Paige Conductivity Stats Methods:

For each site, temperature, SPC and stage height data were characterized by mean, standard deviation (SD), peak frequency, daily minimum and daily maximum. For stage height, we excluded known probe errors, which occurred in the data as negative water level observations. To characterize the daily SPC pattern of each site, we grouped data by site and hour of the day which amounted to approximately 3500 data points per site and hour. These daily SPC data were then smoothed using a general additive model with a cubic spline. To compare site-specific daily SPC signals relativeto other sites, we calculated the normalized SPC by subtracting the mean and then dividing by the standard deviation of each site. To quantify numerically the similarity in daily patterns of SPC at each site, we performed hierarchical clustering on the smoothed, normalized SPC signals with dissimilarity between sites measured by Euclidean distance , where x and y are daily SPC signals of two sites). With the distance matrix found, we then used the complete linkage cluster analysis to discern relationships between daily signals at each site using hclust function in R. The complete linkage method works by assigning each object to its own cluster and the proceeding iteratively to find similar clusters using the Lance-Williams dissimilarity update formula.

We assessed the relationship between SPC and stage height with cross correlation analysis of the time series for each site. The time series used in the cross-correlation analyses were constructed by binning and averaging SPC and stage height data into 15 minute intervals to account for differences in which 5 minute intervals each probe collected data. To satisfy the stationarity assumption for conducting cross-correlation analyses (i.e., variables at time t, , are not related to variables at time *t-1*, *t-2*, etc.), we first-differenced each time series (i.e., ). We interpreted sample cross-correlation analyses of SPC and stage height by assessing the correlations between and for and so on. A significant correlation between and for a positive h means that x lags y (or y leads x). We expected SPC to be correlated with stage height at negative lags.