

Table S1: Percent differences of transpiration, bare soil evaporation, surface runoff and sub-surface runoff fluxes for the DA-VEG-SOIL LSM simulation compared to the OL simulation.

Minimum and maximum changes for the full ensemble are shown. Differences are calculated for the area upstream of USGS Gages 11143000 and 11148900.

Simulation Difference (%-Change)	Transpiration	Soil Evaporation	Canopy Evaporation	Total ET	Surface Runoff	Sub-surface Runoff	Total Runoff
	USGS 11143000						
DA-VEG-SOIL MIN (year-1)	-32.32	11.62	-37.44	-10.55	35.60	4.56	11.58
DA-VEG-SOIL MAX (year-1)	-32.00	12.99	-36.33	-9.82	57.49	11.62	17.75
DA-VEG-SOIL MIN (year-2)	-17.23	12.85	-17.12	-4.29	2.96	2.86	2.94
DA-VEG-SOIL MAX (year-2)	-16.58	15.75	-15.49	-2.71	9.53	6.61	7.10
DA-VEG-SOIL MIN (year-3)	-12.80	9.77	-21.38	-2.78	14.67	27.25	24.28
DA-VEG-SOIL MAX (year-3)	-12.18	11.00	-19.91	-2.00	22.31	42.10	37.42
	USGS 11148900						
DA-VEG-SOIL MIN (year-1)	-8.72	3.40	-11.01	-2.11	9.87	7.60	8.00
DA-VEG-SOIL MAX (year-1)	-8.52	3.97	-9.93	-1.70	14.80	11.20	11.84
DA-VEG-SOIL MIN (year-2)	-6.95	5.31	-15.22	-1.79	1.70	1.66	1.73
DA-VEG-SOIL MAX (year-2)	-6.60	6.64	-14.32	-1.02	4.12	3.12	3.30
DA-VEG-SOIL MIN (year-3)	-3.88	2.42	-7.00	-0.76	6.91	6.49	6.58

DA-VEG-SOIL MAX (year-3)	-3.60	3.35	-5.52	-0.05	11.83	13.08	12.76
-----------------------------	-------	------	-------	-------	-------	-------	-------

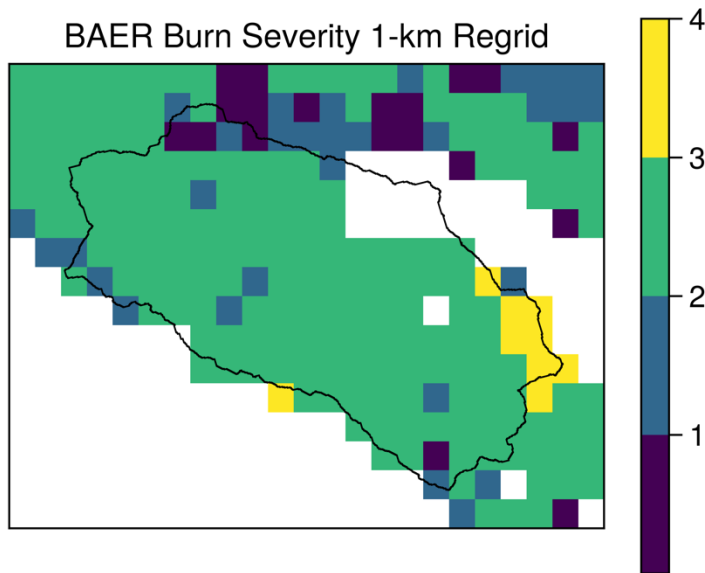
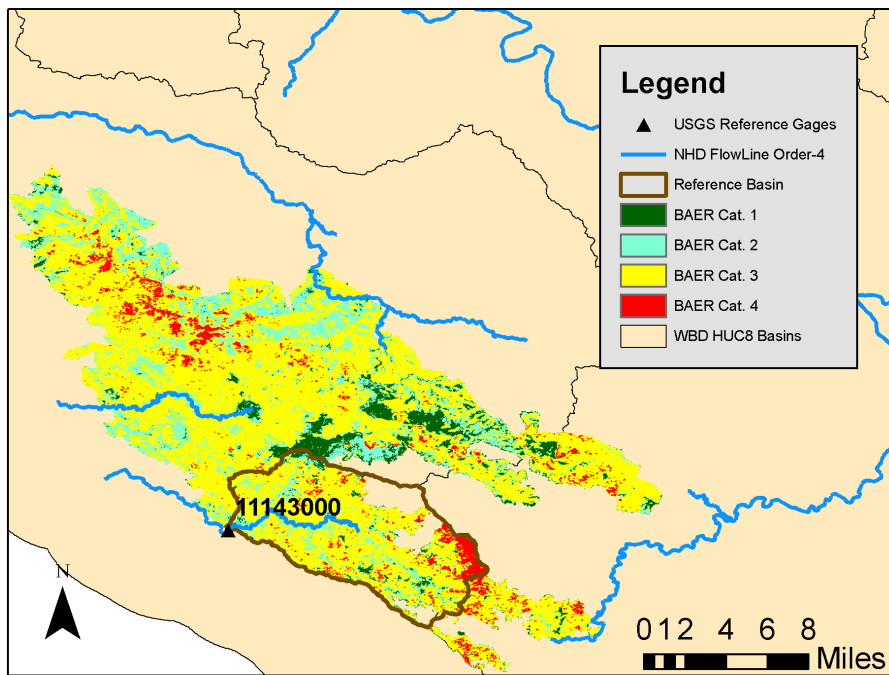


Figure S1: As in Figure 3a, BAER fire severity from the Big Sur case is plotted with the USGS WBD HUC8 basins, NHD order-3 and higher streams, and USGS gages-II reference gage 11143000 (Top). The regridded BAER dataset on the model grid (consistent with the regridding color scheme for MTBS) is shown on the bottom panel (as in Figure 2b). The reference basin for gage 11143000 is also plotted.

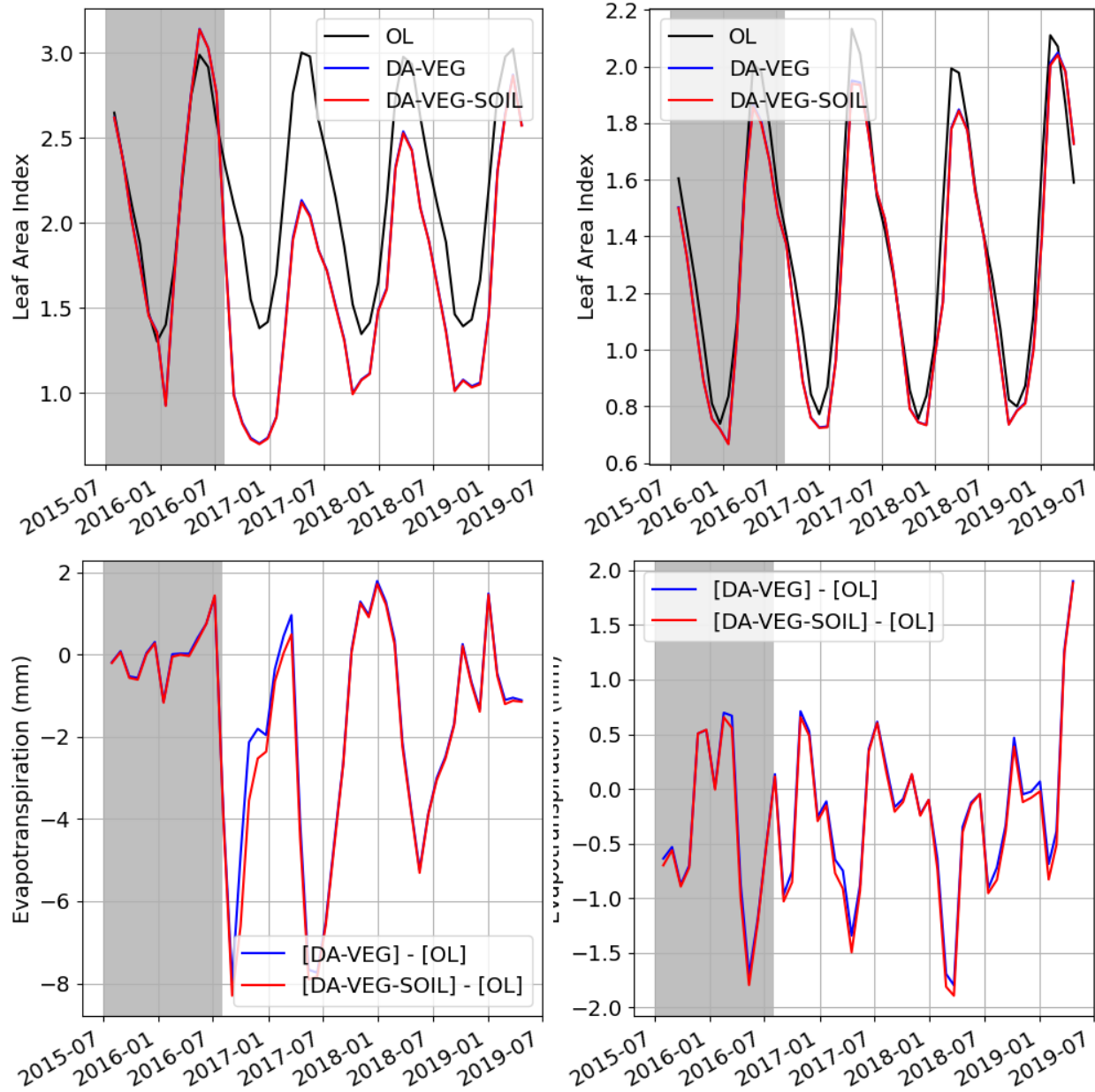
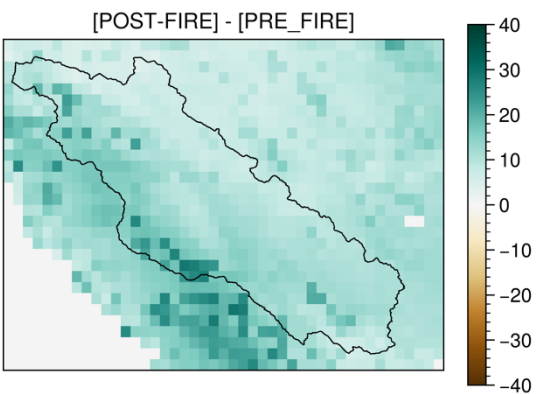
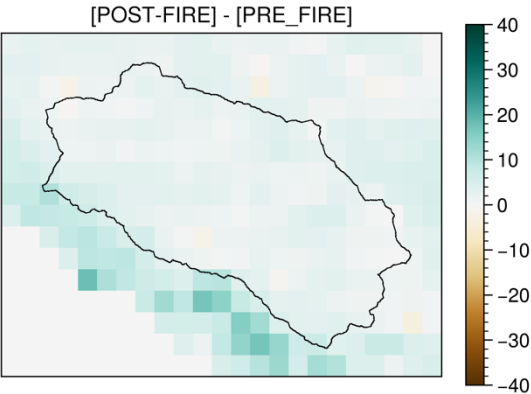
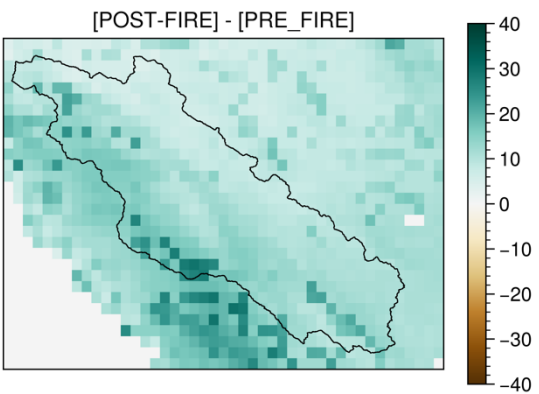
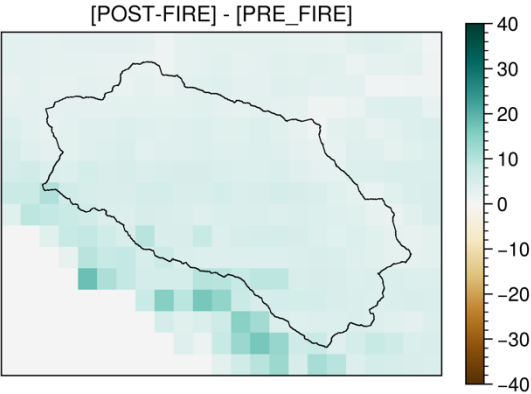
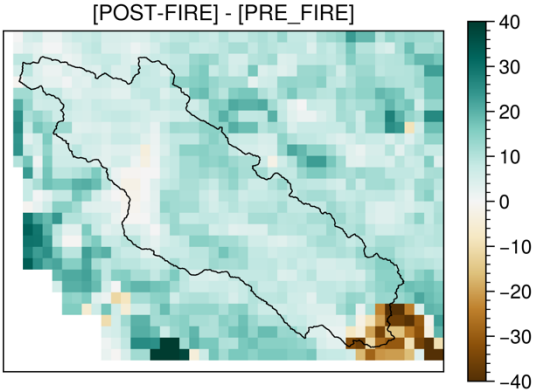
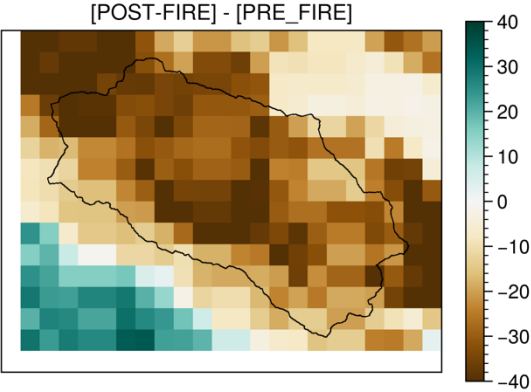


Figure S2: Results for LSM simulations with NLDAS2 forcing. Monthly Leaf Area Index (top) for OL (black), DA-VEG (blue), and DA-VEG-SOIL (red) and differences in monthly ET (bottom) from the OL simulation for the DA-VEG (blue) and DA-VEG-SOIL (red) simulations for the basins upstream of each USGS gage site. Left panels include data for USGS Gage 11143000, and right panels include data for USGS Gage 11148900. The periods with gray shading indicate dates before the fire. Note that the DA-VEG and DA-VEG-SOIL lines overlap for most of the graphs, making them difficult to distinguish.



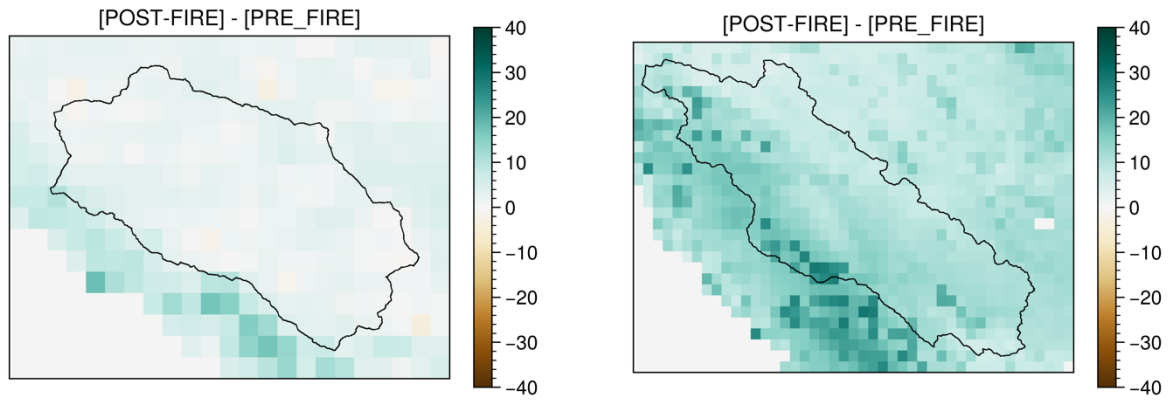


Figure S3: January through June change in ET (mm/month) for 2017 (post-fire) compared to 2016 (pre-fire) for LSM simulations with NLDAS2 forcing. The USGS gage 11143000 basin (Big Sur case) is shown on the left and the USGS 11148900 basin (Bryson case) is shown on the right. From top to bottom, DisALEXI data, OL model output, DA-VEG, and DA-VEG-SOIL model output model output are shown. Basin domains are also plotted with the gridded data.