Was 2016 really the hottest year on record?

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Abstract

Recent experiments conducted by the National Oceanic and Atmospheric Administration regarding trends in global climate change concluded that 2016 was the hottest year ever recorded[1]. We decided to put those findings to the test and discover how the data in this claim is analyzed.

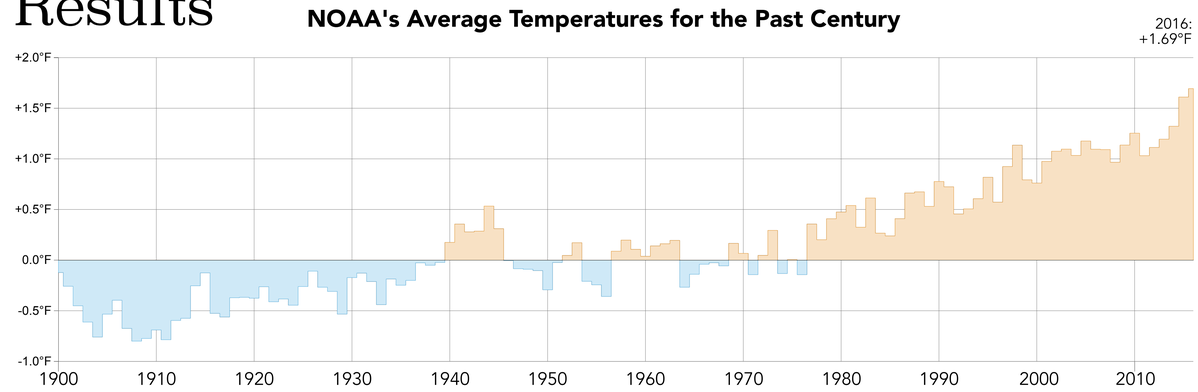
Introduction

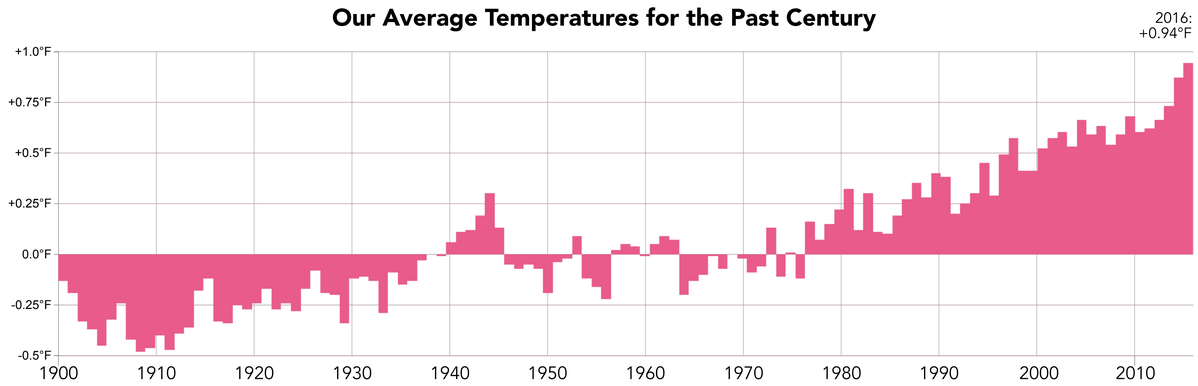
In a time where our political climate is heating up faster than our own planet's, it is important to examine the credibility of news and validity of scientific research. While David and I are not necessarily skepticists, we understand the importance of double-checking facts presented by the mass media.

Methods

- First, we began by extracting existing data from reports provided by National Public Radio and the National Aeronautics and Space Administration using our own custom C++ program.
- Averages for each month of every year were calculated and stored in a MySQL database.
- Next, we took the average temperature of all the months in our graph separately and subtracted the 20th century average (1910 -2000) to get the final anomalies shown in the graph.
- We then used GNUPlot, a scientific graphing tool, to visualize the data.
- Finally we compare our results with the original experiments'.

Results





Conclusion

This project taught us a lot about how temperatures are recorded and analyzed. Temperatures are compared via anomalies in order to give more meaning to the data and construct regional trends. We learned about extracting and filtering public data in order to run calculations on it. Through our calculations, we have concluded that **2016 is indeed the hottest year on record**.

In this project, we used the NOAA's merged data set because the data is already blended[2]. In the future, we would like to learn how to properly blend the data ourselves, using the GHNC[3] and ERRST[4] data sets. Looking forward, we would like to continue our research to predict temperature changes for 2017 and beyond.

References:

[1] http://www.npr.org/sections/thetwo-way/2017/01/18/510405739/2016-was-the-hottest-year-yet-scientists-declare [2] https://www.ncdc.noaa.gov/data-access/marineocean-data/noaa-global-surface-temperature-noaaglobaltemp

[3] https://www.ncdc.noaa.gov/ghcnm/v3.php [4] https://data.nodc.noaa.gov/cgi-bin/iso?id=gov.noaa.ncdc:C00884

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