P2.13 FLORIDA LIGHTNING DEATHS AND INJURIES 2004-2007

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1. INTRODUCTION

Florida is the most lightning prone state in the U.S. During the ten years from 1994 to 2003 annual Florida lightning injuries averaged 57, and deaths averaged 9. As the population increased from 13.5 million in 1992, to over 18 million in 2006, lightning deaths decreased statewide with an average of 7 deaths per year from 2004 to 2007. For the same four year period, injuries averaged 35 per year. This was a 39 percent decrease in injuries and a 22 percent decrease in deaths, possibly indicating that lightning awareness programs were succeeding in their intended purpose.

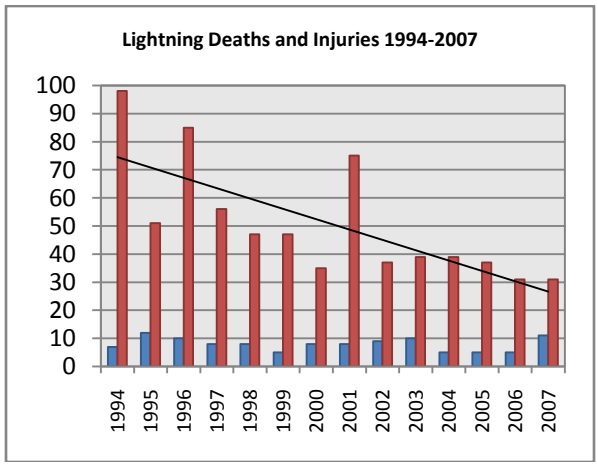

Fig. 1. Deaths (blue) and injuries (red) from lightning 1994-2007 by year.

Year	Deaths	Injuries	Total	Male	Female
2004	5	39	44	15	11
2005	5	37	42	26	2
2006	5	31	36	26	6
2007	11	31	42	25	10
Total	26	138	164	92	29
Avg.	6.5	34.5	Percent	76	24
			Deaths	23	3

Table 1. Lightning deaths and injuries 2004-2007, with male and female death and injury totals.

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Year	Deaths	Injuries	Total
2004	5	39	44
2005	5	37	42
2006	5	31	36
2007	11	31	42
Totals	26	138	164
Average	6.5	34.5	41

Table 2. Lightning deaths and injuries 2004-2007 including averages.

From 1998 to 2003, the counties with the most deaths and injuries were Hillsborough (38), Pinellas (34), and Broward (33). For 2004 to 2007, Broward and Pinellas counties continued to lead with 22 and 15 deaths and injuries respectively, but Orange County moved ahead of Hillsborough with 12 deaths and injuries. While death is absolute, injuries vary considerably from completely debilitating to minimal effects. The most common victims are construction workers and others who work outdoors. Interestingly, 12 percent of the injuries occurred indoors, with 30 percent of those injuries occurring while using electric devices. With continued awareness and education, perhaps the number of lightning victims will continue to decrease.

2. 2004-2007 LIGHTNING DEATHS AND INJURIES

Lightning death and injury information was gathered from the National Climatic Data Center Storm Data. From 2004 to 2007, lightning deaths averaged 7 per year. The 10 year average preceding those years was 9 deaths per year. Lightning injuries have also decreased from a ten year average of 57 to an average of 35 from 2004 to 2007. Males were struck more often than females - more than 75 percent of the time. Additionally, lightning killed males more than females with 23 male and only 3 female deaths. This makes males seven times more likely to die from lightning strikes.

2.1 When Victims Were Struck

Most victims were injured or killed during the summer months (Fig. 2). The greatest number of injuries and deaths occurred in July with 48 injuries and 10 deaths. August had the second greatest number of occurrences, with 40 injuries and 5 deaths. No one was struck by lightning in the months of November and December, and very few people were struck from October through April.

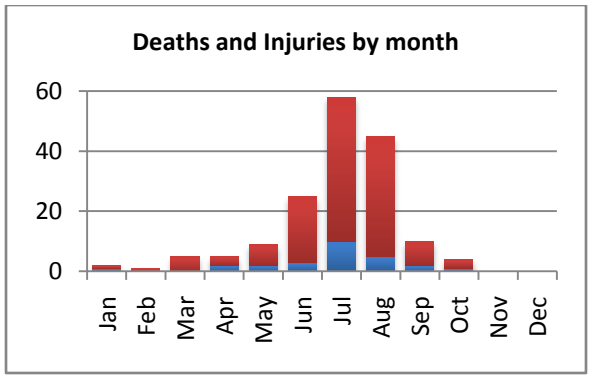

Fig. 2. Deaths (blue) and injuries (red) from lightning 2004-2007 by month.

County	Deaths	Injuries	Total
Broward	6	16	22
Lee	6	3	9
Miami-Dade	2	7	9
Palm Beach	2	8	10
Bay	1	3	4
Brevard	1	3	4
Duval	1	6	7
Manatee	1	1	2
Orange	1	11	12
Pasco	1	6	7
Pinellas	1	14	15
Santa Rosa	1	3	4
St. Johns	1		1
Walton	1		1

Table 3. Lightning deaths and injuries 2004-2007 by county.

The most injuries and deaths occurred in the afternoon (Fig. 3) with the peak number of injuries (27) occurring between 12-1 PM, while the greatest number of deaths (5) occurred from 2-3 PM. There were no lightning events reported from 9 PM to 8 AM.

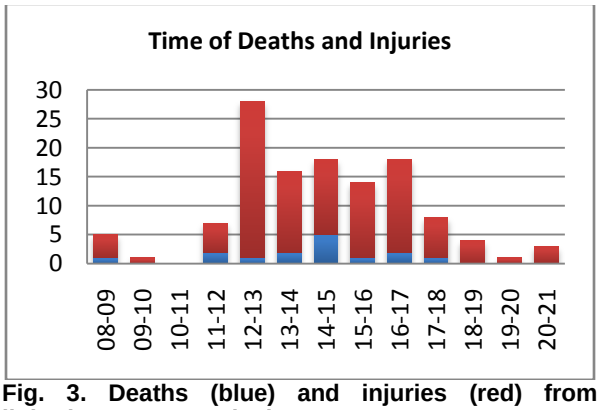

Fig. 3. Deaths (blue) and injuries (red) from lightning 2004-2007 by hour.

Wednesday is the day of the week with the greatest number of injuries (33), (Fig. 4), which may be attributed to people working outside.

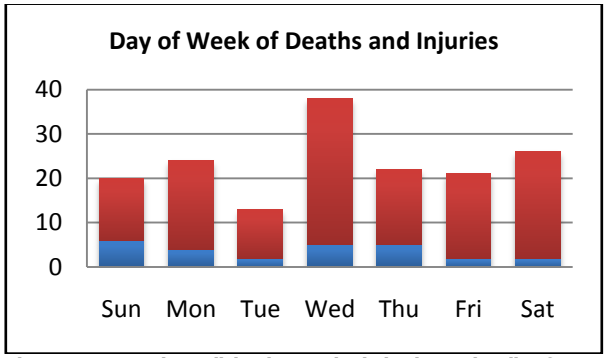

Fig. 4. Deaths (blue) and injuries (red) from lightning 2004-2007 by day of the week.

Sunday has the largest number of deaths (6) during the time period from 2004-2007. Tuesday, Friday and Saturday all had the least number of deaths from lightning (2 each) during this time period, and Tuesday had the lowest amount of lightning injuries (11) during this time period.

2.2 Where Victims Were Struck

Climatologically, a lightning maximum exists over west-central Florida (Hodanish 1997). This maxima coincides with high population densities. From the period from 1998-2003, Hillsborough County had the greatest number of total deaths and injuries, with neighboring Pinellas County in second place. Pinellas County had the most injuries and Hillsborough County the most deaths. The Tampa Bay Weather Forecast Office (WFO) area had the most lightning victims during the 1998-2003 time period (Fig. 5) with 37.5 percent of the deaths and 38.9 percent of the injuries. The Melbourne WFO area had the second highest number of injuries but the Miami WFO area experienced the second largest number of deaths in the state's WFOs.

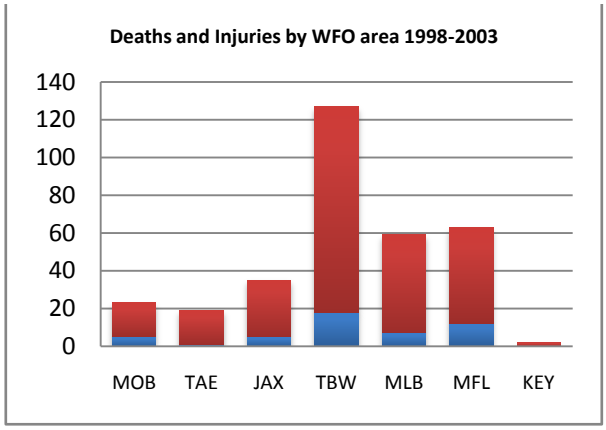

Fig. 5. Lightning deaths (blue) and injuries (red) 1998-2003 by WFO area.

The Tampa Bay WFO area continued to have the highest number of injuries during the 2004-2007 time period (Fig. 6) with a total of 41 events. However, the Miami WFO area had more deaths (10) than the Tampa Bay WFO area (9). 34.6 percent of the deaths and 29.7 percent of the injuries occurred in the Tampa Bay WFO area. The Miami WFO area had the second largest number of injuries.

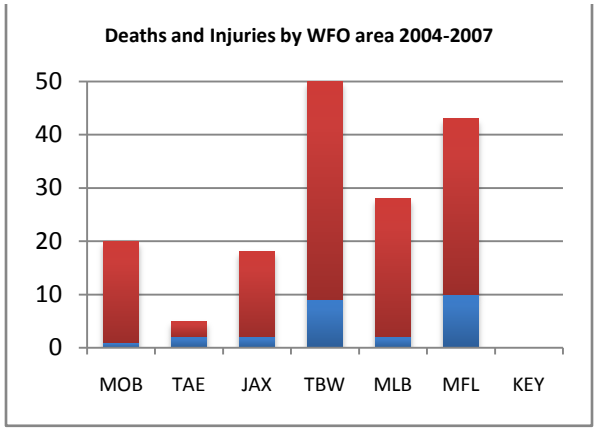

Fig. 6. Lightning deaths (blue) and injuries (red) 2004-2007 by WFO area.

Despite numerous safety awareness programs informing people to not seek shelter under trees, many do not follow this advice. From 2004-2007, 13 percent of the lightning victims were struck while under trees. Those in open fields or on golf courses accounted for another 10 percent of the people struck.

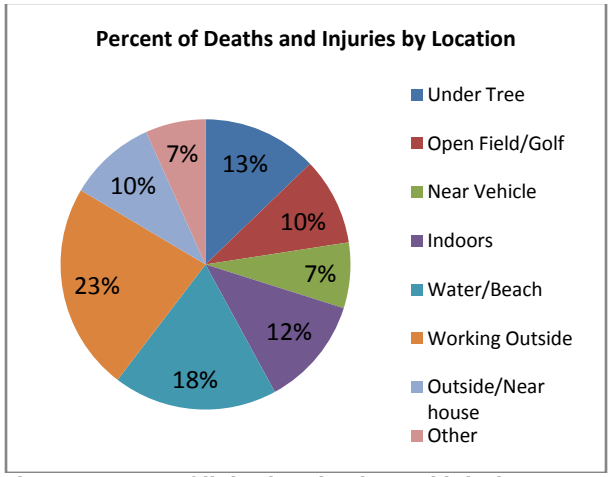

Fig. 7. Percent of lightning deaths and injuries 2004-2007 by location.

Outdoor areas are the most dangerous places to be when lightning is near, accounting for 81 percent of the total strikes from 2004-2007. People working outside accounted for 23 percent of the deaths and injuries during this time frame. People near water made up the second highest amount of deaths and injuries, with 18 percent of the total.

3. SUMMARY

During the time period from 1994-2007, lightning injuries showed a gradual decline. As the population of Florida continues to grow, these values have the potential to increase. In the five years preceding 2001, lightning injuries showed a steady decline. However, in 2001, injuries spiked while deaths remained near average. It is important for all the NWS offices in Florida to inform the public about the dangers of lightning. The central and southern offices in the state especially need to educate the public since lightning strike occurrence is higher in this region, and they have a higher population density. People need to exercise extreme caution during the summer months and especially in the early afternoon when lightning deaths and injuries are at their peak. It is important for the public to know that they may need to adjust their work or leisure activities during this time of the year. Although sometimes it may seem redundant to stress lightning awareness and safety, it is necessary to include it in information to the public. With the combined efforts of the National Weather Service offices across the state, lightning deaths and injuries could continue to diminish.

4. ACKNOWLEDGEMENTS

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5. REFERENCES

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