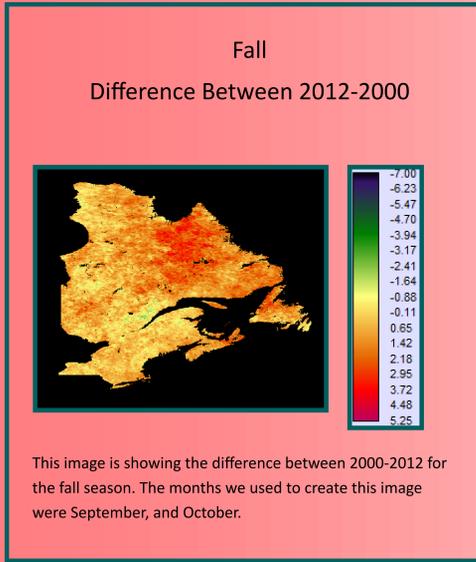
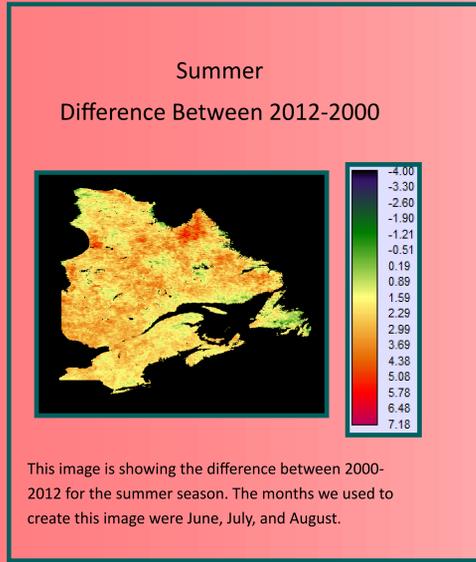
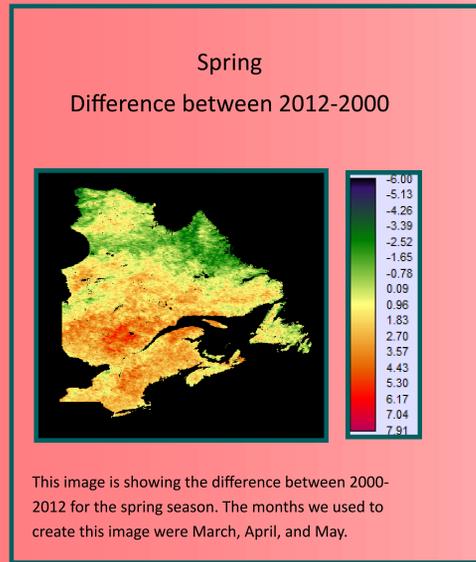


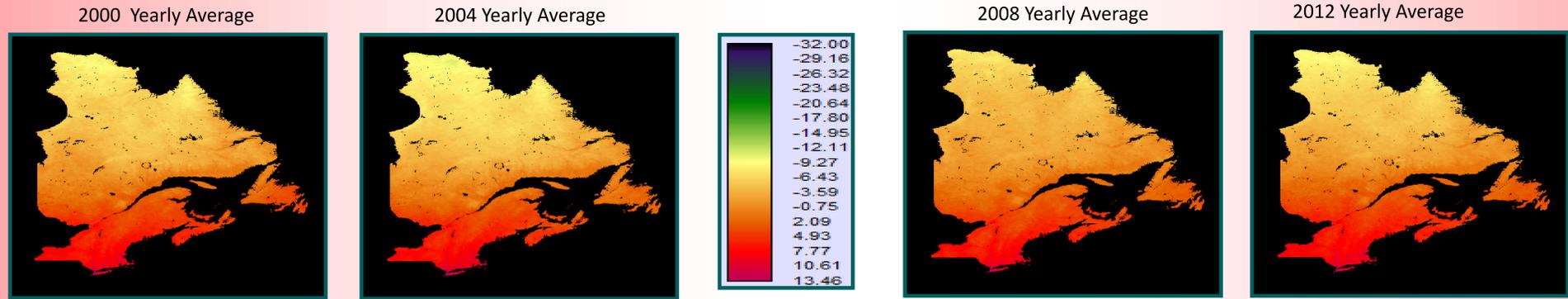
Temperature Change in Northeastern North America

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Class project for GPH444: Professor Young

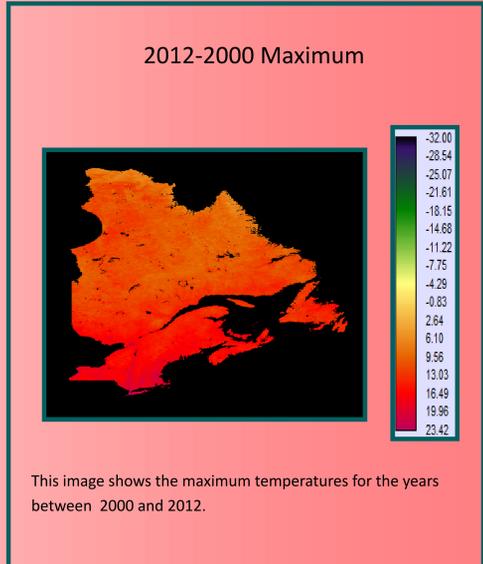
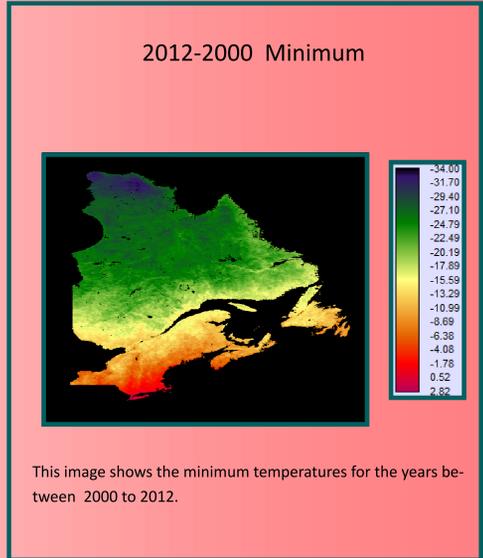


Abstract

Land surface temperature is how hot the surface of the Earth would feel to touch in specific locations, according to NASA. In this research, we have analyzed data of land surface temperature for Northeastern North America. The goal is to show how the temperature has been changing through the years 2000-2012. By analyzing the data, we have found that land surface temperatures in a particular areas were changing: cooling in some regions, not changing at all and in some regions, temperature was increasing



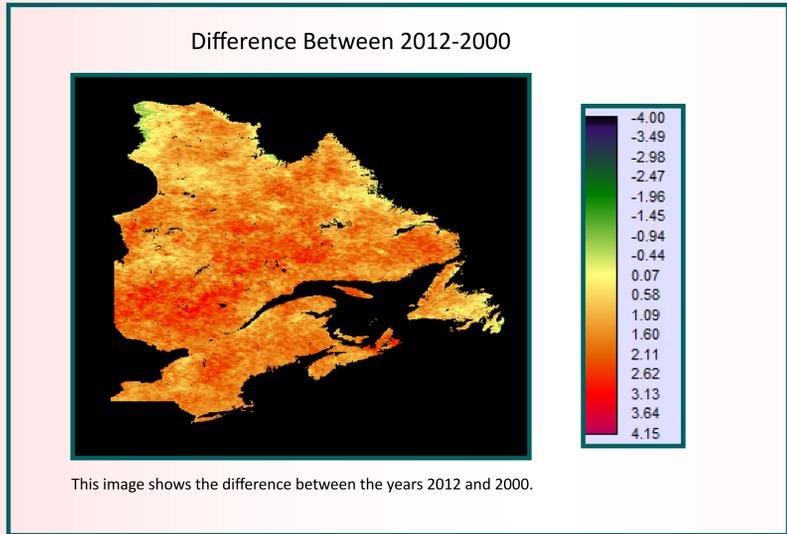
These four images show the average for years 2000, 2004, 2008, and 2012.



Methods and Data

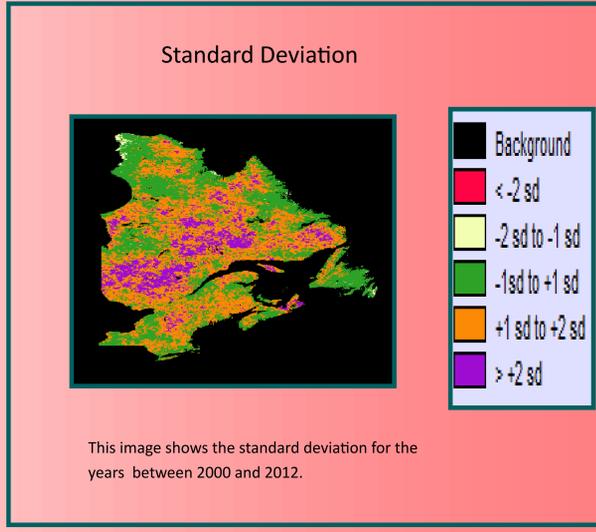
The Land Surface Temperature data for Northeastern North America for the years 2000-2012 was downloaded from NASA Reverb. The images were made by importing the data to IDRISI Selva, then used every four years (2000, 2004, 2008 and 2012) to analyze temperature change during that time period.

Those years were split into seasons (spring, summer and fall) but "winter" was not used due to distortion in the data (low sun angle). All of those maps are night data because the main focus was to study how night temperatures were changing during those years. The temperature data were converted from Kelvin to Celsius and then used it to calculate the images.



Description

The data we used to make these images were nighttime data and were from the years 2000-2012. Between these years, we have only analyzed the data for every four years: 2000, 2004, 2008 and 2012. Data for the winter was too distorted to be used, that's why we have only analyzed the data for three seasons: spring, summer and fall. The top four images are yearly averages for the years 2000, 2004, 2008 and 2012. These images do not show a temperature change between the different years. We have used the same scale for all four maps. The image to the left of the box shows the real difference between 2000 and 2012. This image unlike the four on top shows the temperature change in that period of time. The upper right image shows the minimum temperatures from that time period. The image to the bottom of it shows the maximum temperatures in that same time period. The bottom right image is the standard deviation of the temperatures. The standard deviation is the value of each temperature from the mean/average.



Results and Conclusion

Overall, the images shows that there is temperature change in Northeastern-North America for the past twelve years. The four images that shows the yearly average temperatures do not indicate the temperature change for this region. But when you analyzed the data by calculating the difference between the years 2000-2012, the data shows that there are temperature changes in the region. The southern and central part of the region demonstrates the rise in temperature. But the north-west edge demonstrates a decrease in temperature. This may be caused by the ice caps melting from the north pole. The map with the standard deviation values is showing how far away the temperatures are from the mean or average temperature. This shows how spread out the data is. The standard deviation values are low, that is indicating the data is less spread out. Even though the standard deviation shows less temperature change than most of the other maps and is still showing the same region that have the most temperature change. The minimum and maximum images are showing the minimum and maximum temperatures from 2000-2012. During the spring season, the image is showing that it is getting colder in the northern region and the temperatures are rising in the southern region. But during summer, there are parts of the north-western and north-eastern coastal areas cooling down while the rest of the region is experiencing rise in temperatures. The fall season, the biggest rises in temperature are happening in the north-eastern region. By analyzing all the data, we have notice that the temperature is increasing in the central and lower part of North-eastern North America and it is decreasing in some coastal areas.