

U.S. Fire Administration TOPICAL FIRE RESEARCH SERIES

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Lightning Fires

FINDINGS

- Each year, lightning is the cause of an estimated 17,400 fires. Injuries and deaths per lightning fire are relatively small, but dollar loss per fire is nearly twice that from all U.S. fires.
- Two-thirds of lightning fires occur June–August.
- 55% of lightning fires occur outdoors, and 41% occur in structures. Deaths and injuries occur mostly in structures (89% and 86%, respectively).
- Roofs, sidewalls, framing, and electrical wires are the areas most ignited by lightning fires.

Sources: NFPA and NFIRS

Each year, an estimated 17,400 fires are attributed to lightning. Annually, these fires result in approximately 10 civilian deaths, 75 civilian injuries, and \$138 million in property damage.¹ (The casualties described are those that result from *fires* caused by lightning, not those that result from direct lightning strikes.) Casualty losses per lightning fire are considerably less than those from all U.S. fires, but the dollar loss per fire is nearly twice as high (Figure 1).

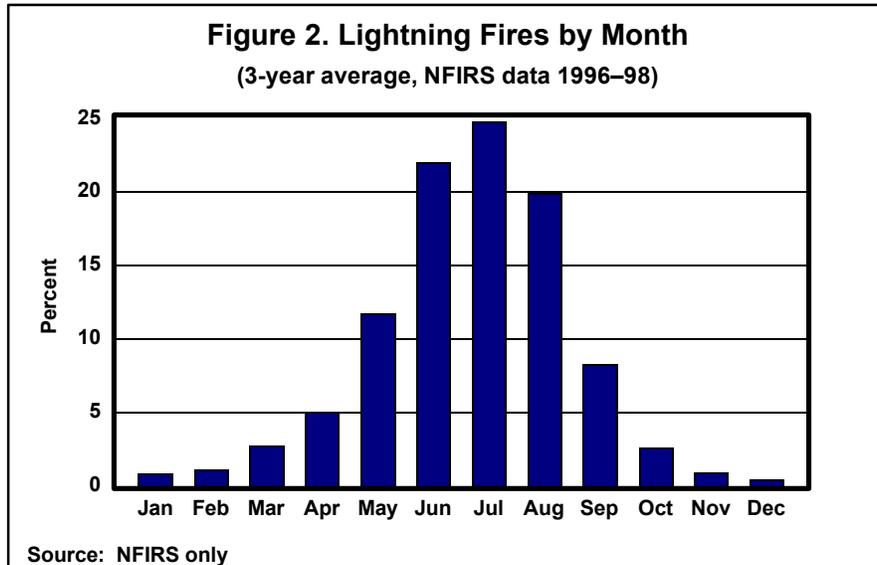
Figure 1. Loss Measures for Lightning Fires
(3-year average, NFIRS data 1996–98)

MEASURE	ALL FIRES	LIGHTNING FIRES
Dollar Loss/Fire	\$5,619	\$9,262
Injuries/1,000 Fires	15.7	4.6
Fatalities/1,000 Fires	2.4	0.4

Source: NFIRS only

This topical report presents an overview of some characteristics of these naturally occurring fires.

Lightning is a natural phenomenon occurring during electrical storms. It is a discharge of atmospheric electricity and is accompanied by a vivid flash of light, commonly from one cloud to another, sometimes from a cloud to the earth. Lightning comes from a parent cumulonimbus cloud (thunderhead). Thunderstorm clouds form wherever there is enough rapid upward air motion and moisture to produce a deep cloud. These conditions most often occur in summer—two-thirds of lightning fires occur in June, July, and August (Figure 2). July has the highest incidence of lightning fire at 25%.



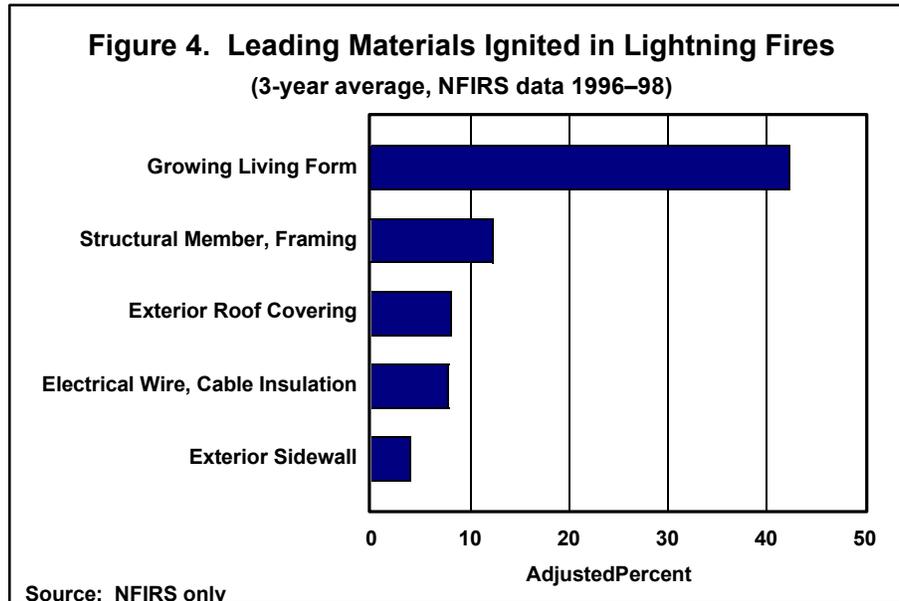
Fifty-five percent of fires caused by lightning strikes occur outside, igniting trees, brush, grass, or other outside materials (Figure 3). Almost as often (41%), lightning strikes residential and other structures. Lightning strikes rarely cause vehicle fires.

Figure 3. Where Lightning Fires Occur

LOCATION OF FIRE	PERCENT
Outdoor Fire	55
Structure Fire	41
Other Fire	3
Vehicle Fire	1

Source: NFIRS only

Because most lightning fires occur outdoors, the most prominent form of material ignited is “growing living form,” which includes trees, brush, and grass (Figure 4). Materials found on residential structures that are commonly ignited include roofs, sidewalls, and framing. Electrical wiring is another material often ignited, as the electrical current in lightning is drawn to electrical wires.



Civilians suffer more injuries than fatalities in lightning fires each year. Most casualties result from lightning structure fires rather than outside or other types of lightning fires. Eighty-nine percent of lightning fire civilian fatalities and 86% of injuries occur in structure fires. Rarely are civilians injured or killed in outdoor lightning fires (7% of injuries and 11% of fatalities). Ninety-three percent of all dollar loss from these fires occur in structure fires.

EXAMPLES

- Residents were evacuated from six homes on June 13, 2001, in Apple Valley, Minnesota, when lightning struck three gas lines, catching fire. No injuries resulted.²
- A house fire resulted from a lightning strike on March 4, 2001, in Salt Lake City, Utah, killing two adults and three children, who were asleep when the lightning struck their home.³
- In Tallahassee, Florida, on June 4, 2001, firefighters fought a blaze that was sparked by lightning. The fire burned hundreds of acres in the state.³

CONCLUSION

Lightning fires are a natural phenomenon. Individuals who live in high strike areas should consult local authorities for current information on how to protect residences and

prevent injuries. For further information on lightning fires, contact the National Oceanic and Atmospheric Administration (NOAA) or the USFA.

NOTES:

1. National estimates are based on National Fire Incident Reporting System (NFIRS) data (1996–1998) and the National Fire Protection Association's (NFPA) annual survey, *Fire Loss in the United States*.
2. Associated Press, June 13, 2001, Apple Valley Minnesota.
3. *The Desert News*, March 4, 2001, Salt Lake City, Utah.
4. Associated Press, June 4, 2001, Tallahassee, Florida.

[CLICK TO REVIEW THE DETAILED METHODOLOGY USED IN THIS ANALYSIS](#)

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