



DIFFERENT KINDS OF TIME

Expert Challenges in Coordinating Messaging with Partners and Publics

Jen Henderson, Julie Demuth, Heather Lazrus, Rebecca Morss, and Jamie Vickery



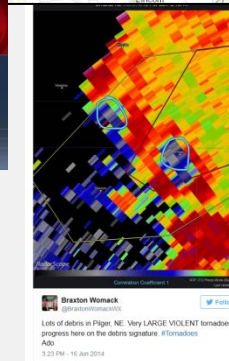
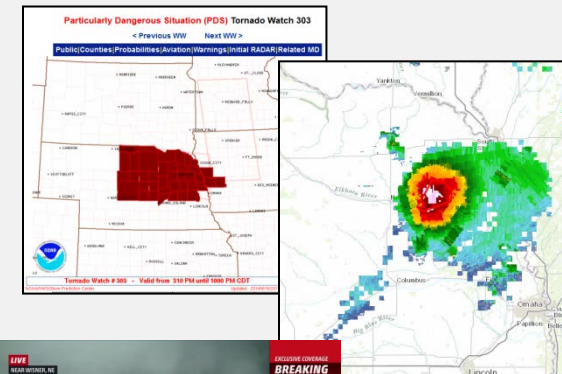
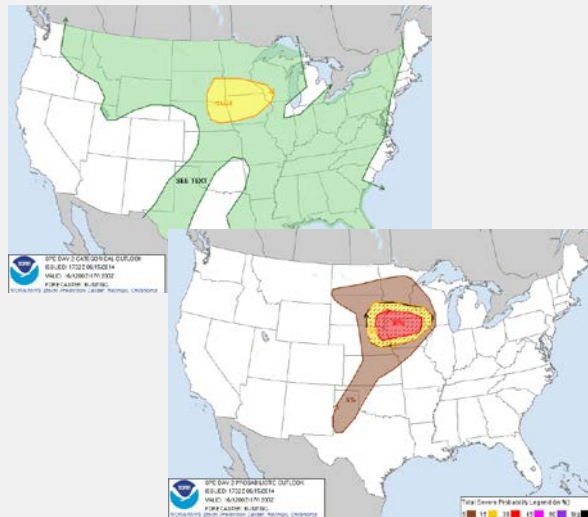
OUTLINE

- Dynamics and Theories of Time
- Chronological Time
- Examples from Case
- Kairological Time
- Next Steps

MOTIVATION

DYNAMIC INFORMATION

Multiple pieces of information, changing and evolving in time



1 day before event

2+ days before event

Day of event

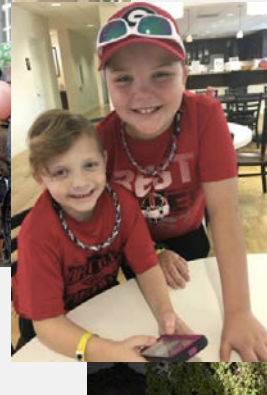


DYNAMIC VULNERABILITIES

Multiple elements of life, changing and evolving in time



Location and Movement



Demographics and Ability



Familiarity and Access

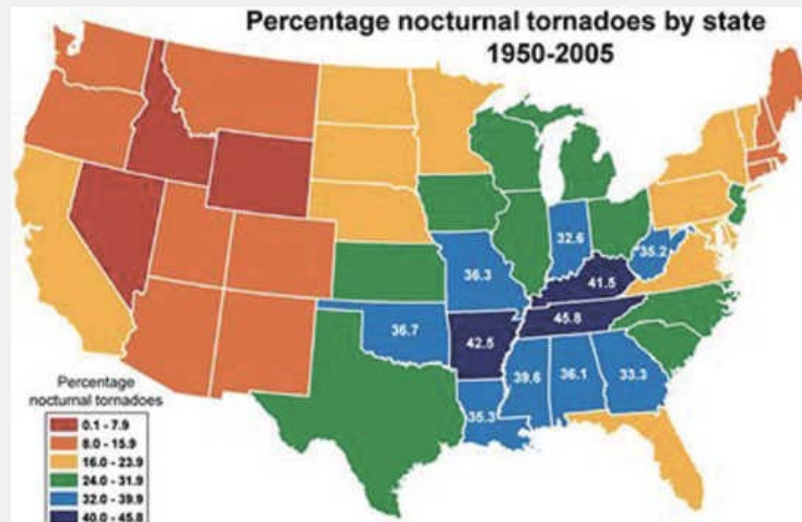


DYNAMIC STORMS

Multiple types of weather, changing and evolving in time



Seasonality



Diurnal / Nocturnal



Type of Threat



TIME IN WEATHER PREDICTION

Timeliness of....

- prediction and detection of threats by professionals
- communications within and between offices
- information dissemination & feedback on public requests
- support services & decision making for partners
- possible actions by different publics

Time is dynamic and important but often taken for granted.

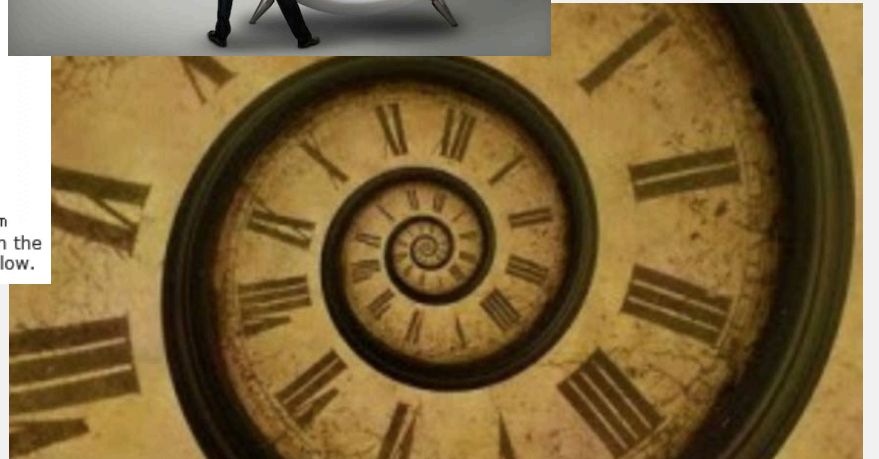
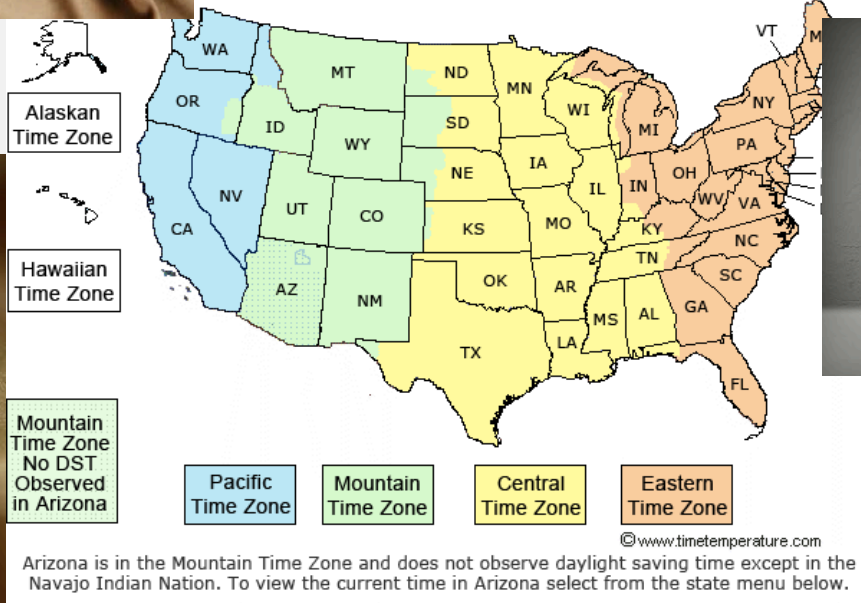
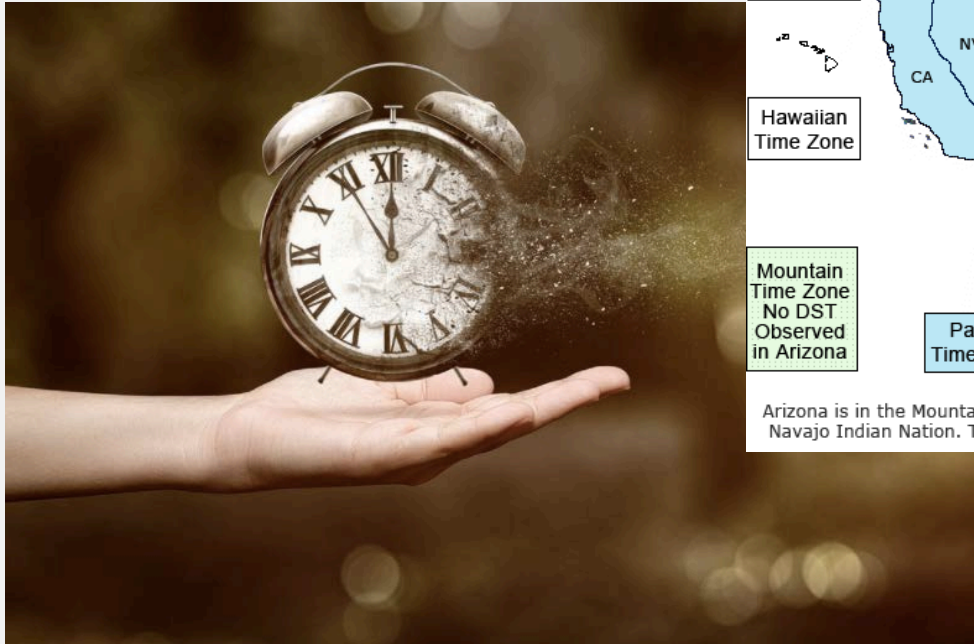


THEORIES OF TIME

Time Perceptions

- Individualized orientations toward time vary (e.g. past / present / future)
- Time is deployed through values placed on chronology, duration, pace of life, coordination of activities, economics, etc.
- Expressions of time as expectation, anticipation, and surprise.

(Levine, 1998; O Murchadha, 2013; Stolarski et al, 2014)





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CHRONOLOGICAL TIME

“A quantitative concept of time. ...an account of what happened during a particular period.” O Murchadha, 2013



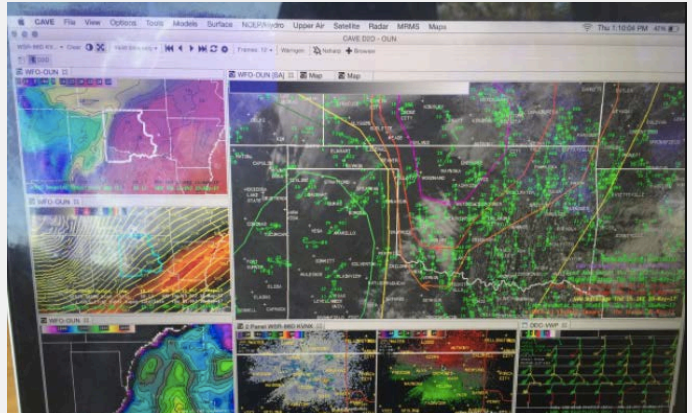
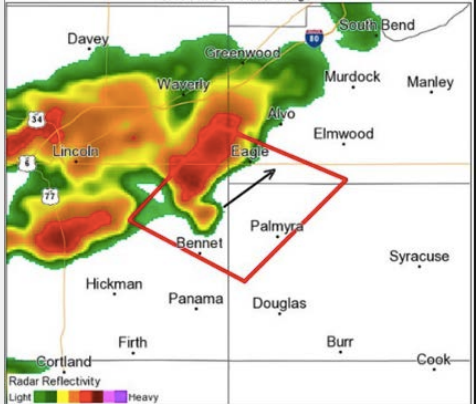
724
 FXUS63 KLOT 162338
 AFDLOT
[Area Forecast Discussion](#)
 National Weather Service Chicago/Romeoville, IL
 538 PM CST Tue Jan 16 2018

.SHORT TERM...
 247 PM CST
 Through Wednesday...

For the remainder in the afternoon and into early evening, the main concern will continue to be the lake effect snowfall over nwrn Indiana.

Latest [radar](#) trends indicate that the lake effect plume that had developed earlier today over southern Lake Michigan is slowly, but steadily moving east across nwrn IL and [nwrn](#) Lake Michigan. The back edge of the snow is along the Lake/Porter County line and snow has ended over nwrn Illinois and Lake and Newton Counties in nwrn Indiana. There is still the potential for moderate to heavy lake effect snow, mainly over Porter County, with some lighter snow extending into nwrn Jasper County. Northern Lake County could possibly see an additional 2 to 3 inches of snow through earlier this evening. The higher of these amounts should be over portions of the county that have not yet seen the heavier snow just yet and snowfall rates of 1 to 2 inches per hour are possible. While the [Winter Weather Advisory](#) has been allowed to expire over Lake and Cook counties in Illinois, the Advisory for Lake and Porter Counties in Indiana will continue.

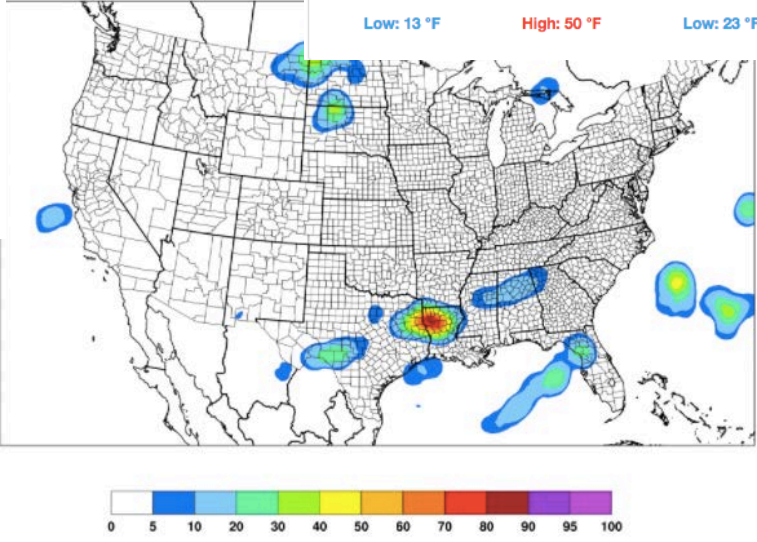
Through the evening and into the overnight hours, high pressure over the Upper Missouri Valley will slide to the southeast, and will be centered over the Lower Ohio Valley by Wednesday morning. Winds across the region will gradually back from [mly](#) to swly, shutting off the [lake effect snow](#) potential through the evening. Under decreasing cloud cover, diminishing winds and fresh snowfall, temperatures should drop into the single digits above 0 F overnight. With winds [arnd](#) 5 to 10 mph, [wind chill](#) readings should drop to -10 to -15 F overnight.



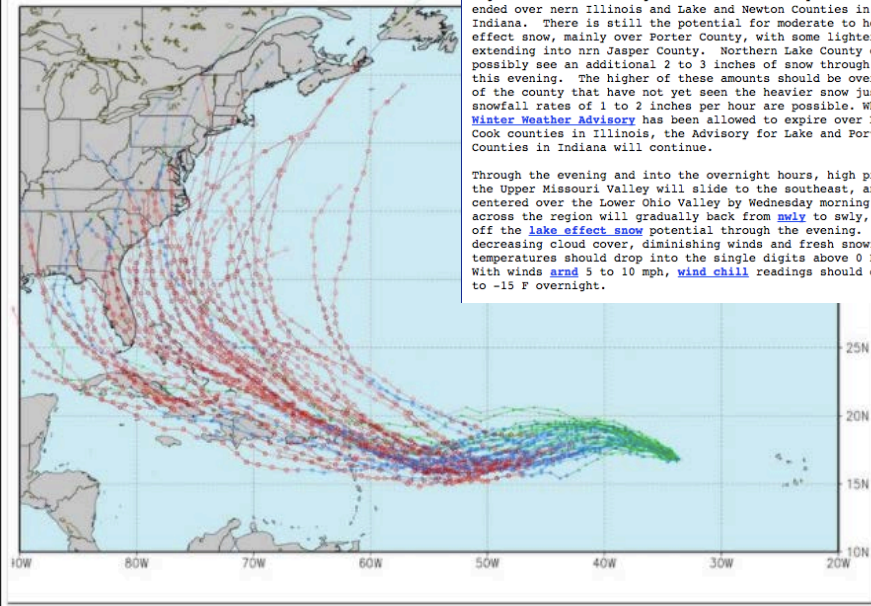
Extended Forecast for
5 Miles NE Denver International Airport CO

Tonight	Wednesday	Wednesday Night	Thursday	Thursday Night
Clear	Sunny	Mostly Clear	Mostly Sunny	Partly Cloudy
Low: 13 °F	High: 50 °F	Low: 23 °F	High: 61 °F	Low: 31 °F

08/02/2017 14 UTC HRRR-TLE Probability



ECMWF EPS 11LIRMA --> Thru [288] hours
 INIT: 12Z31AUG2017



METHODS



CASE STUDY

”Case studies are indispensable to meteorology. By describing how the weather evolved during a specific event, case studies can be integral to improving weather forecasts and can reveal mesoscale phenomena that were previously undiscovered.”

--David Schultz, *Finnish Meteorological Institute, Helsinki, Finland*

JANUARY 21-22, 2017 ALBANY & ADEL, GA

Jan. 21: Adel, GA: 3:45 am EF 3 killed 11 in mobile homes and tracked 25 miles

Jan. 22: Albany, GA: 3:20 pm EF 3 killed 5 people and tracked 71 miles, 1.25 miles wide at times

Deadliest Outbreak in 17 years

4 Significant Tornadoes Killed 16 people

3 Rounds of Severe Weather: Friday, Saturday Sunday

Increasing Severity from Enhanced to High Risk

First High Risk in U.S. since June 2014

Second Tornado Emergency Use for FO

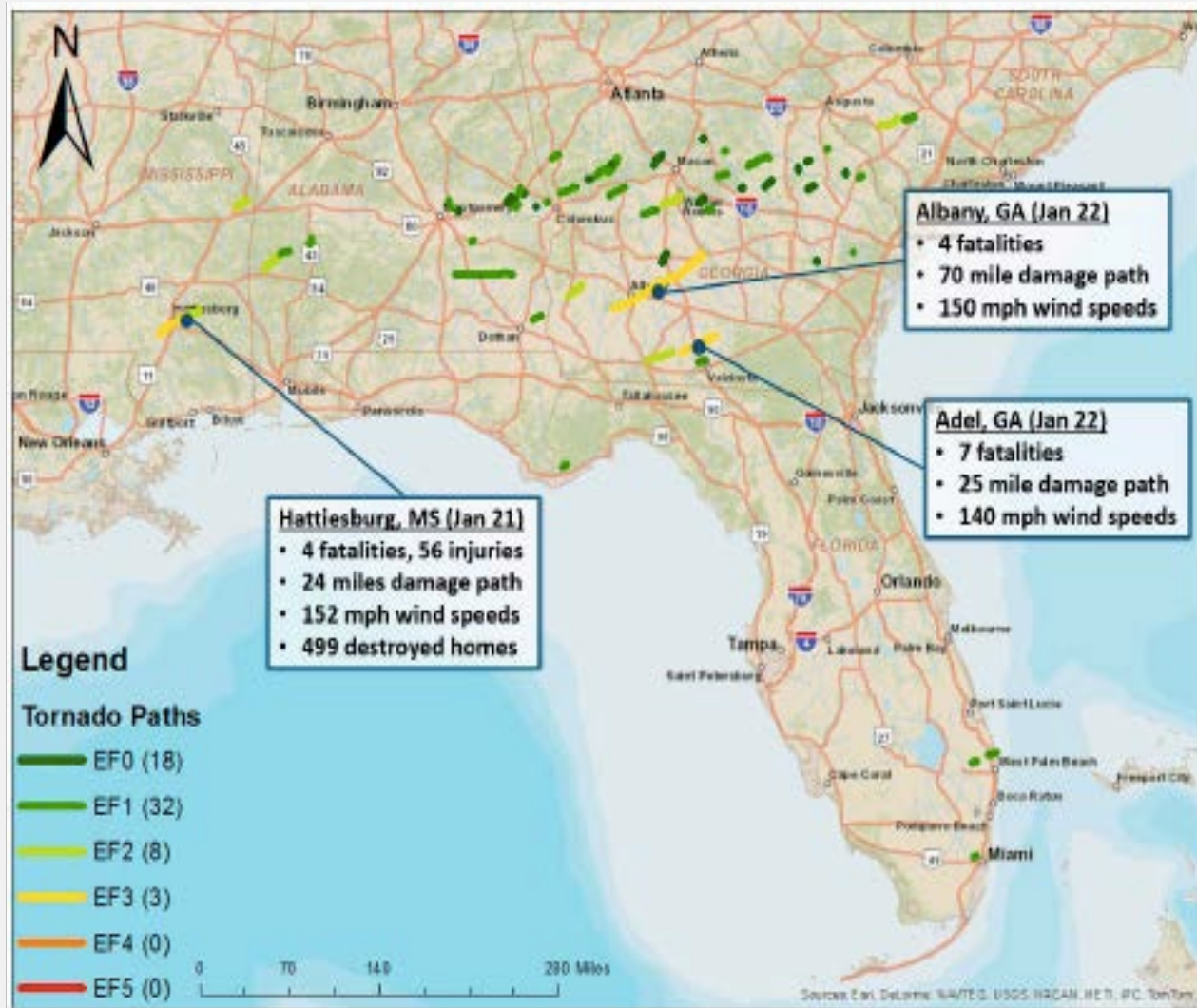
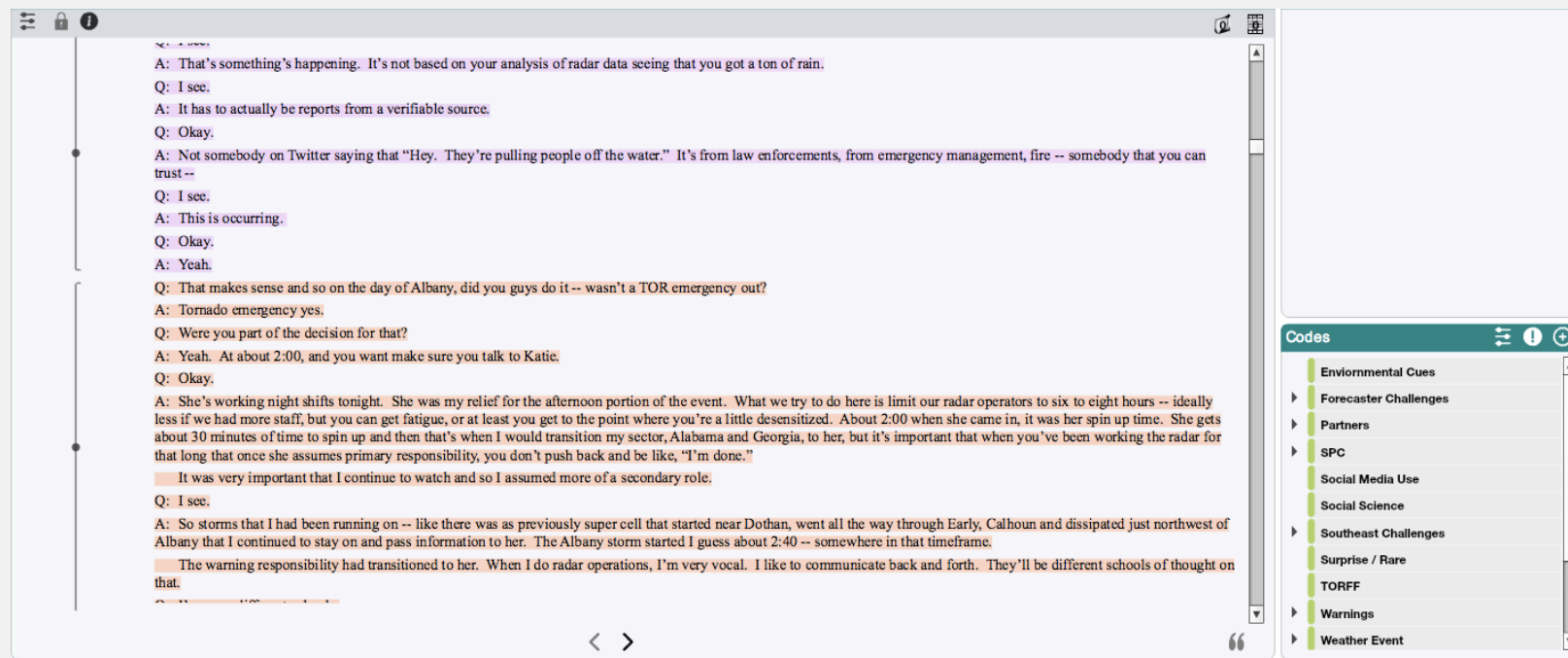


Figure 5: Locations of the 81 confirmed tornado tracks from 21 and 22 January 2017. Tornado paths were extracted from the NWS Damage Assessment Toolkit.

QUALITATIVE DATA

- Interviews conducted with 16 local NWS, 1 emergency manager, & 2 broadcast media; analyzed Facebook feeds for NWS and broadcasters
- Audio recorded, transcribed, and inductively coded with Dedoose software



The screenshot displays the Dedoose software interface. The main window shows a transcript of an interview with alternating questions (Q) and answers (A). The text is color-coded with various shades of orange and yellow, indicating the application of different codes. The transcript includes the following text:

A: That's something's happening. It's not based on your analysis of radar data seeing that you got a ton of rain.
Q: I see.
A: It has to actually be reports from a verifiable source.
Q: Okay.
A: Not somebody on Twitter saying that "Hey. They're pulling people off the water." It's from law enforcements, from emergency management, fire -- somebody that you can trust --
Q: I see.
A: This is occurring.
Q: Okay.
A: Yeah.
Q: That makes sense and so on the day of Albany, did you guys do it -- wasn't a TOR emergency out?
A: Tornado emergency yes.
Q: Were you part of the decision for that?
A: Yeah. At about 2:00, and you want make sure you talk to Katie.
Q: Okay.
A: She's working night shifts tonight. She was my relief for the afternoon portion of the event. What we try to do here is limit our radar operators to six to eight hours -- ideally less if we had more staff, but you can get fatigue, or at least you get to the point where you're a little desensitized. About 2:00 when she came in, it was her spin up time. She gets about 30 minutes of time to spin up and then that's when I would transition my sector, Alabama and Georgia, to her, but it's important that when you've been working the radar for that long that once she assumes primary responsibility, you don't push back and be like, "I'm done."
It was very important that I continue to watch and so I assumed more of a secondary role.
Q: I see.
A: So storms that I had been running on -- like there was as previously super cell that started near Dothan, went all the way through Early, Calhoun and dissipated just northwest of Albany that I continued to stay on and pass information to her. The Albany storm started I guess about 2:40 -- somewhere in that timeframe.
The warning responsibility had transitioned to her. When I do radar operations, I'm very vocal. I like to communicate back and forth. They'll be different schools of thought on that.

On the right side of the interface, there is a 'Codes' panel with a list of categories and sub-categories, each with a green bar indicating its usage:

- Environmental Cues
- Forecaster Challenges
- Partners
- SPC
- Social Media Use
- Social Science
- Southeast Challenges
- Surprise / Rare
- TORFF
- Warnings
- Weather Event

PRELIMINARY RESULTS



#1: LOGISTICAL TIME

(ORGANIZATION OF COMPLEX OPERATIONS)

SPC outlooks coordinate local
(consistency?)



“I set that up years ago where if it’s a **lower end threat [e.g. marginal]**, you email a **briefing packet**. If it’s a **significant event [e.g. moderate]**, you do a webinar.

When they get their **webinar invite in their email, they know that we mean business....**And we ultimately did do [a briefing] the Friday before the event. ...” (F 7)



Use logistics to convey severity

Event Timeline

Wednesday

Thursday

Friday

Saturday

Sunday

T-storms

Svr T-storms

Svr & Tor

Adel Tor

Albany Tor

SPC Timeline

Day 6: Slight

Day 5: Slight

Marginal / Slight

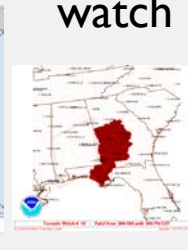
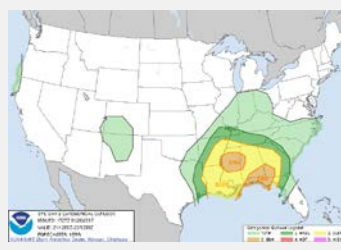
Enhanced

Moderate

High 9 am EST / PDS noon

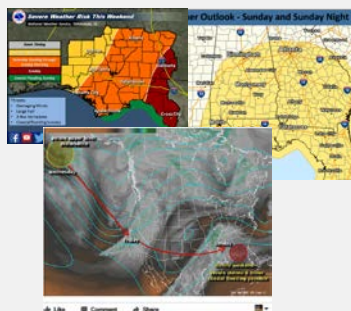
watch

watch

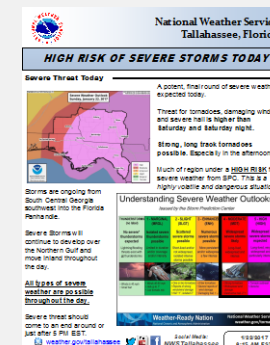


NWS Timeline

AFD



National Weather Service Tallahassee, Florida			
Threats			
	Saturday	Saturday Night	Sunday
Tornado	Warning	Advisory	All Night
Wind	Warning	Advisory	All Night
Hail	Warning	Advisory	All Night



AFD

Email EM head's up
Facebook
Website

Email briefings
Facebook

Webinar
Facebook
Website
Phone Calls

Warnings
Twitter
Phone Calls

Warnings
Twitter
Website
Phone Calls

Email briefings
Verification Calls

Visit Mobile Homes

EM Timeline

Phone calls to WCM

Request Webinar

Webinar

Call WCM


Move Assets

Respond to Events




LOGISTICAL TIME ASSUMPTIONS

SPC time cascades to EM



”...if we’re going into a weekend and they’re getting information at 3:00pm, then it’s a little late because at 5:00 [EMs] are out the door and the phones are off for the weekends. So we learned that lead time is quite important, especially if we’re going to do a webinar on the potential significant event.”

“I mean, they knew that it was coming because we had the email briefings out for several days before the webinar, but it was eye opening to know all the pieces that need to fall in place on their end heading into a weekend: having resources ready to go the bodies ready to dispatch to handle, not only preparation, but response.” (F 2)



Use partners’ need to shape logistics
(IDSS?)

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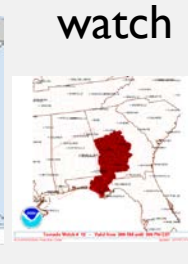
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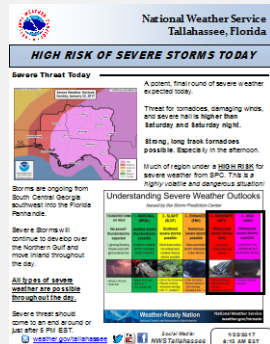


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AFD



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AFD

Email EM head's up
Facebook
Website

Email briefings
Facebook

Webinar
Facebook
Website
Phone Calls

Warnings
Twitter
Phone Calls

Warnings
Twitter
Website
Phone Calls

Email briefings
Verification Calls

EM Timeline

Phone calls to WCM

Request Webinar

Webinar

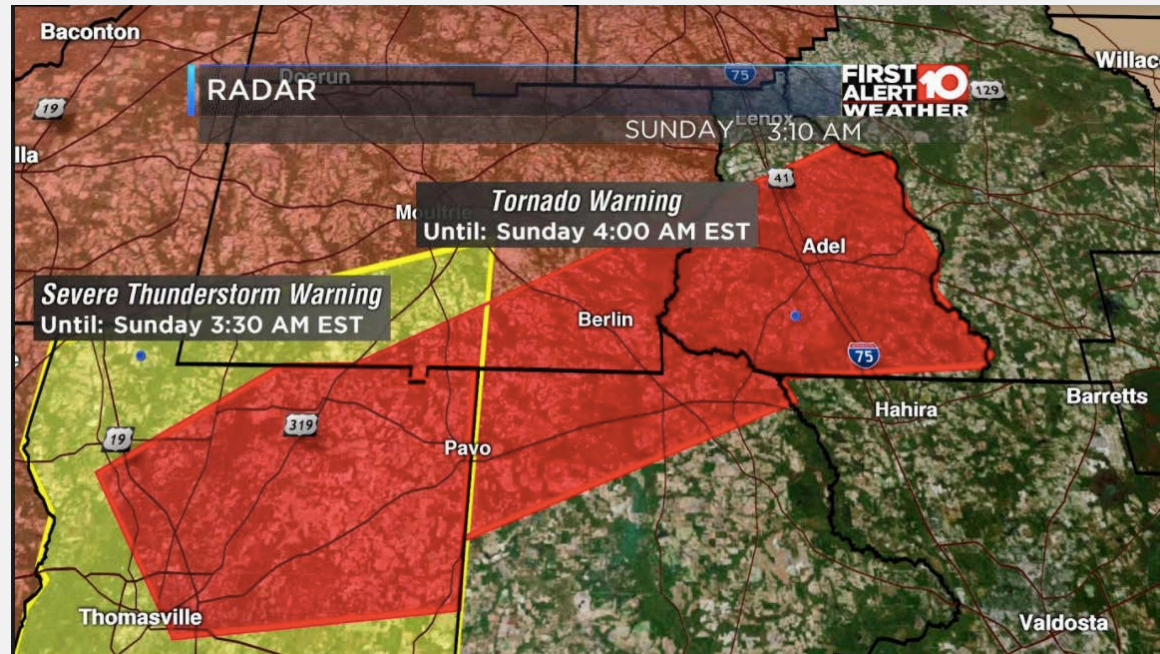
Visit Mobile Homes

Call WCM

Move Assets

Respond to Events


#2: COMMUNICATION TIME (VISUAL AND TEXTUAL MESSAGES)






COMMUNICATION TIME ASSUMPTIONS

SPC shapes public message



“It’s 2:55 am and there’s still not a tornado watch [for Adel] issued by the Weather Service....Thomas County is under the watch, but you go one county over... there’s not a watch. 3:18 am. So right after that warning went out, the Storm Prediction Center or the Weather Service said, all right. All the way from Dothan, Alabama down to Tallahassee to Savannah, you guys are under a watch.” (F 4)

“So that [lack of watch] concerned me because, you know, some people don’t take it as seriously if they’re not under a watch because why would you? If you’re not under a tornado watch, you don’t have to watch out for the conditions.” (F 6)

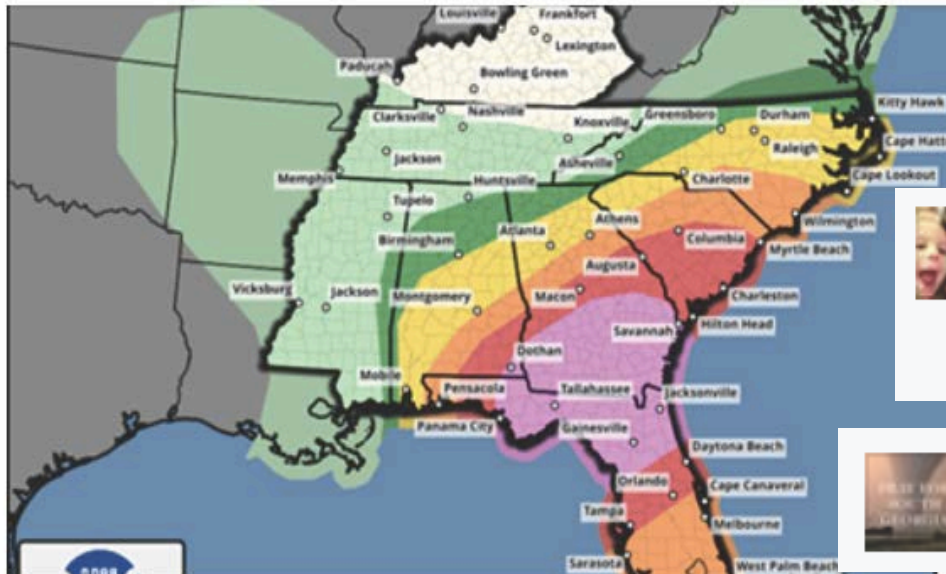


Communication as absence of awareness
(vulnerability?)

COMMUNICATION TIME (TRUST AND PREPARATION)


8am EST: SPC has upgraded to a HIGH RISK for today, which is rare and has only happened a handful of times for our area. Don't be caught off guard by a lull between storms and have multiple ways to get warnings. We won't post individual warnings here on FB, but we do on our Twitter page @NWSTallahassee

Communication as disruption of familiarity
(loss of social capital?)



Debra


I really wish you would post the updates on Facebook. I do not have Twitter.

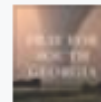
Like · Reply ·  8 · January 22 at 6:51am



Kristi


Why would you not post individual threats on Facebook? There are a lot of People who don't have twitter... With it being so severe maybe you could today? Every opportunity to save a life would be appreciated!

Like · Reply ·  3 · January 22 at 7:22am



Romel

We need Facebook up dates not everyone has twitter

Like · Reply ·  1 · January 22 at 7:51am

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SPC Timeline

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Moderate

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watch

watch



Broadcast Timeline



Facebook SPC

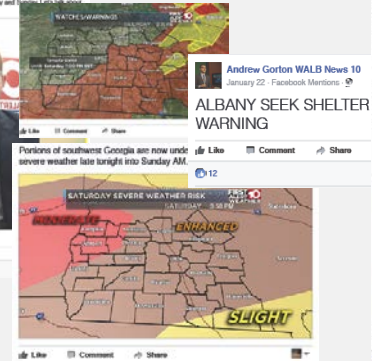
TV First Alert



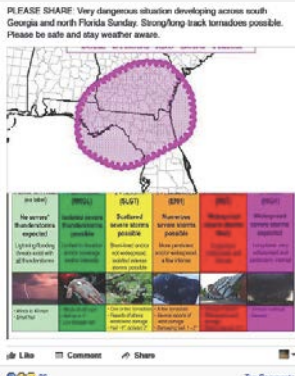
Facebook Live
TV First Alert



SPC Upgrade
Facebook Live
TV First Alert

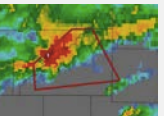
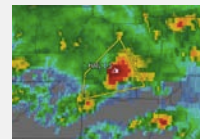


Warnings



Facebook Live

Wall to Wall Coverage
Facebook Live



NWS Timeline



COMMUNICATION TIME (RELATIONSHIP)

Communication reveals loss of partnership



“We don’t need to contact the NWS. We have the SPC to issue Outlooks and we use those. But of course we do forward warnings from the NWS and information about tornadoes. But largely, we’re doing our own meteorology and assessing the situation for our viewers.” (F 13)



Learning context of the public

KAIROLOGICAL TIME

“a qualitative concept of time...the opportune time to do something, the right time to act.” (O Murchadha, 2013)

KAIROS (N.)

The perfect, delicate, crucial moment; the fleeting rightness of time and place that creates the opportune atmosphere for action, words, or movement; also, weather.

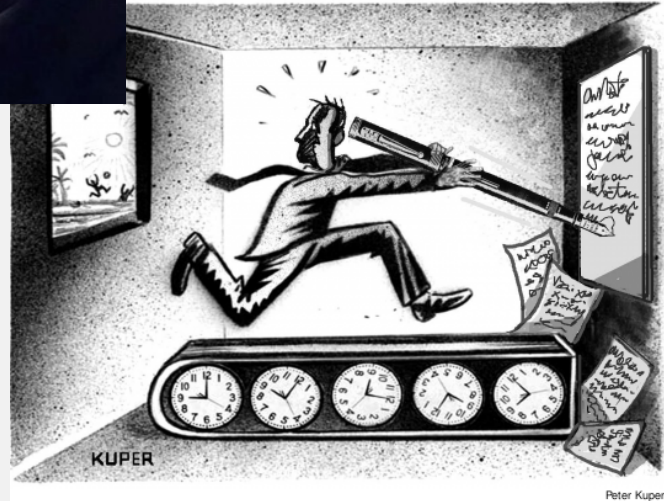
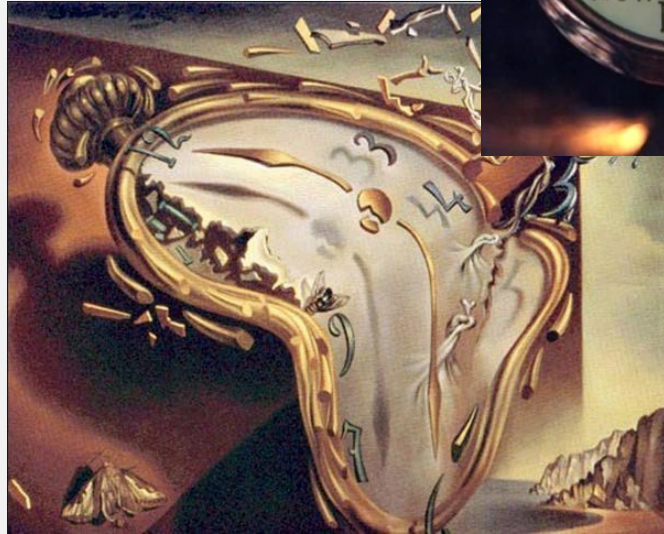
pronunciation | 'kɪ-ros (KYE-ross, English);
kEr-'os (keer-OSS, Greek)

Origins: Greek

“Kairos is all about finding the opportune time to engage another. ... As the saying goes, timing is everything.” (Newbold 2013)

...“what is said [or done] must conform to both audience and occasion.” (Poulakos 1983)

“...taking advantage of the timeliness and appropriateness of a situation, the term also implies being knowledgeable of and involved in the environment where the situation is taking place in order to benefit fully from seizing the opportune moment.” (Hess 2011)




KUPER

Peter Kuper

EXAMPLE

Safe place as a expression of “situated” opportunity

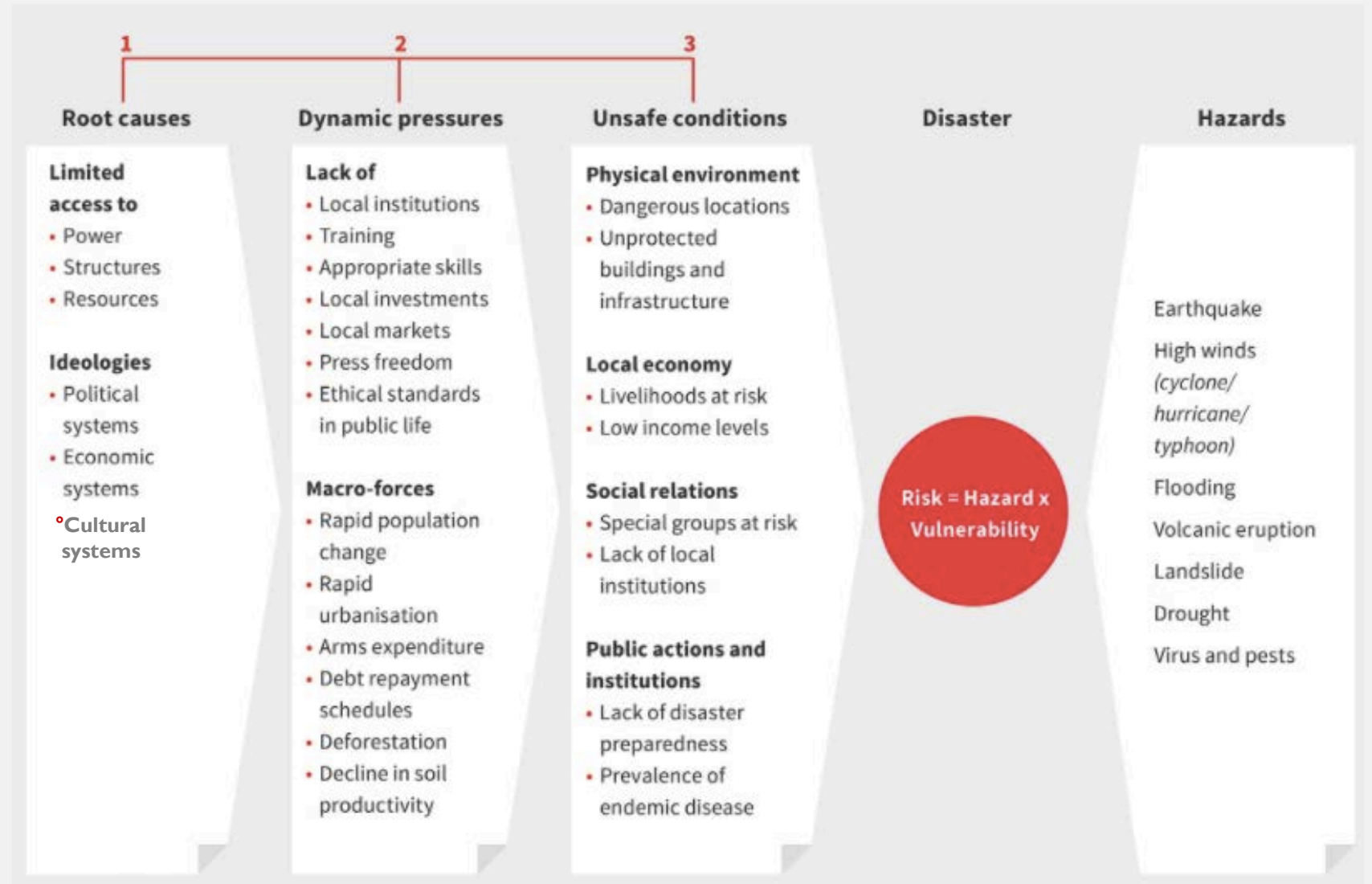
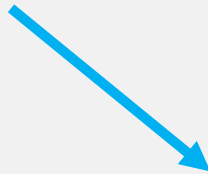


...”I can’t think of anything people can do in a mobile home [at 3 am in a rural area]; **there’s no safe place**. You’ve got to have some system where the people in the mobile home parks will be **able to get out [in time]** and get to a neighbor that has more significant structure, get to family.” (F 15)

NEXT STEPS



Kairological Time



THANK YOU!

References

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