

# USING SOCIAL AND BEHAVIORAL SCIENCE RESEARCH TO MIX PROBABILISTIC WEATHER ADVANCEMENTS WITH DECISION-MAKING

By Dr. Gina Eosco

Cherokee Nation Strategic Programs

Providing Social Science Contract Support to

NOAA's Office of Weather and Air Quality

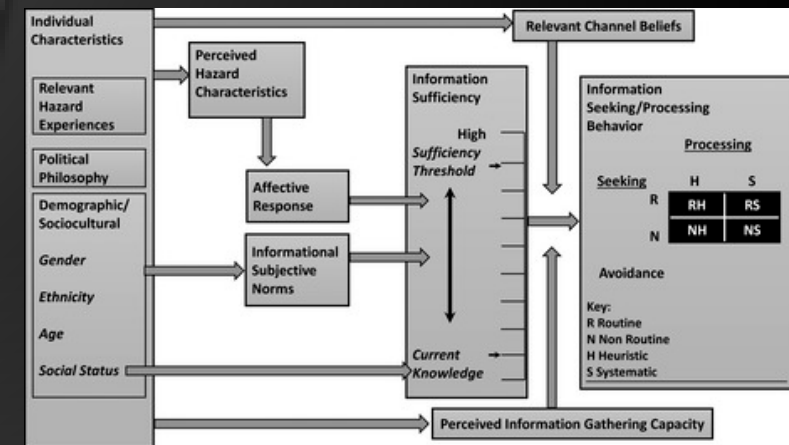
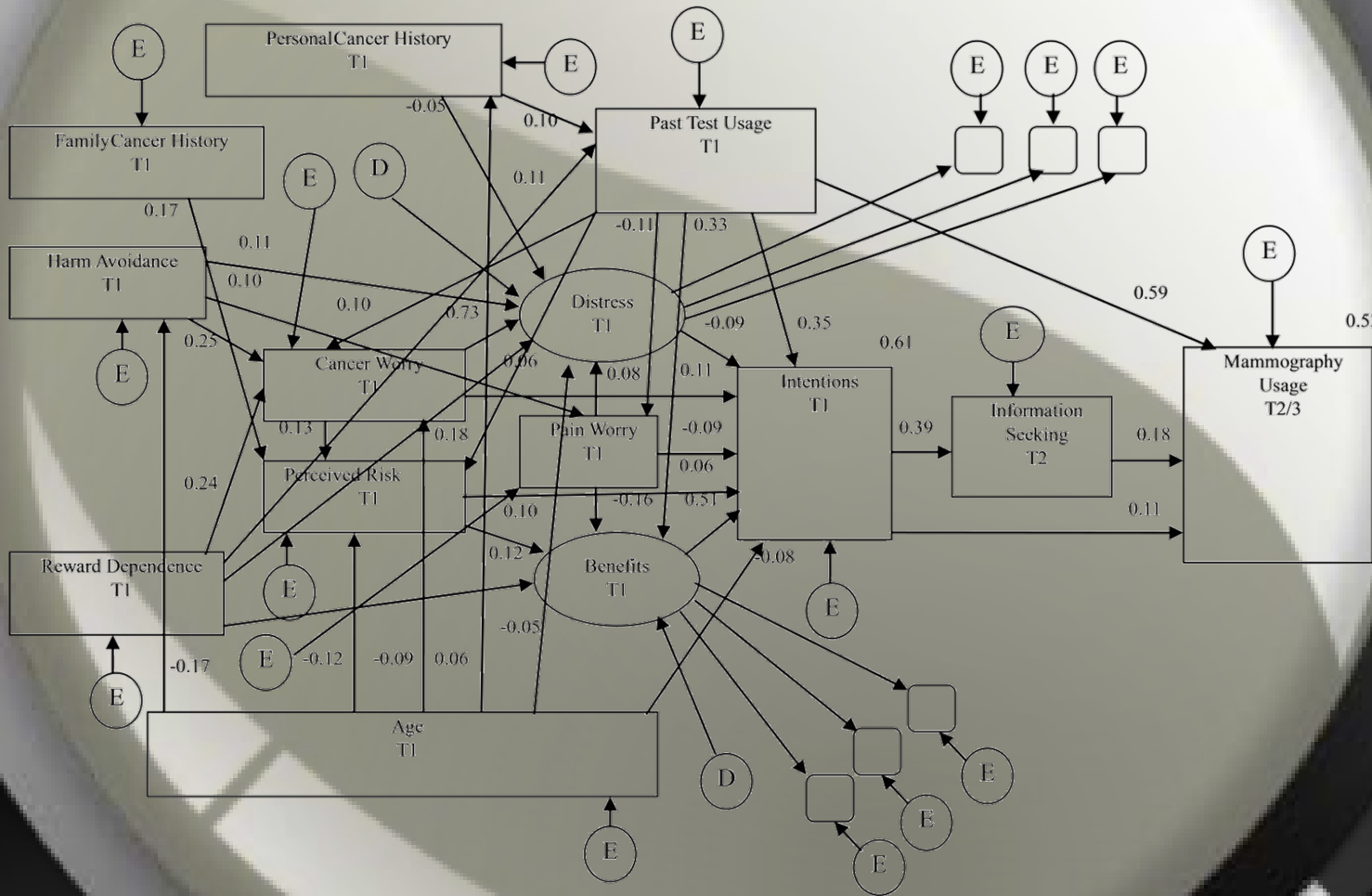


DE-ICE  
80%  
30%  
3 OUT OF 10  
4 OUT OF 10  
CHANGE AIR TRAFFIC CONTROL PRIORITY  
CLEAR RUNWAYS  
0.2  
2-10  
0.4-6  
99%

# EXAMPLE OF THE FORECAST PROCESS



# A RISK INFORMATION SEEKING AND PROCESSING MODEL



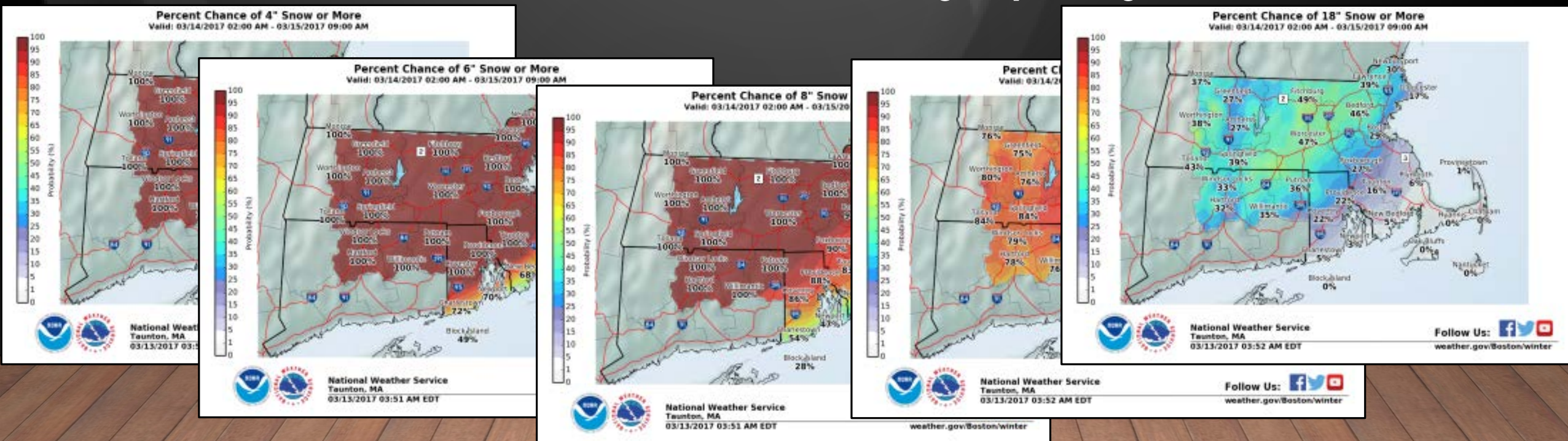
Griffin, R. J., Dunwoody, S., & Neuwirth, K. (1999). Proposed model of the relationship of risk information seeking and processing to the development of preventive behaviors. *Environmental research*, 80(2), S230-S245. [http://file.scirp.org/Html/4-2250052\\_38377.htm](http://file.scirp.org/Html/4-2250052_38377.htm)



# POINT #1: PEOPLE DON'T NATURALLY KNOW THEIR PROBABILITY THRESHOLD

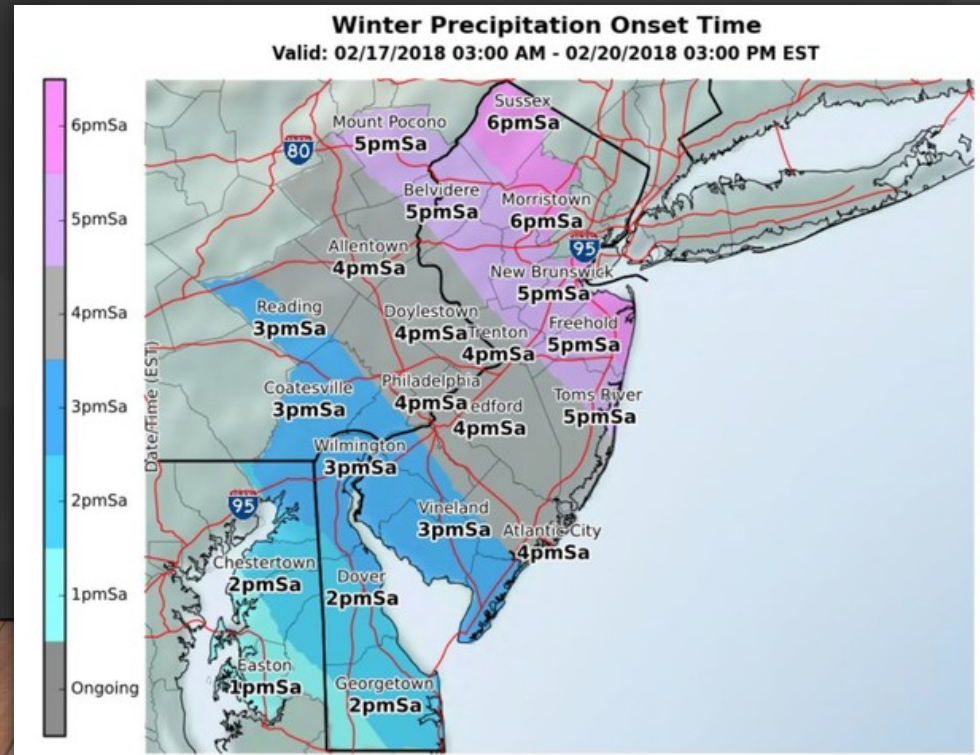
- “Can't the emergency manager just give us their probability threshold? I mean, don't they have a database of past snow storms with how much it costs? Can't they figure out their threshold from that?”

~A forecaster about emergency managers



## POINT #2: PROBABILITIES PLUS CONTEXT CAN CREATE USEFUL INFORMATION

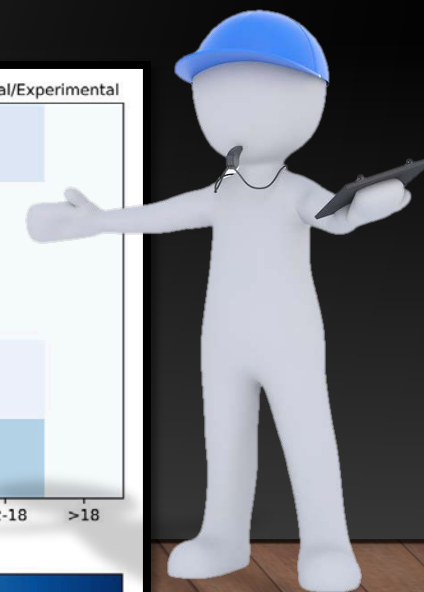
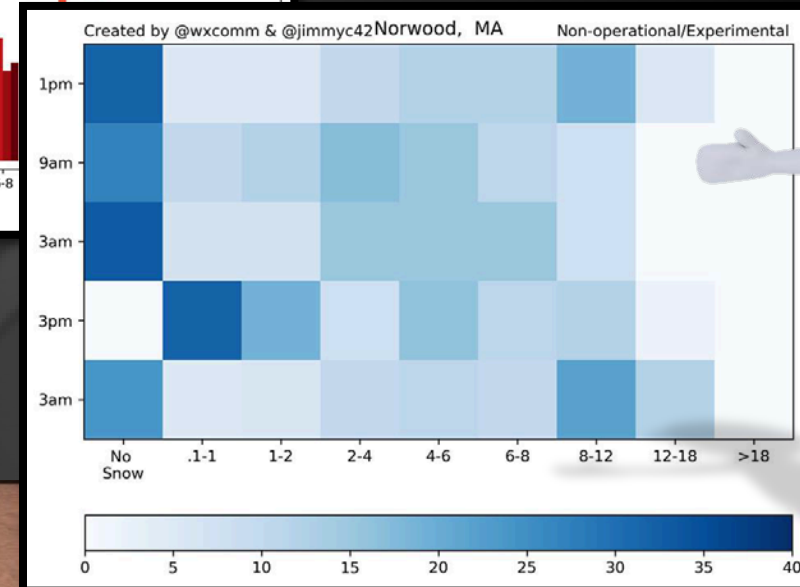
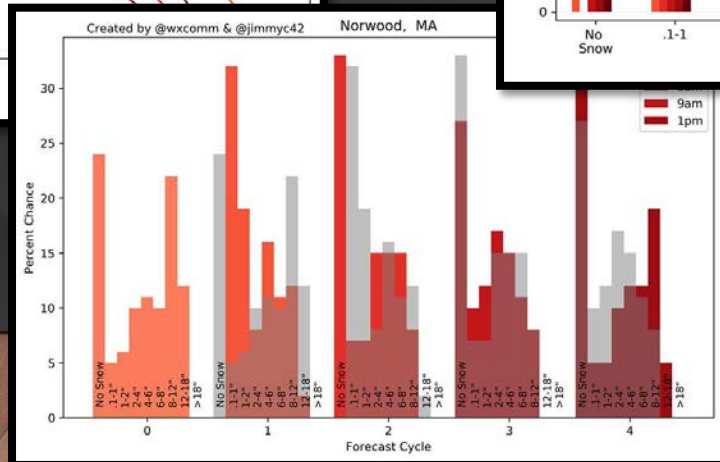
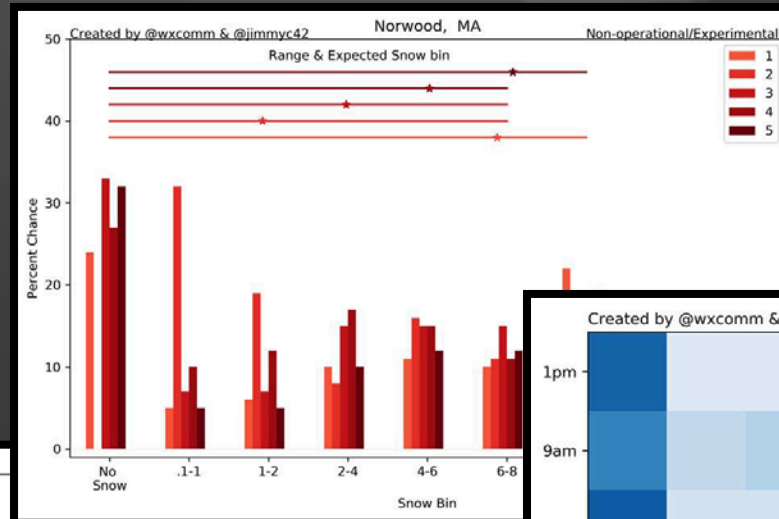
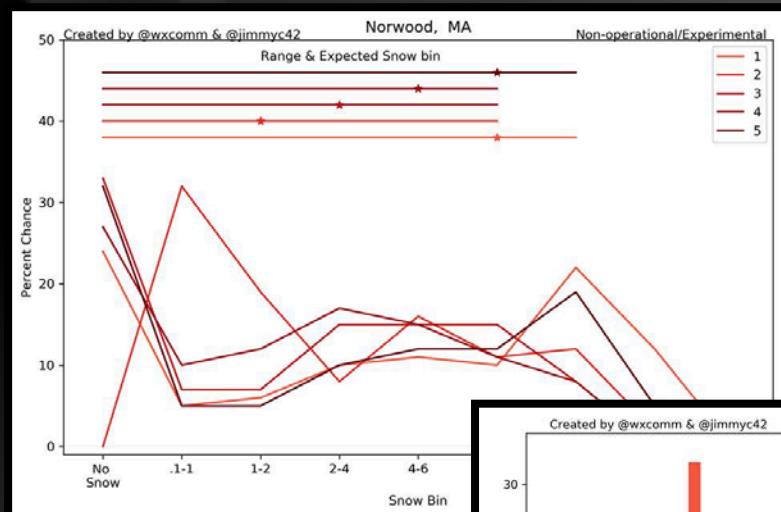
- A New England DOT official said, “Timing, timing, timing. We want to know what to expect, when we will have plows on the road, when will we need to contact schools.” Partners stressed that *all* decisions depend on the time of day. In fact, a North Carolina DOT representative said, “Whether it’s 4, 7, or 10 inches, we deal with it the same way. It’s about the timing.”





# POINT 3: LET YOUR STAKEHOLDERS DRIVE YOUR PROBABILISTIC INNOVATION

- Partners watch for changes from one model run to another. If the models are consistent, partners perceive this as high confidence. If models diverge from run to run, partners perceive this as low confidence.
- This lead to brainstorming with Dr. James Correia (@jimmyC42). How can we use model to model probabilistic output to convey confidence?



# POINT #4: LET STAKEHOLDERS DRIVE THE NEXT RESEARCH QUESTION

- Aviation needs: predicting the location and timing of narrow snow bands
- Airport representatives in the study said increased lead time for snow bands would help reduce the impact on the aviation industry.

With some research,  
our weather  
probabilities could  
do this!

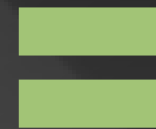
60% chance  
snow band  
will occur...



... in the  
next 40-60  
minutes



...with rapid  
accumulation



Reprioritize  
air traffic  
control for  
key  
connecting  
flights





Thank you for listening!

Dr. Gina Eosco

[Gina.Eosco@noaa.gov](mailto:Gina.Eosco@noaa.gov)

Cherokee Nation Strategic Programs  
Providing Social Science Contract Support  
to  
NOAA's Office of Weather and Air Quality