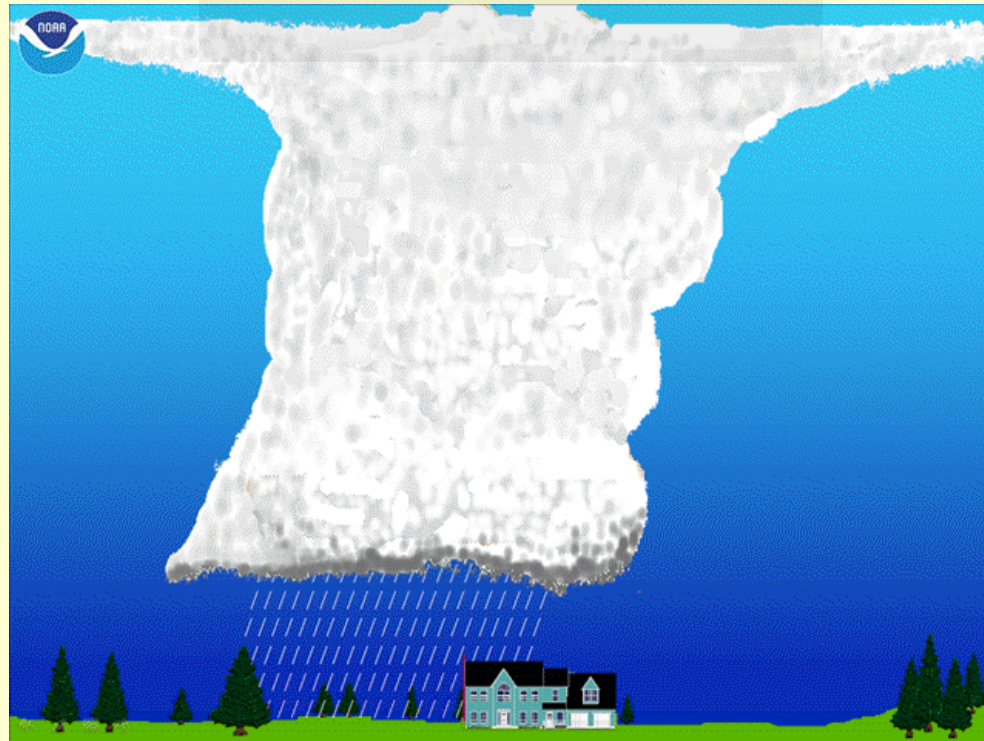
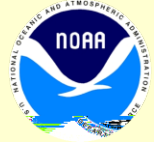




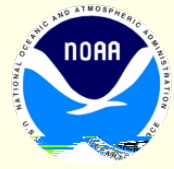
# Dr. Lightning's Guide To Lightning and Thunder -- Victims --



**National Weather Service  
NOAA**



# Lightning Victims

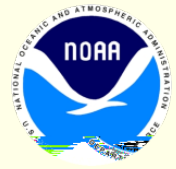


Written, illustrated, and animated  
by  
John Jensenius  
aka: Dr. Lightning





# Lightning Victims



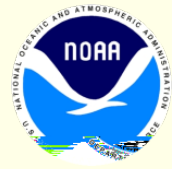
Every year, hundreds of people across the United States fall victim to one of nature's most powerful weather threats... **LIGHTNING!**

Based on data for recent years, lightning kills about 30 people each year in the United States. While most people survive a lightning strike, some survivors are left with permanent, painful neurological disabilities.

Most, if not all, of these tragedies could be prevented with a few simple precautions. Plan ahead so that you can get to a safe place if a thunderstorm threatens, and go there immediately if you see signs of a developing or approaching thunderstorm. A little inconvenience can save your life.



# If Someone is Struck



**Lightning victims do not carry an electrical charge, are safe to touch and may need urgent medical attention. If someone is struck, call 9-1-1 for help. If necessary, begin CPR and use an Automatic External Defibrillator (AED) if one is available. Cardiac arrest is the immediate cause of death for those who die.**



# Lightning Survivors



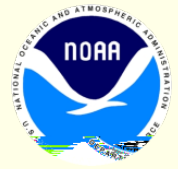
**After being struck, people are often confused and don't know what happened. Although a survivor may suffer burns, a greater concern is the effect of the lightning on the heart and nervous system.**



# Lightning Survivors

## Effects of a Lightning Strike

- Mental –**
  - Difficulty with mental processes
  - Problems multitasking
  - Short-term memory loss
  - Forgetfulness
  - Easily distracted
  - Personality changes
  - Irritability
  - Depression
  
- Physical –**
  - Intense headaches
  - Body pain
  - Easily fatigued
  - Difficulty sleeping



# How People Are Struck By Lightning

1. Direct Strike
2. Side Flash
3. Ground Current
4. Conduction
5. Streamer



# Direct Strike

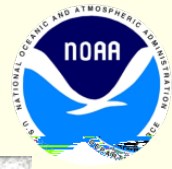


**Victims struck directly by lightning are usually in open areas. Direct strikes are less common than some of the other ways people are struck, but they are potentially the most deadly.**





# Side Flash



**Victims struck by a side flash are usually standing next to a taller object -- often a tree. On its way to the ground, the lightning jumps from the taller object to the person.**



# Side Flash



**In 2011, a man took shelter under this tall tree.  
When lightning struck the tree, the man was  
killed by a side flash.**



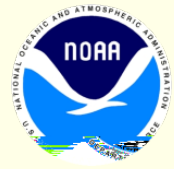
# Ground Current



**People struck by ground current are somewhere very near a lightning strike. The lightning might strike a nearby tree or even the ground. Ground current is likely responsible for most lightning fatalities.**



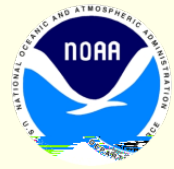
# Ground Current



**Ground current usually passes in one leg and out the other, passing through the body. It is particularly dangerous to anyone lying down. Ground current kills many farm animals every year.**



# Ground Current



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Used with permission

**Ground current moves in and along the surface of the ground. In this case, lightning struck the flag and spread out along the ground.**



# Ground Current

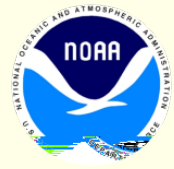
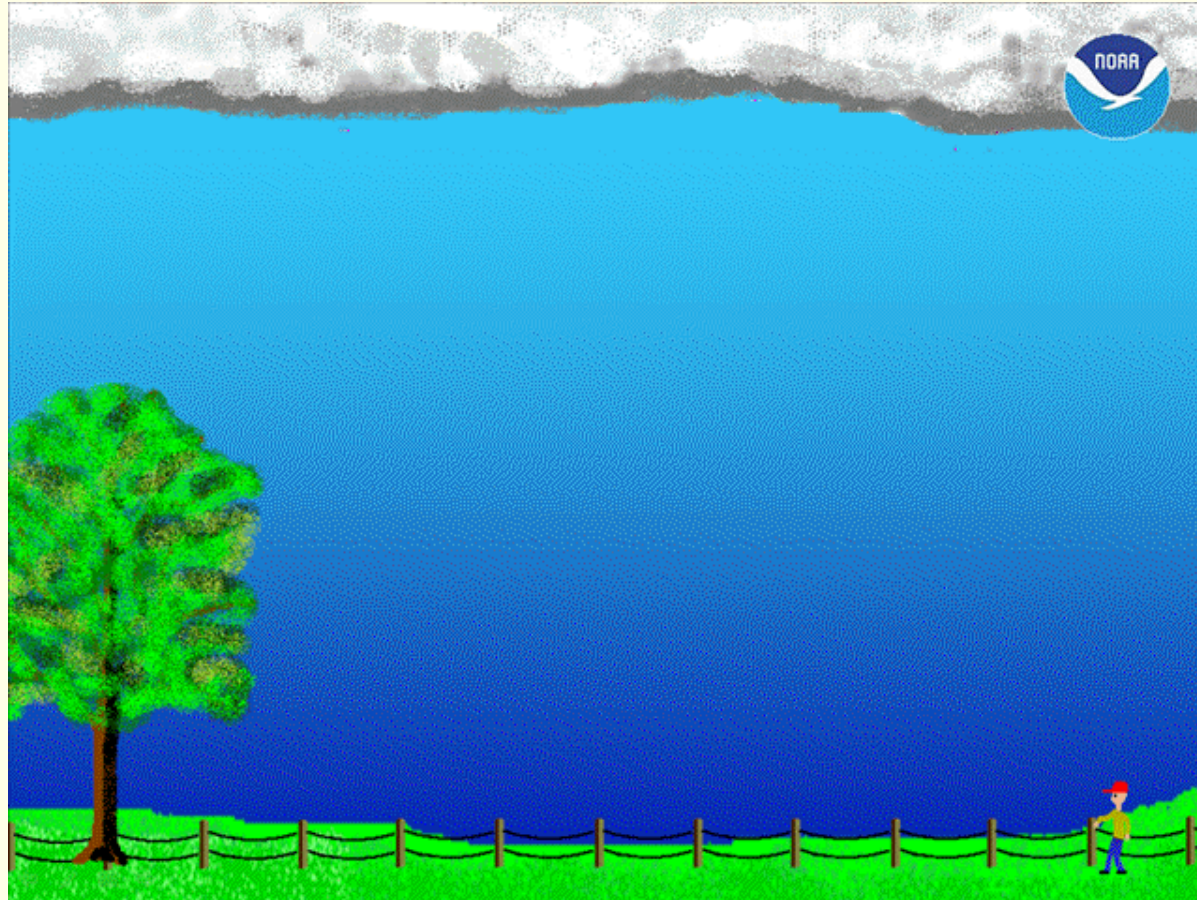
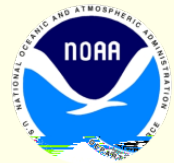


Photo credit: Kelli Easterling | Richmond County Daily Journal  
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**Farm animals are often killed by ground current. In this case, lightning struck the tree and spread out along the ground, killing these cattle.**



# Conduction



**Lightning can travel long distances through wires or metal. Metal does not attract lightning, but it does provide a path for lightning to follow.**



# Conduction

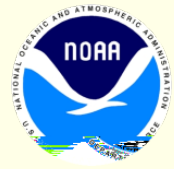


Photo by Ruth Lyon-Bateman  
Permission granted for use in lightning  
safety instruction materials only.  
Do not post on web.

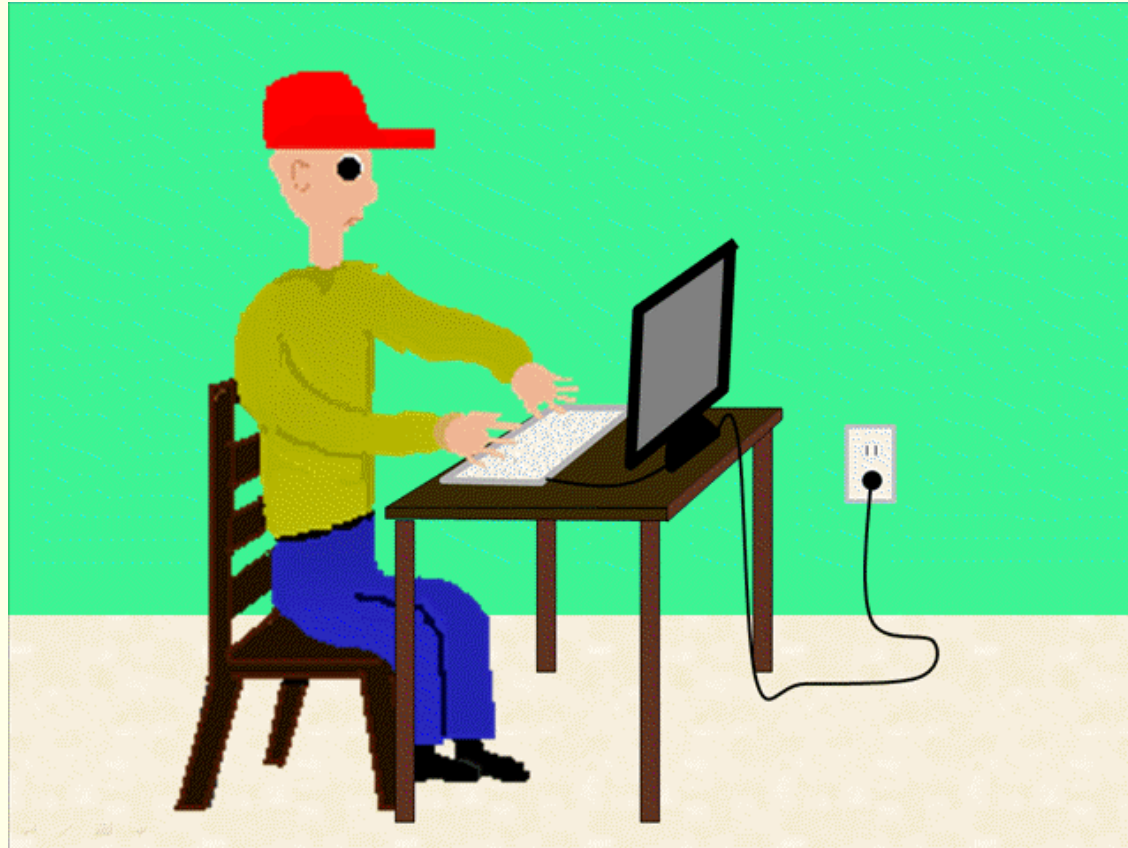
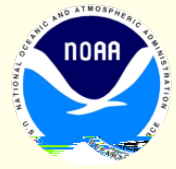


**Lightning struck somewhere along this wire fence.  
The charge traveled along the fence and killed all  
these cows.**





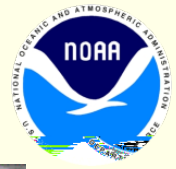
# Conduction



**Conduction is responsible for most indoor lightning casualties. Lightning can enter a home through wires or pipes. Anyone that touches plumbing or anything plugged into an electrical outlet is at risk of being struck.**



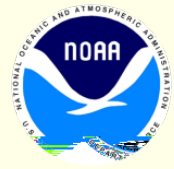
# Streamer



**Although not as common as other types of fatal incidents, victims caught in “streamers” are at risk of being killed or injured. Streamers discharge when lightning strikes nearby.**



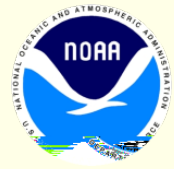
# Streamer



**This photo shows a nearby flash of lightning. The photographer was lucky that he wasn't killed or seriously injured. In addition to the main flash, there are also "streamers" nearby (see next page).**



# Streamer



Copyright: Scott Weberpal – All rights reserved  
Used with permission

**When we zoom in on the picture, you can see two streamers coming from trees in the background.**



# What We Learn By Tracking Lightning Fatalities

The National Weather Service keeps a list of lightning fatalities across the United States to help understand what can be done to prevent these untimely deaths and injuries.

By tracking statistics like age, gender, location, activity, and day of the week for each fatal incident, we get a better understanding of who is being struck and what they were doing at the time.

Our primary goal is to reduce the number of deaths and injuries. By collecting and analyzing these data, we are able to focus our efforts on behaviors and activities that contribute most to lightning deaths and injuries in the United States.



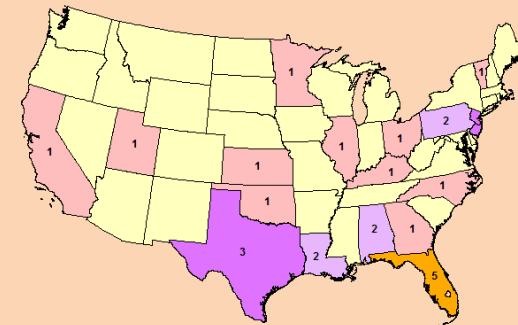
# The National Weather Service Keeps A List Of Lightning Fatalities



To date, there have been 28 lightning fatalities in 2012 in 16 states.  
Florida sadly numbers 5 deaths; New Jersey and Texas, 3  
Alabama, Louisiana, and Pennsylvania, 2

No.	Date	Day	ST	City	Age	Sex	Location	Activity	Victim
1	3/30	Fri	AL	Greenville	12	M	Under Tree	Playing	Aven Brett Schofield
2	4/11	Wed	LA	Ponchatoula	54	M	Small metal structure under tree	Had been fishing	Luther Clyde Baham, Sr.
3	4/11	Wed	LA	Ponchatoula	33	M	Small metal structure under tree	Had been fishing	Luther Clyde Baham, Jr.
4	6/8	Fri	FL	Lake Okeechobee	51	M	Boat in lake	Fishing	Lorenzo Magdaleno
5	6/23	Sat	VT	Post Mills	16	M	Farm field	Harvesting	Connor Cook
6	6/30	Sat	TX	Houston	33	M	Open area	Utility repair	John Henry JansseVanRensburg
7	7/3	Tue	OH	Zanesville	60	M	Under tree	Working in Yard	Dick Sorg
8	7/7	Sat	NJ	Monmouth Beach	48	F	Beach	Family Outing	Indira Tursanova
9	7/7	Sat	KS	Coffey County	68	M	Front Yard	Family gathering	Ronald Nicholas
10	7/7	Sat	IL	Nashville	51	M	Outside home	Stepping out door	Steven J. Rybacki
11	7/13	Fri	GA	Peachtree City	52	M	Under tree by boat ramp	Fishing	Burnette Hayes
12	7/13	Fri	OK	Ada	61	M	Driveway of home		Ray Marshall
13	7/15	Sun	TX	Aldine	27	M	Under tree	Soccer	Jose Romero
14	7/15	Sun	TX	Aldine	26	M	Under tree	Soccer	Angel Delgado
15	7/16	Mon	AL	Huntsville	40	M	Driveway of Home		Daniel Roets
16	7/21	Sat	UT	Boulder Mntn	24	M	Under tree	Fishing	Jesse King
17	7/23	Mon	CA	Nevada County	71	M	Near trees	Camping	Frank Baeta
18	7/24	Tue	PA	Garrett	36	F	Under tree	Picking Berries	Mary Yoder
19	7/26	Thu	KY	Lexington	67	F	Outside	Installing watering system	Kathlyn Friend
20	8/5	Sun	PA	Long Pond	41	M	Parking lot	NASCAR race	Brian Zimmerman
21	8/6	Mon	FL	Shell Island	42	M	Beach	Walking to boat	James Keith Brown
22	8/6	Mon	FL	Shell Island	14	M	Beach	Being carried	Tristan Barger
23	8/15	Wed	NJ	Long Branch	41	M	Beach	Fishing	Sebastian Castillo
24	8/18	Sat	MN	Duluth	9	M	Beach	Sailing	Luke Voigt
25	8/19	Sun	NC	Wilmington	50	M	Near tree	Fishing	Timothy Godwin
26	9/7	Fri	NJ	Demarest	71	M	Near tree	Watching soccer game	Viktor Ovsyankin
27	9/7	Fri	FL	Lakeland	16	M	Under tree	Moving bike	James Pinkstaff
28	10/3	Wed	FL	Ft. Myers	11	M	Open field	Football practice	Jesse Watlington

Lightning Fatalities for 2012 by State



2012 Lightning Fatality Demographics

State	Gender	Age	Day Of Week	By Month												Norm*
				12	11	10	09	08	07	06	05	04	03	02	01	
AL	2	M	25 (89%)	0-9	1 (4%)	Sun	4 (14%)	Jan	0	0	0	0	1	0	1	0
CA	1	F	3 (11%)	10-19	5 (18%)	Mon	4 (14%)	Feb	0	0	0	0	1	0	0	0
FL	5			20-29	3 (11%)	Tue	2 (7%)	Mar	1	0	0	1	0	1	0	1
GA	1			30-39	3 (11%)	Wed	3 (11%)	Apr	2	0	1	0	1	0	1	3
IL	1			40-49	5 (18%)	Thu	1 (4%)	May	0	1	4	2	2	5	5	6
KS	1			50-59	5 (18%)	Fri	6 (21%)	Jun	3	5	7	12	9	12	10	12
KY	1			60-69	4 (14%)	Sat	7 (25%)	Jul	13	9	11	10	14	10	16	16
LA	2			70-79	2 (7%)			Aug	6	6	4	3	0	9	7	12
MN	1			80-89	0 (0%)			Sep	2	4	2	4	1	5	4	5
NC	1							Oct	1*	1	1	1	0	2	2	1
NJ	3							Nov	0	0	0	0	0	0	0	0
OH	1							Dec	0	0	0	0	0	0	0	0
OK	1							Year	28*	26	29	34	28	45	48	54
PA	2															
TX	3															
UT	1															
VT	1															

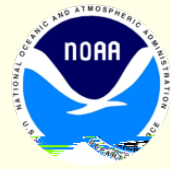
Percentages may not add up to 100% due to rounding. \* - Known Fatalities to date

The current list:

<http://www.lightningsafety.noaa.gov/fatalities.htm>



# Looking At The Statistics

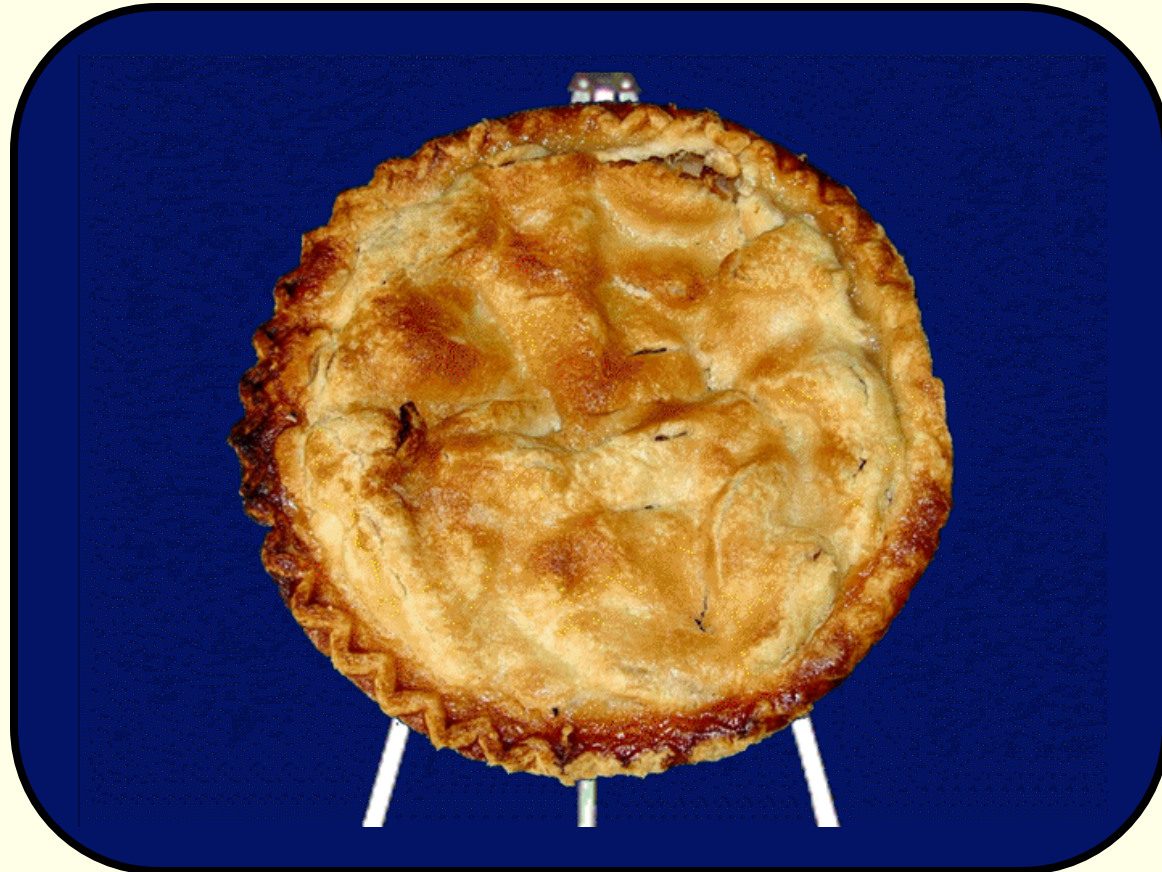
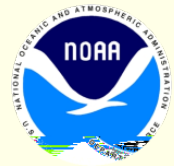


**The National Weather Service analyzes the information in the lightning fatality database to learn about lightning victims. Pie charts and graphs are used to summarize and visualize these data. Our findings show the factors that contribute most to lightning fatalities.**



# Lightning Fatality Pie

## Male versus Female

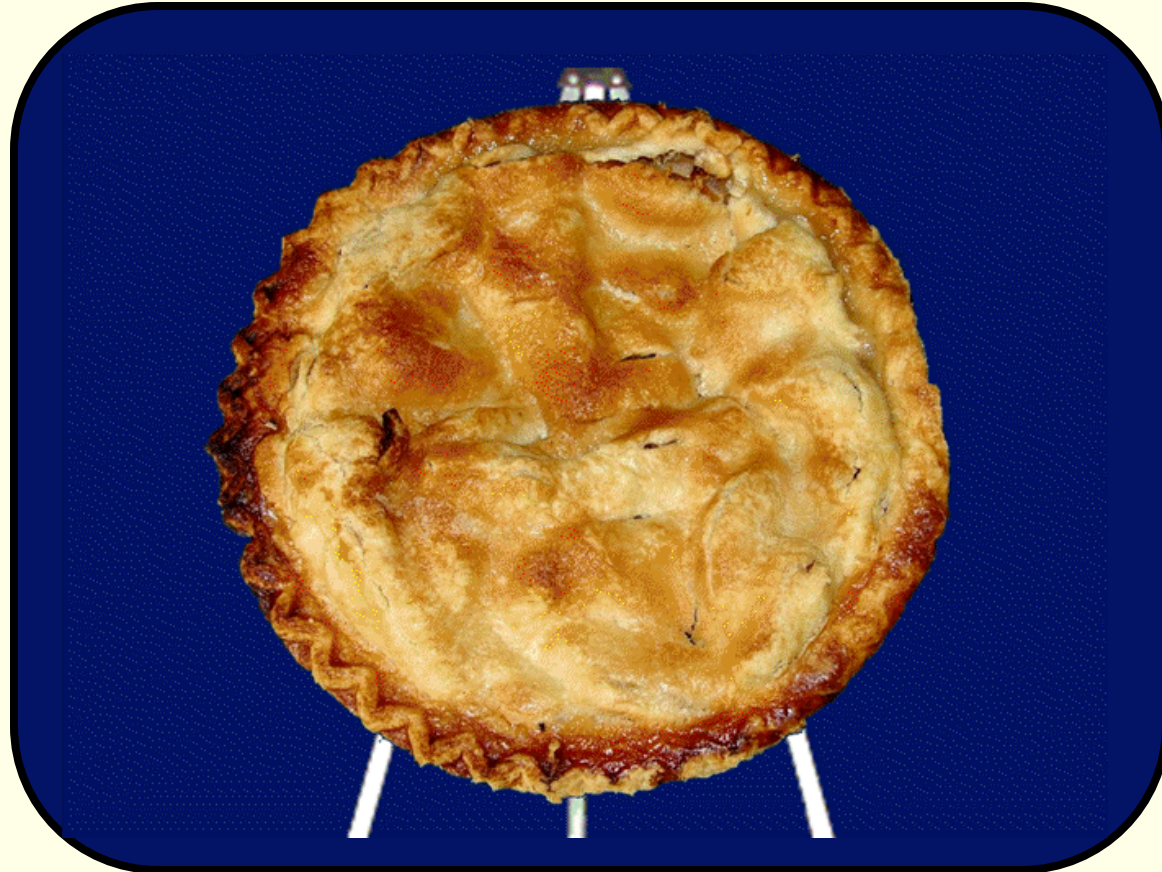
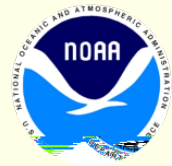


**Men and boys account for more than 80% of the lightning fatalities in the United States. In general, men are less likely to seek shelter immediately when they first see lightning or hear thunder.**





# Lightning Fatality Pie Inside versus Outside

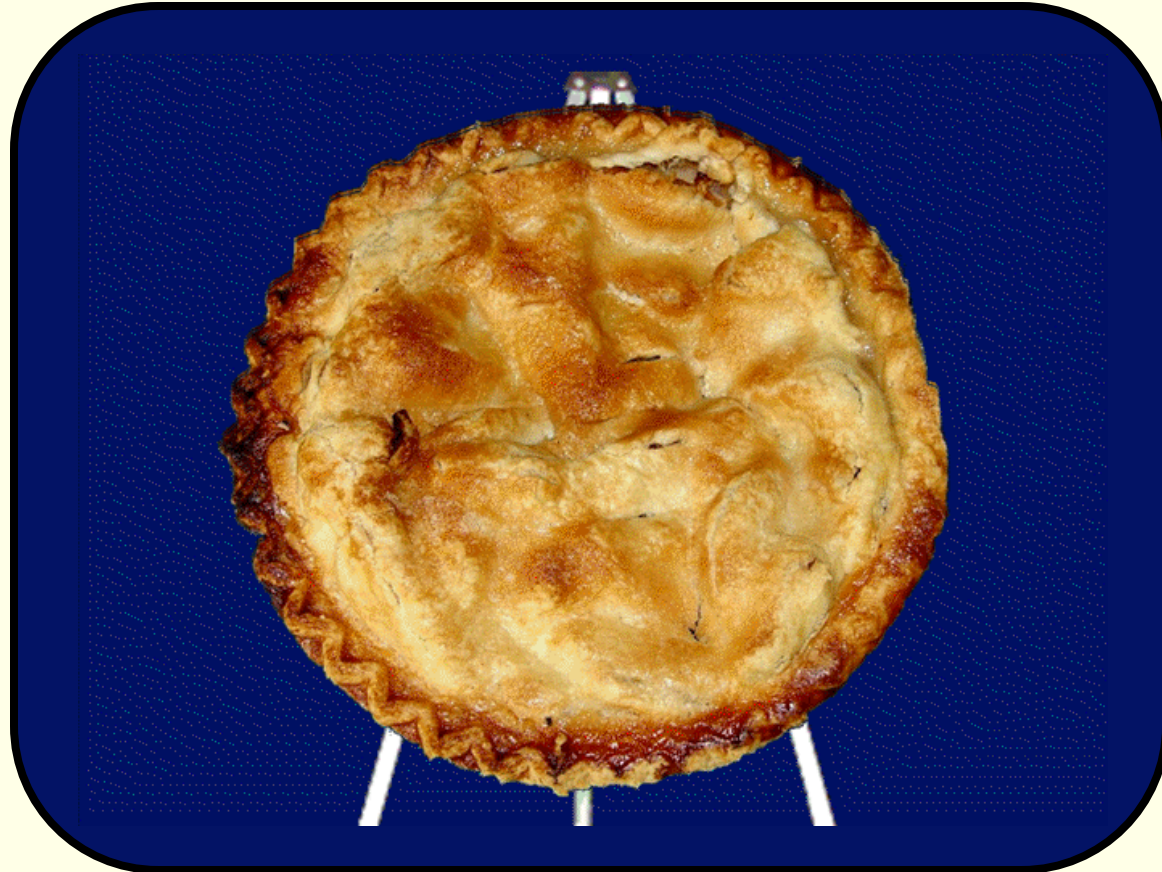
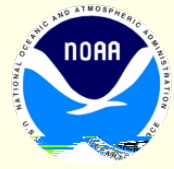


**Almost all lightning fatalities occur outside. People often wait too long to seek shelter when a thunderstorm is approaching or developing. Remember, there is no safe place outside when a thunderstorm is in the area.**



# Lightning Fatality Pie

## Fatal Activities

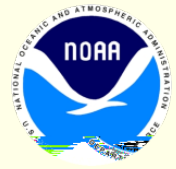


**Most lightning victims are outside enjoying leisure activities. These activities include fishing, boating, hiking, camping, sports, or a trip to a beach or lake. Others are killed during their normal daily activities or at work.**



# Lightning Fatality Pie

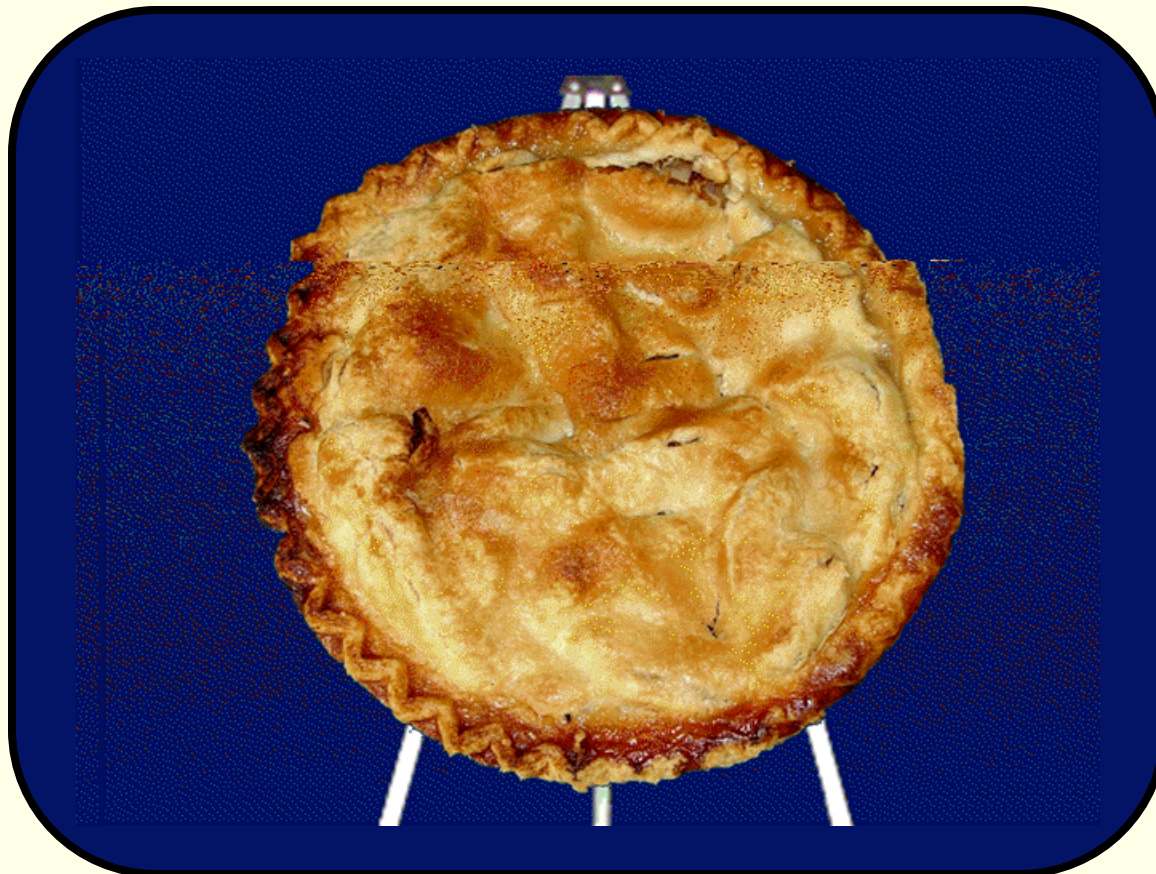
## Water-Related Fatalities



**Almost half of all water-related fatalities are people fishing. It's especially important for people out on the water to plan ahead so that there's adequate time to get to a safe place before a thunderstorm threatens.**



# Lightning Fatality Pie Sports-Related Fatalities

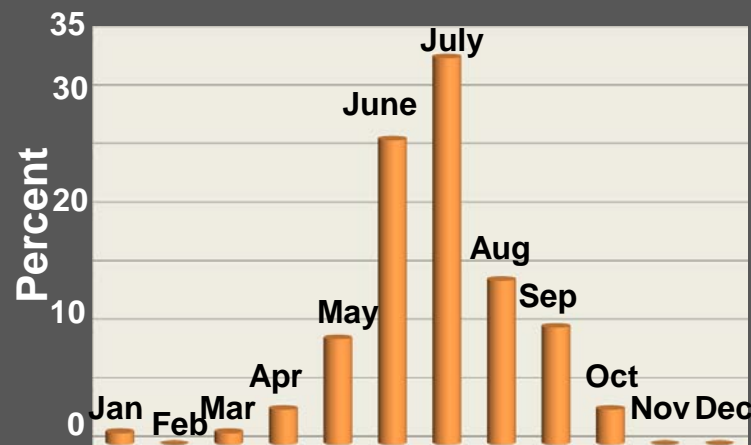


**For sports-related lightning fatalities, soccer tops the list. Golf and running also contribute significantly to the deaths. Both participants and spectators need a plan to get to safety, if necessary.**



# Lightning Fatality Graph

## Month

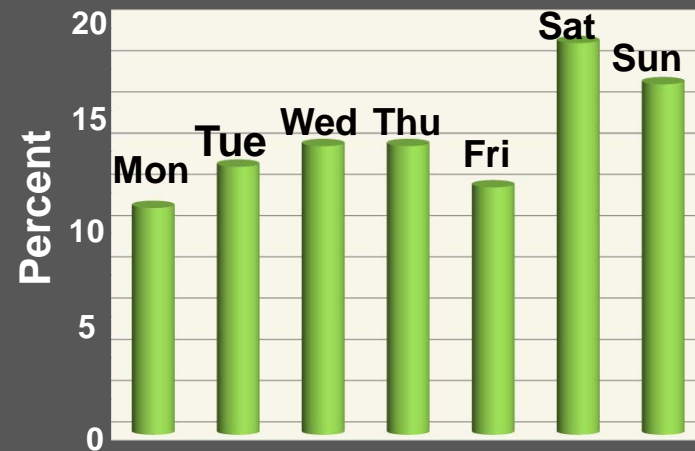
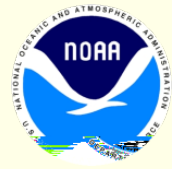


Lightning fatalities can occur at any time of the year but are more frequent during the warmer months. During summer, people spend more time outdoors and there are more thunderstorms.



# Lightning Fatality Graph

## Day of Week

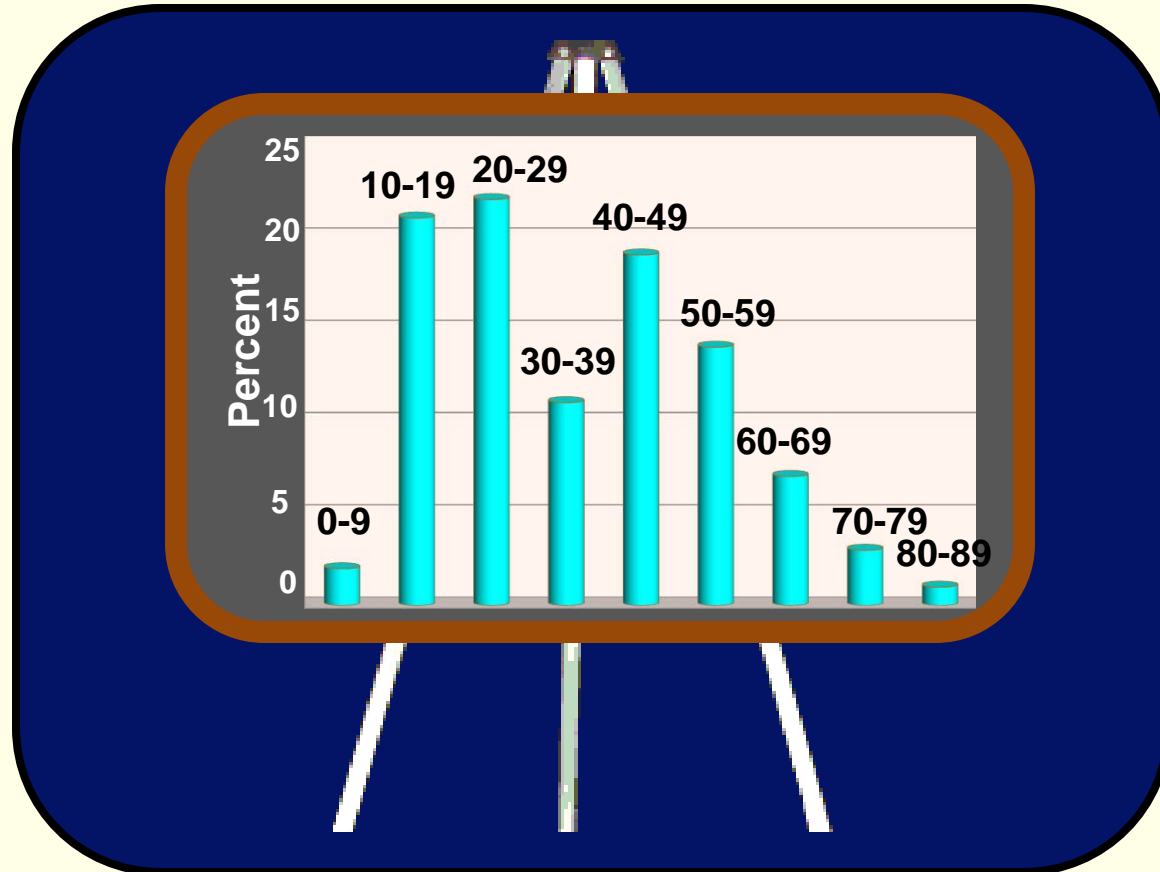
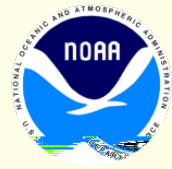


Lightning fatalities occur all days of the week but are more common during the weekend when people enjoy many outdoor leisure activities.



# Lightning Fatality Graph

## Age



Lightning kills people of all ages. However, most of the people killed by lightning are between the ages of 10 and 60.



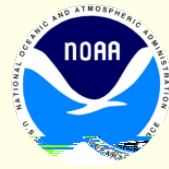
# A Message From A Survivor's Sister



**Christina Bryan was struck by lightning in 2001. Christina's sister, Ellen, a former Miss Ohio, describes the incident and talks about lightning safety in a public service announcement.**

**[Click here to download.](#)**





# For More Information

www.nws.noaa.gov



**National Weather Service**

## Lightning Safety



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### Lightning Safety: *When Thunder Roars, Go Indoors!*

#### What's New?

- [NWS Lightning Safety Awareness Message](#)
- [Lightning Deaths in 2013](#)
- [The Dr Lightning Show: Intro, Victims, Science](#)
- [Latest Lightning Safety Blog](#)
- [Beyond Thunder Dumb: When Lightning Strikes](#)

Summer is the peak season for one of the nation's deadliest weather phenomena—lightning. Though lightning strike peak in summer, people are struck year round. In the United States, an average of 54 people are killed each year by lightning, and hundreds more are severely injured.



**Safety:** Learn what you need to do to stay safe when thunderstorms threaten.



**Victims:** Learn what happens to people who are struck by lightning and look at fatality statistics for the U.S.



**Science:** Learn how thunderstorms develop and what happens during a lightning discharge.



**Myths and Facts:** Get answers to many of the questions you have always wondered about



**Teachers:** find curriculum guides, presentations games, activities, and more.  
**Kids:** Download games, videos, coloring pages and other fun stuff.

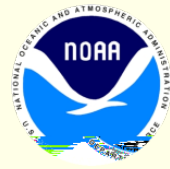


**More Resources:** Download toolkits, posters, pamphlets, and other information to help communities, organizations, and families stay safe from the dangers of lightning

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  Follow us on Facebook

## Visit Our Web Site

[www.lightningsafety.noaa.gov](http://www.lightningsafety.noaa.gov)



# **NOAA Wants You To Have A Safe And Enjoyable Summer**



**If you have any comments or suggestions, please email:  
[Dr.Lightning@noaa.gov](mailto:Dr.Lightning@noaa.gov)**