Conceptual models of snowmelt are used operationally due to a lack of reliable data to drive energy balance models. However, conceptual models need to be calibrated as parameters either don’t have physical meaning or are not easily measured. As distributed model use increases, the need to estimate parameters across a wide variety of climatic conditions increases. Our aim is to produce a parameter set for a given location based on longer-term climate information. Using +550 SNOTEL sites in the Western USA with 11 years (1998-2008) of data we calibrate a simplified 5-parameter version of SNOW-17 for each location for a parameter set that minimises RMSE of snow water equivalent. The resulting mean RMSE over all stations is 38mm of SWE. At each location nine predictor variables were generated: precipitation, average temperature, variance of daily temperature and average diurnal temperature range for both winter and spring periods as well as the duration of snow cover. For a given target station we use the calibrated parameters from the most similar station, as determined by the predictor variables. This strategy is performed at all stations, for all combinations of the 9 predictors. Randomly selecting values (from a reasonable range) for each of the 5 parameters gives an RMSE of 113mm in SWE; randomly applying the calibrated parameter sets at all locations gives an RMSE of 96mm while using parameter sets selected via similarity gives an RMSE of 64mm. The result shows skill in parameter selection and potential for greater improvement is discussed.