EMS Annual Meeting Abstracts
Vol. 14, EMS2017-11-4, 2017

Categorical Verification of Site-Specific Weather Events Using Local Climatologies

Emily Stewart (1,2), Rebecca Hemingway (1), and Michael Sharpe (1)

(1) Weather Science, Met Office, Exeter, United Kingdom, (2) Earth and Environmental Sciences, University of St. Andrews, St. Andrews, United Kingdom

In recent years, providers of weather information have focused upon the impact of events; impact is often related to the frequency of occurrence of an event at a site and this is determined by the local climatology; for example, in the Scottish Highlands, a -5C temperature event may almost go unnoticed whereas in Cornwall it is likely to lead to significant impacts. This presentation outlines work undertaken at the UK Met Office to identify site-specific thresholds to categorise weather events in terms of the climatology local to each observation site. Defining weather events in terms of the local climatology is ideally suited to communication with non-expert forecast users because these consumers often attempt to use weather forecasts to identify abnormal weather at their location. The Met Office routinely generates post-processed deterministic and probabilistic forecast products at sites throughout the UK and the output from a deterministic model currently populates the publicly available web-site. This study uses multiple-categories (defined in terms of percentiles chosen from the climatology at each site) to categorise weather conditions in terms of both the site-specific climatology and (where possible) the resulting impacts and these categories are used to evaluate and compare the performance of the deterministic (web-site) model and its probabilistic counterpart. Model skill has been evaluated for rainfall accumulations, summer day time maximum temperatures, winter night time minimum temperatures and wind speeds at all forecast ranges from 6 to 120 hours using various verification scores. These include: versions of the Continuous Ranked Probability Score, the Symmetric Extremal Dependency Index (for rare events) and a Relative Operating Characteristic / reliability analysis. When forecasting rare or extreme events probabilistic models have a distinct advantage because these categories can be predicted with non-zero probabilities; however, the deterministic models have no such freedom and therefore they are less likely to correctly predict such events.