Final Research Project for Earth 1119

Purpose:

The purpose of this assignment is to demonstrate your understanding of significant weather hazards, how the National Weather Service communicates vital weather information to the public, how weather partnerships are used in creating strategies to protect property and lives, the impacts that various weather events have on society and various constituents of a community as well as how a community prepares and responds to hazardous weather.

Main Objectives:

This project is a case study of weather and preparedness concepts of a significant weather-related event to affect the US. It ought to be a case where there is enough weather data, including NWS text products, that would have been issued prior to and during the event. There are five aspects of your project that you should focus on.

* **Meteorology of the Event** - Since this is a meteorology class, there should be some discussion of the meteorological causes of the significant event. Include weather maps and include an explanation of the main causes of the phenomena being discussed. It would also be helpful to discuss some of the weather basics of the processes that lead to such events. An understanding of antecedent events that pertain to the event should also be discussed in as much detail as might be appropriate. This section’s quality can make or break your grade!
* **NWS Information** - Forecasts and products that the NWS issues should be a high priority to demonstrate your understanding of how information is disseminated. Include your own opinions of how well this event was forecasted. There should be textual and graphical statements that align the event with the information disseminated. Use this site if you need to access historical text products from various NWS offices. <https://mesonet.agron.iastate.edu/wx/afos/list.phtml>
* **Impacts** - A thorough presentation of the impacts of this event will give you a great opportunity for creative thinking. Include compelling eyewitness accounts, anecdotes, pictures, video or news stories. This should be an opportunity to make your paper dynamic and compelling. Tell a story or relate others’ stories.
* **Prior Readiness** - What was the state of preparedness in the communities affected? Were people prepared in advance or only responsive in their actions? What did vital constituents and partners do to mitigate the disaster? Could more have been done?
* **Lessons Learned** - What were the lessons learned? Looking at the event in the past, what were the major successes and failures in being ready for this event? Is there anything learned that could be applied to future scenarios?

Quantity:

The paper should be between 3500-4500 words (do not count the references sheet) although more is acceptable. I would like to have 11pt font and 1.5 line spacing. Appropriate diagrams should be used. Cite references with simple parenthetical references (see [https://en.wikipedia.org/wiki/Wikipedia:Inline\_citation/examples](https://en.wikipedia.org/wiki/Wikipedia%3AInline_citation/examples)).

Quality:

Of course, the quality of your paper will matter. To accomplish the task of this paper, you will break your paper into the five different sections as listed above. Consider each section to be a short paper between 1-4 pages each, depending on how much information you find on each topic. You should include diagrams and pictures and even video clips within the paper. You may also embed hyperlinks if that is easier. Just bear in mind that most of your paper should be writing and not just a series of diagrams.

Your project should address (but not be limited to) the following questions:

1) Were there any important meteorological aspects leading up to the event (or lack thereof)?

2) How did the event unfold from a forecasting perspective? (For example, what products did the NWS issue before and during the event. (*i.e.* outlooks, watches, bulletins, special weather statements, advisories, etc...)

3) What were the main meteorological features that made this event so impactful?

4) Was there a societal component that influenced the degree of the hazard? Were people prepared?

5) How common is your event from a climatological perspective?

6) What did the overall timeline of events look like?

7) Were any actions taken to mitigate the hazard? Why or why not?

8) What were the overall societal and economic consequences of the event?

9) Were any changes made to policy following the event? Did the event have political implications?

10) What actions would you recommend if another event like this were to occur?

How to Accomplish this Project:

***First think of a weather situation.***

Consider blizzards, ice storms, severe weather outbreaks, hurricanes, floods, droughts, wildfires, heat waves or cold spells or any other weather hazard that interests you.

***Pick the specific event.***

Just make sure that the *weather* event was major and *affected the US* including Puerto Rico *during the 21st Century*. Remember, you must discuss how the NWS handled the event. Everyone in class ought to have a unique case to work on. Post your topic under the thread on the Discussion Board on Blackboard, so you know what has not been taken.

***Start with Wikipedia***

If the event is large, there is probably a Wiki article about the event. Use that as a basis to find other sources. At the bottom of each article are a list of references. With a ton of information given there, it should be easy to find all the information needed. There should be links to NWS products that were issued. A great place to find all of them is here: <https://mesonet.agron.iastate.edu/wx/afos/list.phtml>
This will take a little time to find what you want to use, but it is worth it. You should find out all the local office products, including warnings and HWO's.

***Look at the Meted case study***

This is Chapter 6 of our backbone module. <https://www.meted.ucar.edu/emgmt/hazwx/print_6.htm>
This is a great way to help organize your paper. Look at the way they do things.

***Think one small paper at a time.***

Each section is a relatively short paper. After writing each section, write an introductory paragraph and at the end, a brief summary paragraph. Make it professional in all aspects. You have control over the quality of the project. Start working on it now because this is not a last second project. Also, include a References page. Just let me know the web site you used and what the name of the page was.

*Having problems thinking of events? Here are a few major ones to consider.*

***Hurricane Katrina 2005-08-25/2005-08-30***

Category 3 hurricane initially impacts the U.S. as a Category 1 near Miami, FL, then as a strong Category 3 along the eastern LA-western MS coastlines, resulting in severe storm surge damage (maximum surge probably exceeded 30 feet) along the LA-MS-AL coasts, wind damage, and the failure of parts of the levee system in New Orleans. Inland effects included high winds and some flooding in the states of AL, MS, FL, TN, KY, IN, OH, and GA.

***Western Wildfires of 2012 2012-06-01/2012-11-30***

Wildfires burned over 9.2 million acres across the U.S. in 2012. This is the 3rd highest annual total since the year 2000. The most damaging wildfires occurred in the western states (CO, ID, WY, MT, CA, NV, OR, WA). Colorado experienced the costliest wildfires (e.g., Waldo Canyon fire) where several hundred residences were destroyed.

***Superstorm Sandy 2012-10-30/2012-10-31***

Extensive damage across several northeastern states (MD, DE, NJ, NY, CT, MA, RI) due to high wind and coastal storm surge, particularly NY and NJ. Damage from wind, rain and heavy snow also extended more broadly to other states (NC, VA, WV, OH, PA, NH), as Sandy merged with a developing Nor'easter. Sandy's impact on major population centers caused widespread interruption to critical water / electrical services and caused 159 deaths (72 direct, 87 indirect). Sandy also caused the New York Stock Exchange to close for two consecutive business days, which last happened in 1888 due to a major winter storm.

***Northeast U.S. Flooding 2010-03-01/ 2010-03-31***

Heavy rainfall over portions of the Northeast in late March caused extensive flooding across several states (RI, CT, MA, NJ, NY, PA). The event caused the worst flooding in Rhode Island's history.

***2011 Southeast Tornado Outbreak 2011-04-25/2011-04-28***

Outbreak of tornadoes over central and southern states (AL, AR, LA, MS, GA, TN, VA, KY, IL, MO, OH, TX, OK) with an estimated 343 tornadoes. The deadliest tornado of the outbreak, an EF-5, hit northern Alabama, killing 78 people. Several major metropolitan areas were directly impacted by strong tornadoes including Tuscaloosa, Birmingham, and Huntsville in Alabama and Chattanooga, Tennessee, causing the estimated damage costs to soar.

***Spring Freeze 2007-04-13/ 2007-04-17***

Widespread severe freeze over much of the east and Midwest (AL, AR, GA, IL, IN, IA, KS, KY, MS, MO, NE, NC, OH, OK, SC, TN, VA, WV), causing significant losses in fruit crops, field crops (especially wheat), and the ornamental industry. Temperatures in the teens/20s accompanied by rather high winds nullified typical crop-protection systems.

***Northeast Ice Storm 1998-01-05/1998-01-09***

Intense ice storm hits Maine, New Hampshire, Vermont, and New York, with extensive forestry losses.

***Groundhog Day Blizzard 2011-02-01/ 2011-02-03***

A large winter storm impacted many central, eastern and northeastern states. The city of Chicago was brought to a virtual standstill as between 1 and 2 feet of snow fell over the area.

***2012 U.S. Drought 2012***

The 2012 drought is the most extensive drought to affect the U.S. since the 1930s. Moderate to extreme drought conditions affected more than half the country for a majority of 2012. The following states were affected: CA, NV, ID, MT, WY, UT, CO, AZ, NM, TX, ND, SD, NE, KS, OK, AR, MO, IA, MN, IL, IN, GA. Costly drought impacts occurred across the central agriculture states resulting in widespread harvest failure for corn, sorghum and soybean crops, among others. The associated summer heatwave also caused 123 direct deaths, but an estimate of the excess mortality due to heat stress is still unknown.

***Hurricane Irene 2011-08-26/ 2011-08-28***

Category 1 hurricane made landfall over coastal NC and moved northward along the Mid-Atlantic Coast (NC, VA, MD, NJ, NY, CT, RI, MA, VT) causing torrential rainfall and flooding across the Northeast. Wind damage in coastal NC, VA, and MD was moderate with considerable damage resulting from falling trees and power lines, while flooding caused extensive flood damage across NJ, NY, and VT. Over seven million homes and businesses lost power during the storm. Numerous tornadoes were also reported in several states further adding to the damage.