Comparison of Global Forecast Systems to Field Data using GIS and its Application on Watershed Management and Community Development

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Abstract: On the average statistics by Asian Disaster Reduction Center, 20 typhoons strike the Philippines per year. Due to lack of disaster preparedness, lives and properties are lost. Precipitation being the primary input to the hydrologic cycle, without considering topography and size of catchment, is the main source of devastating floods. However, there are opportunities to mitigate these effects and augment community resilience which also give way to planning and building resilient structures. Modern scientific applications including satellite, radars, and remote sensing technology allows precipitation and tropical cyclone forecasting. Numerical weather prediction (NWP) models use different mathematical representation of the ocean and atmosphere to forecast weather and sea state. The Global Forecast System (GFS) is a global numerical weather prediction computer model run by National Oceanic and Atmospheric Administration (NOAA). Being an open source, data of GFS is one of the special feature of the University of the Philippines Resiliency Institute Nationwide Operational Assessment of Hazards (UPRI-NOAH), a multidisciplinary research center housed in the UP National Institute of Geological Sciences with the goal of helping reduce the impacts of hazards and community resiliency. This research aims to use the downscaled GFS and WRF for flood forecasting, water resource management, planning and project development of disaster resilient structures. The researcher also intends to extend the data to areas that are ungauged and determine the applicability of GFS and WRF locally.

Keywords: NWP, GFS, WRF