This paper describes the Short Term Ensemble Prediction System (STEPS) that has been developed as a joint project between the Australian Government Bureau of Meteorology and the Met Office (U.K.). STEPS generates ensembles of rainfall forecasts that are based on a blend of an advection forecast and a NWP rainfall forecast. The skill of a rainfall forecast that is based on advecting a radar rainfall field forwards in time increases with scale and decreases with lead-time. The skill of the NWP forecast can be assumed to be independent of lead time since this is limited to 6 hours, but decreases with scale. The skill of the current advection forecast can be modelled as a function of scale and lead time and the skill of the NWP as a function of scale can be estimated in real-time using the NWP forecast for the current radar analysis. STEPS decomposes the radar rainfall and NWP forecasts into a cascade of spectral components and then blends the forecasts together using weights that depend on both scale and lead-time. The skill of the resulting blend can be estimated for each scale and the ensemble is generated by perturbing each scale in the deterministic blend with appropriate stochastic noise.

This paper describes the formulation of the system and then presents results using a case study from Melbourne.