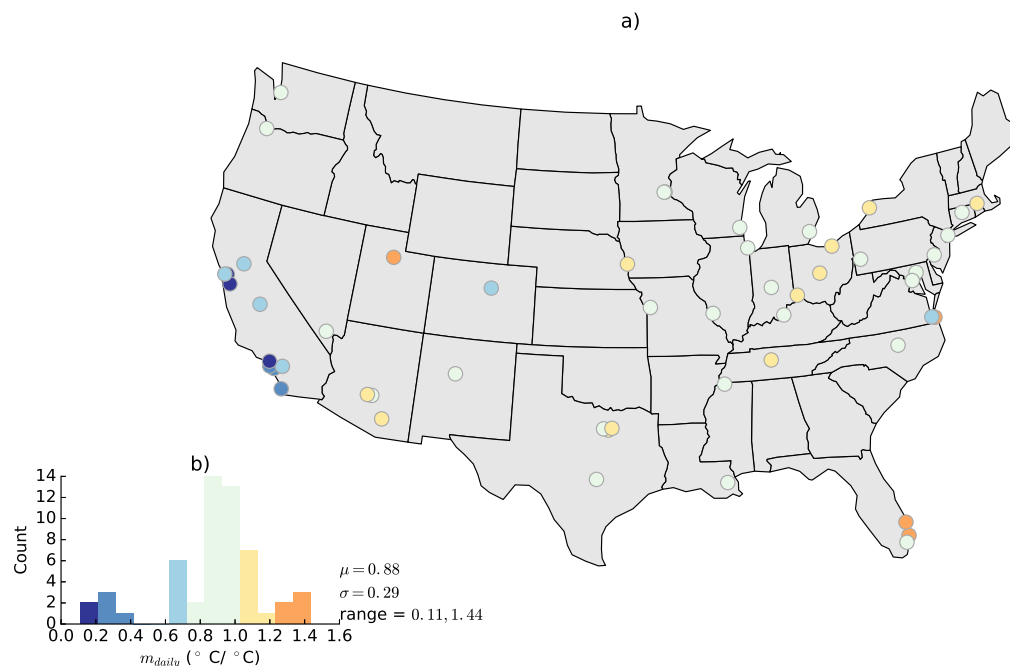


**Figure S1.** The difference between nighttime UHI  $\Delta T_{min}$  and daytime  $\Delta T_{max}$  is plotted for each city as a (a) map and (b) as a histogram. The color scale is as indicated by the histogram. The mean  $\mu$ , standard deviation  $\sigma$ , and range are listed.



**Figure S2.** As in Fig. S1 but for the distribution of  $m_{daily}$ .

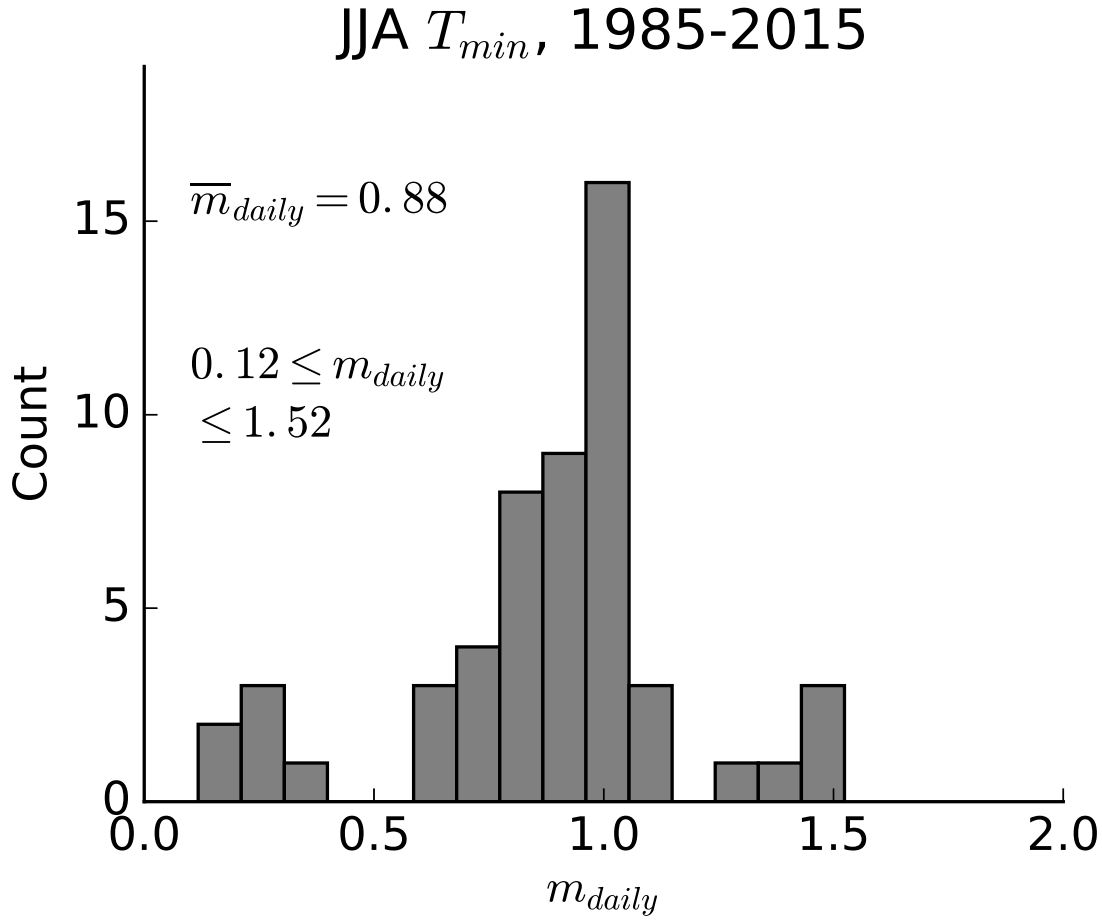


Figure S3. As in Fig. 1a but for 1985-2015 data.

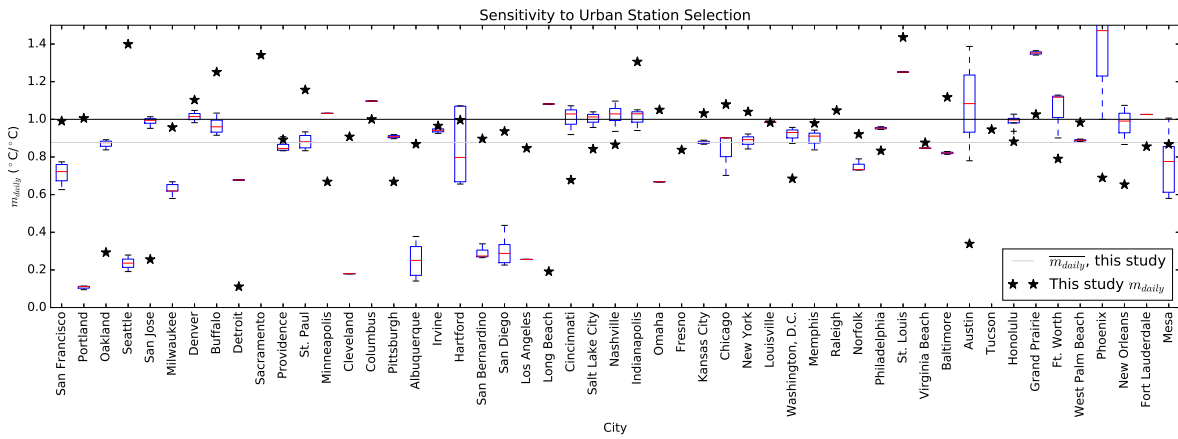
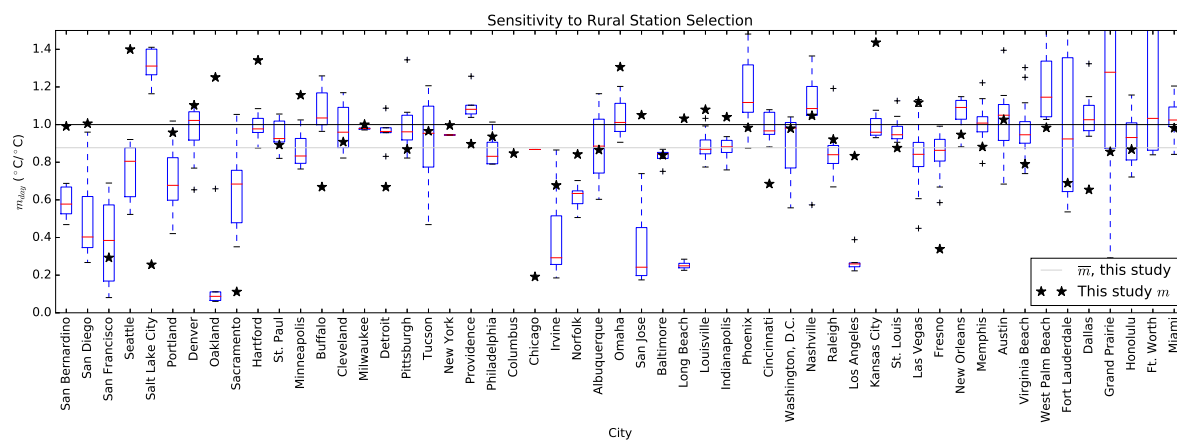
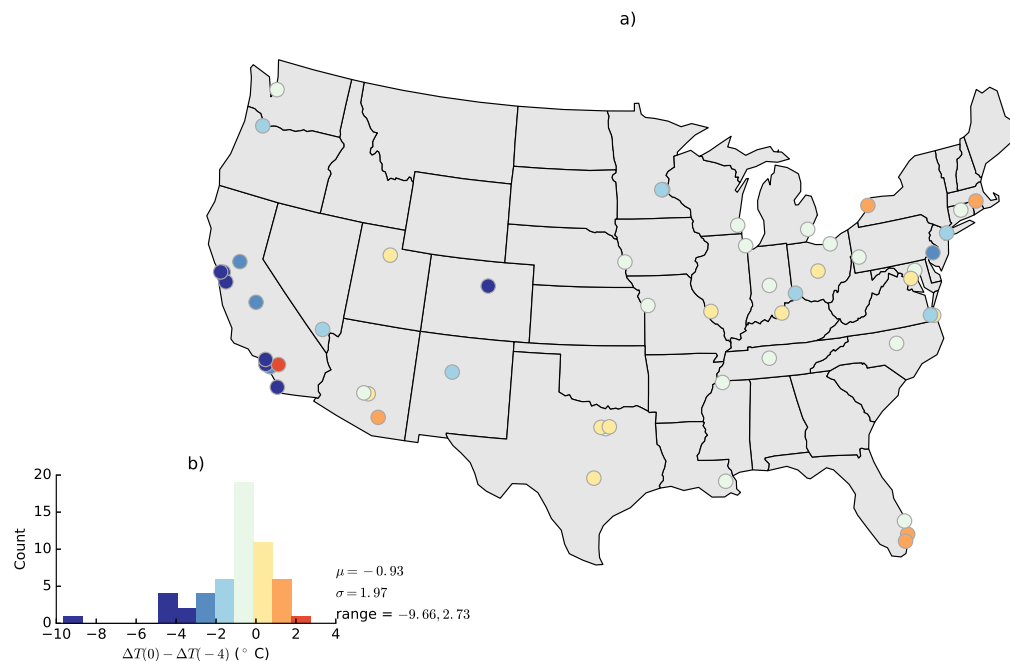


Figure S4. Distribution of slope  $m_{day}$  in each city when urban station selection is varied. Cities are ordered by increasing mean urban station temperature going left to right. Boxes indicate the middle two quartiles (Q2 and Q3), red lines indicate the mean, and whiskers represent the wide interquartile range ( $1.5 \cdot (Q3 - Q2)$ ). Crosses indicate data points beyond this range, that is, statistical outliers. The gray line denotes the mean of all cities  $m_{daily}$ .



**Figure S5.** As in Fig. S4 but for varying rural station selection. Cities are ordered by increasing mean rural station temperature going left to right.



**Figure S6.** As in Fig. S1 but for the temperature change of  $\Delta T$  during heat events ( $\Delta T$  on heat event day zero minus  $\Delta T$  four days prior).

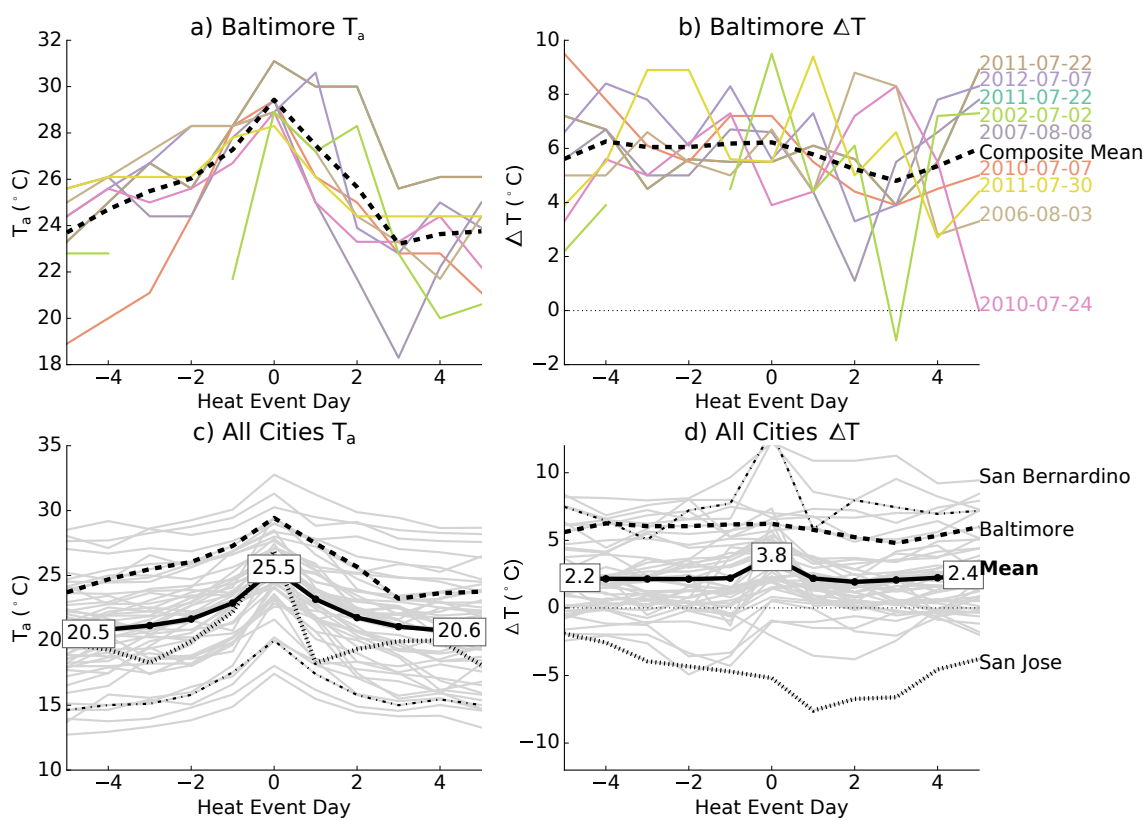
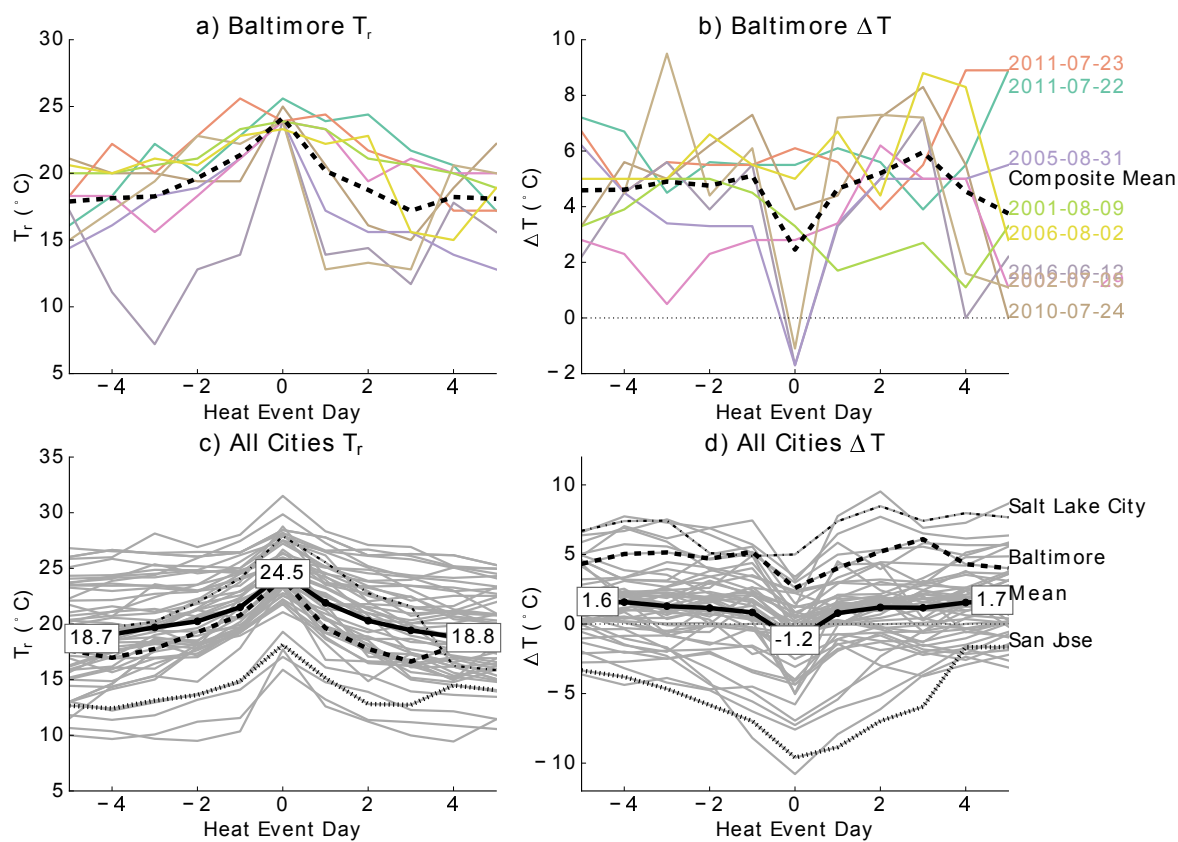
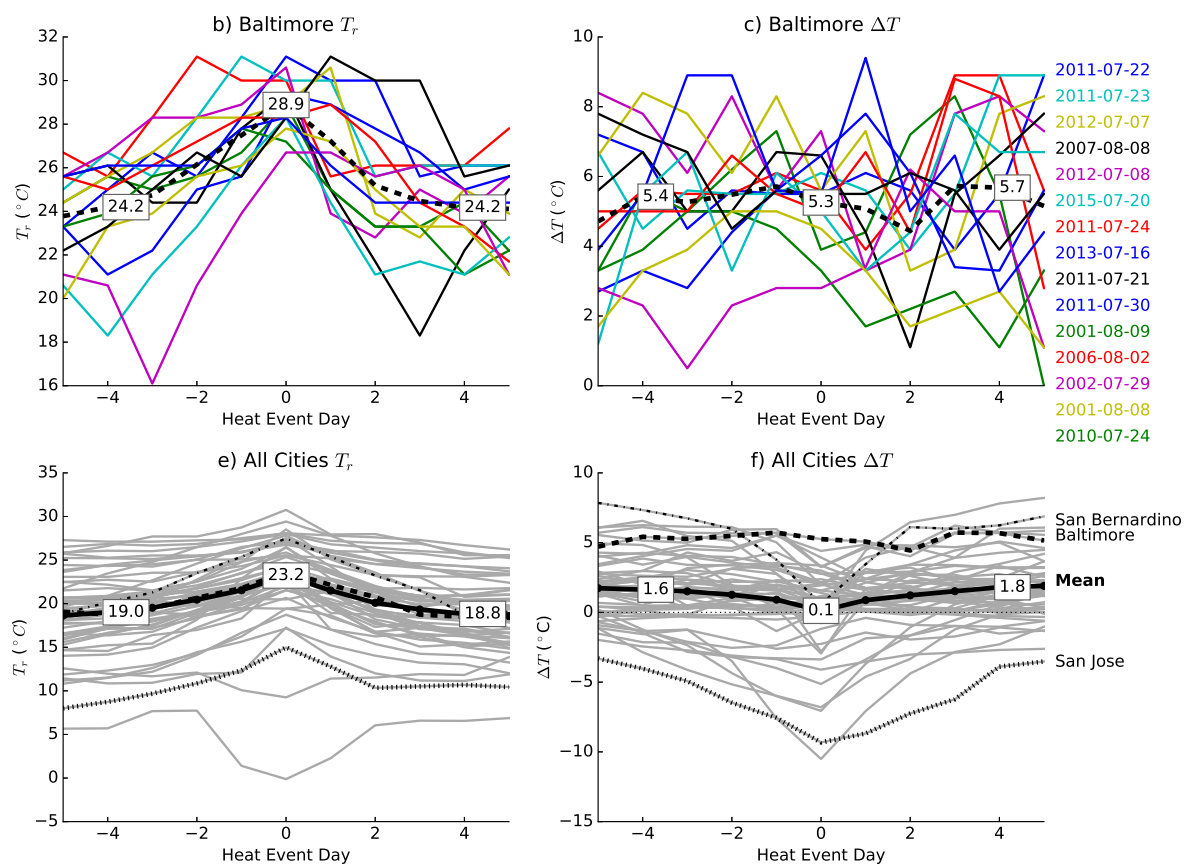


Figure S7. As in Fig. 3 but for heat events selected using  $T_u$ .



**Figure S8.** As in Fig. 3 but for heat events selected using  $T_r$ .



**Figure S9.** As in Fig. S7 but for 15 heat events selected using PC1, the first principal component of  $T_u$  and  $T_r$ .