

List of Publications

1. A logistic regression approach for monthly rainfall forecasts in meteorological subdivisions of India based on DEMETER retrospective forecasts by K. Prasad, S. K. Dash and U. C. Mohanty, *Int. J. Climatol.*30: 1577-1588 (2010), Published online 29 September 2009 in Wiley InterScience (www.interscience.wiley.com) DOI:10.1002/joc.2019.

ABSTRACT: A multi-predictor logistic regression model has been developed for probabilistic forecasts of domain average rainfall on monthly timescale for three study regions namely, India as a whole, and two homogeneous meteorological subdivisions of India, i.e. Orissa on the east coast and Gujarat on the west coast. The time series of the monthly total observed rainfall as the predictand variable was constructed from the gridded (1°×1°) daily rainfall produced by India Meteorological Department, and those of the predictor data sets from 1-month lead forecasts of several atmospheric and oceanic variables produced by the 'Development of a European Multi-model Ensemble system for seasonal to inter-annual prediction (DEMETER)' project of European Centre for Medium-Range Weather Forecasts (ECMWF). Multi-model ensembles of nine-member retrospective forecasts for the month of August generated by three constituent models of the DEMETER system, viz., ECMWF, United Kingdom Meteorological Office (UKMO) and Meteo France are used. The predictor variables (totally 36 in number) include direct model-predicted total precipitation and its inter-member standard deviation. A two-stage procedure has been designed, where logistic regression is first computed for each individual variable and then for the variables ranked on the basis of Brier scores. The top-ranked variables (up to four) are used for fitting the multiple logistic regression model in a stepwise manner. The fitted model provides estimates of probability of the value of an observation exceeding a specified quantile (such as median) of the statistical distribution of the predictand variable. The model shows good performance in capturing the extreme rainfall years and appears to perform better than the direct model forecasts of total precipitation in respect of such years.