was killed. The track of the storm was two miles long and about 400 yards wide.
- 1948 — **May 28.** A severe thundersquall struck the city. Winds at the Naval Air Station reached 64 m.p.h. A motor court in north Jacksonville was damaged, and twenty-five transformers were knocked out by lightning.
- 1952 — **May 11.** Heavy thunderstorms caused county-wide damage. There was much damage at Craig Field where a few tornadoes were seen. Four hundred telephones were knocked out of service. WMBR-TV, now WJXT, was off the air for nearly seven hours. Three women were hurt in the Riverside Baptist Church from a glass window that blew in, and a train was stopped by a tree across the tracks.
- 1959 — **May 20-21.** Torrential rains submerged low sections of Jacksonville. Up to fifteen inches fell on the Southside. Hogans Creek, near the State Board of Health, flooded to car tops. Some roads and bridges were washed out. There was very little rain reported at Waycross and St. Augustine.
- 1962 — **May 20-28.** A nine-day heat wave began with 99 degrees on the 20th, the hottest temperature so early in the season (until 1967).
- 1964 — **May 2.** Up to seven inches of rain fell in northwest Clay County, causing the flooding of Black Creek around Middleburg.
- 1967 — **May 13.** The temperature hit 100 degrees for the first time since August 7, 1956.
- 1969 — **May 15.** A severe thunderstorm dropped 2.18 inches of rain at Imeson airport, moved southward producing hail to near baseball size around Arlington, and produced wind gusts to 55 m.p.h. at WJXT.

**JUNE** marks the beginning of the summer shower season. June's rainfall is

nearly twice that of May, as thundershowers may be expected, on the average, one out of three days. Occasional cold fronts during this month have little effect on daytime temperatures, but bring drier and more comfortable conditions. Nighttime temperatures are not yet oppressive on most nights, as readings may still lower to the middle or upper 60's.



- 1885 — **June 10.** Very heavy rains totalling 5.11 inches in less than five hours.
- 1919 — **June 29-30.** Water stood two feet deep on Bay Street, covering the floor of Union Station, as a result of a 7.66 inch rainfall. Streetcar service was abandoned on several lines.
- 1924 — **June 11.** Lightning from a severe thunderstorm struck the Masonic Temple, breaking windows in adjacent buildings.  
**June 23.** Lightning killed a man on a pier off Talleyrand Avenue and injured two others.
- 1945 — **June 24, 26.** Rain in connection with a tropical storm passing into the Atlantic just north of Daytona Beach dropped 4.69 inches of rain on Jacksonville; but two days later on the 26th, a violent thundersquall did more damage than the tropical storm.
- 1949 — **June 8.** Hail covered the ground on the Southside at Lovegrove Road (University Blvd. W.).
- 1950 — **June 27.** Hottest June day on record. Downtown was 102 degrees; the airport had 103.
- 1954 — **June 25-July 4.** One of the hottest spells on record began with 97 degrees on the 25th, reaching 101 on the 27th, and 103 on the 28th. Daily highs continued 97 degrees or higher each day through the 4th of July.
- 1957 — **June 8-9.** Rain over Northern Florida was accompanied by nine tornadoes or windstorms, due to a tropical disturbance in the Gulf. Two tornadoes touched down in Duval County, one in the Springfield section of Jacksonville.
- 1960 — **June 11.** The coldest June temperature since 1913 . . . 57 degrees.
- 1961 — **June 30.** A hailstorm extended from the southwest sections of Jacksonville into northwestern sections of the city, hailstones ranging from one to two and a half inches in diameter. High winds caused about \$20,000 damage to homes in the southwest section.
- 1964 — **June 6.** A severe windstorm, classified as a tornado, caused damage in excess of \$300,000 in southwest Jacksonville, from the Normandy section through Hyde Grove toward Avondale. Many large trees were snapped and uprooted; one WPDQ radio tower was toppled by the high winds, estimated up to 125 m.p.h.
- 1966 — **The coolest** June on record. Low temperatures were 56 on the 2nd and 57 on the 3rd, while only four days during the month reached 90 degrees.

**1967** — **The wettest** June in 30 years. Total rainfall 12.84 inches. Southside streets were swamped with nearly six inches on the 15, while on the 30th the airport had wind gusts of 67 m.p.h. A waterspout was sighted off New Berlin Road.

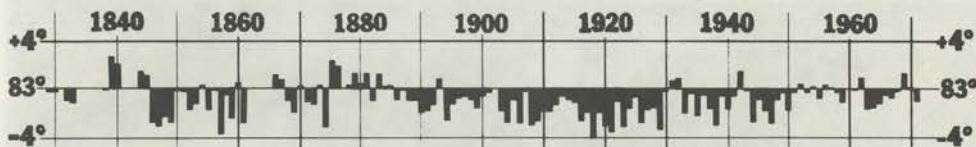
**1968** — **June 6.** Tropical storm Abby moved up the coast.

**June 12.** Severe flooding in south Jacksonville from evening thunderstorms. WJXT measured 6.75 inches of rain.

**1969** — **The hottest** June since 1952. Highest temperature was 97 on the 25th.

**1970** — **June 18-23.** A six-day heat wave with 99 degrees on the 19th, 20th, and 22nd.

**JULY is normally the hottest and wettest month of the year. Wind patterns of the upper atmosphere may cause dry scorching heat for a week or longer, or may draw enormous amounts of heat and moisture skyward to produce severe electrical storms and locally heavy rains. While these are the extremes that may occur during the month, most days are a lesser combination of summer heat and scattered afternoon or evening thundershowers.**



**1875** — **A hot July** which saw the temperature reach 90 degrees or higher on every day of the month and 100 degrees or higher on five days. The mercury reached 100 on the 19th, 101 on the 20th, 100 on the 21st, 101 on the 25th and 100 on the 29th. This was the driest July on record with a total of only .14 inches of rain.

**1879** — **July 8-13.** A heat wave lasting six days that caused the highest temperature for Jacksonville (until 1942). All six days saw readings of 100 degrees or higher—the hottest day, the 11th with 104 degrees.

**1896** — **July 20-August 19.** Thirty-one consecutive days with temperatures of 90 or higher.

**1917** — **July 27.** A severe electrical storm and heavy rain caused \$8,000 damage to the Miller Piano Company and collapsed the roof of the Savoy Theatre at Main and Forsyth Streets.

**1924** — **July 25.** Lightning struck the sulfuric acid plant of the Armour Fertilizer Company on Talleyrand Avenue, causing \$200,000 damage.

**1927** — **July 27.** Lightning shattered the cupola of the Main Street Baptist Church.

**1937** — **July 28.** Lightning killed two men and injured nine at the Municipal docks.

**1942** — **July 21.** The highest temperature ever recorded in Jacksonville—105 degrees at Imeson Airport. Downtown reported 102. This was the hottest July since 1881.

**1957** — **July 9.** A small tornado or waterspout developed over Ribault River in the Lake Forest section.

**1959** — **July 12.** A "waterspout" formed about three blocks inland from Jacksonville Beach, reportedly lifted a three-year-old boy about a

foot off the ground until he was pulled down by two men. The "waterspout" then moved a few hundred yards offshore, remaining nearly stationary for about a half hour.

**1965 — July** rainfall. An example of rainfall variation. The driest July in 34 years at Imeson Airport with only 2.71 inches of rain, while downtown had a wet monthly total of 9.05 inches. Rain at the Beaches totalled 8.40 inches.

**1969 — July 1-14.** A heat wave with 95 degrees or higher on 11 out of 14 days. Hottest was 100 degrees on July 6.

**1971 — July 20.** High winds struck Deerwood Country Club, knocking down 35 to 40 trees and a tennis court fence.

**AUGUST** is almost identical to July, as far as the averages go. It is during this month, however, that the humidity is highest and the summer heat can be very oppressive. While the hurricane season officially begins in June, it is during the last week in this month that hurricanes in the tropics can become more active and pose a more serious threat to the Gulf and Atlantic states.



**1859 — August 28.** The Aurora Borealis (northern lights) were plainly visible during early evening.

**1886 — August 31.** This was the date of the Great Charleston Earthquake. Shocks were felt in Jacksonville from 8:52 P.M. to 9:03 P.M. Windows, doors, and furniture rattled. The earthquake caused much excitement and was noted over a large part of the state.

**1894 — August 20-21.** An unusually severe and long thunderstorm began on the evening of the 20th and ended during early morning of the 21st. Many trees were struck by lightning, but damage was small, except to the Standard Oil storehouse on the river in Riverside, which burned at a loss of \$16,000.

**1937 — August 13.** Lightning struck the Lutheran Church at Post and Cherry Streets.

**1946 — August 5.** Lightning struck the tanker, Homestead, at the Standard Oil dock. The ship was almost completely destroyed with a cargo loss of near four million dollars. Three men were killed, thirty injured.

**1954 — August 17.** Highest August temperature on record—102 degrees.

**1961 — August 22.** A locally heavy downpour flooded the Sandalwood subdivision.

**1962 — August 23.** Numerous waterspouts were sighted along the Jacksonville Beaches.

**1964 — August 28.** The eye of a weakened hurricane, Cleo, passed over St. Augustine, Jacksonville Beach, and Fernandina, moving northward along the coast.

**1968 — August 29.** A tornado hit Ponte Vedra from the ocean, unroofing

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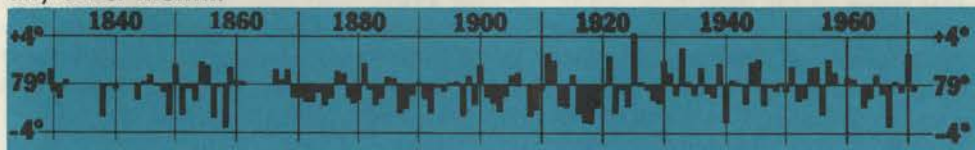
several homes.

**1969 — August 22-23.** Rainfalls of 12.31 inches and 12.95 inches hit St. Simons Island, Georgia and the Sans Souci section of Jacksonville respectively on a slow moving east-west cold front. A disturbance on the front was named tropical storm Eve off Daytona Beach on the 23rd.

**1970 — August 16.** A waterspout was sighted around 11 A.M. over the St. Johns River from Arlington.

**August 19.** Windstorm or small tornado in Cedar Hills at Eudine Drive.

**SEPTEMBER** is the month of hurricanes. While Jacksonville is in a position that causes most storms to pass over land and weaken before reaching the city, a blow from the east, such as hurricane Dora, can be extremely devastating. Although Dora caused Jacksonville's highest sustained wind on record, the hurricane slowed and weakened slightly before landfall, which means that this area is not immune to hurricanes more severe than Dora. September is also characterized by occasional northeasters, warm humid days and nights, and unsettled showery weather. It has less sunshine than any other month.



**1565 — And other dates.** See HURRICANES AFFECTING NORTHEAST FLORIDA

**1859 — September 2.** Brilliant Aurora during the evening and night illuminated the entire heavens. Some imagined that the end of the world was at hand.

**1871 — September 11.** The Army Signal Service opened an office in the Jacksonville Masonic Hall to take weather observations.

**1882 — September 10.** A tornado at Darbyville (30 miles west of Jacksonville) destroyed several buildings, killed one man, and injured several others. A number of cattle and hogs were killed.

**1884 — September 15-18.** Unusually high tides in the St. Johns River did considerable damage. Wharves were flooded, freight damaged, and the well supplying the city water was flooded.

**1885 — September 26.** A heavy 6.20 inch rain washed out parts of the railroad and flooded Bay Street stores. Rains on the 27th and 28th brought the September total to 16.93 inches.

**1889 — September 23.** A severe thunderstorm produced rain and a tornadic wind which unroofed the Murray Hall Hotel and killed one man.

**1908 — September 9-11.** Three days of rain brought a total of 12.79 inches.

**1937 — September 30-October 1.** Heavy rains and high tides inundated parts of Atlantic Blvd., said to be the highest water in 34 years.

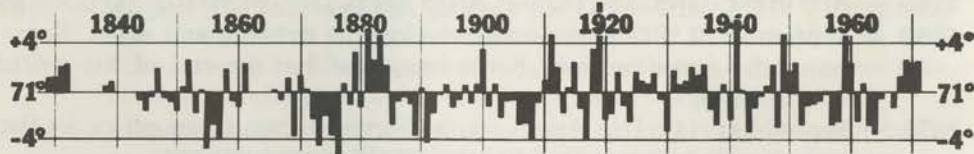
**1945 — September 4.** Heaviest one hour rainfall on record for September—3.10 inches.

**1947 — September 26-29.** A severe northeaster at the beaches washed out long stretches of seawall, carried out beach sand, and undermined

several homes. Damage was about \$500,000.

- 1949 — September 24-25.** Heavy rains caused flooding. Worst was in Murray Hill. Twenty-four hour rainfall was 10.13 inches.
- 1950 — September 5-6.** The Cedar Key Hurricane dropped as much as ten inches of rain on parts of the city.
- 1961 — September-December.** The driest fall on record. Total rain during the four month period was only 2.65 inches.
- 1964 — September 9-10.** Jacksonville's worst hurricane . . . Dora.
- 1965 — September 27-28.** The wettest September since 1950 with over five inches of rain on the 27th and 28th.
- 1968 — September 7.** Tornado at Orange Park caused mostly tree damage.
- September 8.** Small tornado reported at Whitehouse.
- 1970 — The warmest** September since 1933.
- 1971 — September 6.** Labor Day. Waterspouts off the St. Johns River Jetties around 1:45 P.M.

**OCTOBER** is a month which brings cold weather to the northern states, but seasonably mild temperatures continue in northeast Florida until about the last week in the month, when the season's first cold snap often arrives. The last hurricanes of the season usually move over tropical waters during this month, and if Jacksonville were to have a tropical storm, it would most likely come out of the Gulf of Mexico. Stagnant fronts and disturbances in a moist easterly flow of air sometimes produce heavy rains, but this month is moving toward the driest month of the year.



- 1880 — October 8-10.** A torrential rain totalled 8.15 inches in three days.
- 1886 — October 22.** An earthquake shock was felt throughout the city at 4:24 A.M. lasting 15 seconds and strong enough to rattle dishes and windows.
- 1890 — October 1.** Five inches of rain fell between 5 P.M. and 7:30 P.M.
- 1933 — October 23-24.** Heavy rains dumped a total of 6.48 inches with 3.22 falling in one hour.
- 1938 — October 23-24.** Another heavy rain total of 5.79 inches in twenty-four hours.
- 1941 — October 19-21.** Over five inches of rain fell in 24 hours, bringing a 48 hour total of 7.40 inches.
- 1947 — October 7.** A tornado struck north Jacksonville about 8 P.M. moving south to north. The path was three quarters of a mile long and 50 to 150 yards wide. It damaged several roofs and a trailer camp. Ten people were injured; total damage around \$100,000.
- 1947 — October 24.** Twenty-four hour rainfall total was 4.69 inches.
- 1954 — October 31-November 4.** One of the earliest cold waves on record for Jacksonville. The low on the 31st was 39, followed by a low of



29 degrees on November 3.

- 1968 — October 18-19.** Hurricane Gladys passed into the Atlantic after crossing the Florida peninsula. Winds from Jacksonville to Palatka reached 65 m.p.h. in gusts.
- 1969 — October 31-November 1.** Halloween night dumped 5.44 inches of rain on Jacksonville while an all-time record twenty-two inches submerged Fernandina and parts of Nassau County. Many schools were closed and roads blocked.
- 1970 — October 16.** Over four inches of rain fell in one hour in the city of Jacksonville, closing the Riverside expressway for several hours. The Times Union measured 8 inches of rain. Hailstones up to three quarters of an inch in diameter fell.

**NOVEMBER is normally the driest month of the year. The first freezing temperature of the winter sometimes occurs in this month. Pleasant temperatures are usually experienced during many days this month, but occasional cold snaps require furnaces to be turned on several times during the month. Cold fronts pass into central or southern Florida and become stationary. This produces overcast conditions, and sometimes northeasters, along the east coast. Rainfall accumulations are not as much as in previous months, since cool air does not hold as much moisture as warm air.**

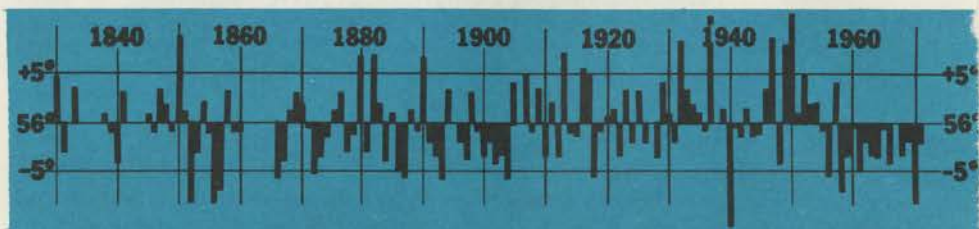


- 1888 — November 25.** Prayers for a killing frost were answered, signaling the end of Jacksonville's Yellow Fever Epidemic of 1888.
- 1906 — The driest** November on record until 1970 with only .01 inches of rain.
- 1932 — November 27-29.** A three-day northeaster eroded 3 to 5 feet of sand from the beaches, advancing the ocean some 60 to 75 feet. Bulkheads, docks, and some cottages on the oceanfront were wrecked. Damage was placed around a half million dollars. Tides were reported the highest in 30 years.
- 1940 — November 16.** A minimum of 22 degrees with a killing frost was the lowest temperature for so early in the season. The next day saw another record low—23 degrees.
- 1950 — November 25-26.** The coldest Thanksgiving! Lowest temperatures were 23 on the 25th, and 27 on the 26th.
- 1962 — November 29-December 1.** A severe northeaster caused about two million dollars damage to Jacksonville Beach and the northeast Florida coast.
- 1966 — November 4.** The second earliest freeze on record. There was frost and one hour of freezing temperatures in west and north Jacksonville.
- 1970 — The driest** November on record and the coldest November since 1901. Only a trace of rainfall recorded during the entire month;

the monthly temperature averaged 57.7.

**November 24-25.** A severe freeze. The coldest ever in November with lows of 25 on the 24th, and 21 on the 25th. There was much damage to tender plants and citrus because of unseasonably warm temperatures in September and October.

**DECEMBER** brings some of the coldest weather of the year, but like January, it may be as mild as any early spring month. During normal winters, a few days of mild weather are experienced between cold snaps.



- 1868 — December 25.** A hard freeze destroyed much fruit; young trees were frozen to the ground. This was the coldest Christmas on record—20 degrees.
- 1870 — December 24.** A severe freeze with a low of 19 degrees.
- 1876 — December 1-6.** Low temperatures were in the 20's for six consecutive days, the lowest being 24 degrees on the 3rd.
- 1894 — December 28-30.** This cold wave brought a low of 14 degrees on the 29th, and 21 on the 30th. This was the coldest outbreak since 1835.
- 1917 — December 30-31.** A cold wave on these dates produced lows of 21 on the 30th, and 19 on the 31st. The cold wave continued into January with minimums in the 20's through January 4.
- 1925 — December 1-2.** A storm of tropical origin passed east of Jacksonville, dumping 3.44 inches of rain and causing winds gusts to 50 m.p.h.
- 1927 — December 17-23.** A seven-day cold wave. The coldest night was 27 degrees on the official thermometer atop the Graham (Florida Title) Building. It was colder in the suburbs.
- 1934 — December 7-15.** A cold spell of nine days duration caused the temperature to average eleven degrees below normal for this period.
- 1957 — December 13.** The lowest temperature since January 1940 was recorded on this date—7.3 degrees.
- 1962 — December 13.** The most severe freeze since 1899 extended into south Florida. Many camphor trees and Australian pines were killed. Low temperatures were: Jacksonville—12 degrees; Gainesville and Ocala—14; Sanford and Tampa—19; Orlando—20; Fort Myers—25; Miami—35.
- 1970 — A drought** brought only .90 inches of rain during the 59 day period ending December 28.
- 1971 — The warmest** December since 1931. The temperature averaged 64.4 degrees, which was more than eight degrees above normal.

## AVERAGES AND EXTREMES FOR JACKSONVILLE, FLORIDA \*

TEMPERATURE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Average month	55.9	57.5	62.2	68.7	75.8	80.8	82.6	82.3	79.4	71.0	61.7	56.1	69.5
Warmest month	67.5	66.9	71.3	73.8	80.7	86.0	85.5	84.8	83.2	78.6	69.2	64.6	86.0
Year	1937	1832	1945	1908	1953	1839	1839	1954	1925	1919	1948	1829	1839
Coldest month	45.5	47.6	55.4	63.2	71.9	75.8	79.0	78.8	75.5	66.2	55.4	48.4	45.5
Year	1940	1895	1960	1901	1920	1966	1918	1922	1858	1873	1848	1917	1940
Average Day High	67	69	73	80	86	91	92	91	88	80	72	67	79.6
Record High	85	88	91	95	100	103	105	102	100	96	87	84	105
Average Day Low	45	47	51	58	65	71	73	73	71	62	51	46	59.4
Record Low	15	8	25	34	46	54	64	64	49	37	21	12	8
Days 32° or lower	4	3	1	0	0	0	0	0	0	0	1	3	12
Days 90° or higher	0	0	0	2	10	17	24	21	10	1	0	0	85
<b>RAINFALL</b>													
Average month	2.45	2.91	3.49	3.55	3.47	6.33	7.68	6.85	7.56	5.16	1.69	2.22	53.36
Wettest month	9.12	9.16	12.52	9.74	14.80	23.32	16.21	16.55	21.79	16.25	7.85	7.76	23.32
Year	1881	1920	1948	1944	1903	1932	1960	1953	1908	1880	1947	1885	1932
Driest month	.01	.13	.12	.11	.09	1.25	.14	.76	.07	.08	Trace	Trace	Trace
Year	1950	1911	1945	1892	1927	1879	1875	1930	1931	1909	1970	1889	1889/ 1970
Wettest 24 hours	3.43	6.22	7.12	4.88	9.06	7.66	10.09	7.93	10.17	9.62	5.44	4.97	10.17
<b>RELATIVE HUMIDITY</b>													
Average month	76	72	70	70	70	75	77	79	78	78	77	77	75
<b>WIND</b>													
Average speed	9	10	10	10	9	9	8	8	9	9	9	8	9
Prevailing direction	NW	WSW	NW	SE	WSW	SW	SW	SW	NE	NE	NW	NW	NW
Highest recorded **	51	76	66	54	57	59	53	51	82	72	60	62	82

\* From records of Judge F. Bethune and Dr. A.S. Baldwin for the period 1829-1871, and Army Signal Service and U.S. Weather Bureau (now National Weather Service) for the period 1871-1971.

\*\* Highest sustained wind, not wind gust.



# WEATHER MAP.

PUBLISHED BY AUTHORITY OF THE SECRETARY OF AGRICULTURE

WILLIS L. MOORE, Chief U. S. Weather Bureau.



### EXPLANATORY NOTES

(Illustrations taken at 5 a. m. except this morning time, all pressures reduced to sea level.)  
 Isotherms of continuous lines, pass through points of equal air temperature.  
 Isobars of dotted lines, pass through points of equal barometric pressure.  
 Symbols indicate state of weather: ☉ clear; ☁ partly cloudy; ☁☁ cloudy; ☁☁☁ storm; ☁☁☁☁ heavy storm; ☁☁☁☁☁ heavy storm with rain; ☁☁☁☁☁☁ heavy storm with rain and hail; ☁☁☁☁☁☁☁ heavy storm with rain and hail and snow; ☁☁☁☁☁☁☁☁ heavy storm with rain and hail and snow and sleet.  
 "P" in table, indicates amount too small to measure.

### U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

JACKSONVILLE, FRIDAY, FEB. 23, 1900.  
 ASTOR BUILDING TELEPHONE 206.

WASHINGTON FORECAST TIME 3 P.M.,  
 SATURDAY:

#### EASTERN FLORIDA:

Fair tonight with rising temperature. Variable winds shifting to fresh south, Saturday fair.

#### WESTERN FLORIDA:

Cloudy and warmer tonight. Rain and colder Saturday. Increasing south winds.

#### WEATHER CONDITIONS.

Since the last issue of this map the storm has taken a rapid north-eastward advance and now covers the St. Lawrence valley. It gave severe easterly gales along the upper seaboard and high northwest winds over the east lakes. Another depression is developing over the Southwest, and is exercising a marked influence upon the weather over southern sections west of the Mississippi river. Overcast skies with high winds are reported from there. A moderate cool wave is central in the South Atlantic states, and another of greater severity is approaching from the Northwest.

T. F. Davis,  
 Acting Sec. D.S.

STATIONS.	Temperature.		Wind.	Max. wind gust per hour at 10 feet in 24 hours.	Precipitation last 24 hours.	STATIONS.	Temperature.		Wind.	Max. wind gust per hour at 10 feet in 24 hours.	Precipitation last 24 hours.
	Min.	Max.					Min.	Max.			
ABILENE	32	50	1t		0	MACON	32	42	1t		0
ALABAMA	30	70	34	32	0	MEMPHIS	38	50	10		0
ATLANTA	32	56	14	26	0	MERIDIAN	30	52	0		0
AUGUSTA	36	46	1t		0	MOBILE	38	54	0		0
BISMARCK	4	38	24	32	0	MONTGOMERY	30	44	1t		0
BOSTON	32	44	6		.70						
BUFFALO	30	36	22		.38	NEW ORLEANS	46	60	6		0
CHARLESTON	40	52	12		0	NEW YORK	36	52	30		.01
CHARLOTTE	32	50	6		T	ROFOLK	38	56	16		.01
CHICAGO	20	32	6		0	SOUTH PLATTE	30	52	14		.02
CINCINNATI	26	34	8	28	.04	OKLAHOMA	26	58	6		0
CLEVELAND	25	32	20	56	.26	OKLAH	18	42	24	28	.02
CORPUS C <sup>o</sup> STI	54	68	18		0	PALESTINE	34	64	1t		0
DAVENPORT	18	32	1t		0	PITTSBURG	26	40	14		.36
DETROIT	26	34	12		.14	PHILADELPHIA	24	54	12		.06
DODGE CITY	30	64	20		.01	RALPHIGH	34	50	10		.01
GALVESTON	46	60	12		0	SAVANNAH	40	48	12		T
HATTERAS	42	56	28		0	ST. LOUIS	30	42	8		0
HURON	18	50	28		T	ST. PAUL	20	28	16		.36
JACKSONVILLE	38	36	8		0	TAMPA	46	64	1t		0
JUPITER	48	62	6		0	VICKSBURG	40	58	8		0
KANSAS CITY	22	46	1t		0	WASHINGTON	36	38	18		.06
KEY WEST	62	70	8		0	WILMINGTON	36	54	12		0
KNOXVILLE	30	36	6		.02						