

## 6.9 LIGHTNING



### 6.9.1 Description.

Lightning is defined by the National Weather Service as, “A visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds, between the cloud and air, between a cloud and the ground, or between the ground and a cloud.”

A lightning discharge may be over five miles in length, generate temperatures upwards of 50,000 degrees Fahrenheit, and carry 50,000 volts of electrical potential.

Lightning is most often associated with thunderstorm clouds. Thunder is caused by the rapid expansion of air heated by a lightning strike. Cloud-to-ground lightning strikes occur with much less frequency in the Northwestern United States than in other sections of the country. (*Fremont County AHMP, 2008*)

### 6.9.2 Location.

The entirety of Kootenai County is susceptible to lightning strikes. Lightning can strike as far as five to ten miles from a storm. Lightning strikes not only occur near the precipitation shaft or virga of a dry thunderstorm, but can also occur near the anvil many miles away from the precipitation shaft of the storm. These “bolts from the blue” are often associated with faster fire ignitions as they tend to hit drier fuels or grasses and take people who are outdoors by surprise.

### 6.9.3 Magnitude and Severity of the Hazard.

The magnitude of a lightning strike can range from virtually no impact to regional disaster.

**Table 6.9.1**

Magnitude of Natural Disasters – Lightning Strikes						
Value	Reconstruction Assistance From	Geography (Area) Affected	Expected Bodily Harm	Loss Estimate Range	Population Sheltering Required	Warning Lead Times
1	Family	Parcel	Little to No Injury/ No Death	\$1,000s	No Sheltering	Months

2	City	Block or Group of Parcels	Multiple injuries with Little to No Medical Care/ No Death	\$10,000s	Little Sheltering	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required/ Minimal Death	\$100,000s	Sheltering Requiring Neighborin g Counties Assistance	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	\$1,000,000s	Long Term Sheltering Effort	Hours
8	Federal	County Wide	Massive Casualties /Catastrophic	\$10,000,000s	Relocation Required	Minutes

Typically, lightning strikes have a magnitude score of 13.

**Scoring Rationale.** Lightning strikes have provide little to no warning (Warning Lead Times = 8). Lighting storms may blow across the entire Kootenai County, but the strike itself will impact only a parcel. (Geography Area Affected = 1) This does not preclude multiple strikes per each storm. Strikes cause few injuries each year in Kootenai County. (Bodily Harm = 1). Impact of a lightning strike on a home or structure without lighting rods or other protective measures may cost thousands of dollars (Lost Estimate Range = 1). Public sheltering is not normally required unless a lighting strike results in a fire.(Population Sheltering = 1). Recovery will be managed at a family or business level. (Reconstruction Assistance = 1). The total magnitude score for Kootenai County is 13.

**6.9.4 Previous Occurrences.**

While thunderstorms and lightning are frequent occurrences each year, four significant lighting storms were reported in Kootenai County since January 1, 1950, resulting in an estimated \$105,000 in damages.

**Table 6.9.2**

Significant Lighting Events Reported in Kootenai County (1950-2008)			
Place	Date	Time	Reported Damage

Post Falls	Sep 7, 1995	1700	\$50K
Hayden	May 19, 2006	2000	\$10K
Coeur d'Alene	July 5, 2006	0030	\$15K
Coeur d'Alene	June 4, 2007	2000	\$20K

<http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms>

### 6.9.5 Probability of Future Events.

Lightning strikes occur frequently in Kootenai County each year. Frequency is assessed as High.

**Table 6.9.3**

FREQUENCY – Lightning Strikes	
Ranking	Description
<b>HIGH</b>	<b>Multiple Times a Year to 5 Years</b>
<b>MEDIUM</b>	<b>5 to 25 Years</b>
<b>LOW</b>	<b>25 Years to Has Not Occurred</b>

### 6.9.6 Vulnerability.

Areas throughout Kootenai County are subject to lightning strikes though high elevations and structures are generally more susceptible to strikes than low elevations.

Forested areas are vulnerable to the ignition of fuels by lightning.

Communications towers. Petroleum storage tanks, tall mast boats on Lake Coeur d'Alene, Lake Pend Oreille, and Hayden Lake are all likely targets for lightning strikes.

### 6.9.7 Impact.

Lightning is the second most deadly weather phenomenon in the United States, second only to floods. (Fremont County AHMP, 2008) Lightning occurs during every thunderstorm and accounts for 93 deaths and over 300 injuries annually. In Idaho, fatalities average less than one each year. (Fremont County AHMP, 2008) Although fatalities from lightning strikes are rare in North Idaho, they do occur. In July 1996, lightning near Burley killed a farm worker. Additionally, lightning is a major cause of ignition of range and wildland fires every summer.

Lightning can also result in death or injury to animals, either from direct strikes or resulting fires. It can cause power outages, damage or destruction of structures, and spark wildfires or structural fires.

### 6.9.8 Repetitive Loss

There is no record of repetitive losses in Kootenai County resulting from lightning strikes.

### 6.9.9 Loss Estimates

The extent of dollar loss per lightning strike is situation dependent and difficult to estimate. Strikes to structures can be easily mitigated through the installation of lightning protection devices. As a result, buildings could incur a lightning strike with little to no effect. However, lightning strikes to an unprotected building could result in significant damage from fire and possibly total loss of the structure. Lightning strikes that result in the ignition of range or wildfires can result in anywhere from thousands of dollars in damages to a regional disaster.

### 6.9.10 Mitigation Actions

The following actions to mitigate the threat of lightning strikes were approved by the Kootenai County All Hazard Mitigation Committee from recommended County/Regional actions in support of the State of Idaho Mitigation Plan:

No	Action Item
L1	Install lightning protection devices on critical communications equipment
L2	Install lightning protection devices on critical utility, water, and wastewater systems