The state of Oregon experiences heavy rainfall throughout the year. While preliminary evidence appears to indicate that extreme precipitation trends remain steady, the perception that changes in extreme precipitation patterns have become more pronounced is prevalent. Standard regression techniques such as autoregressive modelling or quantile regression provide weak evidence of changes in these patterns; however, these techniques do not fully account for spatiotemporal dependence, large-scale variability, and other important features in the data, which may affect the power of the statistical tests used to detect changes in the trends of interest. Using data collected for the last forty years across different weather stations throughout the state, we use several statistical approaches to study the behavior of frequency and severity of extreme precipitation events (EPE) throughout the region, and determine and quantify and changes in trends accounting for some of the important features in the data.