E6893 Big Data Analytics:

The Impact of Global Warming from Big Geographical Data

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E6893 Big Data Analytics – Final Project Presentation   **© 2016 CY Lin, Columbia University**

Motivation

- The issue of Global Warming has been a controversial topic over the past decades.
- President-elect even claimed it is a made-in-China topic.
- The impact of global warming can truly be devastating to our planet.
- For example, 40% of population in the Netherlands are exposed to the risk of drowning.
- Growing sea level resulted from global warming can lead to submerging city's land like Manhattan.
- We are looking for evidence from big geographical data, evaluating the impact of global warming and Mr. Trump statement as well.

Donald J. Trump
@realDonaldTrump

Follow

The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive.

RETWEETS   LIKES
104,260   65,675

Expected Contributions and Timeline

- Analyzing Data: 11/20

- Filtering Data: 11/24

- Algorithm Decisions: 11/24

- Coding and Using Tools: 12/07

- Results Analysis and Verification: 12/10

- Presentation: 12/12

- Work will be equally distributed

Dataset, Algorithm, and Tools

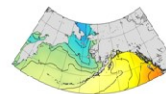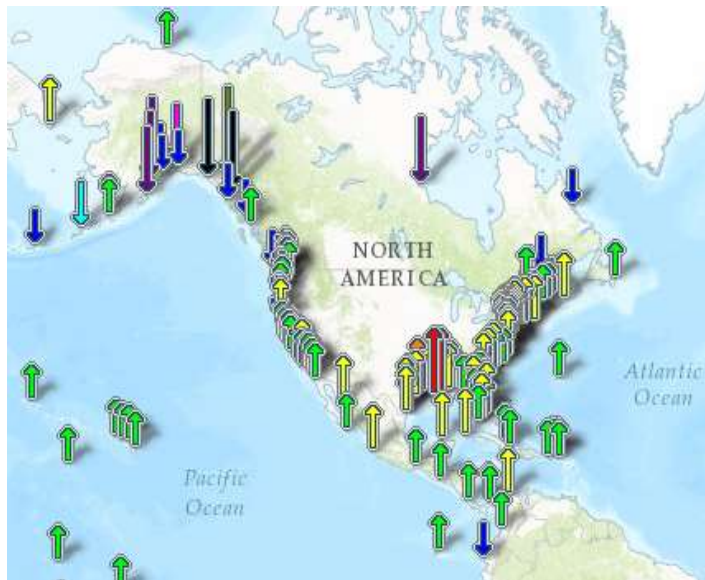- **Dataset:** Climatology Data from NOAA
  https://www.nodc.noaa.gov/access/index.html
  Sea Level Trends Data from NOAA
  http://tidesandcurrents.noaa.gov/sltrends/sltrends.html
  Global Surface Temperature Data
 http://data.giss.nasa.gov/gistemp/
- **Languages:** Python
- **Tools:** Spark, System G
- **Analytics:** K-means, Regression, Variational Inference, Similarity Algorithm


Northern North Pacific Regional Climatology
The Northern North Pacific (NNP) plays a critical role in long-term earth and ocean climate change. The NNP is a resource-reach coastal zone with abundant fisheries and other material resources. To provide an improved oceanographic foundation and reference for multi-disciplinary studies of the NNP, NCEI Regional Climatology team developed a new set of high-resolution quality-controlled long-term annual, seasonal and monthly mean temperature and salinity fields on different depth levels. This new regional climatology is based on the World Ocean Database archive of temperature and salinity from observations spanning over more than a hundred years and incorporates a great deal of new data not previously available.
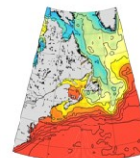
Northwest Atlantic Regional Climatology
The Northwest Atlantic (NWA) plays a crucial role in long-term earth and ocean climate change. The Gulf Stream and North Atlantic Current System are the key elements of northward heat transport and Meridional Overturning Circulation in the Atlantic Ocean. The NWA is a resource-reach coastal zone with abundant fisheries and other material resources. To provide an improved oceanographic foundation and reference for multi-disciplinary studies of the NWA, NCEI Regional Climatology Team developed a new set of high-resolution quality-controlled long-term annual, seasonal and monthly mean temperature and salinity fields on different depth levels. This new regional climatology is based on the World Ocean Database archive of temperature and salinity from observations spanning over more than a hundred years and incorporates a great deal of new data not previously available. The NWA high-resolution regional climatology is a part of the NOAA-wide Sustained Marine Ecosystem in Changing Climate (SMECC) Project.
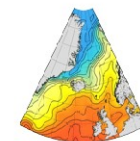
GIN Seas Regional Climatology
The Greenland, Iceland and Norwegian Seas (GINS) – the gateways for water exchange between the North Atlantic Ocean and the Arctic – play a key role in the entire high-latitudinal ocean climate formation and change. The magnitude of fisheries, oil and other material resources and climatic importance of GINS has spurred intensive observation and research programs in the region. To provide an improved oceanographic foundation and reference for multi-disciplinary studies of the GINS, NCEI Regional Climatology Team developed a new set of high-resolution quality-controlled long-term annual, seasonal and monthly mean temperature and salinity fields on different depth levels. This new regional climatology is based on the NCEI archive from observations spanning over more than a hundred years and incorporates a great deal of new data not previously available.