A common problem in time series analysis is the filling of 'gaps' in the data record. We consider a new technique for generating interpolated values using external data records, especially in the context of multi-site observations of physical phenomena using estimated auto- and cross-correlations. The test case is the daily 2695 GHz noon flux record from the Sagamore Hill, Mass. observatory, with external site the DRAO in Penticton, BC observing at 2802 GHz. Daily contiguous records from Penticton are used in conjunction with time-lagged records from Sagamore to fill missing data gaps due to instrumental failure.