EM Insider Knowledge about the National Weather Service to Strengthen Integrated Warning Teams

Poster Showcase
#IAEM25

University of Oklahoma; Center for Analysis and Prediction of Storms

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Poster Showcase, Competitive

Integrated Warning Teams

- **IWT-** Key members who perform **tasks related to identifying and communicating weather hazards** (Cavenaugh et al., 2016)
  - EMs, government officials, broadcast meteorologists, and NWS (Doswell et al., 1999)
- Information sharing is a **TEAM effort** (Blair & Leighton, 2014; Cavenaugh et al., 2016)
  - NWS **relationships with core partners** in the IWT must be strong for warnings to reach public- **part of IWS** (Cavenaugh et al., 2016)
  - **Personal relationships** in IWT facilitate **information exchange** (Demuth et al., 2012)

High-Reliability Teams

High-Reliability Teams and Organizations (HRT&O)

- **Near perfect performance** in quality and safety; **consequence of error very high, frequency of error very low** (Riley et al., 2010)

High Reliability=Technical Skills + Non-technical Skills + Designed Processes (Riley et al., 2010)

  - **Collective Mindfulness** (Novac & Sellnow, 2009)
  - **Flawless communication and coordination** to manage **situational awareness** (Autry & Moss, 2006)
- NWS as an HRO (Roeder et al., 2021)

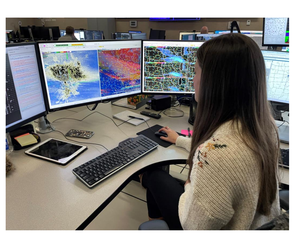
Research Context

Brief Vulnerability Overview Tool (BVOT)

- Method for collecting hazard-specific vulnerability data; Tool used alongside meteorological data

Rural Region Readiness (RRR)

- ***Plan***, ***host***, and ***evaluate*** IWT workshops aimed at tornado readiness in rural communities; Gather **local vulnerability knowledge** from community IWT and NWS meteorologists



Figures 1 & 2: *NWS Meteorologist using BVOT in winter operations (left); Rural Region Readiness IWT Workshop (right)*

Special Thanks
Dr. Daphne LaDue; University of Oklahoma; Center for Analysis and Prediction of Storms
Dr. Michelle Saunders; Mississippi State University; Department of Geosciences
Alex Marmo; University of Oklahoma; Center for Analysis and Prediction of Storms
Mara Davis; University of Oklahoma; Department of Communication

RQ1: What do NWS meteorologists want core partners, like EMs, to know?
RQ 2: How do NWS meteorologists *perceive* EM/partner knowledge shaping IWT relationships?

Data Collection & Analysis

Data Collection

- Background interviews were conducted across **12 WFOS; 9 WFO** interview sets included for this analysis
- Interviews were transcribed by OU IRB approved transcription services (BVOT) or by a trained GRA (RRR)

- **74 Interviews**; Structured/Semi-Structured Format
  - Room for additional probing
  - Interviews conducted by multiple interviewers

Study	# of Interviews	Length of Interview
BVOT Methods	36	R: 39-99 min; M: 73 min
BVOT Streamline	26	R: 50-92 min; M: 64 min
RRR	12	R: 39-83 min; M: 53 min

Table 1: *Interview information from each study*

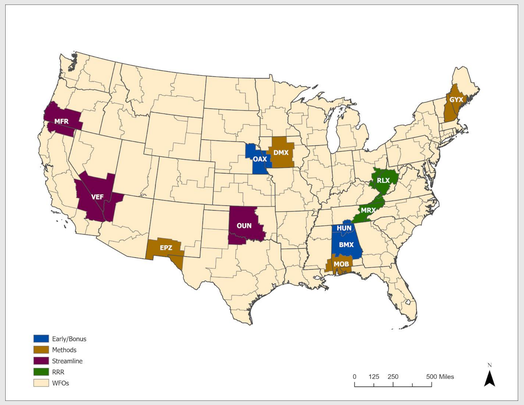


Figure 3: *Study WFO Map*

Data Analysis

- **1,842 Pages of Transcripts**

Pragmatic Iterative Analytic Approach (Tracy, 2013)

- Data immersion, organizing, manual coding, literature, memo writing
- Non-linear approach; Analytic Dance

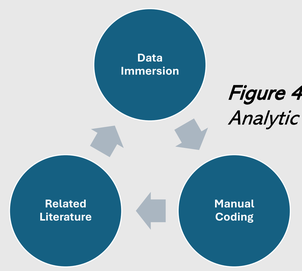


Figure 4: *Analytic Dance*

What Do EMs *Need to Know?*

Task Interdependence

- Who does what on the IWT team & member capabilities
  - *HL: So, you know, build relationships like that and they see what we're dealing with, how much data we're looking at to try to come up with that answer.*
  - *JM: I think they understand enough. I think they don't care about the 'why?' like meteorologists do, they just want to know the 'what, when, and where*

Weather Science

- Wide range in EM science/meteorology knowledge
  - *GM: Um, that's probably really polarized. You got some people that are weather geeks, and they're trying to interpret the radar themselves, and then others that wear a black box too if we don't send out a warning, they would have no idea.*
- Complexity of a forecast & probabilistic forecasting
  - *JA: So in that way, I think it is helpful for them to understand a little bit of the complexity so that they know, you know, there are legitimate reasons why the forecast was either wrong or why they're giving me a probabilistic forecast versus a real deterministic one answer forecast*

Relationship Building

HIGH-RELIABILITY *requires* Interpersonal Relationships!

- Tailored communication

A: And that's something I think in recent years has helped us understand our core partners just that much better. When I first came in, there was a lot of us pushing information that we felt…we thought was great information because we understand it…but they don't…they may not. Right?

Building and maintaining relationships within the IWT is the responsibility of *all* IWT members.

Figure 5: Relationship building activities

Next Steps and Conclusions

Next Steps

- Lots of interview data left to analyze (from NWS meteorologists *and* Ems); Continue iterative process; More interviews to conduct!

Conclusions

- The NWS is considered an HRO…*Insider Knowledge* is needed for an IWT to be an HRT
- IWT members need to know "enough" weather science
- Effective team-work requires knowledge of *everyone's role* on the team
- Members of the IWT must continue to seek out ways to build and maintain relationships

References & Funding

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Funding Information

- Streamlining Development of the Brief Vulnerability Overview Tool (BVOT) and Assessing the BVOT's Impact on Tailored Messaging; **NOAA Award #NA23OAR4590365**
- Developing, Testing, and Evaluating Methods for Transitioning the Brief Vulnerability Overview Tool (BVOT) to NWS Weather Forecasting Offices; **NOAA Award #NA21OAR4590212**
- Rural Region Readiness: Collaborative Learning through Integrated Warning Team Workshop Sessions on Tornado Safety; **NOAA Award #: NA23OAR4590349**