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Design and Justification of Forecasting Development in Equatorial Africa

Creating a meteorological observation network for the people of Central Africa

METR 4911

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Senior Capstone Project Outline 2011-2012

Topic: Design and justify an effective weather forecasting and climate-monitoring network for the region of equatorial Africa (between 10N and 10S)

Motivation: The region of study is roughly the same area size and population as the United States; so many people are affected by and would benefit from an operational forecasting system. Since weather has both societal and economical effects, it is necessary to measure and predict the most useful weather information for the public at the least cost.

Basic Concepts to Research:

- Infrastructure of countries:
  - Societal/demographical background
  - Current forecasting abilities and network
  - Economics of meteorology (salaries)
  - Forecast consumers and their applications
- Basic weather and climate variability of equatorial Africa
  - Daily temperatures and their variability
  - Precipitation and its space and time variability
  - Important weather events to predict
  - Time and space scales of variation
- Implementation of a weather forecasting and climate monitoring system
  - Instrumentation (what is needed, cost, quality)
  - Analysis of observed data
  - Generating forecasts from analyzed data
  - Distributing forecasts to society
- Possible Societal Impacts
  - Evaluate usefulness of forecasts
  - Justification of forecasting network

Methodology: Since this is a remote type research project and we won't be able to travel to Africa ourselves, the majority of our research is going to be online and through email. We are going to pick about 3 or 4 specific countries in the equatorial region of Africa (i.e. Uganda, Kenya, Somalia) and evaluate their current national weather services, climatology for each country, and then what improvements and/or additions can be made to each country's observation system. We will be contacting people of the region by email and also gaining information that way. Overall, our research is going to be heavy internet and email based as opposed to actual on site observations.

Societal Impact: The regions that we want to study are populated countries that are affected by serious weather conditions all the time. It is important that each of these countries gets a sufficient forecasting and observing system in place so that the people of these countries can be prepared and protected in the case of weather danger.