

Assessing the impacts of Simulation on Decision Making: Using a Hurricane Simulation for Preparedness

1. Introduction

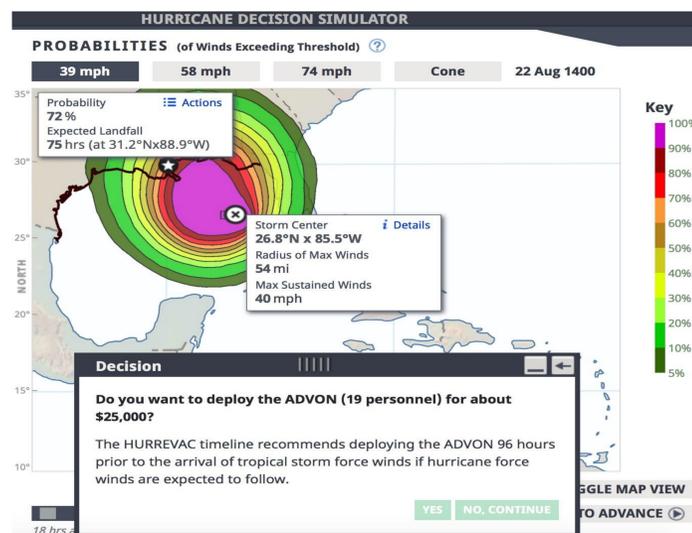
New Orleans is home to a U.S Marine Corps Forces Reserve base housing 1600 personnel. This location is highly vulnerable to tropical storms and hurricanes.

Experience can help improve intuitive judgement; however, there are not many opportunities for individuals to learn from real storms.

Goal: Test the effectiveness of a Hurricane simulation tool to aide the Marine Forces in training their decision makers to prepare for hurricanes in the New Orleans area.

2. Hurricane Decision Simulator

- Probabilistic model of storm center and wind speeds
- Uses historical tracks of storms and forecasts to create realistic scenarios
- Decisions based on Marine Corps context
- Allows users to experience multiple storms and make real time decisions
- Decision Feedback and outcomes given after every simulation



3. Testing the Simulator

IE 305 students were participants in this 2 part study

Questions to Answer

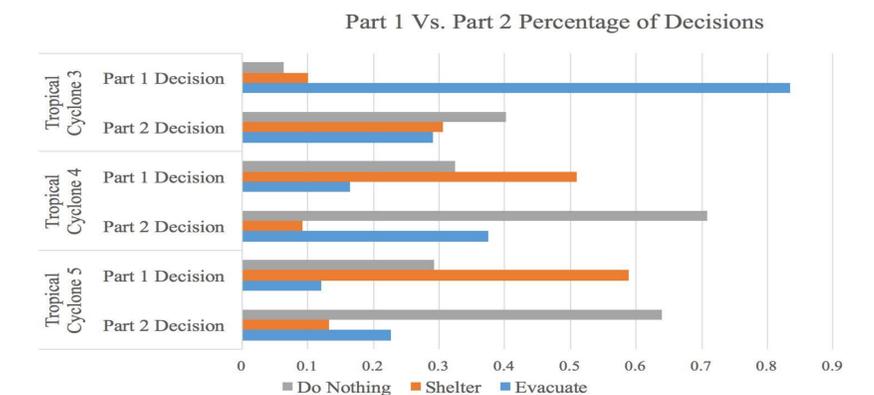
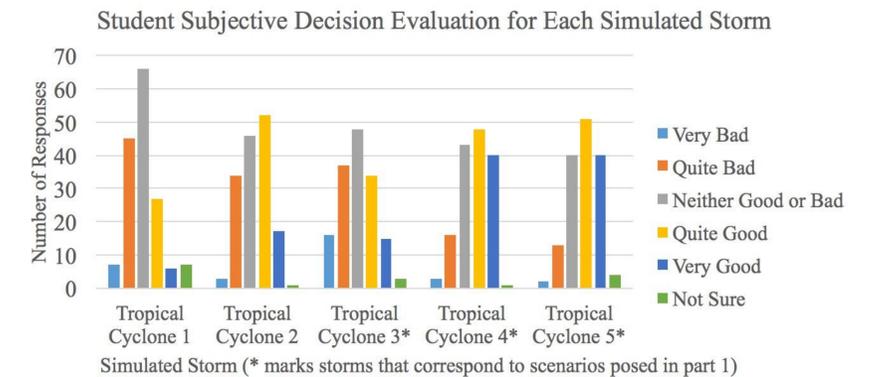
1. Do participants feel the quality of their decisions are better as they practice with the simulator?
2. Does practicing making decisions on the simulator change an individual's decision with respect to making evacuation decisions before a hurricane?

Part 1

- Before practicing with the simulator, participants were given textual descriptions of 3 different storms that included wind probabilities and time to landfall
- Participants made decision if they would order the Marines to Evacuate, Shelter or Do Nothing (i.e. wait) for each of the 3 storms
- Participants then learned Marine Corps terminology and practiced with the simulator

Part 2

- Participants used the simulator to make decisions for 5 storms
- Participants needed to make same decision (evacuate, shelter, or do nothing) for same 3 storms in Part 1
- Participants ranked their perceived riskiness of each storm on a 1-5 scale
- Participants recorded the quality of their overall decision making process on a 1-5 scale with a "Not Sure" option



4. Data and Results

- Participants reported better quality of decisions as they practiced with more storms
- Fewer participants answered "Bad" or "Quite Bad" on Tropical Cyclones (TC) 4 and 5 compared with TC 1
- More participants answered "Quite Good" or "Very Good" on TCs 4 and 5
- In TC3, majority of participants chose evacuate in Part 1; plurality of participants chose do nothing (i.e., wait) in Part 2 (simulation)
- In TCs 4 and 5, majority of participants chose shelter in Part 1; majority of participants chose do nothing in Part 2 (simulation) and many chose evacuate

5. Conclusion

From this study, there is evidence that participants not only make different decisions after using the simulator, but that they also feel their decisions are better. The next steps for this research would be to perform a statistical analysis of these decision changes.