Despite improvements in the overall performance of numerical weather prediction (NWP), there are still times when forecast models experience errors that are drastically greater than the mean. These periods of poor performance are referred to as dropouts, or busts, and are characterized by a verifying atmosphere that is significantly different from the forecast. The verification of a forecast is directly related to how accurately the phase and amplitude of Rossby waves are captured around the globe. Mishandling of these waves result in discrepancies in both the amplitude and phase, and the errors often take on the appearance of wave structures themselves. NWP synoptic-scale errors have been observed to behave like wave packets, propagating at a group velocity (Hakim 2005). These observations provide motivation to examine error in a wave-like framework.

Using ECMWF operational and ensemble forecasts from the last ten years, medium-range regional forecast busts are identified through a combination of regional ACC and RMSE of 500hPa heights. A phase-independent quantity is derived using streamfunction to describe the total amplitude of the error, and a phase-independent wave activity flux is formulated for the error field to investigate sources and propagation. Time-extended EOFs of the total error amplitude and ensemble spread reveal preferred modes of error growth during bust cases versus non-bust cases. Initial 500hPa and 250hPa pattern composites are created based on the PCs for each case, with the objective being to provide insight into early anticipation of bust potential.