

PUBLISHER: Leslie Mackenzie  
EDITOR: David Garoogian  
EDITORIAL DIRECTOR: Laura Mars  
  
PRODUCTION MANAGER: Kristen Thatcher  
MARKETING DIRECTOR: Jessica Moody  
  
EDITORIAL ADVISOR: Michael Rawlins, PhD  
Manager, Climate System Research Center  
Department of Geosciences, University of Massachusetts  
WEATHER STATION MAPS: Michael Marturana

Grey House Publishing, Inc.  
4919 Route 22  
Amenia, NY 12501  
518.789.8700  
FAX 845.373.6390  
www.greyhouse.com  
e-mail: books @greyhouse.com

While every effort has been made to ensure the reliability of the information presented in this publication, Grey House Publishing neither guarantees the accuracy of the data contained herein nor assumes any responsibility for errors, omissions or discrepancies. Grey House accepts no payment for listing; inclusion in the publication of any organization, agency, institution, publication, service or individual does not imply endorsement of the editors or publisher.

Errors brought to the attention of the publisher and verified to the satisfaction of the publisher will be corrected in future editions.

Except by express prior written permission of the Copyright Proprietor no part of this work may be copied by any means of publication or communication now known or developed hereafter including, but not limited to, use in any directory or compilation or other print publication, in any information storage and retrieval system, in any other electronic device, or in any visual or audio-visual device or product.

This publication is an original and creative work, copyrighted by Grey House Publishing, Inc. and is fully protected by all applicable copyright laws, as well as by laws covering misappropriation, trade secrets and unfair competition.

Grey House has added value to the underlying factual material through one or more of the following efforts: unique and original selection; expression; arrangement; coordination; and classification.

Grey House Publishing, Inc. will defend its rights in this publication.

Copyright © 2011 Grey House Publishing, Inc.  
All rights reserved

First edition published 1996  
Third edition published 2011  
Printed in the USA

ISBN: 978-1-59237-598-1 Softcover

---

## Introduction

---

This is the third edition of *Weather America*, the premier reference source organizing, analyzing, and ranking U.S. weather data for the last 30 years. Unique among dozens of weather data publications, *Weather America* provides the most comprehensive and useful compilation of weather data and statistics available.

More than 95% of the content from the last edition has been updated. This new edition includes valuable new data and features, including a detailed section on Billion Dollar Weather Disasters, as well as over 100 Full-Color State and National maps.

- **Coverage:** *Weather America* includes data for 2,021 weather stations. The 243 National and 1,778 Cooperative Stations were chosen based on not only state coverage, but also on geography, allowing users to see, for example, the variance in weather between oceanfront communities and mountainous regions.
- **Detail:** *Weather America* computes 32 data points for National and 19 for Cooperative Stations—five more data points than last edition. In addition, users will find **NEW Five-Year Average Charts, NEW Full-Color Maps, MORE detailed Storm Data, and MORE Rankings and Comparisons.**
- **Currency:** *Weather America* uses the most recent data available. Almost all weather data originates from the National Oceanic and Atmospheric Administration (NOAA), and more specifically within NOAA, the National Climatic Data Center (NCDC), in Asheville, North Carolina. NCDC organizes over 10,000 weather stations across the country, and, on a regular basis, collects, compiles, edits, and adjusts climatological data. Traditionally, 30 years of weather data is collected and presented every 10 years (e.g. 1961-1990, 1971-2000, etc.). Because more recent data exists, this edition is based on data from 1980-2009, the most recent thirty-year period for which complete year data is available.

### Section One: State Chapters

More comprehensive than the previous edition, these chapters offer more complete data for complete, easy state research. Each state chapter opens with a narrative of the state's climatological conditions, covering Physical Features, General Climate, Precipitation, Relative Humidity, Storms, Drought, and Other Climatic Elements. Following the narrative are three state maps: A Full-Color General Reference Map with cities by population, roads, rivers, and lakes; a Full-Color Relief Map with capital cities and topography; and a Weather Station Map with major cities and larger type for easier reading.

Researchers will find state charts that list weather stations by county, by city, and by elevation. These charts are followed by National Weather Stations (operated by professional meteorologists) with a detailed climatological description and 32 data points, and then Cooperative Stations (manned primarily by volunteers) with 19 data points. The new data points charted in this edition include: Extreme Maximum Daily Precipitation; Days with  $\geq 0.5$  inches of Precipitation; and Maximum Snow Depth.

Following these station profiles are weather station rankings of 19 data points. These charts list the top 25 and the bottom 25 stations in the state for each data point. If states have fewer than 25 stations, all stations are listed.

Storm data is the final element of each state chapter. This chart includes specific location, exact date, storm type and severity, deaths, injuries, property and crop damage. Years covered are 2000- 2009.

### Section Two: National Statistics

- **National Weather Rankings:** These National tables include detailed temperature, precipitation and snowfall data.
- **Five-Year Averages:** **NEW** to this section are Five-Year Averages, 1950–2009 for 19 data points.
- **All-Time Weather Records:** **NEW** This section includes state charts for six of the most basic weather criteria, such as Minimum and Maximum Temperature, Precipitation, Snowfall, and Snow Depth.
- **Storm Events:** Includes 20 charts with information on storms of any type with the greatest number of fatalities, injuries, property damage, and specific charts on hurricanes, tornadoes, floods, and hail.

**Section Three: Appendices**

- **Appendix A:** National, Regional and State Climate Centers with complete contact information, including web sites and contact names.
- **Appendix B:** **NEW** Glossary of Terms includes nearly 700 weather terms from Ablation and Absolute Humidity to Zone of Maximum Precipitation and Zulu Time.
- **Appendix C:** Map of U.S. NEXRAD (Doppler Radar) Network
- **Appendix D:** **NEW** Billion Dollar Climate and Weather Disasters that includes maps, charts, and timeline
- **Appendix E:** **NEW** Hurricane Strike Maps in full color
- **Appendix F:** **NEW** National Climate Maps in full color

This third edition of *Weather America* Ebook is also available online.

---

# ALABAMA

---

**PHYSICAL FEATURES.** The surface of Alabama rises as a rolling plain from the Gulf of Mexico in the southwest to foothills in the central part of the State. Thence there is a rise to the Appalachian Mountains which extend into the northeastern counties. Ridges from the Appalachians extend southward through the eastern counties, with elevations along these ridges as much as 600 to 800 feet above sea level in the southeast. The general elevation of the high northeastern area is about 800 feet above sea level, but some mountain summits rise to over 2,000 feet, the highest (Mount Cheaha in southwestern Cleburne County) being 2,407 feet.

**GENERAL CLIMATE.** The climate is temperate, becoming largely subtropical near the coast. The summers are long, hot, and humid, with little day-to-day temperature change. In the northeastern counties, higher altitudes help make the summer nights more comfortable. From late June through middle August, approximately a third of the evenings are made comfortable by local afternoon thundershowers which bring cool breezes over the areas where they occur.

In the coldest months of December, January, and February, there are frequent shifts between mild air, which has been moistened and warmed by the Gulf, and dry, cool continental air. Severely cold weather seldom occurs. Even in the northern third of the State, temperatures of zero or lower are rare and occur only when there is snow on the ground. Since cold air on clear nights collects in low places, there is considerable irregularity in the distribution of the last spring or first fall freezes in all sections.

**PRECIPITATION.** Precipitation is nearly all in the form of rain. Snow falls in the northern counties on an average of about twice each winter. The average fall in that area is only about three inches per year, and since this includes unusually heavy snows in a few individual winters, some winters have little or none. From late June through the first half of August, nearly all precipitation is from local thundershowers which occur mostly in the afternoons. During late August and in September, summer conditions of atmospheric temperature and moisture persist, but thundershowers become less frequent. However, late night and early morning thundershowers, characteristic of late summer on the coast, continue in the coastal counties until mid-September. Rains during October are nearly always from showers or thundershowers occurring ahead of temperature drops. Such changes become more frequent and

more pronounced as winter approaches. Dry, sunny weather prevails most of the time in September and October, but from August through early October, heavy general rain may occur with a tropical disturbance or hurricane moving inland from the Gulf of Mexico. Since summer rain is heavier near the coast than elsewhere and winter rain is heavier in the north, the middle areas of the State get somewhat less precipitation for the year as a whole than the other areas.

Droughts may occur any time during the growing season from late April through October. Relatively long periods with little or no rain are more likely to occur in late summer and autumn than at any other time, while a secondary maximum of such periods occurs in May and June. Severe local droughts occur nearly every year, but severe statewide droughts are practically unknown.

Rivers in Alabama overflow about once a year on an average. Most floods occur from rains in late winter and early spring, with March the month of greatest flood frequency. The lower Tombigbee overflows most often, and in some stretches may stay over the banks most of the time in wet winter and spring seasons.

**STORMS.** Nearly all tornadoes occur during the season from November through early May. The greatest frequency is in March and April. The area covered by the average tornado is small. Destructive tropical hurricanes visit the coastal area on an average of about once in seven years between July and November. Windstorm damage may occur in local thundersqualls any time of the year.

Thunderstorms in the north and central sections occur on an average of one day each month in winter, on about 13 days in July, and on about 60 days during the year. Almost all the hail that falls in Alabama occurs in the period from February through May, although in the northern counties there are rare occurrences of damaging hail in June.

Heavy fog occurs mostly in winter. It occurs on an average of five days per year in Birmingham, eight days per year in Montgomery, and 31 days per year in Mobile, near the coast.

**WINDS.** In winter, winds from a northerly direction are most frequent. In summer, the wind is quite variable, but most often comes from southerly directions.



# ALABAMA

**nationalatlas.gov**<sup>TM</sup>  
Where We Are

### POPULATED PLACES

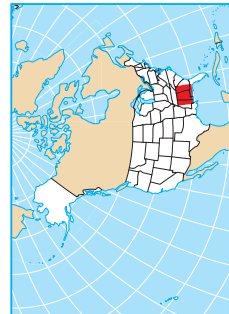
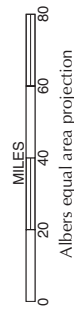
- 100,000 – 499,999 • **Huntsville**
- 25,000 – 99,999 • **Florence**
- 24,999 and less • Jasper
- State capital ★ **Montgomery**

### TRANSPORTATION

- Interstate; limited access highway **65**
- Other principal highway
- Railroad

### PHYSICAL FEATURES

- Streams
- Lakes
- Highest elevation in state (feet) **+2405**
- The lowest elevation in Alabama is sea level (Gulf of Mexico).



U.S. Department of the Interior  
U.S. Geological Survey

The National Atlas of the United States of America®

## Birmingham Municipal Airport

Birmingham is located in a hilly area of north-central Alabama in the foothills of the Appalachians about 300 miles inland from the Gulf of Mexico. There is a series of southwest to northeast valleys and ridges in the area.

The city is far enough inland to be protected from destructive tropical hurricanes, yet close enough that the Gulf has a pronounced modifying effect on the climate.

Although summers are long and hot, they are not generally excessively hot. On a typical mid-summer day, the temperature will be nearly 70 degrees at daybreak, approach 90 degrees at mid-day, and level off in the low 90s during the afternoon. It is not unusual for the temperature to remain below 100 degrees for several years in a row. However, every few years an extended heat wave will bring temperatures over 100 degrees. July is normally the hottest month but there is little difference from mid-June to mid-August. Rather persistent high humidity adds to the summer discomfort.

January is normally the coldest month but there is not much difference from mid-December to mid-February. Overall, winters are relatively mild. Even in cold spells, it is unusual for the temperature to remain below freezing all day. Sub-zero cold is extremely rare. Extremely low temperatures almost always occur under clear skies after a snowfall.

Snowfall is erratic. Sometimes there is a two- or three-year span with no measurable snow. On rare occasions, there may be a two to four inch snow-storm. The snow usually melts quickly. Even one or two inches of snow can effectively shut down this sunbelt city because of the hilly terrain, the wetness of the snow, and the unfamiliarity of motorists driving on snow and ice.

Birmingham is blessed with abundant rainfall. It is fairly well distributed throughout the year. However, some of the wetter winter months, plus March and July, have twice the rainfall of October, the driest month. Summer rainfall is almost entirely from scattered afternoon and early evening thunderstorms. Serious droughts are rare and most dry spells are not severe.

The stormiest time of the year with the greatest risk of severe thunderstorms and tornadoes is in spring, especially in March and April.

In a normal year, the last 32 degree minimum temperature in the spring is in mid to late March and the first in autumn is in early November.

**Birmingham Municipal Airport** *Jefferson County* Elevation: 620 ft. Latitude: 33° 34' N Longitude: 86° 45' W

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Mean Maximum Temp. (°F)	54.0	58.4	66.7	74.3	81.5	87.7	90.8	90.7	85.1	75.1	65.3	56.1	73.8
Mean Temp. (°F)	43.7	47.5	55.0	62.0	70.3	77.2	80.8	80.4	74.4	63.6	54.0	45.9	62.9
Mean Minimum Temp. (°F)	33.4	36.5	43.2	49.7	59.0	66.7	70.6	70.0	63.6	52.1	42.7	35.7	51.9
Extreme Maximum Temp. (°F)	78	83	89	92	96	100	106	105	100	91	85	79	106
Extreme Minimum Temp. (°F)	-6	4	2	27	39	45	58	52	39	28	20	1	-6
Days Maximum Temp. ≥ 90°F	0	0	0	0	2	12	20	19	7	0	0	0	60
Days Maximum Temp. ≤ 32°F	1	0	0	0	0	0	0	0	0	0	0	1	2
Days Minimum Temp. ≤ 32°F	16	10	5	1	0	0	0	0	0	0	6	14	52
Days Minimum Temp. ≤ 0°F	0	0	0	0	0	0	0	0	0	0	0	0	0
Heating Degree Days (base 65°F)	655	490	323	142	24	0	0	0	9	122	335	587	2,687
Cooling Degree Days (base 65°F)	1	3	19	61	194	374	496	483	298	86	12	3	2,030
Mean Precipitation (in.)	4.93	4.50	5.53	4.51	4.93	4.37	4.82	3.86	4.06	3.42	4.79	4.43	54.15
Maximum Precipitation (in.)*	11.0	17.7	15.8	13.8	11.1	8.4	13.7	10.8	10.4	11.9	15.3	14.0	76.5
Minimum Precipitation (in.)*	1.1	1.1	1.7	0.4	1.1	0.7	0.3	0.4	trace	0.1	0.4	0.8	39.2
Extreme Maximum Daily Precip. (in.)	4.71	3.42	4.69	4.13	5.71	3.51	5.47	3.40	9.75	6.94	4.41	4.03	9.75
Days With ≥ 0.1" Precipitation	8	7	7	6	7	8	8	6	5	5	7	7	81
Days With ≥ 0.5" Precipitation	4	4	4	3	3	3	3	3	3	2	3	3	38
Days With ≥ 1.0" Precipitation	1	1	2	1	2	1	1	1	1	1	2	1	15
Mean Snowfall (in.)	0.7	0.1	0.6	0.2	trace	trace	trace	0.0	trace	trace	trace	0.1	1.7
Maximum Snowfall (in.)*	7	2	13	5	0	0	0	0	0	trace	1	8	13
Maximum 24-hr. Snowfall (in.)*	5	2	10	5	0	0	0	0	0	trace	1	8	10
Maximum Snow Depth (in.)	4	1	13	5	trace	trace	trace	0	trace	trace	trace	trace	13
Days With ≥ 1.0" Snow Depth	0	0	0	0	0	0	0	0	0	0	0	0	0
Thunderstorm Days*	2	2	4	5	7	8	12	9	4	1	2	1	57
Foggy Days*	15	13	13	11	14	13	15	15	14	14	13	14	164
Predominant Sky Cover*	OVR	OVR	OVR	OVR	SCT	SCT	SCT	SCT	CLR	CLR	OVR	OVR	OVR
Mean Relative Humidity 7am (%)*	82	81	78	76	76	78	81	82	81	82	82	82	80
Mean Relative Humidity 4pm (%)*	57	53	48	46	51	54	58	55	54	50	52	58	53
Mean Dewpoint (°F)*	33	36	41	49	58	66	69	68	62	51	42	36	51
Prevailing Wind Direction*	N	N	S	S	S	NE	S	NE	NE	NE	N	N	NE
Prevailing Wind Speed (mph)*	9	9	10	10	9	6	7	6	6	6	9	9	8
Maximum Wind Gust (mph)*	66	61	69	71	89	59	61	66	52	43	66	53	89

Note: (\*) Period of record is 1948-1995

Annual Snowfall					
Highest			Lowest		
Rank	Station Name	Inches	Rank	Station Name	Inches
1	Heflin	1.9	1	Dauphin Island #2	0.0
1	Pinson	1.9	1	Jackson	0.0
3	Birmingham Municipal Arpt	1.7	3	Coden	Trace
4	Belle Mina 2 N	1.5	3	Enterprise 5 NNW	Trace
5	Sand Mt Substation	1.3	3	Fairhope 2 NE	Trace
6	Talladega	1.1	3	Geneva No 2	Trace
7	Bridgeport 5 NW	1.0	3	Headland	Trace
8	Bessemer 3 WSW	0.9	8	Demopolis Lock and Dam	0.1
9	Centreville WSMO	0.8	8	Gadsden	0.1
9	Guntersville	0.8	8	Opelika	0.1
9	Jasper	0.8	11	Andalusia 3 W	0.2
9	Russellville No 2	0.8	11	Bankhead Lock and Dam	0.2
13	Alexander City	0.6	11	Bay Minette 3 NNW	0.2
14	Fayette	0.3	11	Clayton	0.2
14	Greenville	0.3	11	Highland Home	0.2
14	Lafayette 2 W	0.3	11	Milstead	0.2
14	Tuscaloosa Municipal Arpt	0.3	11	Mobile Regional Arpt	0.2
18	Andalusia 3 W	0.2	18	Fayette	0.3
18	Bankhead Lock and Dam	0.2	18	Greenville	0.3
18	Bay Minette 3 NNW	0.2	18	Lafayette 2 W	0.3
18	Clayton	0.2	18	Tuscaloosa Municipal Arpt	0.3
18	Highland Home	0.2	22	Alexander City	0.6
18	Milstead	0.2	23	Centreville WSMO	0.8
18	Mobile Regional Arpt	0.2	23	Guntersville	0.8
25	Demopolis Lock and Dam	0.1	23	Jasper	0.8

Annual Maximum Snow Depth					
Highest			Lowest		
Rank	Station Name	Inches	Rank	Station Name	Inches
1	Birmingham Municipal Arpt	13	1	Dauphin Island #2	0
1	Pinson	13	1	Demopolis Lock and Dam	0
3	Guntersville	9	1	Enterprise 5 NNW	0
4	Centreville WSMO	8	1	Jackson	0
5	Alexander City	7	5	Coden	Trace
6	Highland Home	6	5	Fairhope 2 NE	Trace
7	Lafayette 2 W	5	5	Geneva No 2	Trace
8	Fayette	4	5	Greenville	Trace
8	Russellville No 2	4	5	Headland	Trace
10	Bridgeport 5 NW	3	5	Milstead	Trace
10	Heflin	3	5	Opelika	Trace
10	Jasper	3	5	Talladega	Trace
10	Sand Mt Substation	3	13	Andalusia 3 W	1
10	Tuscaloosa Municipal Arpt	3	13	Bankhead Lock and Dam	1
15	Bay Minette 3 NNW	2	13	Bessemer 3 WSW	1
15	Belle Mina 2 N	2	13	Clayton	1
15	Mobile Regional Arpt	2	13	Gadsden	1
18	Andalusia 3 W	1	18	Bay Minette 3 NNW	2
18	Bankhead Lock and Dam	1	18	Belle Mina 2 N	2
18	Bessemer 3 WSW	1	18	Mobile Regional Arpt	2
18	Clayton	1	21	Bridgeport 5 NW	3
18	Gadsden	1	21	Heflin	3
23	Coden	Trace	21	Jasper	3
23	Fairhope 2 NE	Trace	21	Sand Mt Substation	3
23	Geneva No 2	Trace	21	Tuscaloosa Municipal Arpt	3

Highest Annual Extreme Maximum Temperature					
Rank	Station Name	°F	Rank	Station Name	°F
1	Death Valley, CA	129	41	Midland Regional Air Terminal, TX	116
2	Bullhead City, AZ	126	41	Newman, CA	<b>116</b>
3	Fountain Hills, AZ	125	41	Penwell, TX	116
3	Laveen 3 SSE, AZ	125	41	Ponca City Municipal Arpt, OK	116
3	Needles Airport, CA	125	41	Rio Grande City 1 SE, TX	116
6	Alamo Dam, AZ	124	41	Riverside Fire Sta 3, CA	116
6	Maricopa 4 N, AZ	124	41	Victorville Pump Plant, CA	116
6	Willow Beach, AZ	124	58	Altus Irig Res Station, OK	115
6	Yuma Citrus Station, AZ	<b>124</b>	58	Barstow Fire Station, CA	115
6	Yuma Proving Ground, AZ	124	58	Basin, WY	115
11	Parker Reservoir, CA	123	58	Bridgeport, TX	<b>115</b>
12	Blythe, CA	122	58	Brownlee Dam, ID	115
12	Borrogo Desert Park, CA	122	58	Buffalo, OK	115
12	Gila Bend, AZ	122	58	Candelaria, TX	115
12	Phoenix Sky Harbor Intl Arpt, AZ	122	58	Coalinga, CA	115
16	Beaver Dam, AZ	120	58	Cordes, AZ	115
16	Casa Grande, AZ	<b>120</b>	58	Covelo, CA	115
16	Castle Hot Springs, AZ	120	58	Crystal City, TX	115
16	Yucca 1 NNE, AZ	120	58	Dell City 5 SSW, TX	115
20	Florence, AZ	119	58	Elsinore, CA	115
20	Hayfield Pumping Plant, CA	119	58	Falfurrias, TX	115
20	Kofa Mine, AZ	119	58	Frederick, OK	115
20	Lees Ferry, AZ	<b>119</b>	58	Henrietta, TX	<b>115</b>
24	Ash Mountain, CA	118	58	Hot Springs 1 NNE, AR	115
24	Organ Pipe Cactus N M, AZ	118	58	Morrilton, AR	<b>115</b>
24	Redlands, CA	118	58	Mountain Home, ID	115
27	Amargosa Farms Garey, NV	117	58	Stockton Metropolitan Arpt, CA	115
27	Boquillas Ranger Stn, TX	<b>117</b>	58	Tatum, NM	115
27	Castolon, TX	117	58	Tucson 17 NW, AZ	<b>115</b>
27	Childress Municipal Arpt, TX	117	58	Tucson NWSO, AZ	115
27	Childs, AZ	<b>117</b>	58	Waurika, OK	115
27	Cottonwood 2 E, SD	117	82	Amistad Dam, TX	114
27	Desert Natl Wl Range, NV	117	82	Anson, TX	<b>114</b>
27	Grandfalls 3 SSE, TX	<b>117</b>	82	Anvil Ranch, AZ	114
27	Haiwee, CA	117	82	Bakersfield, TX	114
27	Las Vegas-McCarran Intl Arpt, NV	117	82	Big Spring, TX	<b>114</b>
27	Pierre Municipal Arpt, SD	117	82	Bitter Lakes Wl Refuge, NM	114
27	St George, UT	117	82	Carlsbad, NM	114
27	Tucson Intl Arpt, AZ	117	82	Conchas Dam, NM	114
27	Wichita Falls Municipal Arpt, TX	117	82	Dupree 15 SSE, SD	114
41	Arches Np Hqs, UT	116	82	El Paso Intl Arpt, TX	114
41	Canoga Park Pierce College, CA	<b>116</b>	82	Fairfield, CA	114
41	Cascabel, AZ	116	82	Faulkton 1 NW, SD	114
41	Cedar Butte 1 NE, SD	116	82	Friant Government Camp, CA	114
41	Chattanooga 3 NE, OK	116	82	Healdton, OK	114
41	Clifton, AZ	<b>116</b>	82	Hobbs, NM	<b>114</b>
41	Columbus, TX	116	82	Independence, CA	114
41	Encinal, TX	<b>116</b>	82	Laredo 2, TX	114
41	Falcon Dam, TX	116	82	Lubbock Regional Arpt, TX	114
41	Gail, TX	116	82	Medford Jackson County Arpt, OR	114

## Annual Mean Maximum Temperature

Five-Year Averages: 1950 - 2009

State	Weather Station	1950-1954	1955-1959	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
Alabama	Birmingham-Shuttlesworth Int'l Airport	74.9	73.7	73.5	72.1	73.0	72.2	73.4	73.4	74.2	74.1	73.4	na
Alaska	Anchorage Int'l Airport	na	42.1	42.4	na	40.5	44.2	43.4	43.7	43.5	43.2	45.0	43.0
Arizona	Phoenix Sky Harbor Int'l Airport	85.9	84.1	84.6	84.7	85.7	86.0	86.2	87.6	86.4	85.9	87.2	87.3
Arkansas	Little Rock National Airport	73.5	72.2	72.8	72.0	72.7	71.7	72.0	72.8	73.0	73.7	72.4	73.7
California	Los Angeles Int'l Airport	69.2	72.3	69.4	69.8	69.8	70.8	71.0	70.4	71.0	70.5	69.4	70.0
California	San Francisco Int'l Airport	64.1	66.3	64.8	64.6	64.6	65.0	65.7	66.4	66.2	65.5	65.6	65.4
Colorado	Denver Stapleton Int'l Airport	64.8	63.8	64.1	64.1	64.4	64.3	63.5	64.4	65.1	na	65.5	na
Connecticut	Bridgeport-Sikorsky Memorial Airport	60.7	59.8	58.8	59.0	60.0	59.2	59.4	59.6	60.9	60.2	59.7	60.5
Delaware	Wilmington-New Castle Airport	64.5	63.3	62.7	62.8	64.3	62.8	63.8	63.8	65.1	63.9	63.4	64.5
Florida	Jacksonville Int'l Airport	80.2	79.5	78.9	78.7	79.6	78.3	79.0	79.5	80.1	79.1	78.9	79.3
Florida	Miami Int'l Airport	83.5	82.9	82.5	82.1	82.6	81.9	83.1	84.2	84.6	84.0	83.9	84.4
Georgia	Atlanta Hartsfield Int'l Airport	72.7	71.9	70.1	69.8	71.4	70.9	71.6	72.4	73.1	72.3	71.6	72.3
Hawaii	Honolulu Int'l Airport	na	82.0	83.4	na	84.0	84.3	84.6	85.5	85.0	84.9	84.5	na
Idaho	Boise Air Terminal	62.7	62.0	62.7	63.6	63.1	62.4	61.5	63.0	63.9	64.1	64.3	64.2
Illinois	Chicago O'Hare Int'l Airport	na	na	58.2	58.2	58.6	58.5	58.2	59.0	59.1	59.0	59.0	59.1
Indiana	Indianapolis Int'l Airport	63.0	61.8	61.3	61.9	62.4	61.5	61.9	62.5	63.0	62.6	62.5	62.9
Iowa	Des Moines Int'l Airport	59.6	59.9	58.5	58.6	59.3	59.6	60.0	60.8	59.9	59.3	60.6	60.6
Kansas	Wichita Mid-Continent Airport	na	67.5	67.2	67.4	66.8	67.6	67.2	67.8	na	67.6	68.4	68.6
Kentucky	Lexington Bluegrass Airport	66.5	65.1	64.4	63.9	64.9	63.8	64.4	65.2	65.5	64.9	64.9	65.6
Louisiana	New Orleans Int'l Airport	78.6	77.5	77.2	76.9	78.2	77.2	77.7	77.5	78.3	78.4	78.2	78.7
Maine	Portland Int'l Jetport	56.2	55.2	55.0	54.8	54.5	54.5	55.3	55.4	55.9	55.8	55.4	55.8
Maryland	Baltimore/Washington Int'l Airport	65.7	64.5	64.7	64.7	65.0	65.3	64.7	65.2	66.3	66.0	65.0	65.8
Massachusetts	Boston Logan Int'l Airport	60.1	58.9	58.5	57.6	58.9	59.7	59.2	58.5	60.0	59.2	58.8	59.0
Michigan	Detroit Metro Airport	na	na	58.0	57.9	58.1	58.0	57.8	58.5	59.3	59.0	58.8	59.2
Minnesota	Minneapolis-Saint Paul Int'l Airport	53.7	54.9	54.2	53.2	53.4	54.3	54.4	55.4	54.6	55.0	55.3	55.7
Mississippi	Jackson Int'l Airport	na	na	na	75.4	76.7	75.1	76.1	76.3	76.4	76.0	75.7	76.7
Missouri	St Louis-Lambert Int'l Airport	66.8	65.7	64.7	64.8	65.6	64.5	65.0	66.1	66.5	65.7	66.3	66.6
Montana	Billings Logan Int'l Airport	58.2	58.2	59.3	57.4	57.1	57.0	59.7	59.5	59.8	58.6	59.5	60.0
Nebraska	Omaha Eppley Airfield	61.5	61.8	61.3	61.8	62.0	62.2	59.8	na	61.8	na	62.5	62.1
Nevada	Las Vegas-McCarran Int'l Airport	na	na	79.3	79.2	78.9	80.4	79.0	80.6	79.8	79.9	80.4	80.7
New Hampshire	Concord Municipal Airport	58.3	na	57.6	56.7	56.4	56.9	57.3	57.2	58.2	58.1	57.8	57.8
New Jersey	Newark Int'l Airport	63.2	62.5	62.3	61.9	63.1	62.0	63.0	63.5	65.1	63.6	63.1	63.8
New Mexico	Albuquerque Int'l Airport	71.5	70.2	69.4	69.7	70.0	70.5	71.0	69.8	70.5	70.3	70.3	70.1
New York	Buffalo Niagara Int'l Airport	57.3	56.8	55.8	55.4	55.6	55.2	55.9	56.6	57.2	56.5	56.1	57.0
New York	New York LaGuardia Airport	62.9	61.9	60.9	60.7	60.9	60.6	61.1	62.0	63.5	62.9	62.3	63.3
North Carolina	Charlotte Douglas Int'l Airport	72.3	72.3	70.6	69.6	70.1	70.1	69.8	71.2	72.4	71.4	70.9	71.8
North Dakota	Fargo Hector Int'l Airport	50.5	51.8	52.9	50.1	50.5	50.5	51.6	52.7	52.8	51.7	52.4	52.4
Ohio	Columbus Intl Airport	63.3	63.1	61.5	60.7	61.4	60.4	61.0	62.2	63.2	62.8	62.1	63.0
Oklahoma	Oklahoma City-Will Rogers World Arpt	72.1	70.1	70.8	71.1	70.7	71.0	71.1	70.5	na	71.8	71.3	73.2
Oregon	Portland Int'l Airport	61.3	61.2	61.1	62.8	63.0	62.0	62.6	63.2	63.9	63.0	63.2	62.9
Pennsylvania	Philadelphia Int'l Airport	64.8	63.4	62.4	62.6	63.7	63.5	63.0	64.3	65.8	64.6	64.4	64.8
Rhode Island	Providence TF Green Airport	na	59.0	58.8	58.9	59.7	59.2	60.2	59.9	61.3	60.8	60.1	60.8
South Carolina	Columbia Metro Airport	76.6	75.5	74.9	74.1	76.1	75.0	74.2	75.7	76.4	75.3	74.9	75.4
South Dakota	Sioux Falls Foss Field	56.0	57.6	57.1	56.1	56.3	56.0	56.9	57.8	56.9	56.0	57.4	57.2
Tennessee	Memphis Int'l Airport	73.0	71.6	70.9	70.8	71.3	71.5	71.8	72.2	72.7	72.2	72.1	73.3
Texas	Dallas-Fort Worth Int'l Airport	na	76.1	76.3	75.7	76.1	75.9	76.0	76.1	76.3	77.0	76.1	78.5
Texas	El Paso Int'l Airport	78.2	77.1	77.1	76.9	77.6	77.7	78.1	77.3	78.6	78.2	77.9	78.4
Texas	Houston Intercontinental Airport	na	na	na	na	78.8	78.1	79.0	79.1	79.5	80.3	79.3	80.5
Utah	Salt Lake City Int'l Airport	63.7	64.2	63.6	64.0	63.5	64.2	63.1	63.9	64.1	64.8	64.0	64.0
Vermont	Burlington Int'l Airport	55.1	53.9	53.5	52.5	53.0	53.7	54.5	54.5	55.4	55.8	55.0	55.6
Virginia	Norfolk Int'l Airport	69.1	68.6	67.3	66.7	68.5	68.7	68.0	68.8	70.4	68.5	68.6	69.0
Virginia	Washington-Reagan National Airport	66.6	65.6	65.5	66.5	67.1	67.1	67.0	66.3	67.5	67.0	66.2	67.0
Washington	Seattle-Tacoma Int'l Airport	57.9	58.1	58.6	59.9	58.7	60.0	59.0	60.1	60.8	59.9	59.4	59.7
West Virginia	Charleston Int'l Airport	67.2	66.0	64.9	64.9	65.7	64.6	65.8	66.2	67.2	65.5	65.7	66.8
Wisconsin	Milwaukee-Mitchell Int'l Airport	55.4	55.4	54.7	54.4	53.9	54.1	54.4	55.8	56.8	56.0	56.0	56.1
Wyoming	Casper/Natrona County Int'l Airport	58.8	58.4	58.3	58.4	57.4	57.9	59.1	59.2	60.4	59.3	59.9	60.0

Note: na indicates that data is not available for one or more years in the five-year period.

## All-Time Record Minimum Temperature by State

State	Location	Value	Date	Station ID	Status*
Alabama	New Market	-27 °F	30-Jan-66	015867	E
Alaska	Prospect Creek Camp	-80 °F	23-Jan-71	507778	E
Arizona	Hawley Lake	-40 °F	7-Jan-71	023926	E
Arkansas	Brook Farm Pond	-29 °F	13-Feb-05	032930	E
California	Boca	-45 °F	20-Jan-37	040931	E
Colorado	Maybell	-61 °F	1-Feb-85	055446	E
Connecticut	Falls Village	-32 °F	16-Feb-43	062658	E1
	Coventry	-32 °F	22-Jan-61	061689	E1
Delaware	Millsboro	-17 °F	January 17, 1893	076020	E
Florida	Tallahassee	-2 °F	February 13, 1899	088754	E
Georgia	CCC Fire Camp F-16	-17 °F	27-Jan-40		EA
Hawaii	Mauna Kea Observatory	12 °F	17-May-79	516183	E
Idaho	Island Park Dam	-60 °F	18-Jan-43	104598	E
Illinois	Congerville	-36 °F	5-Jan-99	111836	E
Indiana	New Whiteland	-36 °F	19-Jan-94	126304	E
Iowa	Washta	-47 °F	12-Jan-12	138693	E1
	Elkader	-47 °F	3-Feb-96	132603	E1
Kansas	Lebanon	-40 °F	13-Feb-05	144598	E
Kentucky	Shelbyville	-37 °F	19-Jan-94	157324	E
Louisiana	Minden	-16 °F	February 13, 1899	166244	E
Maine	Big Black River	-50 °F	16-Jan-09	USGS BBRM1	NS
Maryland	Oakland	-40 °F	13-Jan-12	186620	E
Massachusetts	Taunton	-35 °F	5-Jan-04	198367	E1
	Coldbrook	-35 °F	15-Feb-43	191589	E1
	Chester	-35 °F	12-Jan-81	191430	E1
Michigan	Vanderbilt	-51 °F	9-Feb-34	208417	E
Minnesota	Tower	-60 °F	2-Feb-96	218311	E
Mississippi	Corinth	-19 °F	30-Jan-66	221962	E
Missouri	Warsaw	-40 °F	13-Feb-05	238733	E
Montana	Rogers Pass	-70 °F	20-Jan-54	247156	E
Nebraska	Bridgeport	-47 °F	February 12, 1899	251145	E1
	Oshkosh	-47 °F	22-Dec-89	256385	E1
Nevada	San Jacinto	-50 °F	8-Jan-37	267284	E
New Hampshire	Mount Washington	-46 °F	8-Jan-68	275639	N
New Jersey	River Vale	-34 °F	5-Jan-04	287620	E
New Mexico	Gavilan	-50 °F	1-Feb-51	293505	E
New York	Old Forge	-52 °F	18-Feb-79	306184	E1
North Carolina	Mount Mitchell	-34 °F	21-Jan-85	315923	E
North Dakota	Parshall	-60 °F	15-Feb-36	326867	E
Ohio	Milligan	-39 °F	February 10, 1899	335310	E
Oklahoma	Vinita	-27 °F	13-Feb-05	349203	N1
	Watts	-27 °F	18-Jan-30	349382	N1
	Guthrie	-27 °F	4-Jan-47	343821	N1
Oregon	Ukiah	-54 °F	9-Feb-33	358726	E1
	Seneca	-54 °F	10-Feb-33	357675	E1
Pennsylvania	Smethport	-42 °F	5-Jan-04	368190	E
Rhode Island	Wood River Junction	-28 °F	11-Jan-42	379327	NA
South Carolina	Caesar's Head	-19 °F	21-Jan-85	381256	E
South Dakota	McIntosh	-58 °F	17-Feb-36	395381	E
Tennessee	Mountain City	-32 °F	30-Dec-17	406287	E
Texas	Seminole	-23 °F	8-Feb-33	418201	E
Utah	Strawberry Tunnel (East)	-50 °F	5-Jan-13	422319	NA
Vermont	Bloomfield	-50 °F	30-Dec-33	430690	E
Virginia	Mountain Lake Biological Stn	-30 °F	21-Jan-85	445828	E
Washington	Mazama	-48 °F	30-Dec-68	455133	E2
	Winthrop	-48 °F	30-Dec-68	459376	E2
West Virginia	Lewisburg	-37 °F	30-Dec-17	465224	E
Wisconsin	Couderay	-55 °F	February 2 & 4, 1996	471847	E1
Wyoming	Riverside Ranger Stn	-66 °F	9-Feb-33		EA

*These values have been evaluated by the NOAA National Climatic Data Center and/or by the State Climate Extremes Committee and determined to be valid. The data may come from sources other than official NOAA-supervised weather stations, but are archived, officially recognized observations.*

*\* Record Status*

*Locations without associated station IDs are not archived in NCDC's digital data collection. They may be derived from historical documents (official or otherwise) in NCDC archives or may be archived elsewhere. Please contact NCDC at [ncdc.info@noaa.gov](mailto:ncdc.info@noaa.gov) for more information.*

*E Value is unchanged from previous extremes tables last updated by NCDC between 1998 and 2006. Value exceeds all other valid values.*

*N Value is changed from extremes tables last updated by NCDC between 1998 and 2006. Value exceeds all other valid values.*

*1 Value ties values from earlier dates.*

*2 Value set at multiple stations on the same date.*

*3 Value set at multiple locations on the same date and ties values from earlier dates.*

*S Value has been officially reviewed by a State Climate Extremes Committee.*

*A Additional information is available. Official value may be exceeded by a widely accepted unofficial value that is not supported by a direct, calibrated observation (e.g., estimates, uncalibrated instruments, anecdotal reports). Please refer to the state extremes page footnotes.*

---

**National Climate Centers**


---

National Oceanic and Atmospheric Administration  
1401 Constitution Avenue, NW  
Room 5128  
Washington, DC 20230  
Tel: 202-482-6090  
Fax: 202-482-3154  
<http://www.noaa.gov>  
Dr. Jane Lubchenco, Administrator

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville NC 28801-5001  
Tel: 828-271-4800  
Fax: 828-271-4876  
<http://www.ncdc.noaa.gov>  
Thomas R Karl, Director

Climate Prediction Center  
World Weather Building  
5200 Auth Road  
Camp Springs, MD 20746  
Tel: 301-763-8000  
<http://www.cpc.ncep.noaa.gov>  
R W Higgins, PhD, Director

Office of Oceanic and Atmospheric Research  
Silver Spring Metro Center  
Building 3, Room 11458  
1315 East-West Highway  
Silver Spring, MD 20910  
Tel: 301-713-2458  
<http://www.oar.noaa.gov>

National Weather Service Headquarters  
1325 East-West Highway  
Silver Spring, MD 20910  
<http://www.nws.noaa.gov>

National Hurricane Center  
11691 S.W. 17th Street  
Miami, Florida 33165-2149  
Tel: 305-229-4470  
<http://www.nhc.noaa.gov>

Storm Prediction Center  
120 David L Boren Blvd  
Norman, Oklahoma 73072  
Tel: 405-579-0771  
<http://www.spc.noaa.gov>  
Russell Schneider, Director

Aviation Weather Center  
7220 NW 101st Terrace, Room 118  
Kansas City, Missouri 64153-2371  
Tel: 816-584-7200  
<http://www.aviationweather.gov>

---

**Regional Climate Centers**


---

**High Plains**

Dr. Martha Shulski, Director  
High Plains Regional Climate Center  
727 Hardin Hall, 3310 Holdrege St  
School of Natural Resources, University of  
Nebraska  
Lincoln, NE 68583-0997  
Tel: 402-472-6709  
Fax: 402-472-8736  
E-mail: [info@hprcc.unl.edu](mailto:info@hprcc.unl.edu)  
<http://www.hprcc.unl.edu>

**Midwest**

Steve Hilberg, Director  
Midwestern Regional Climate Center

Illinois State Water Survey  
2204 Griffith Drive  
Champaign, IL 61820  
Tel: 217-244-8226  
Fax: 217-244-0220  
E-mail: [mrcc@isws.illinois.edu](mailto:mrcc@isws.illinois.edu)  
<http://mrcc.isws.illinois.edu>

**Northeast**

Arthur DeGaetano, Director  
Northeast Regional Climate Center  
1123 Bradfield Hall  
Cornell University  
Ithaca, NY 14853-1901  
Tel: 607-255-1751  
Fax: 607-255-2106  
E-mail: [nrcc@cornell.edu](mailto:nrcc@cornell.edu)  
<http://www.nrcc.cornell.edu>

**Southeast**

Dr. Charles E. Konrad II, Director  
Southeast Regional Climate Center  
University of North Carolina at Chapel Hill  
Saunders Hall Campus Box 3220  
Chapel Hill, NC 27599-3220  
Tel: 919-843-9721  
Fax: 919-843-9060  
E-mail: [sercc@climate.ncsu.edu](mailto:sercc@climate.ncsu.edu)  
<http://www.sercc.com>

**South**

Dr. Kevin Robbins, Director  
Southern Regional Climate Center  
Louisiana State University  
E328 Howe-Russell Complex  
Baton Rouge, LA 70803  
Tel: 225-388-5021  
Fax: 225-388-2912  
E-mail: [krobbins@srcc.lsu.edu](mailto:krobbins@srcc.lsu.edu)  
<http://www.srcc.lsu.edu>

**West**

Dr. Tim Brown, Director  
Western Regional Climate Center  
2215 Raggio Parkway  
Reno, NV 89512  
Tel: 775-674-7010  
Fax: 775-674-7016  
E-mail: [wrc@drri.edu](mailto:wrc@drri.edu)  
<http://www.wrc.drri.edu>

---

**State Climate Centers**


---

**Alabama**

Dr. John Christy, State Climatologist  
National Space Science and Technology Center  
Room 4082  
320 Sparkman Drive  
Huntsville, Alabama 35805  
Tel: 256-961-7771  
<http://nsstc.uah.edu/oasc>

**Alaska**

Dr. Gerd Wendler, Director  
Alaska Climate Research Center  
University of Alaska Fairbanks  
903 Koyukuk Drive  
PO Box 757320  
Fairbanks, AK 99775-7320  
Tel: 907-474-7885  
Fax: 907-474-7290  
E-mail: [webmaster@climate.gi.alaska.edu](mailto:webmaster@climate.gi.alaska.edu)  
<http://climate.gi.alaska.edu>

**Arizona**

Dr Nancy Selover, State Climatologist  
State Climate Office  
Arizona State University  
PO Box 871508  
Tempe, AZ 85287-1508  
Tel: 480-965-0580  
Fax: 480-965-1473  
E-mail: [selover@asu.edu](mailto:selover@asu.edu)  
<http://azclimate.asu.edu>

**Arkansas**

No state climate center at this time.

**California**

Michael Anderson  
Acting State Climatologist  
CA Dept of Water Resources  
Division of Flood Management  
3310 El Camino Avenue  
Suite 200  
Sacramento CA 95821  
Tel: 916-574-2830  
Fax: 916-574-2767  
E-mail: [manderso@water.ca.gov](mailto:manderso@water.ca.gov)  
<http://www.climate.water.ca.gov/>

**Colorado**

Nolan Doesken, State Climatologist  
Colorado Climate Center  
Dept of Atmospheric Science  
Colorado State University  
1371 General Delivery  
Fort Collins CO 80523-1371  
Tel: 970-491-8545  
Fax: 970-491-3314  
E-mail: [nolan@atmos.colostate.edu](mailto:nolan@atmos.colostate.edu)  
<http://ccc.atmos.colostate.edu>

**Connecticut**

Dr. X Harrison Yang, State Climatologist  
Natural Resources Management and Engineering  
University of Connecticut  
1376 Storrs Rd  
Storrs CT 06269  
Tel: 860-486-0135  
Fax: 860-486-5408  
E-mail: [csc@canr.uconn.edu](mailto:csc@canr.uconn.edu)  
<http://www.canr.uconn.edu>

**Delaware**

Dr. Daniel J. Leathers  
Center for Climatic Research  
210 Newark Hall  
Department of Geography  
University of Delaware  
Newark DE 19716  
Tel: 302-831-2294  
Fax: 302-831-6654  
E-mail: [leathers@udel.edu](mailto:leathers@udel.edu)  
<http://www.udel.edu/leathers/stclim.html>

**Florida**

David Zierden, State Climatologist  
Florida Climate Center  
Florida State University  
Center for Ocean-Atmospheric Prediction Studies  
2035 E Paul Dirac Dr, 223 RM Johnson Bldg  
Tallahassee, FL 32306-2840  
Tel: 850-644-3417  
Fax: 850-644-5092  
E-mail: [climate@coaps.fsu.edu](mailto:climate@coaps.fsu.edu)  
[http://www.coaps.fsu.edu/climate\\_center](http://www.coaps.fsu.edu/climate_center)

---

## Glossary of Terms

---

**Ablation** The process of being removed. Snow ablation usually refers to removal by melting

**Absolute Humidity** The density of water vapor. It is the mass of the water vapor divided by the volume that it occupies.

**Accretion** Growth of precipitation particles by collision of ice crystals with supercooled liquid droplets which freeze on impact

**Accessory Clouds** Clouds that are dependent on a larger cloud system for development and continuance. Accessory clouds associated with the thunderstorm include roll, shelf, mammatus, and wall clouds.

**Acid Rain** Cloud or rain droplets containing pollutants, such as oxides of sulfur and nitrogen, to make them acidic (e.g. pH 5.6).

**Additive data** A group of coded remarks in a weather observation that includes pressure tendency, amount of precipitation, and maximum/minimum temperature during specified periods of time.

**Adiabatic** changes in temperature caused by the expansion (cooling) or compression (warming) of a body of air as it rises or descends in the atmosphere.

**Adiabatic Process** The change of temperature of air without transferring heat. In an adiabatic process compression results in warming, and expansion results in cooling.

**Advection** The horizontal transport of air, moisture or other atmospheric properties. Commonly used with temperatures, i.e., "warm air advection".

**Advection Fog** a type of fog that results from the advection of moist air over a cold surface and the cooling of the air to its dew point that follows; this type of fog is most common in coastal regions.

**Advisory** Advisories are issued for weather situations that cause significant inconveniences but do not meet warning criteria and, if caution is not exercised, could lead to life-threatening situations. Advisories are issued for significant events that are occurring, are imminent, or have a very high probability of occurrence.

**Aerosol** Particles of matter, solid or liquid, larger than a molecule but small enough to remain suspended in the atmosphere (up to 100 $\mu$ m diameter). Natural origins include salt particles from sea spray and clay particles as a result of weathering of rocks. Aerosols can also originate as a result of man's activities and in this case are often considered pollutants.

**Aerovane** Aerovanes are commonly used at many weather stations and airports to measure both wind direction and speed. They are similar to wind vanes and cup anemometers except have three-bladed propellers attached to the end of the vane.

**AFOS** the Automation of Field Operations and Services; AFOS is the computer system that links National Weather Service offices and other computer networks, such as the NOAA Weather Wire, to transmit weather information.

**AGL** above ground level.

**Air** the mixture of gases that make-up the earth's atmosphere. **Air Mass** A large body of air that has similar horizontal temperature and moisture characteristics.

**Air-mass Thunderstorm** Generally, a thunderstorm not associated with a front or other type of synoptic-scale forcing mechanism. Air mass thunderstorms typically are associated with warm, humid air in the summer months; they develop during the afternoon in response to insolation, and dissipate rather quickly after sunset.

**Air Parcel** An imaginary small body of air that is used to explain the behavior of air. A parcel is large enough to contain a very great number of molecules, but small enough so that the properties assigned to it are approximately uniform throughout. **Air Pollution** The existence in the air of substances in concentrations that are determined unacceptable. Contaminants in the air we breathe come mainly from manufacturing industries, electric power plants, automobiles, buses, and trucks.

**Air Pressure** (atmospheric pressure) air pressure is the force exerted on a surface by the weight of the air above it. The internationally recognized unit for measuring this pressure is the kilopascal.

**Airstream** A significant body of air flowing in the same general circulation.

**Albedo** The percentage of light reflected by an object. Snow covered areas have a high albedo (0.9 or 90%) due to their white color.

**Alberta Clipper** A small, fast-moving low-pressure system that forms in western Canada and travels southeastward into the United States. These storms, which generally bring little precipitation, generally precede an Arctic air mass.

**Altimeter** An active instrument (see active system) used to measure the altitude of an object above a fixed level.

**Altimeter setting** That pressure value to which an aircraft altimeter scale is set so that it will indicate the altitude above mean sea-level of an aircraft on the ground at the location for which the value was determined.

**Altitude** Height expressed as the distance above a reference point, which is normally sea level or ground level.

**Altostratus** Mid-altitude clouds with a cumuliform shape. **Altostratus** Mid-altitude clouds with a flat sheet-like shape. Anabatic wind flowing up an incline, such as up a hillside; upslope wind.

**Anafront** A front at which the warm is ascending the frontal surface up to high altitudes.

**Anemometer** An instrument that measures wind speed.

**Aneroid barometer** An instrument built around a metal structure that bends with changing air pressure. These changes are recorded on a pointer that moves back and forth across a printed scale.

**Angular Momentum** the energy of motion of a spinning body or mass of air or water.

**Angular Velocity** the rate at which a spinning body rotates.

**Anomaly** The deviation of (usually) temperature or precipitation in a given region over a specified period from the normal value for the same region.

**Anticyclone** A large body of air in which the atmospheric pressure is higher than the pressure in the surrounding air. The winds blow clockwise around an anticyclone in the Northern Hemisphere. Anticyclonic describes the movement of air around a

high pressure, and rotation about the local vertical opposite the earth's rotation. This is clockwise in the Northern Hemisphere.

**Anvil Cloud** The flat, spreading top of a Cb (cumulonimbus), often shaped like an anvil. Thunderstorm anvils may spread hundreds of miles downwind from the thunderstorm itself, and sometimes may spread upwind (see back-sheared anvil).

**Anvil Crawler** A lightning discharge occurring within the anvil of a thunderstorm, characterized by one or more channels that appear to crawl along the underside of the anvil. They typically appear during the weakening or dissipating stage of the parent thunderstorm, or during an active MCS.

**Anvil Dome** A large overshooting top or penetrating top.

**Anvil Rollover** A circular or semicircular lip of clouds along the underside of the upwind part of a back-sheared anvil, indicating rapid expansion of the anvil. See cumuliform anvil, knuckles, mushroom.

**Anvil Zits** Frequent (often continuous or nearly continuous), localized lightning discharges occurring from within a thunderstorm anvil.

**Arctic Air** a mass of very cold, dry air that usually originates over the Arctic Ocean north of Canada and Alaska.

**Arctic High** a very cold high pressure that originates over the Arctic Ocean.

**Arcus** A low, horizontal cloud formation associated with the leading edge of thunderstorm outflow (i.e., the gust front). Roll clouds and shelf clouds both are types of arcus clouds.

**Aridity** A general term used to describe areas suffering from lack of rain or drought. More specifically, a condition in which evaporation exceeds precipitation.

**ASOS** Automated Surface Observing System. This system observes sky conditions, temperature and dewpoint, wind direction and speed, and barometric pressure, and precipitation.

**Atmosphere** The mass of air surrounding the earth and bound to it more or less permanently by the earth's gravitational attraction.

**Atmospheric Pressure** (also called air pressure or barometric pressure) The pressure asserted by the mass of the column of air directly above any specific point.

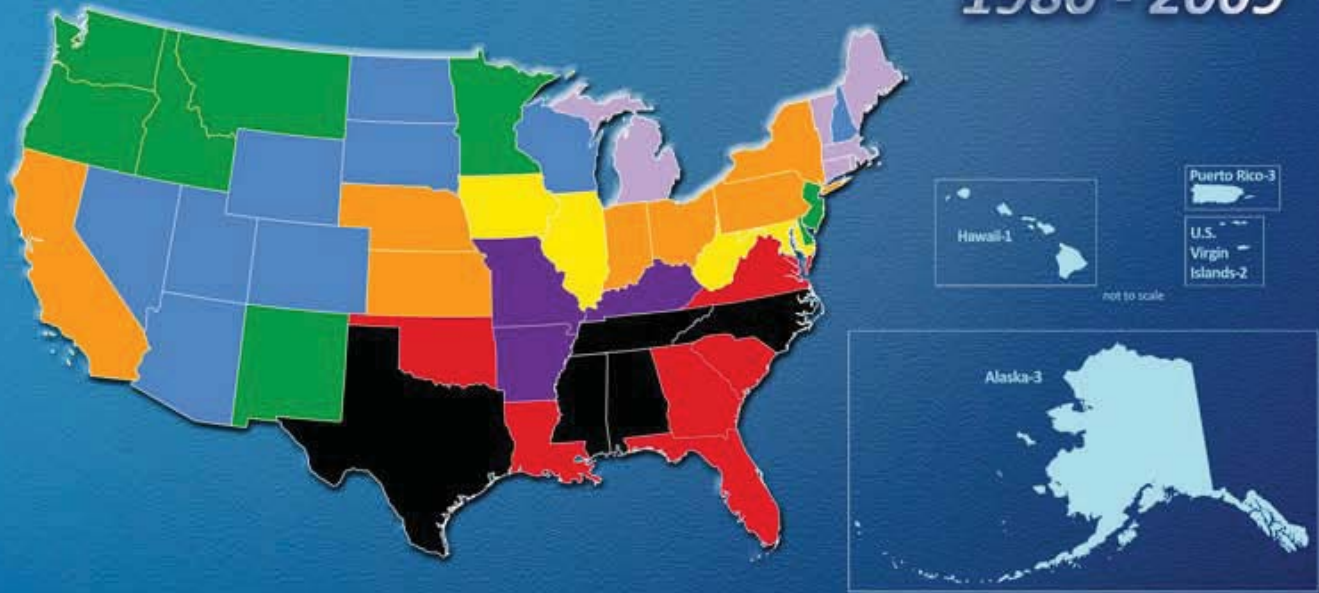
**Atmospheric Stability** An indication of how easily a parcel of air is lifted. If the air is very stable it is difficult to make the parcel rise. If the air is very unstable the parcel may rise on its own once started.

**Aurora Borealis** Also known as the northern lights. The luminous, radiant emission from the upper atmosphere over middle and high latitudes, and centered around the earth's magnetic poles. These silent fireworks are often seen on clear winter nights in a variety of shapes and colors.

**Automated Weather Station** An unmanned station with various sensors that measure weather elements such as temperature/wind/pressure and transmit these readings for use by meteorologists.

**VHRR** Advanced Very High Resolution Radiometer. Main sensor on U.S. polar orbiting satellites.

# BILLION DOLLAR CLIMATE and WEATHER DISASTERS 1980 - 2009\*



DISASTER TYPE	NUMBER OF EVENTS	PERCENT FREQUENCY	NORMALIZED DAMAGES (Billions of Dollars)	PERCENT DAMAGE
Tropical Storms/Hurricanes	27	28.1%	367.3	51.1%
Severe Weather	20	20.8%	38.4	5.3%
Heatwaves/Droughts	15	15.6%	185.2	25.7%
Non-Tropical Floods	13	13.6%	70.5	9.8%
Fires	10	10.4%	19.2	2.7%
Freezes	6	6.3%	18.6	2.6%
Blizzards	2	2.1%	11.9	1.7%
Ice Storms	2	2.1%	5.9	-0.8%
Noreaster	1	1.0%	2.2	-0.3%
	<b>96</b>		<b>719.2</b>	

\*IMPORTANT NOTE: An event is counted if total damage estimate exceeds \$1 billion dollars. A single event may affect multiple states.

NOAA'S NATIONAL CLIMATIC DATA CENTER ■ ASHEVILLE, N.C.



[www.ncdc.noaa.gov/oa/reports/billionz.html](http://www.ncdc.noaa.gov/oa/reports/billionz.html)

*Protecting the past... Revealing the future*

