In this presentation a non-linear non-Gaussian state space model with generalized extreme value (GEV) marginals is proposed. For heavy-tailed stationary GEV observations, parameter estimation as well as prediction and filtering are of interest. The fact that ordered statistics of GEV marginals from an AR(1) time series have the same distribution as the ordered statistics of independent variables under some weakly mixing conditions can be used to estimate tail and scale parameter via recursive linear regression. Prediction and filtering can be addressed through particle filter techniques. Different importance particle filter schemes are compared on this presentation.