Cyclones and cyclonic patterns are commonly responsible for rainfall events around the world, but the nature of those rainfall events differs. Primarily these events differ not because of location, but because certain atmospheric configurations, which themselves can occur in many different parts of the world, deliver rainfall of different “types”. For example, one can have slow moving convective cells that lead to very large local variations in rainfall, or broadscale frontal ascent for which the local variations are much less.

Numerical models handle the different types of rainfall with varying degrees of accuracy. Forecast accuracy for point (rain gauge) measurements may be lacking because of high spatial variability, or because model biases are typically associated with the ongoing weather type. In the last 3-4 years ECMWF has developed, and implemented operationally, a new global post-processing system for ensemble-generated rainfall totals to improve accuracy by addressing these issues. Output currently comprises probabilistic rainfall forecasts, for overlapping 12-hour periods up to day 10, on the ECMWF global ensemble (ENS) grid, that denote point rainfall for sites assumed to be randomly located within each gridbox. One year of global verification shows major improvements relative to the raw ENS, in reliability and resolution metrics, for tiny through to relatively extreme point totals (e.g. 50mm/12h). The main reason for the success stems from the massive expansion of a training dataset that can be achieved by removing the location constraint typical of most post-processing systems. We focus instead on physical equivalence in “gridbox weather types” seen around the world. Using 1 year of global calibration data in our method can equate, in extreme cases, to using, in a simple single-site MOS approach, daily data going back to 50,000 BC.

This presentation will describe the calibration and forecast methodology, show verification statistics, demonstrate the operational products now available and illustrate the method’s utility with case studies of both extreme and more benign rainfall events. The current limitations and numerous opportunities to refine and improve the method will also be discussed.