



# WEATHER SAFETY WARMUP

WEBINAR SERIES

# HOUSEKEEPING

- This webinar is being recorded and will be sent out shortly after the webinar
- Have a question? Use the chat box and we will get to the question at the end of the session
- Want to learn more? We have additional sessions every month!
- You can also provide feedback, suggest a topic or ask a question by emailing us at [info@earthnetworks.com](mailto:info@earthnetworks.com)

# BEST PRACTICES FOR LIGHTNING ALERTING

## AGENDA

- Lightning overview
- Types of lightning strikes
- Types of lightning alerting
- NOAA's recommendation and why
- Factors to consider when configuring your lightning policy
- Conclusion

## PRESENTER


**JEFF LAPIERRE**

*Lightning Scientist at Earth Networks*

# BEST PRACTICES FOR LIGHTNING ALERTING







It only takes a  
**second** for a  
lightning strike to  
lead to a tragic  
incident!



## HERE ARE SOME FACTS FROM NOAA

Over the last 30 years in the U.S., about **500 people are struck by lightning every year**. Of those, about 10% of them are killed.

About **two-thirds of all lightning deaths** in the U.S. are associated with **outdoor sports and recreational activities**.

The most vulnerable time to be struck by lightning is between **4 pm and 8 pm**, which coincides with most outdoor sports and recreational events.



# LIGHTNING

An atmospheric discharge of electricity when positively-charged particles in one area meet negatively-charged particles in another area.



# TYPES OF LIGHTNING



## IN-CLOUD (IC) LIGHTNING

Lightning that does not make contact with ground; sometimes referred to as intra-cloud and inter-cloud lightning.



## CLOUD-TO-GROUND (CG) LIGHTNING

Lightning that extends from the cloud to the ground.

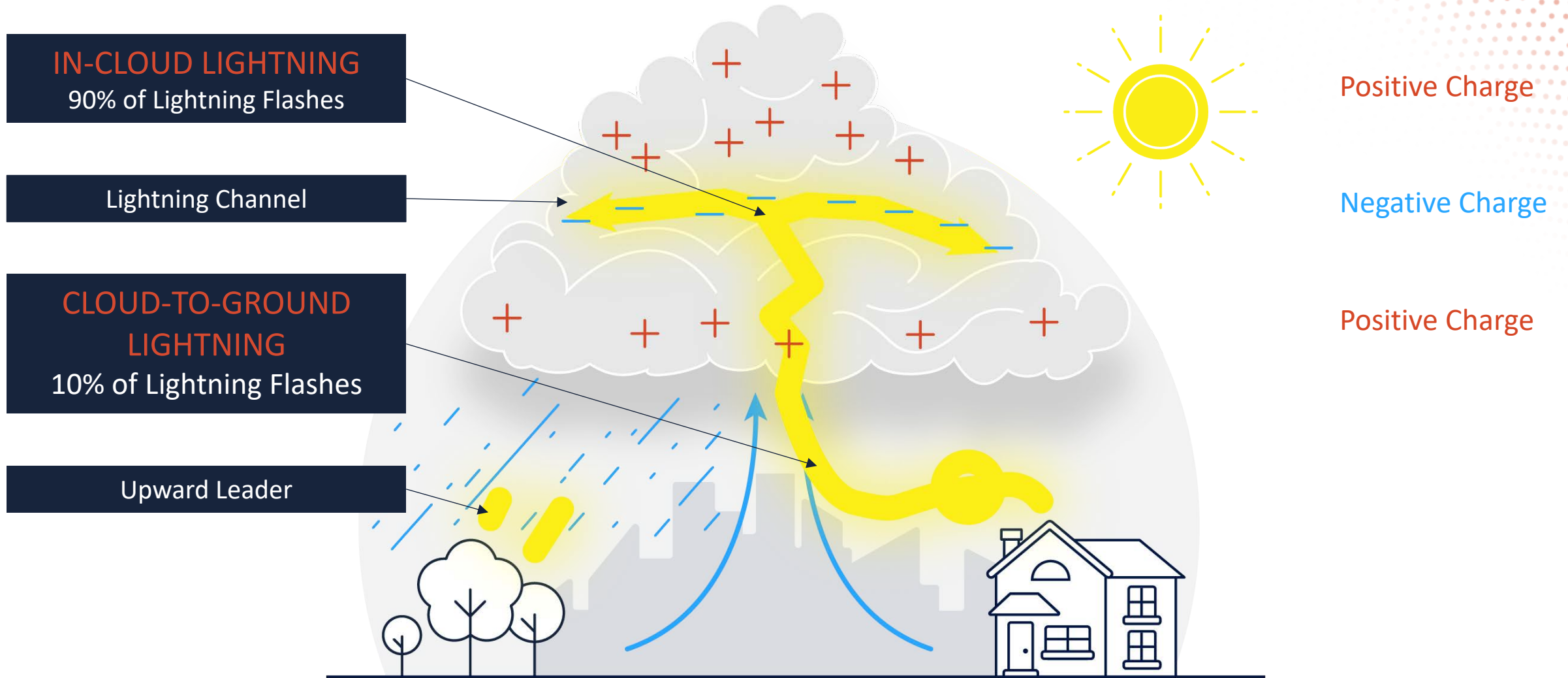


## BOLT FROM THE BLUE

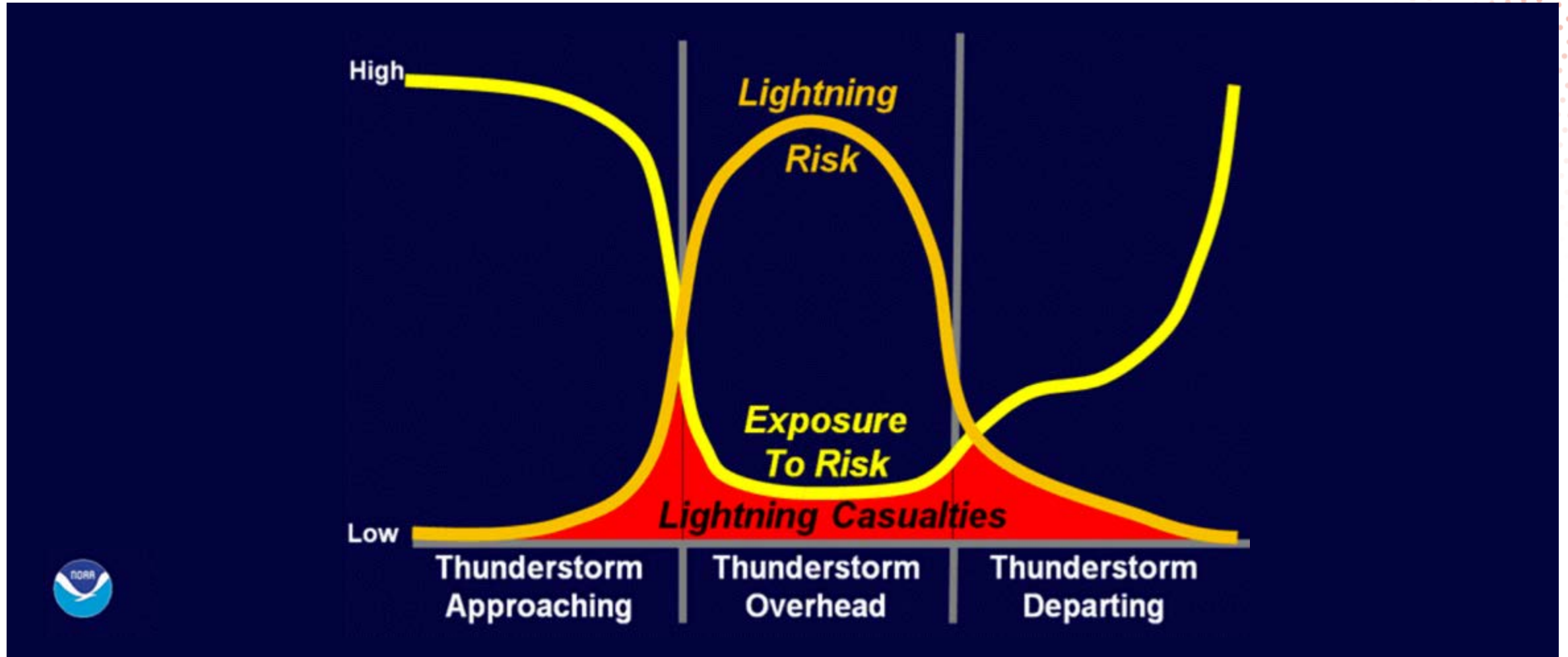
A cloud-to-ground lightning flash which typically comes from the back or front side of the thunderstorm cloud and can travel up to 15 miles in clear air away from the storm cloud, and then angles down and strikes the ground.



# HOW DOES LIGHTNING HAPPEN



# THREAT OF LIGHTNING CASUALTIES



# TYPES OF LIGHTNING STRIKES

- 1. Ground Current - 50% of lightning fatalities**
  - Lightning strikes the ground and travels to a nearby victim
- 2. Side Splash - 33% of lightning fatalities**
  - Lightning strikes a nearby object and travels to a victim
- 3. Upward Streamer - 10% of lightning fatalities**
  - In a lightning storm, upward current travels through victim
- 4. Direct Strike - 3% of lightning fatalities**
  - Lightning strikes a victim directly
- 5. Contact Strike - 3% of lightning fatalities**
  - Lightning strikes something the victim is touching, sometimes through a conducting path





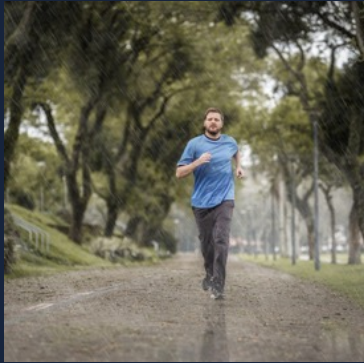
## LIGHTNING ALERTING

Sharing information on lightning threats with stakeholders when predetermined thresholds are reached.



# TYPES OF ALERTING

## IN PERSON



## AUDIBLE ALERTS



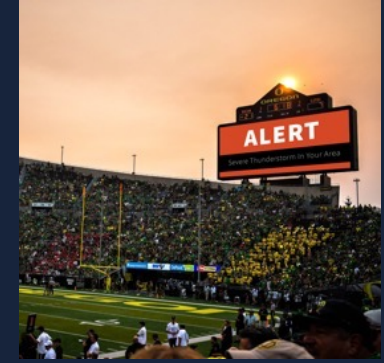
## VISUAL ALERTS



## MOBILE ALERTS



## SYSTEM ALERTS



# SO WHAT DOES THE NATIONAL WEATHER SERVICE (NWS) RECOMMEND?

**When  
Thunder  
Roars,  
Go Indoors!**



**Alert Radius: 10 miles**

**STOP all activities.**

**Seek shelter in a substantial building  
or hard-topped vehicle.**

**Wait 30 minutes after the storm to  
resume activities.**



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

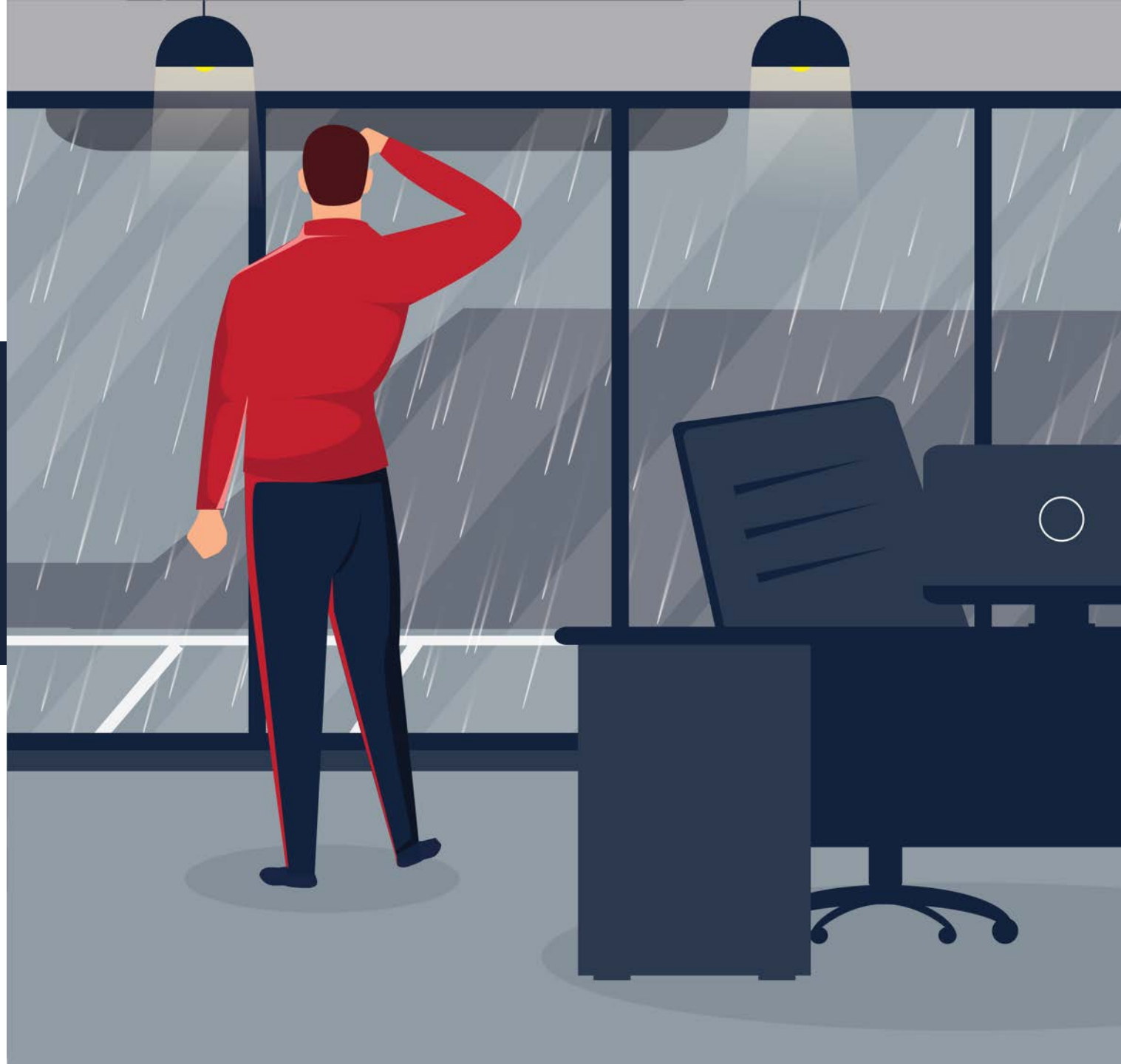




Why does NWS  
recommend 10  
miles?



So what factors should you consider when configuring your lightning alerting policy?





# FACTORS INFLUENCING YOUR LIGHTNING ALERTING POLICY

## LIGHTNING THREAT RADIUS

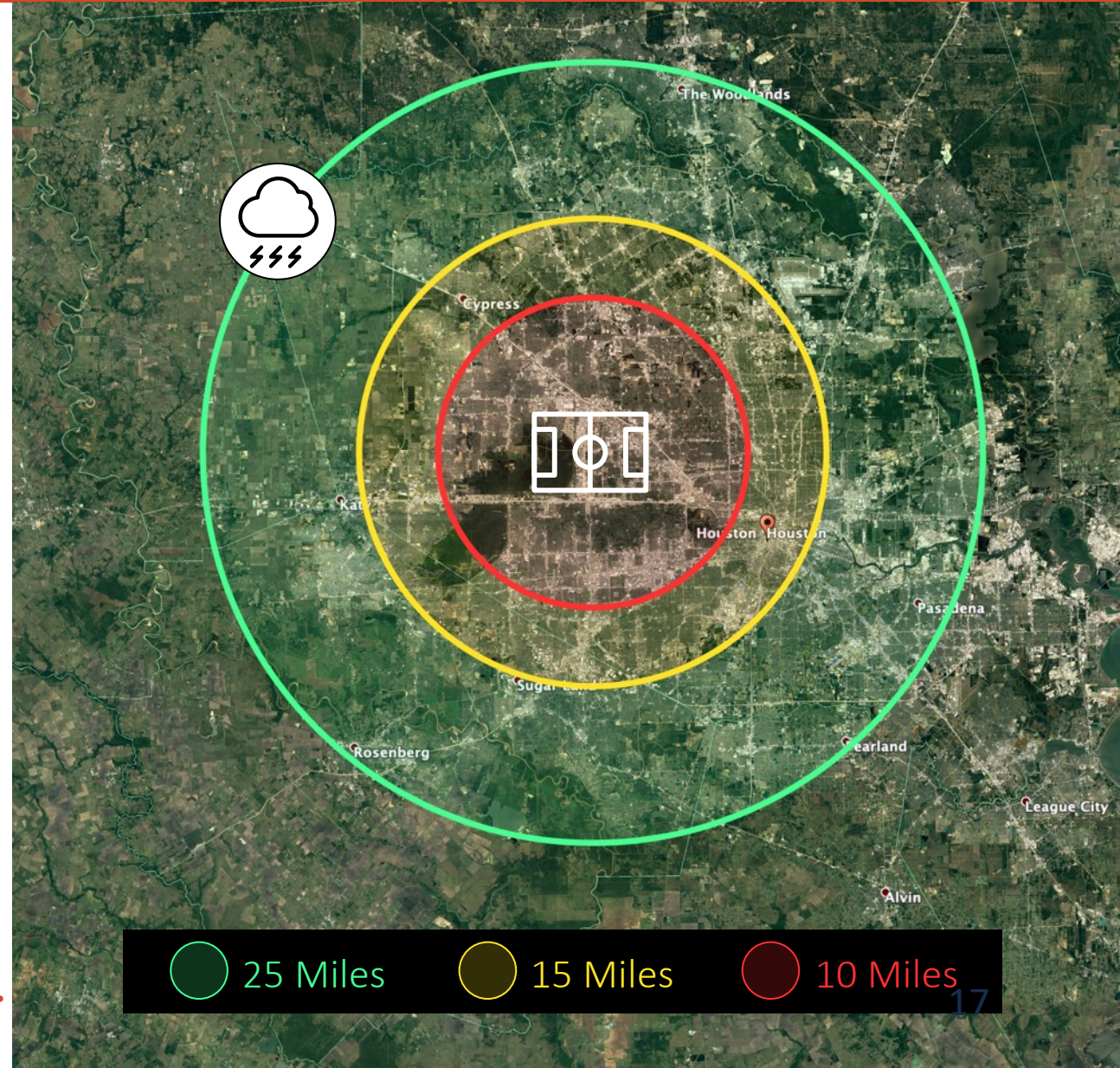
- 15 miles or smaller
- 10 miles is a great starting point

## LOCAL CLIMATE AND TERRAIN

- How frequent is lightning?
- Where is your facility located?
- Are there other lightning-related threats you need to worry about?

## FACILITY BEING INFORMED

- Size and type of facility
- Activities on facility
- Complexity of operations





# FACTORS INFLUENCING YOUR LIGHTNING ALERTING POLICY

## STAKEHOLDERS

- Who are your stakeholders? (Colleagues, safety team, general public, students, athletes, patrons, etc.)
- Are they easy to alert and lead to a shelter?

## SHELTER LOCATIONS

- How many shelter locations do you have?
- Are they easily accessible?
- How long would it take a stakeholder to get to the a shelter location from the furthest part of your facility?

## AVAILABLE HUMAN RESOURCES

- How big is your weather safety team?
- Are their other departments that can help speed up evacuation in the event of an alert?





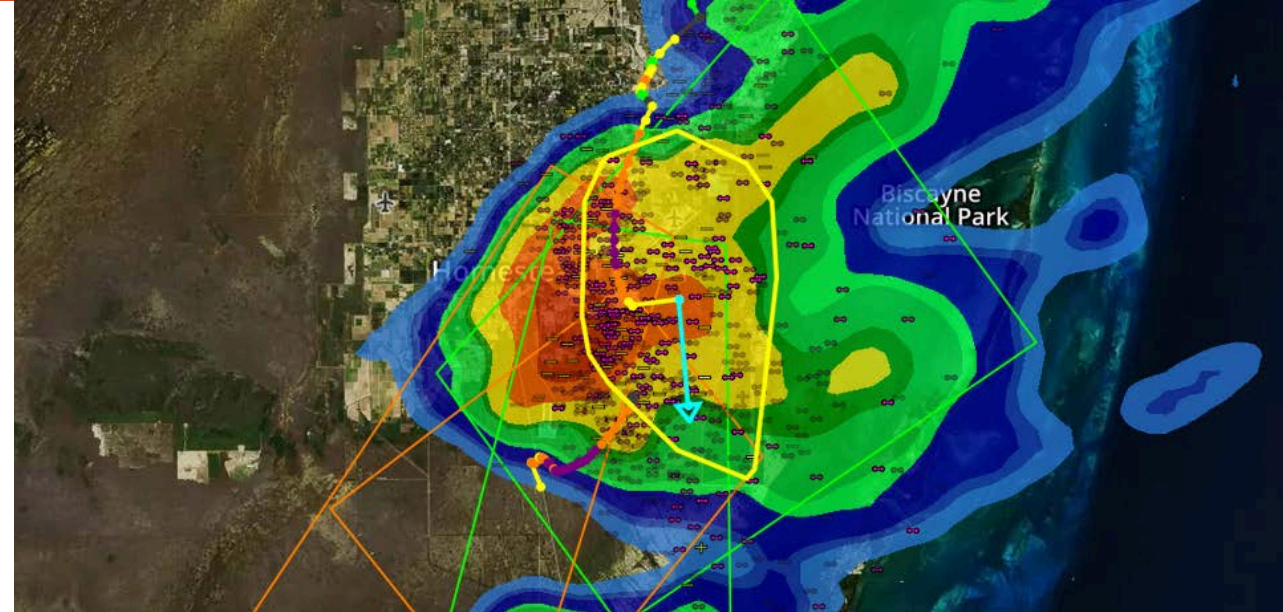
# FACTORS INFLUENCING YOUR LIGHTNING ALERTING POLICY

## MONITORING SOLUTION

- How are you monitoring lightning?
  - Free vs. professional
  - Single node vs. network-based
  - Automated vs. manual
  - Detection vs. "Prediction"

## ALERTING SOLUTION

- What is the most effective and efficient alerting type for your different stakeholders?
  - Safety team, Emergency department – Mobile alerts
  - General public, athletes, patrons etc – Outdoor visual and audible alerts
- What do your stakeholders respond to best?
- Are there system alerting solutions already existing at your facility?



# FACTORS INFLUENCING YOUR LIGHTNING ALERTING POLICY

## **COST OF DOWNTIME**

- What are the operational and financial implications when under alert?

## **COST OF RESUMPTION**

- Does starting and stopping operations/activities incur a high cost?

## **COST OF INCIDENT**

- No one wants human injury or death!
- What are the financial implications of severe thunderstorm incidents
  - Property damage
  - Major disruptions





# FACTORS INFLUENCING YOUR LIGHTNING ALERTING POLICY

All the previous points influences your  
**LEAD TIME** requirements



# KEY TAKEAWAYS

## FACTORS INFLUENCING YOUR LIGHTNING ALERTING POLICY

- Lightning threat radius
- Local climate and terrain
- Facility being informed
- Stakeholders

- Shelter locations
- Available human resources
- Monitoring Solution
- Alerting solution

- Cost of downtime
- Cost of resumption
- Cost of incident
- **LEAD TIME**

**REMEMBER – ONE SIZE DOESN'T FIT ALL**

Consult a weather safety expert when building your lightning alerting policy





# THANK YOU

QUESTIONS AND COMMENTS?

Contact us at [info@earthnetworks.com](mailto:info@earthnetworks.com)

Learn more about WBGT

[www.earthnetworks.com/wet-bulb-globe-temperature](http://www.earthnetworks.com/wet-bulb-globe-temperature)