

Abstract

The research team collected and analyzed climate change in the north of Thailand using meteorological stations from five agencies, including the Department of Meteorology, Department of Water Resources, the Royal Irrigation Department, the Royal Project, and the Highland Research and Development Institute. The data are in daily and monthly format depending on the agency dated as far back as the data is available. The data were then screened for quality control prior to the construction of climate database. Data from the Thai Meteorological Department (TMD) is the most complete with highest continuity in daily resolution and is dating back over 50 years in most area. The finding includes the following:

1. The research team analyzed the statistics and mathematics to identify climate change in the long term. The analysis of monthly and daily data in winter and summer seasons and daily data shows that most areas have an increase by 85-100 mm during AD 2005 - 2014 compared prior year average (~ AD 1951 - 2004). That accounts for 10% of the rainfall. Relative humidity also increased. Site elevation do not have a linear relationship with rainfall changes.

2. Duration of seasonality is likely to change. The timing of rainy season has been changing with an increase of rainy days and longer period of continuous rainy days and well as there is a decrease of dry days.

3. Analysis of Information during the rainy season and winter and all year daily data show that the most likely temperature rises 0.5 - 1°C approximately during AD 2005 - 2014 compared with the average from prior years (~ AD 1951 - 2004). There is an impact of elevation to this temperature change as temperature is increasing at the rate of 0.11 °C for every 100 m increase over 35 years average. All daily data shows an increase risk of high temperatures and perhaps insufficient freezing period for trees. The b changes is higher in winter than during summer.

4. Analysis of the changing trends are consistent with the results from other existing models, such as that of Suwanno et al (2551) that is widely used. The similar patterns include temperature increases uniformly across the landscape. The results of this research show that the rainfall change in each area does not depend on site elevation and there are increasing change in seasonal variations. Thus, rain forecast for the area is especially important to improve agricultural planning.

5. Our team created a new rain forecast model specifically for northern region using mathematical relationships of climate and environmental variables. The model is able to forecast 1-5 seasons in advance with high accuracy.

6. Basic climate database and web interface has been created in accordance with the existing HRDI climate. There will be more meetings with users and stakeholders to improve the design of the database in the next phase.

