

Climate Trends and Climate Change Projection in the Philippines

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The Philippines, like many developing countries is especially vulnerable to the potential impacts of climate change because of its geographic location, low incomes, and its greater reliance on climate sensitive sectors such as water resources and agriculture. At present, it is already susceptible to extreme weather and climate events. Studies of historical climate records of the country show signals of a changing climate. The annual average mean temperature has risen by about 0.61 °C during the last fifty six years. From 1960 to 2003, significant increases in the frequency of hot days and warm nights in many areas of the country have been noted while cool days and cold nights have been seen to be generally decreasing. Changes in the amount and intensity of rainfall although not statistically significant, were observed to increase in Visayas and Mindanao and tend to decrease in northern Luzon. In the case of tropical cyclones, there is no significant trend in the number of cyclones forming in or entering the Philippine Area of Responsibility (PAR) in the past 58 years (1948-2005), however tropical cyclone greater than 150kph are found to be more during El Nino events.

Future changes in temperature and precipitation over the Philippines was simulated using the global climate model developed by United Kingdom Meteorological Office Hadley Climate Centre for Climate Prediction and Research known as HadCM3 A1B scenario. PRECIS, a regional climate modeling system was used to downscale the HadCM3 for 1971-2000 as baseline and for



future climate change responses for two time slice centered on 2020 (2006-2038) and 2050 (2039-2065).

Climate change projection of temperature indicated that, both minimum and maximum temperature will exhibit increasing trends both in 2020 and 2050 in relation to A1B scenario. The model results indicate that significant warming will occur in the middle of the next century in the Philippines, with the largest warming occurring in June-July-August (JJA) and March-April-May (MAM) over Mindanao. Projected change in mean, minimum and maximum temperature is significant at 99% confidence level for all the seasons evaluated. Under the A1B scenario mean annual temperatures in the Philippines are expected to rise by about 0.9 °C to 1.4 °C for 2020 and 1.7 °C to 2.4 °C by 2050.

For the annual rainfall, the model projections showed large seasonal variation. Climate change projections of rainfall over the country indicate that JJA and September-October-November (SON) seasonal rainfall in 2020 and 2050 will exhibit increasing trends with major peaks in JJA under the A1B scenario. Projection of seasonal temporal rainfall variation is largest (-35% to 45%) during the seasons of JJA and MAM. Projection of seasonal temporal rainfall variation is lesser (-0.5% to 25%) during the seasons of DJF and SON. The results showed that the drier period in the country will get drier while the wetter period will be wetter.

Assessments of the impacts of the future climate are based on the results from impact models that rely on quantitative climate scenario as input. The climate change projection in the Philippines can be used to assess both the biophysical and socio-economic impacts of climate change and the vulnerability and options for adapting to such impacts.