Logic of the Problem

Problems: State the problem

We would like to analyze how various natural disasters are affected by weather patterns. We specifically would like to analyze how rainfall, temperature, wind speed, and atmospheric pressure affects earthquakes, tsunamis, and hurricanes. We would like to do this in order to see if seemingly random events like natural disasters have a specific cause in order to predict their recurrence in the future.

Purpose

We would like to analyze how various natural disasters are affected by weather patterns. We specifically would like to see if we can predict natural disasters using weather patterns in order to help people in possibly affected areas evacuate and save lives.

Checkpoint 2: What/Why have you updated during this data exploration phase

During this checkpoint 2, we decided to change to using weather data from 2 hours before the event occurred. Due to this, we had to modify our assumptions to reflect our assumption that data from 1 hour before the storm will be a better predictor of the event itself. We updated this because we wanted to make the information more relevant and hopefully better predict weather patterns in a manner that gives people just enough time to evacuate before the natural disaster actually occurs.

Checkpoint 2: Do you have any suggestions for Logic of the Problem as an Analytical Thinking tool?

We believe that logic of the problem as an analytical thinking tool is of the utmost importance as the logic of the problem allows us to thoroughly think out all the issues and unknown ideas for our problem before we actually perform any analysis on real data. It also helps us to better understand where we might be biased in the data and helps us get results that are actually relevant and predict natural disasters in a way that makes sense and will be effective.

Question

1. Have I stated the question as clearly and precisely as possible?

   Yes, our questions is "Does rainfall, temperature, wind speed, and atmospheric pressure affect occurrence of earthquakes, tsunamis, and hurricanes?", which is something that is directly measurable and answerable.

2. Does my formulation of the question give me [or others] some unjust advantage?

   No, the formulation of the question does not give me or others some unjust advantage, because the question deals specifically with naturally occurring events only, so it is not susceptible to a bias and does not provide a human input or way to manipulate data for human gain.

Information

1. Have I included all the important relevant information?
   We have included important and relevant data by compiling worldwide data about natural disasters and weather. Since taking a better look at our data we have found that it the weather patterns will be more useful to us hour hour vs daily.

2. Have I left out any relevant information I would rather not have to consider?
   We have left out information about certain natural disasters, but this is only for the purpose of keeping the scope of our project narrow enough to be practical for the timeframe we have and the computing power we have access to.

3. Have I checked to see that my information is accurate?
   This information is from a credible source and is based on scientifically captured data, so the data is definitely accurate.

Interpretation & Inference

1. Am I clear about the inferences I have made in coming to this conclusion?
   We are clear about the inferences we have made in coming to this conclusion, because the inferences we have made are simply that there will be some type of correlation between weather patterns and natural disasters, which based on previous research, we know to be true in at least some cases, but also as a part of our inference, we understand that there may not be a correlation between all types of disasters.

2. Have I considered the fact that any or all of my inferences may be more or less sound?
   Yes, we have considered the fact that our inferences may be more or less sound because we know that while some natural disasters can be correlated to weather, we do not know for sure if all the natural disasters we are testing specifically will be able to be correlated to weather data.

3. Do my inferences clearly follow from the evidence, or have I failed to consider important information in coming to my conclusions?
   Our inferences are based clearly and simply off of the evidence. Our evidence is based off of the research of other credible people in the weather field, so we know it is evidence based, we just don't know how applicable our inferences may be to certain specific natural disasters, which is why this is a part of our inference in the first place -- that some disasters may not have a correlation.

4. Can I articulate the assumptions that have led to my inferences?
   Yes, our assumption is that certain natural disasters can correlate to weather patterns, which has led to our inference that some of the natural disasters we analyze will have a correlation to weather, but some may not depending on the type of disaster and other factors.

5. Do I have a vested interest in coming to a particular conclusion, and if so, has this clouded my judgment?
   No, we do not have any interest in coming to a particular conclusion because this is simply in the interest of saving random people's lives, it does not affect us personally for any type of competitive advantage of financial gain.

Concepts

1. Have I identified the main concepts guiding my thinking through this issue?
   The main concept is that we generally have an issue relating weather and natural disasters, which is preventing people from doing early evacuations of possibly dangerous areas, so we want to figure if they correlate.

2. Am I even clear about what a concept is and the role concepts play in human thinking?
   To define it better the abstract idea is that weather information and natural disasters are related, which we want to test. We understand that in human thinking these concepts are simply abstract things that we can later on test to make them concrete and come up with conclusions.

3. Have I distorted some idea to fit my vested interest? Do any of my concepts need to be questioned?
   With any problem there is always going to be some sort of distortion especially with small groups such as this one. But nevertheless we believe that we have done a good job at keeping our personal views out of it and making it clear and concise as possible.

4. Have I thought deeply about the concepts I am using?
   Yes, we have thought deeply about the concepts we are using, by reviewing the process and creating multiple conclusions then working through each conclusion to create a overall better ending model.

5. Am I using concepts superficially?
   No, we do not think that we are using concepts superficially, because this concept resonates well with most people at a deep level in an effort to help the entire world as a whole. We feel that this type of deep socially conscious concept is anything but superficial.

Assumptions

1. Do I recognize the beliefs I have taken for granted in reasoning through this issue, In other words, have I uncovered the important assumptions guiding my thinking in this situation?
   We assume that there is some correlation between Natural disasters and Weather patterns, due to this assumption being a generally proven fact even outside of our research and data collection there still could be some sort of subconscious or unconscious level of foresight that might of affected our thought process . After gathering more of our data and analyzing it we assume that the hourly data will help correlate the the connection between weather patterns and natural disasters.

2. Have I questioned assumptions that may not be based in sound reasoning?
   Yes, we have questioned assumptions that may not be based in sound reasoning by disregarding assumptions that are not scientifically proven. Because the data and assumptions we would like to make are all weather based and therefore scientific, we have no reason to use assumptions that are based on anything but science.

3. Am I holding onto assumptions that cannot be justified based on the evidence?
a thing that is accepted as true or as certain to happen, without proof.
   Our assumptions that we have made have been worked over to make sure that they are accurate assumptions to help create a more accurate conclusion. Thus we are not holding on to unjustifiable assumptions due to keeping our assumption based on scientific evidence thus avoiding bias.

Implications & Consequences

1. Have I traced out the important implications in this situation?
   Yes we have traced out many of the important implications to this situation through careful though of how natural disasters can affect people.

2. Have I thought through the potential negative as well as positive implications connected with this issue?
   Yes, *we specifically considered that if we find incorrect data about when natural disasters could happen then we could cause unnecessary evacuation and distress or if we miss a natural disaster we could cause unnecessary death.*

3. Are there implications I would rather not face, and so I am refusing to consider them?
   No, we have tried to think about most implications as we know that things we discover throughout this project could have a very large impact and there is no room for ignoring some implications just to get a result as it could actually cause human death.

4. Have I anticipated the implications of the obvious implications, and then the implications of those implications, and the implications of those implications, and so on, as well?
   We have tried to consider the entire chain of implications by trying to consider specifically how mispredictions or correct predictions of natural disasters could affect every part of people's life.

Point of View

Understanding the limitations of our point of view is key and why it is very important that we gather data from multiple resources and not just one refined resources. in regards to our research we are making sure that we have found data from multiple locations with multiple different view points being considered.

1. Have I considered all-important viewpoints relevant to this situation before formulating my viewpoint?
   We have considered all important viewpoints relevant to this situation before formulating our viewpoint by looking at how different scientists and weathermen feel about natural disasters and what cause them. Based on the viewpoints of these scientists we formed our own viewpoints.

2. Have I inadvertently distorted some other viewpoints in order to maintain my viewpoint?
   Our viewpoint has had to change from being focused on the viewpoints of any person analyzing weather to specifically well proven scientists and weather people in order to create a more unbiased point of view so that our overall presentation of our problem does not get skewed.

3. Have I articulated and considered other ways of looking at the situation, in good faith, before coming to conclusions about how to think and how to act?
   Yes we have considered other ways of looking at the situation by thinking about if other types of metrics could be used to determine natural disasters, but we eventually came to the conclusion that weather patterns would be the best.

Summary

1. While reasoning through the logic of this problem, I have gained the following insights and come to the following decisions
   By analyzing scientific data, assumptions, information, concepts, points of views, and inferences, we have been able to determine that through analysis of weather data, we will likely be able to predict some types of natural disasters. We have had to rework our various points of views and assumptions, but in the end, we have a strong belief that we will be able to find some types of relations that will allow us to help people understand what causes natural disasters and possibly help people avoid them.