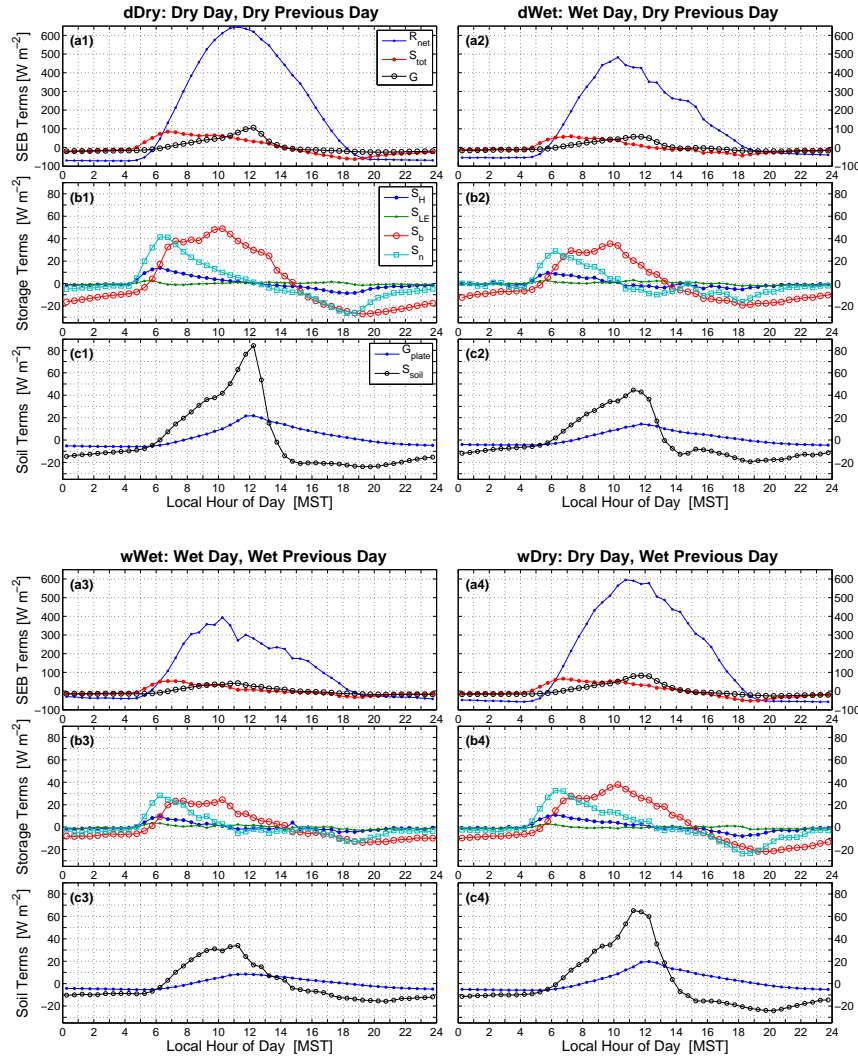
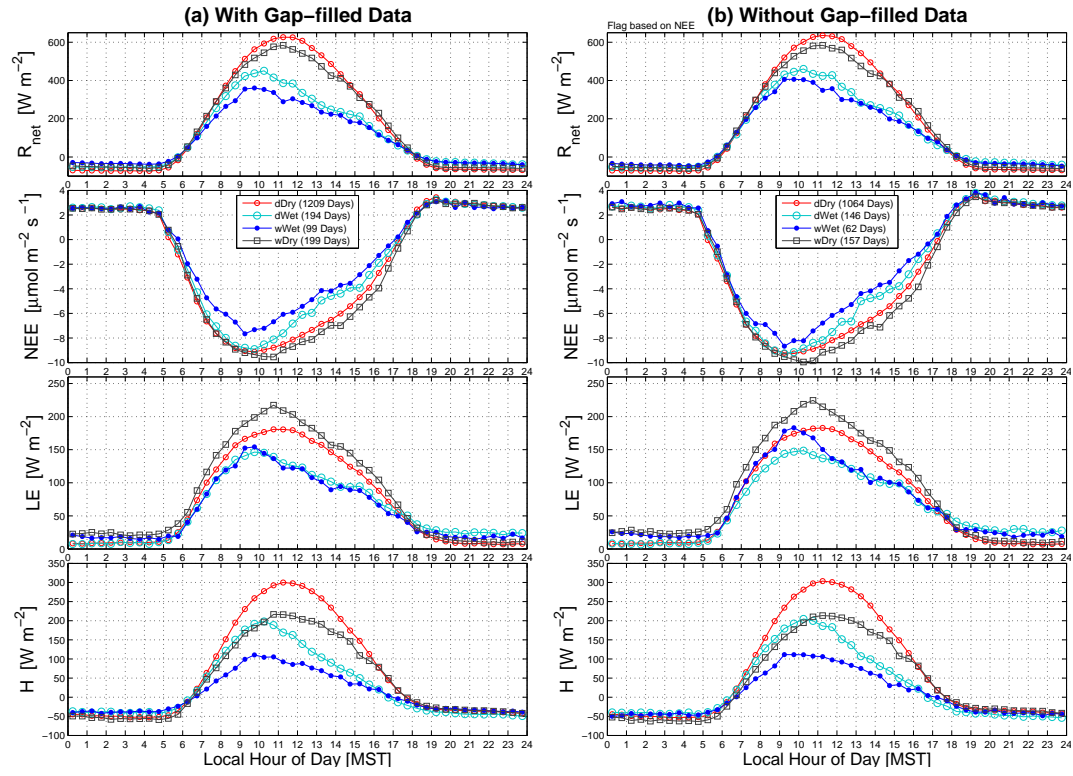


**Figure S1.** Monthly precipitation statistics from the LTER C-1 climate station between years 1953–2012 (Belfort gauge) and the USCRN Hills Mill station between years 2004–2012 of **(a)** the mean monthly cumulative precipitation and **(b)** the standard deviation of monthly totals among years. Additional details about the precipitation measurements are in Appendix A1. For comparison, the LTER Belfort gauge data between years 2004–2012 are also shown. Vertical lines with the arrows indicate the average warm-season period used for our study.



**Figure S2.** The warm-season mean diel cycle of (a1-a4) net radiation  $R_{\text{net}}$ , the sum of four storage terms  $S_{\text{tot}}$ , and soil surface heat flux  $G$ ; (b1-b4) storage terms, sensible heat in the air column  $S_H$ , latent heat in the air column  $S_{LE}$ , heat storage in tree boles  $S_b$ , and heat storage in tree needles  $S_n$ ; and (c1-c4) the average soil heat flux measured at 10 cm depth by several heat flux plates  $G_{\text{plate}}$  and the heat stored in the soil between the heat-flux plates depth and the ground surface  $S_{\text{soil}}$ . The diel cycles are shown for dDry, dWet, wWet, and wDry conditions. All panels use the legends shown for dDry conditions.





**Figure S4.** The warm-season diel cycle of net radiation  $R_{\text{net}}$ , net ecosystem exchange of  $\text{CO}_2$  NEE, latent heat flux LE, and sensible heat flux  $H$  for (a) gap-filled and (b) non-gapfilled periods. The legend in the NEE panel shows the different precipitation state along with the average number of days used to create the composite diel cycle.