



Predicting the Unpredictable:

Keeping People Safe From the Storm During Sporting Events, Concerts and Other Outdoor Activities



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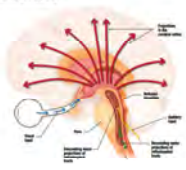
 @texasembassy

The reticular activating system (RAS) is a vital part of our brain.


The functions of the reticular activating system control sleeping, walking, sex, eating, and elimination.

Perhaps the most important function of the RAS is its control of consciousness and our ability to focus attention on something.

You also likely know that the brain (RAS) of a meteorologist is slightly different (broken)!



Your Situational Awareness is controlled in your.. Um.. RAS!

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Situational Awareness is a choice.

One has to choose to pay attention. But once that choice is made, the Reticular Activating System (RAS) takes over. The RAS will scan for and acknowledge threats when it encounters them.

BASELINE. Our environment has a baseline – what things usually look like, sound like and feel like. But, everyone has their own baseline. (*we are all unique – just look around!*)

Being able to develop situational awareness is dependent upon first knowing the baseline for you and the area you are in, and recognizing any variations to the baseline. One must then learn to recognize disturbances to the baseline, and if those disturbances represent a specific threat.

This requires detailed knowledge of your environment.


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I think we all need a good kick in the RAS!

“Look at all the crap blowin’ in the sky.”
 “Here comes the hail.”
 “You sure that isn’t a tornado?”
 “I saw lightning there.”

<team takes field to thunderous applause>

“It’s a microburst.”
 “It’s blowing in circles.”
 “I know, but I want to get this video.”

“This is awwwesooooome!” “Woooooowooooo!!!”

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“This is awwwesooooome!” “Woooooowooooo!!!”

“He REALLY went to Texas A&M”

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Speaking of Texas A&M...

<http://video.theeagle.com/AM-Adopts-New-Weather-Policies--News-3-at-6-26686018>

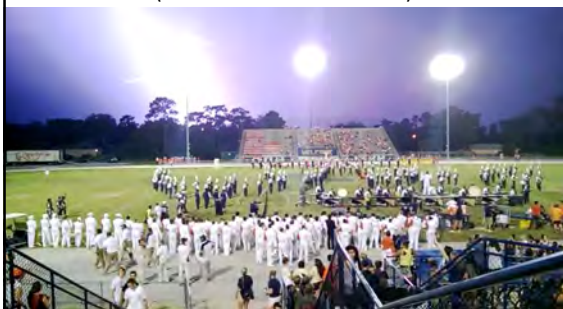


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Cloud to ground Lightning strike 1 – 0:08, thunder followed at 0:25 (~ 3 miles)
(Note: More thunder is audible at 0:38)



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Cloud to ground Lightning strike 2 – 1:04, thunder followed at 1:23 (~ 4 miles)



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Cloud to ground Lightning strike 3 – 1:29 (You can see the distance!)



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Microseconds after the flash, the tree is still on fire.



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**And microseconds after that, the tree is still on fire, and a leader is visible.
(and the "Please take shelter" announcement comes at 1:56)**



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I think we all need a good kick in the RAS!

Insane Lightning Strike Surprises High School Football Halftime Show

See 14, 2012 Photos · Like · Comment · Share · Retweet · Tweet · Facebook

459 SHARES


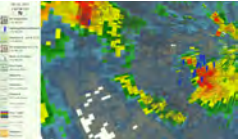


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Some things we know, but don't communicate well...

Lightning doesn't always strike the tallest object.
Lightning doesn't always strike the best conductor.
Lightning isn't always preceded by rain.

Sub-severe winds can be dangerous, especially to temporary structures.

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And these things all have one thing in common...

Lightning doesn't always strike the tallest object.
Lightning doesn't always strike the best conductor.
Lightning isn't always preceded by rain.

Sub-severe winds can be dangerous, especially to temporary structures.

There are no NWS warnings for lightning or sub-severe winds.

Venue safety plans MUST take into account that life-saving actions will be necessary in the absence of official government weather warnings.

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Some questions to think about...

How well do you know your environment when you go to a concert? A game? A festival? A National Tornado Summit?

How many of you have read the emergency plan for the venue you are attending?

How about the hazardous weather plan?

Do you simply assume the venue has one?

Is it printed on the back of your ticket?
Or your name badge?

ATTENTION:
THE PERSON USING THIS TICKET ASSUMES ALL RISK OF PERSONAL INJURY, LOSS, THEFT OR DAMAGE TO PROPERTY. MANAGEMENT MAY DESIGNATE WHERE HOLDER IS TO BE SEATED OR PARKED AND RESERVES THE RIGHT TO REVOKE THE LICENSE GRANTED BY THIS TICKET.

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I think we all need a good kick in the RAS!

:04 Shulman: Right now, nobody throwing in the Tampa Bay pen... and MORE lightning.

:12 Kruk: Is that lightning or are the lights flickering down here.

:14 Lightning strikes...

:15 Shulman: Noooo, that's lightning (laughter)
Thunder booms 1.8 seconds later..


:17 Shulman: And that's thunder

CROWD ROARS (where have we heard that before?)

More thunder is audible at :26 Lightning flashes again at :38

:39 Shulman: Yeah, that's Lightning. Kruk: That IS Lightning

:40 Shulman: If this is the 5th inning, the tarp's probably on the field right now. But, with 2 outs in the 9th?




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I think we all need a good kick in the RAS!

19 Cloud to Ground Lightning Strikes w/in 6.9 miles during the bottom of the 9th inning

Jul 6, 2014 11:10:56 PM EDT	42.3083	-83.0354	-30140 amps	2.26 miles	159.781
Jul 6, 2014 11:10:57 PM EDT	42.2877	-83.0152	-18013 amps	3.58 miles	152.8746
Jul 6, 2014 11:11:51 PM EDT	42.3253	-83.0383	-40359 amps	3.98 miles	146.2682
Jul 6, 2014 11:11:51 PM EDT	42.3265	-83.0297	-40168 amps	3.98 miles	128.9769
Jul 6, 2014 11:11:51 PM EDT	42.3023	-83.0134	-48233 amps	3.14 miles	143.0918
Jul 6, 2014 11:12:23 PM EDT	42.3073	-83.0224	-58443 amps	2.63 miles	146.6294
Jul 6, 2014 11:12:23 PM EDT	42.2938	-83.02	-32220 amps	3.49 miles	153.3067
Jul 6, 2014 11:14:00 PM EDT	42.3474	-81.1035	-19525 amps	2.76 miles	282.2353
Jul 6, 2014 11:16:33 PM EDT	42.2966	-82.9994	-41700 amps	3.93 miles	138.1377
Jul 6, 2014 11:16:33 PM EDT	42.2947	-82.9918	-22300 amps	4.29 miles	135.426
Jul 6, 2014 11:16:34 PM EDT	42.2974	-82.9887	-21061 amps	4.28 miles	132.2224
Jul 6, 2014 11:16:34 PM EDT	42.2853	-82.966	-21239 amps	5.70 miles	130.5962
Jul 6, 2014 11:18:13 PM EDT	42.3091	-82.9834	-30230 amps	4.04 miles	121.0205
Jul 6, 2014 11:18:13 PM EDT	42.2942	-82.961	-33443 amps	5.53 miles	124.0344
Jul 6, 2014 11:18:13 PM EDT	42.2899	-82.9621	-95512 amps	5.66 miles	126.8282
Jul 6, 2014 11:18:13 PM EDT	42.2864	-82.9491	-32180 amps	6.34 miles	124.9446
Jul 6, 2014 11:18:13 PM EDT	42.2877	-82.9477	-21591 amps	6.35 miles	123.9456
Jul 6, 2014 11:20:33 PM EDT	42.3438	-82.9401	-21823 amps	5.66 miles	86.6
Jul 6, 2014 11:20:33 PM EDT	42.2845	-82.9386	15762 amps	6.86 miles	123.2687

Also note how long it took to play the bottom of the 9th. After going to a 3-ball count on one hitter for 8 innings, the pitcher David Price proceeded to walk 2, forcing a pitching change, and extending the time of risk.




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I think we all need a good kick in the RAS!




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Comerica Park
Home of the Detroit Tigers



AUDIENCE PARTICIPATION TIME!!!

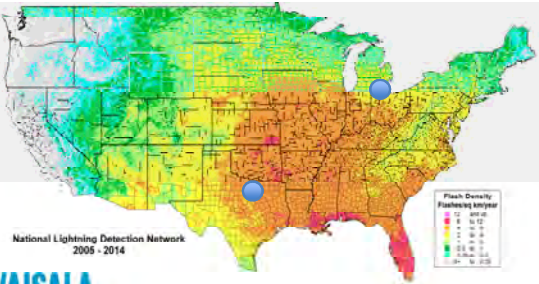
What is your general impression of the lightning risk in Detroit, MI?

Would it be greater, or less than say, Globe Life Park in Arlington, TX?




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Both ballparks have approximately the same climatological flash density.



National Lightning Detection Network
2005 - 2014



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Comerica Park
Home of the Detroit Tigers




During the 2014 Major League Baseball Regular Season...

2,583 Cloud to Ground Lightning Strikes w/in 8 miles of Comerica Park
These CGs occurred on 31 days during the season. (avg. = 83 per day)


On 21 of these 31 days, the Tigers were playing away games or idle.

That leaves 10 days...



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Comerica Park
Home of the Detroit Tigers



During the 2014 Major League Baseball Regular Season...

CG Lightning occurred on 10 home game dates (1322 CGs)
An average of 132 CGs on each home game date.
12% of home schedule threatened by lightning

During 5 home game days, lightning did not occur during the game.
That leaves 5 games... and you've already seen the video from July 6

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July 6, 2014
July 30, 2014
Aug 2, 2014
Aug 26, 2014
Sep 5, 2014



The home games on July 30 and August 26 were delayed, due to torrential downpours that made play impossible.

July 6, August 2, and Sept 5 games continued play with CGs within 8 miles.

Why? It wasn't raining at the ballpark (or the storm arrived in the 9th inning – July 6)

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Aug 2, 31 CGs w/in 8mi

Sept 5, 11 CGs w/in 8mi



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I think we all need a good kick in the RAS!

Wait, WHAT? "The one a few moments ago was immediate enough.."



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Globe Life Park
Home of the Texas Rangers



During the 2014 Major League Baseball Regular Season...


1,170 Cloud to Ground Lightning Strikes w/in 8 miles of Globe Life
These CGs occurred on 22 days during the season. (avg. = 53 per day)

On 12 of these 22 days, the Rangers were playing away games or idle.

That leaves 10 days... (sound familiar?)

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Globe Life Park
Home of the Texas Rangers




During the 2015 Major League Baseball Regular Season...

2,736 Cloud to Ground Lightning Strikes w/in 8 miles of Globe Life
These CGs occurred on 31 days during the season. (avg. = 88 per day)

On 21 of these 31 days, the Rangers were playing away games or idle.

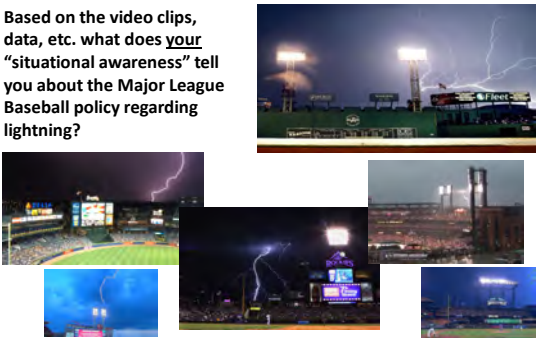

That leaves 10 days... (this is getting creepy!)



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I think we all need a good kick in the RAS!

Based on the video clips, data, etc. what does your "situational awareness" tell you about the Major League Baseball policy regarding lightning?

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I think we all need a good kick in the RAS!

Rule 4.03 (e) of the Official Baseball Rules, 2015 Edition states:

4.03 (e) As soon as the home team's batting order is handed to the umpire-in-chief the umpires are in charge of the playing field and **from that moment the umpire-in-chief shall have sole authority to determine when a game shall be called, suspended or resumed on account of weather or the condition of the playing field.**

Not only are umpires in charge of your weather safety, but Rule 4.03 also carries the following directive: "The umpire-in-chief shall at all times try to complete a game."



Major League strike-out: Putting weather decisions in the hands of umpires

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I think we all need a good kick in the RAS!

Mariners fans give raucous ovation to bolt of lightning and clap of thunder

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SATURDAY STORMS IN MANHATTAN, KS
KRISTEN RANGONE - SHAWNEE, KS

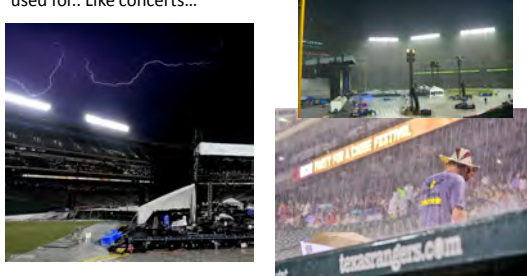

...and it's not just baseball!



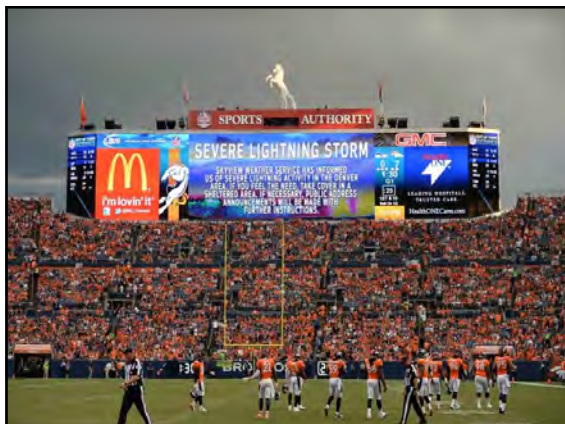

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I think we all need a good kick in the RAS!

I want to admit that the lightning analysis did NOT include all of the other events that stadiums like Globe Life in Arlington, TX are used for.. Like concerts...

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Is this truly how we want our expertise to be applied?

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Liability 'schm-iability'...

Family of boy struck by lightning on soccer field settles lawsuit

Pocono Raceway sued over lightning death

Dallas Cowboys employees settle lawsuit over 2009 practice facility collapse

Have a plan or you will pay out your RAS!

Archives: \$50M settlement reached in State Fair stage collapse

Family of boy struck by lightning seeks \$10 million in lawsuit

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Armed with highly technical information, requiring years of study to interpret correctly... (& some of the info is conditional/probabilistic)

Would anyone here want me in charge of making decisions on behalf of your favorite football team?

But, but, but...

I watch football on multiple TV channels...and


"LOOK! I have an app!!"

So why do we do it??



...And call it decision support?

We MUST Model The Actions We Seek!




Your Weather Plan MUST also contain a communications plan.



Pre-determined and pre-agreed upon signage/messaging tied to specific actions.

Digest of State Laws - Updated/Revised Title 63 – July 2007
 State of Oklahoma
 Page 1 of 46
 63 O.S. 2001, Section 681.

“Each school, administration building and **institution of higher learning** shall have written plans and procedures in place **for protecting students, faculty, administrators and visitors from natural and man-made disasters and emergencies.**”

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#OUsafe

EMERGENCY PREPAREDNESS
 THE UNIVERSITY OF OKLAHOMA

Emergency Preparedness Home
 Emergency Plans
 Status
 Local Weather

WEATHER FORECAST

6PM to 7PM CDT Saturday, 22 November 2014

6:00 PM to 7:00 PM CDT
 6:00 PM to 7:00 PM CDT
 6:00 PM to 7:00 PM CDT
 6:00 PM to 7:00 PM CDT
 6:00 PM to 7:00 PM CDT
 6:00 PM to 7:00 PM CDT

Lightning Storms Today

Follow us on Twitter @OUemergency for the week. @OUemergency

Always Be Weather Ready

Quick Look at Surrounding Area Weather Conditions:

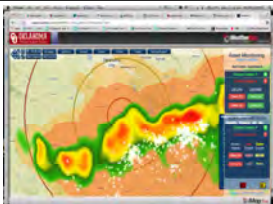
Next Seven Days

Sat Sun Mon Tue Wed Thu Fri

@OUEmergencyPrep

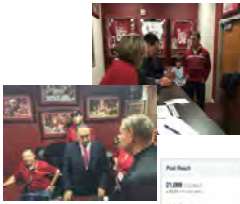
LIGHTNING DELAY

12:30 PM

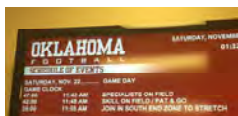


27 ground lightning strikes within 6 miles of the 50-yd line
 10 ground lightning strikes on the campus and periphery

We got our RAS in gear!



EMERGENCY PREPAREDNESS
 THE UNIVERSITY OF OKLAHOMA



ERROR: ioerror
OFFENDING COMMAND: image

STACK: