Team: Twin Buttes 1

Title: Climate change in New Mexico and its effects

Definition of problem:

The people of New Mexico rely on water for everyday use. The state has a large scale of agriculture, meaning that most of its people grow vegetables and other plants that are useful for cooking. Our project is researching how climate change will affect our states reproduction of foods and also the effects that it will have on local people.

The state of New Mexico is a region of dry land and is prone to wild forest fires and to drought. Climate change will indeed affect the state in a very negative way. This will create a drier and hotter climate due to global warming. If this were to happen the state will face a drought which water will be very scarce. The climate will become arid and the production of crops will decrease. The water which is one of the important components for life because it keeps us alive will begin to deplenish. The state will be in disaster if a water shortage were to occur because it is a precious commodity. When the climate dries it will create fires which will destroy the land scape. Without precipitation or water the dry landscape will be threatened.

Global warming has always been thought of as a myth, but studies from NASA and other resources have proved that the Earth's temperature is indeed rising. The studies showed that in the last 3-4 years there have been record breaking temperature recordings for each summer. Since scientists started recording their data in the 1880's it has been discovered that in the summers temperatures would rise and the temperature decreased in the winter. Now studies show that summer temperatures rise even higher in the summers and that they only decrease a small portion or stay the same in the winter. The temperature readings cover the entire world and it proved that the Earth is getting hotter.

The concern for New Mexico is the water shortage that it will face because it is in fact essential in order for a human to function properly. The Rio Grande is a perfect example. The Rio Grande's water level has lowered and this will lead to a permanent drought if not treated properly. With the loss of water the state would then have no choice but to turn to alternative solutions. This could include the production and installment of pipelines which will cost lots of money and may destroy the landscape. Wells will be drilled and the water table will be depleted to nothing.

Possible solutions may be made to conserve our home land and our lives. Humans will have to use the water sparingly and must stop using it to wash cars and water lawns. People will need to learn to recognize the problem that so many are contributing to. They will need to learn that it should be used for necessary purposes such as drinking, washing, and for agriculture. Agriculture is not such wasteful with water. There are methods that do not require much costs or damage such as using natural irrigation systems like canals. The business industry is a great contributor to pollution which is the cause for global warming. Large amounts of greenhouse gasses are released into our atmosphere and most of it originates in factories and businesses.

There is a possible solution but it will require a large scale of dedicated people to perform this task. With great efforts the catastrophe can be avoided. The time to act is now if we want a happy, peaceful, and successful future. The whole world must act now because the problem will affect not only New Mexico but the entire Earth.

Our project is to build a model that can predict the effects of changing temperature on water availability and vegetation coverage in western New Mexico. The idea is that early prediction will help the people of Zuni Pueblo to prepare for the effects of climate change.

The Plan: We will use data from NCDC to find relationships between temperature and precipitation in the past. We will also use maps of vegetation coverage in the past from the USGS. We will use these relationships to build a model in NetLogo that relates temperatures, rainfall, and vegetation coverage.

We will validate our model by using figures from past temperatures to test the rainfall and vegetation predictions.

Last, we will use our model to predict future trends, based on 3 different temperature increases in the years 2020 to 2050, using 10 year increments. These results will be used to make recommendations for the people in Zuni pueblo so they can prepare for the future.

Expected Results: We expect to get a working model that allows us to input changes in temperature and see changes in rainfall and vegetation, both graphically and visually on the NetLogo interface.

Citations:

http://climate.nasa.gov/news/

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http://aces.nmsu.edu/pubs/research/economics/TR45.pdf

https://www.usgs.gov/science/science-explorer?lq=vegetation+maps+

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