## 

DAT 530 Final Project Milestone One

Michael Surdek

Southern New Hampshire University

The purpose of this project is to create three separate visual representations of the National Centers for Environmental Information Storm Events Database that will provide useful tools and convey necessary information for the state budget office, the state emergency management agency (EMA), and the general public. The visualizations of this historical storm data will be used to increase overall preparedness and to implement more effective responses by all parties involved for future storms. The goal of the first visualization for the state budget office is to help establish a monetary reserve and to allocate emergency resources to areas that are more likely to be impacted in the future. The goal of the second visualization for the EMA is to provide an informational tool that can be analyzed for risk assessment, resource allocation, and media inquiries. The goal of the third visualization for the general public is to reinforce the importance of universal preparedness for severe weather events.

The comprehensive storm events dataset from 2015 and 2016 should be sufficient to accomplish the given goals. The dataset contains over 113,000 records of storms across the US and surrounding areas from the two-year period. There are many variables that were tracked for each individual storm record. Many of these variables could be included in visualization models in order to provide information to the various audiences. The state variable includes the fifty united states, the District of Columbia, territories such as American Samoa and the Virgin Islands, and bodies of water such as the Great Lakes. The event\_type variable identifies the type of storm of each record such as thunderstorm, tornado, or drought. There are variables that show counts of injuries, deaths, and other damages. There are also variables that provide more detailed descriptions of the storms, which could be used to separate the severity of the storms in order to provide more information. One issue that might create uncertainty regarding the dataset and how it applies to future storm events is whether the nature of natural disasters is trending worse or differently due to overall climate change. For example, if there were a wider range of historical data, we could see with more certainty if severe storms were becoming more frequent in certain areas such as the south or the coastal regions.

The project requires three separate visualizations because there are three categories of stakeholders who consume information in different ways. For the state budget office, the ideal visualization is a PowerPoint presentation that shows general storm activity and information about how money and resources can be allocated in response. The members of the state budget office would be familiar with this method of information display because they likely see similar presentations on other types of budgetary issues on a regular basis. They might not be extremely familiar with severe storm trends and metrics, but they should have an understanding of how funds are currently allocated and of the power that they have to rearrange the budget to provide a more optimal response.

For the Emergency Management Agency, the ideal visualization is an interactive dashboard that they can use themselves to discover information about recent severe storms and typical damages and responses. This audience will likely be the most educated overall and the most familiar with severe storm trends and metrics. For this reason, a dashboard makes the most sense because they can use filters and other dashboard features to look into specific areas where they have ideas about potential information. The best way to approach the dashboard would be to try to retain granularity from the dataset and use individual visualizations as gateways for the EMA to discover relationships and trends that are useful to them.

For the general public, the ideal visualization is a one-page pamphlet or simple webpage that emphasizes the importance of each individual’s role when it comes to preparedness and therefore damage minimalization of severe weather events. With this type of visualization, the audience needs to be shown the most important information directly. This information should include summary statistics and easily readable charts. The general public is likely less educated than those working for the state in either the budget office or the EMA. For this reason, it is important to make the pamphlet as digestible as possible, by including significant whitespace and creating some type of flow so the audience knows how to process the information. One element that is not defined in the project description is the particular state that is requesting this consultation. If the state were known, the information shown on the pamphlet might differ. For example, a state in the Midwest might need more information about tornadoes, and a state like Florida might need more information about hurricanes. Knowing the state would also provide demographic information about the general public. One reason this could be useful is if the state has a lot of non-English speaking residents. In this case, it would also be ideal to provide the writing on the pamphlet in multiple languages, but that is beyond the scope of this project.