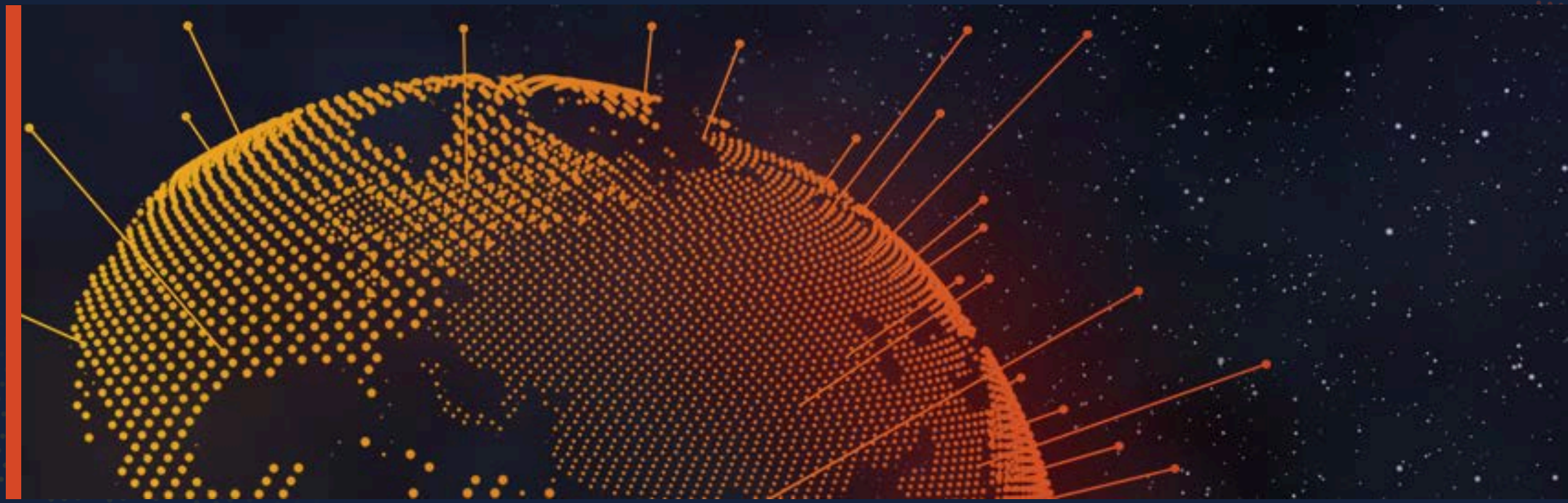
EARTH NETWORKS



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!
- For those interested in a **certificate of attendance**, please let us know in the chat or reply to the follow up email
- You can also provide feedback, suggest a topic or ask a question by emailing us at info@earthnetworks.com

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STAYING AHEAD OF SEVERE THUNDERSTORMS

AGENDA

- The threats we live with – Severe weather events
- What's at stake?
- A closer look at the threats
- Planning for severe weather 101
  - Preparation
  - Anticipation
  - Communication
  - Execution
- Takeaways

PRESENTER

DR. MICHAEL STOCK | *Principal Lightning Scientist at **Earth Networks***

PLANNING FOR SEVERE WEATHER 101

Severe weather isn’t completely random. Most threats can be detected in time and managed

You shouldn’t only worry about the big natural disasters

Actually, these are just as impactful

LET'S KEEP IT SIMPLE

Severe weather events are hazardous weather conditions produced by extreme weather.

WHAT IS AT STAKE?

Property Damage

- Outdoor sporting equipment
- Picnic tables, umbrellas, signage, and other outdoor furniture
- Trees, turf and landscape
- Windows and roofing

Human Risk

- Injury, illness or death

Business Disruption

- Suspension of outdoor activities or festivals in a park
- Interruption of a game at a golf club
- Cancelation of amusement park rides
- Suspension of game at an athletic facility

THE THREATS WE LIVE WITH EVERY DAY

Tornadoes

Flooding

Wildfires

Lightning

Severe Thunderstorms

High Winds

Tropical Cyclones

Hail

Heat Waves

Snow

Sleet & Freezing Rain

Drought

A BOLT FROM THE BLUE

DATE: September 13th 2013

LOCATION: University High School, Orlando, FL

DETAILS

- A late evening game between Orlando University High School and Boone High School football
- A typical halftime scene:
  - Teams are on the sidelines
  - Marching band is on field
  - Visitors are in stands
- No storm in sight
- Lightning strikes and only half the people react
- The band actually played on

https://youtu.be/ycTg7OmFpbU

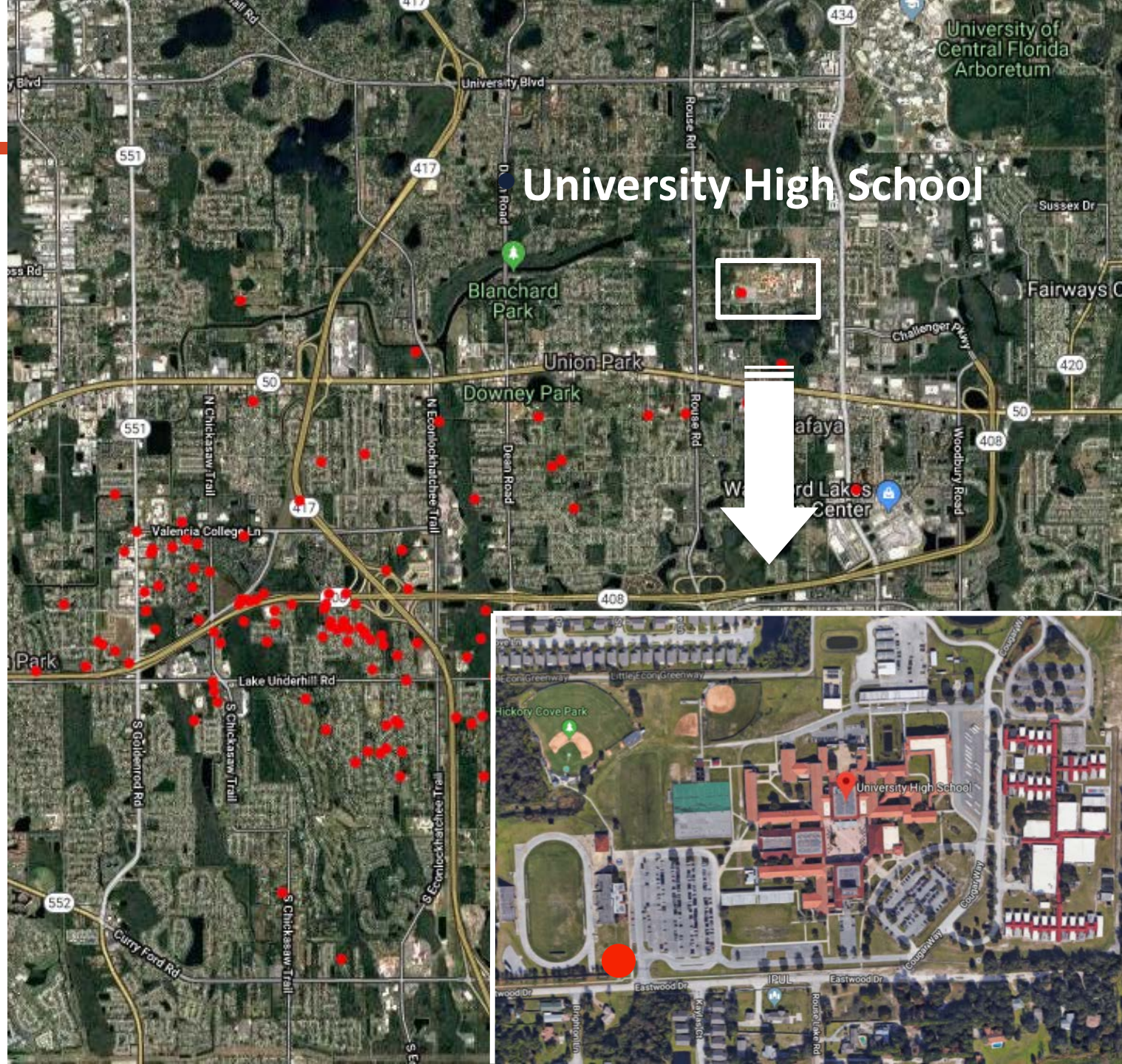
LET'S TAKE A CLOSER LOOK

TIME: Between 8–9pm local time

WHAT: 10 mile radius search from the school with Earth Networks Total Lightning Network

RESULTS

- 130 CG & IC pulses detected
- Large lightning activity in the area leading up to the strike
- Concentrated a couple of miles SW of the school
- The strike was detected at 8:45pm local time



PLANNING FOR SEVERE WEATHER 101

PLANNING FOR SEVERE WEATHER 101

Preparation

- Education on threats
  - Climatology
  - Seasonal threats
  - Government information resources
- Analyzing exposures
  - Outdoor properties
  - Human risk
  - Outdoor activities and business processes
- Creating policy and procedures to protect:
  - Property
  - People
  - Operations

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PLANNING FOR SEVERE WEATHER 101

Consideration of policy and procedures

- Risk assessment
- Cost-benefit analysis

	Adverse Weather Occurs	Adverse Weather Does Not Occur
Precaution taken	Cost (Time/Money well spent)	Cost (Wasted time/Money)
Precautions not taken	Loss (Property damage, lawsuits, human risk, overtime, legal fines)	

EXAMPLE - HEAT STRESS SAFETY POLICY CHART

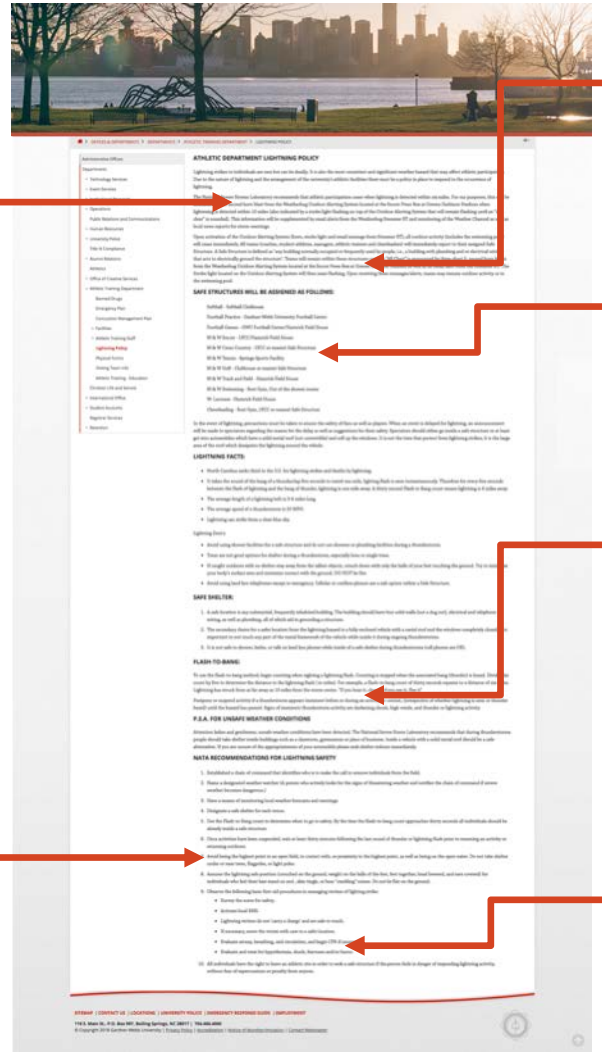
Wet Bulb Globe Temperature Category Work/Rest and Water Intake

Unacclimated and Acclimated Work/Rest and Water Intake Chart

Heat Risk Category		Wet Bulb Globe Temp	Light Work		Moderate Work		Heavy Work	
			Work/Rest	Water Intake (quart/hr)	Work/Rest	Water Intake (quart/hr)	Work/Rest	Water Intake (quart/hr)
No Risk	Unacclimated	78 – 79.9	50/10 min	½	40/20 min	¾	30/30 min	¾
	Acclimated	78 – 79.9	continuous	½	continuous	¾	50/10 min	¾
Low	Unacclimated	80 – 84.9	40/20 min	½	30/30 min	¾	20/40 min	1
	Acclimated	80 – 84.9	continuous	½	50/10 min	¾	40/20 min	1
Moderate	Unacclimated	85 – 87.9	30/30 min	¾	20/40 min	¾	10/50 min	1
	Acclimated	85 – 87.9	continuous	¾	40/20 min	¾	30/30 min	1
High	Unacclimated	88 – 90	20/40 min	¾	10/50 min	¾	avoid	1
	Acclimated	88 – 90	continuous	¾	30/30 min	¾	20/40 min	1
Extreme	Unacclimated	> 90	10/50 min	1	avoid	1	avoid	1
	Acclimated	> 90	50/10 min	1	20/40 min	1	10/50 min	1

Source: http://blog.mesonet.org/agriculture/wet-bulb-globe-temperature-what-it-is-and-how-to-use-it/

EXAMPLE: LIGHTNING SAFETY POLICY



DETECTION METHOD
Mentions the technology and process in place to monitor lightning activity. Monitoring 30 mile radius.

SAFETY PROTOCOL
Mentions what to do in the event of a lightning strike and outlines the criteria for event suspension and resumption. It has instructions for both weather safety admins and the general public.

ALERTING PROCEDURE
Mentions both the technology and covers process of alerting everyone in the event of a lightning strike. Alerts will be sent out at 10 mile radius.

DESIGNATED SAFE SHELTERS
Mentions where to go if the alarms go off. During an event, public are instructed to go to the main park building or seek shelter in their cars.

WEATHER SAFETY ADMINS & CHAIN OF COMMAND
Mentions who is in charge and what their responsibilities are. Director oversees the safety protocol.

COMMUNICATION STRATEGY
Mentions how the policy is shared with the public. It also talks about how the safety protocol and technology will be made aware to all parties. Outdoor strobes, park app, social media and website

PLANNING FOR SEVERE WEATHER 101

Anticipation

- Weather monitoring and forecasting
- Detect changing weather conditions in real-time
- Staying on top of predetermined severe weather threats
  - Lightning
  - Severe thunderstorms
  - Tornadoes
  - Heat waves
  - Hail
  - Heavy rain & flooding
  - High winds
  - Severe winter conditions

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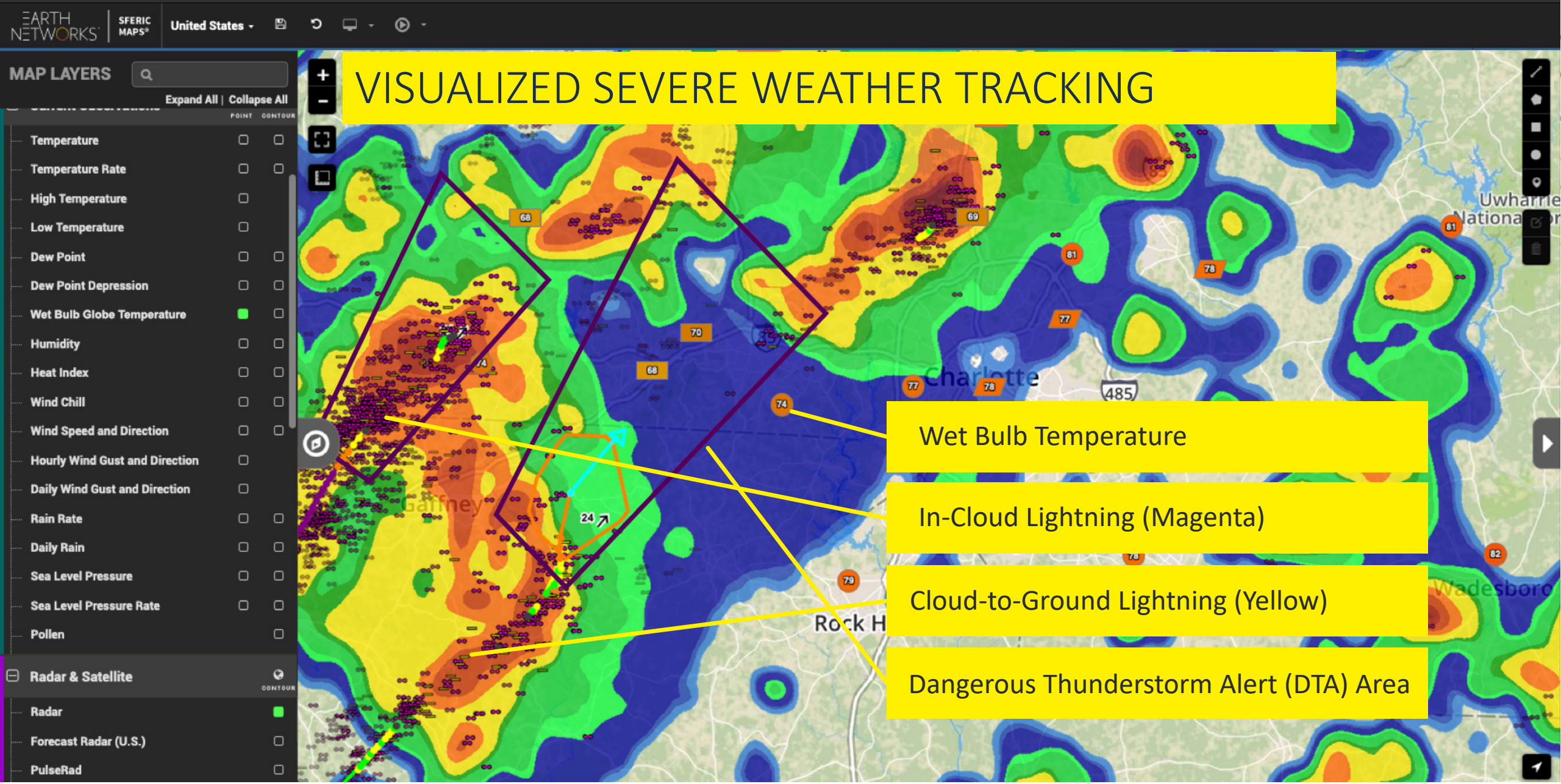
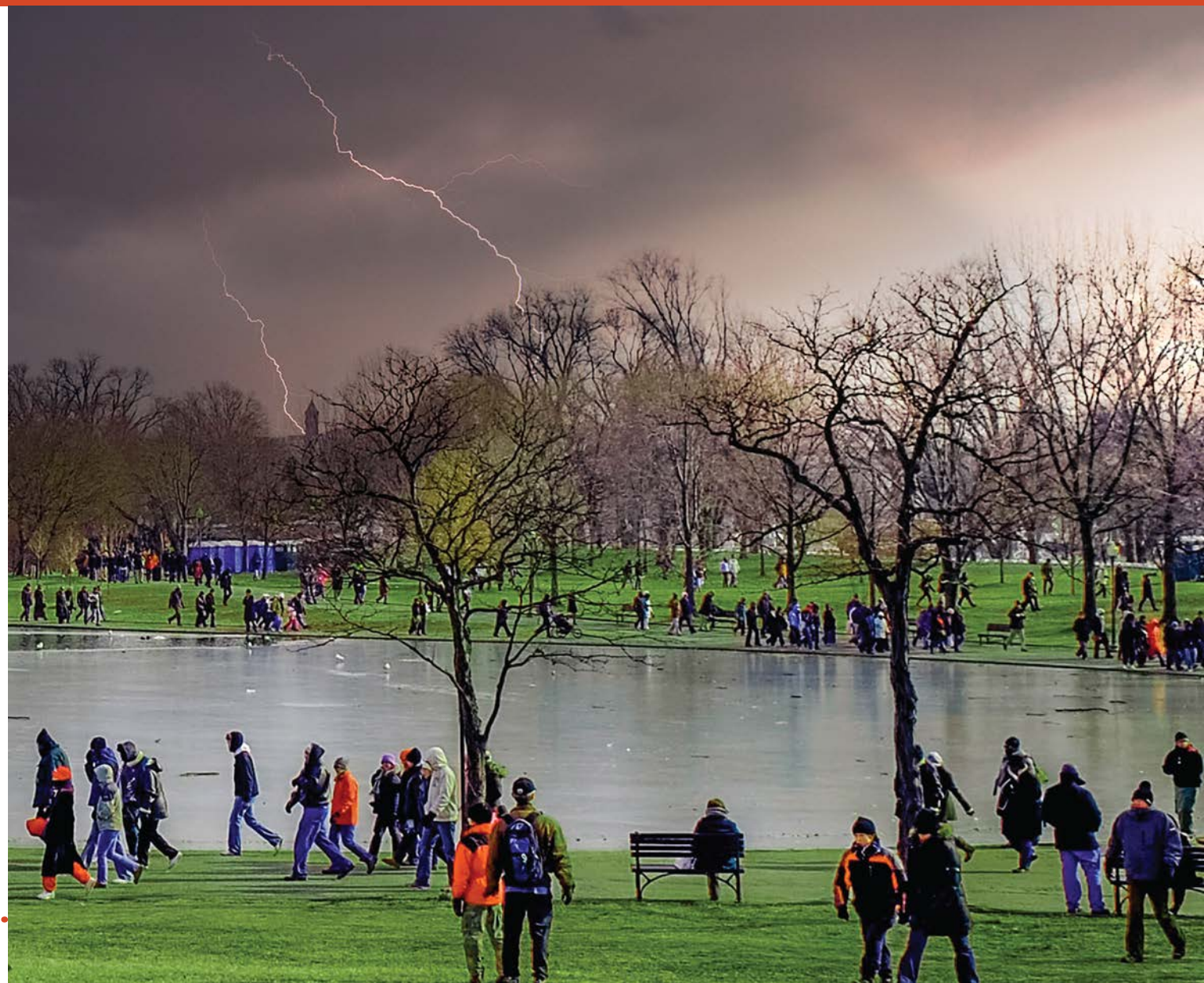
VISUALIZED SEVERE WEATHER TRACKING



PLANNING FOR SEVERE WEATHER 101

Communication

- Identify stakeholders
  - Key weather safety admin
  - Weather safety team
  - Patrons
  - General public
  - Emergency departments
- Use the appropriate type of alert for each stakeholder per severe weather threat
- General education on:
  - The threat of severe weather
  - The types of alert and what they signify
  - The safety procedure
  - Shelter locations
  - Safety tips



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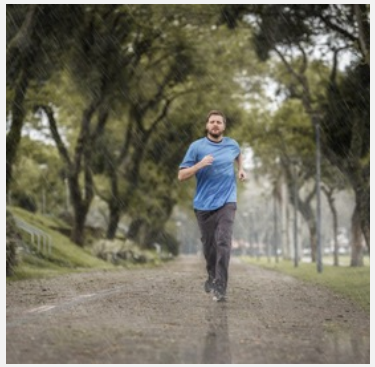
PLANNING FOR SEVERE WEATHER 101

TYPES OF ALERTS

IN PERSON



AUDIBLE ALERTS

VISUAL ALERTS

MOBILE ALERTS

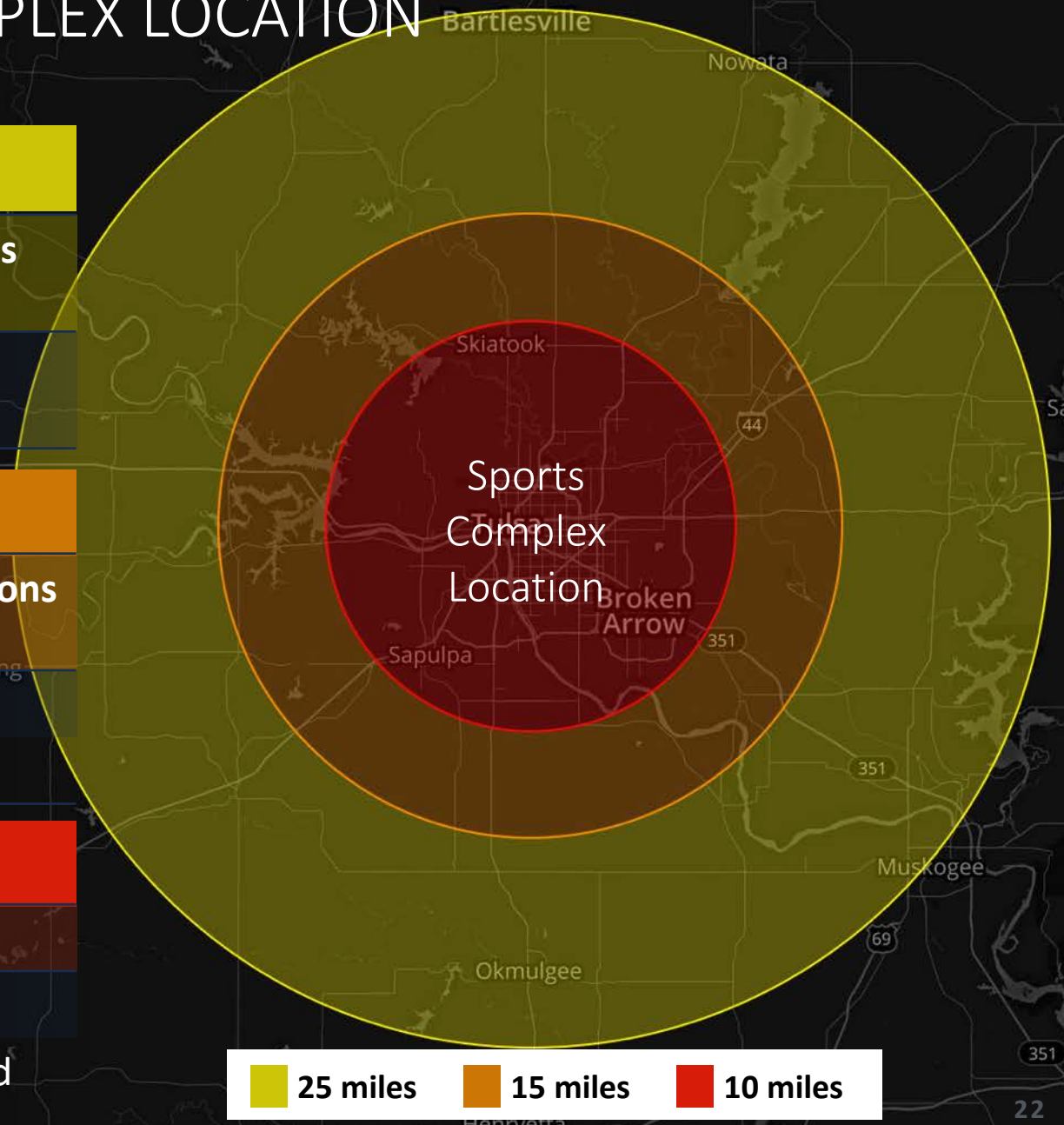
SYSTEM ALERTS

ALERTING EXAMPLE: A SPORTS COMPLEX LOCATION

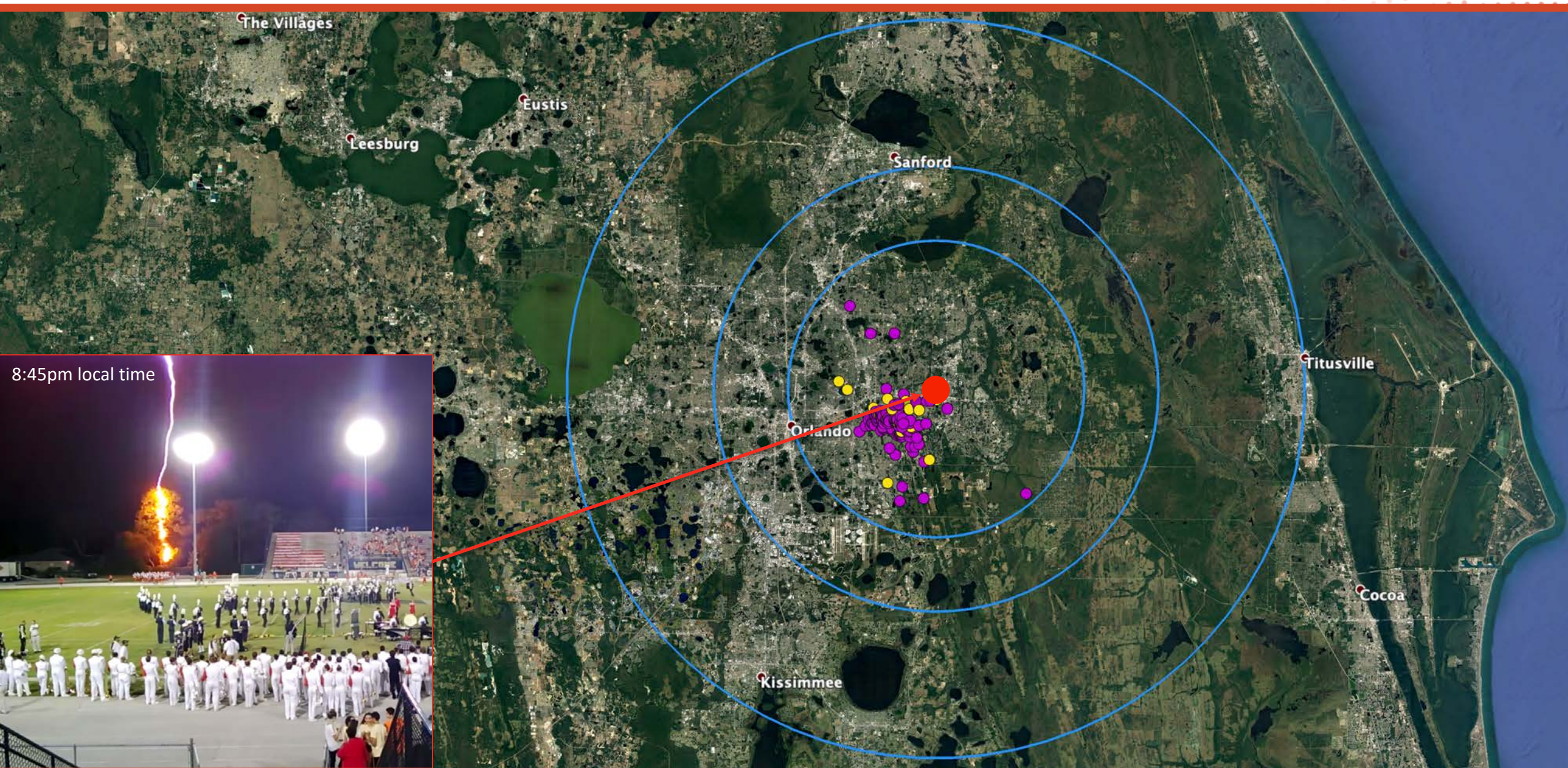
OUTER – 25 Miles	
ALERT	**Email warning sent to key admin: Operations Manager**
ACTION	Monitor the situation (Take note of potential severe weather movement)

MIDDLE – 15 Miles	
ALERT	**Mobile alerts are sent to managers: Operations manager & head grounds crew**
ACTION	Monitor direction of storm
ACTION	Prepare to halt all outdoor activities

INNER – 10 Miles	
ALERT	**Outdoor alerts are activated**
ACTION	All outdoor activities are halted
ACTION	Staff, athletes and visitors head to designated indoor area for safety until all clear is given



BACK TO OUR CASE STUDY



PLANNING FOR SEVERE WEATHER 101

Execution

- Have a checklist of action items
- Have a chain of command with responsibilities at every level
- Also conduct a post-event review
- Test, test, test!

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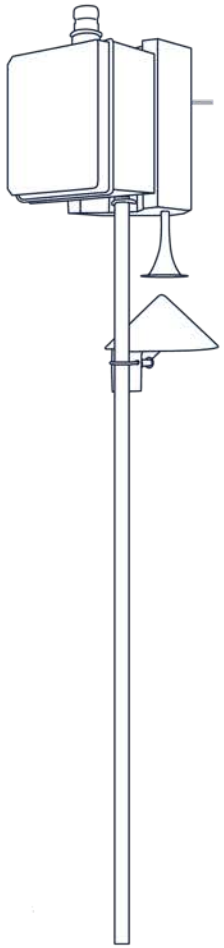
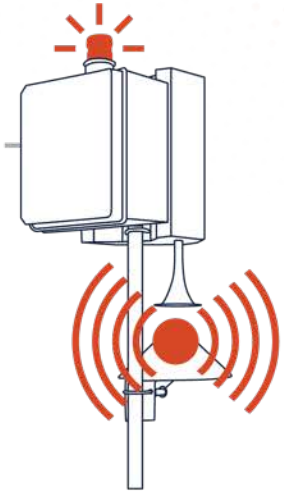
https://www.weather.gov/safety/thunderstorm-during

EXECUTION WITH AUTOMATED LIGHTNING ALERTING

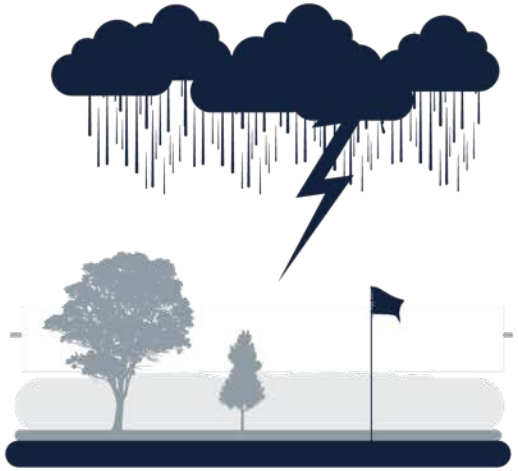
1. System detects lightning within a pre-determined radius around the facility.



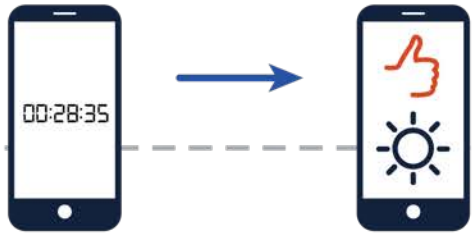
2. Horn sounds for 15 seconds and strobe light activates (strobe stays on during the entire alert period).



3. Everyone must immediately seek shelter. Activities suspended until all-clear signal is received.



4. Countdown clock keeps people informed. When system no longer detects a threat beyond the pre-configured time frame, three 5-second blasts from horn will sound and the strobe light will stop.



5. This is the signal that it is safe to return outdoors.

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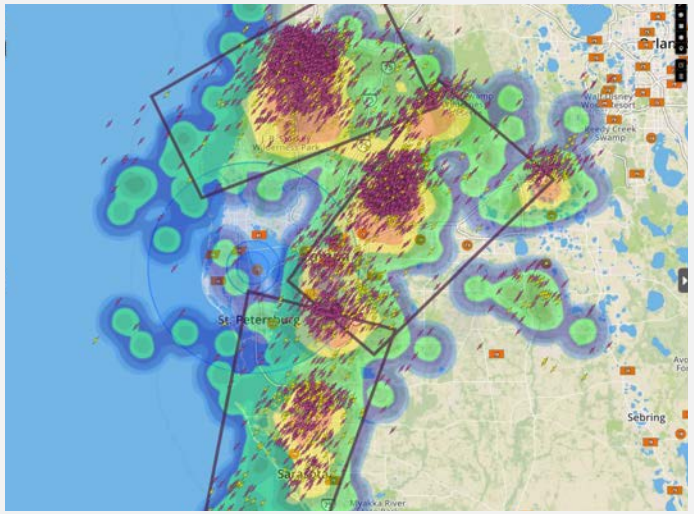
https://www.earthnetworks.com/product/decision-support-collaboration-tools/outdoor-alerting-system/

TAKEAWAYS

Severe weather have different forms, are dangerous, and can be a threat anywhere in the U.S.



Analyze your threats and exposures, as well as use real-time weather monitoring to effectively prepare and anticipate

Communicate and execute effectively by alerting your stakeholders and adequately carrying our safety procedures

THANK YOU

QUESTIONS AND COMMENTS?

Contact us at info@earthnetworks.com