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Wildfire-induced disruptions to evapotranspiration, runoff, and water-balance closure across California's water supply watersheds

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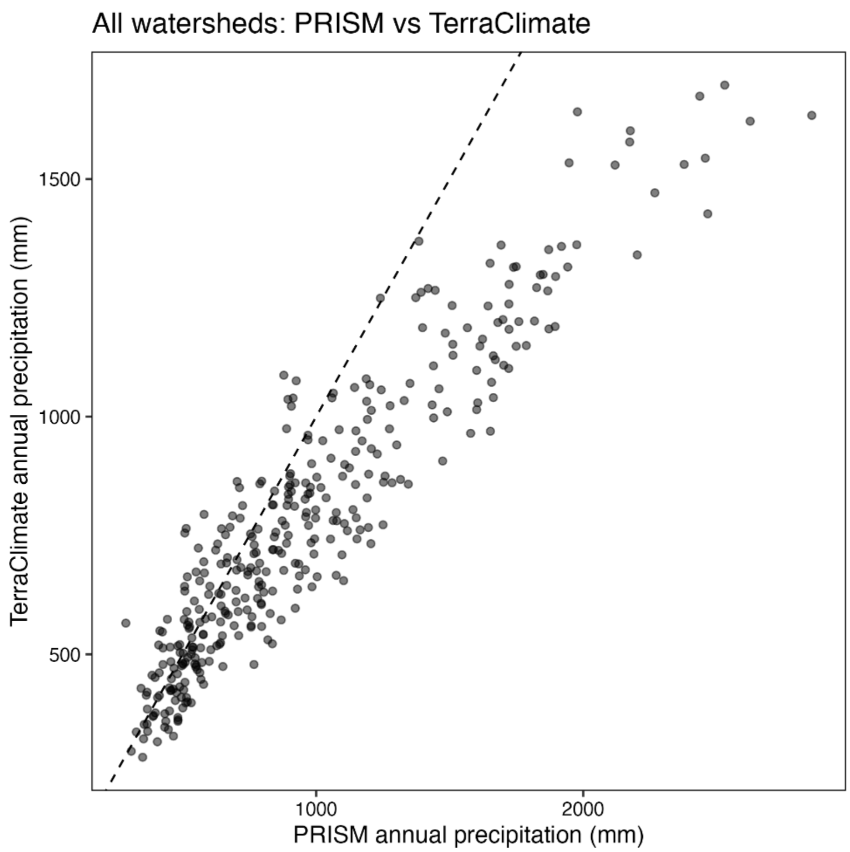


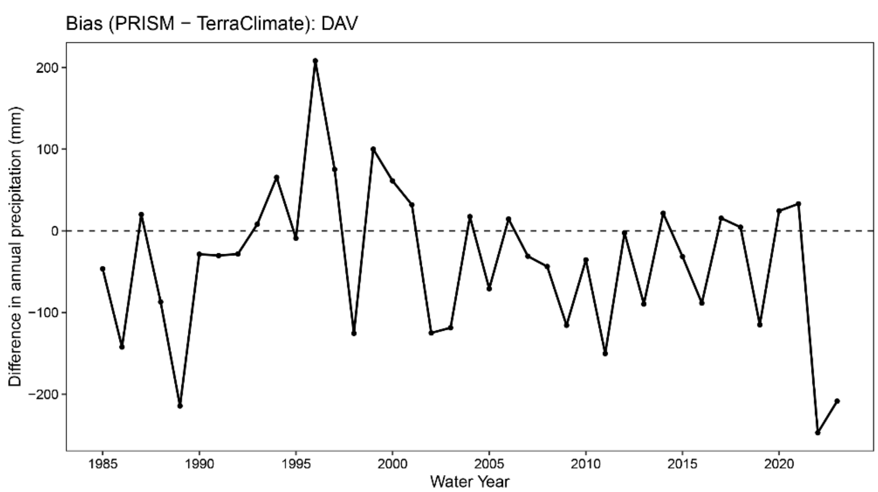


Figure S1. Comparison of annual precipitation between PRISM and TerraClimate across all basins and Annual precipitation differences between PRISM and TerraClimate in the DAV basin (PRISM − TerraClimate).

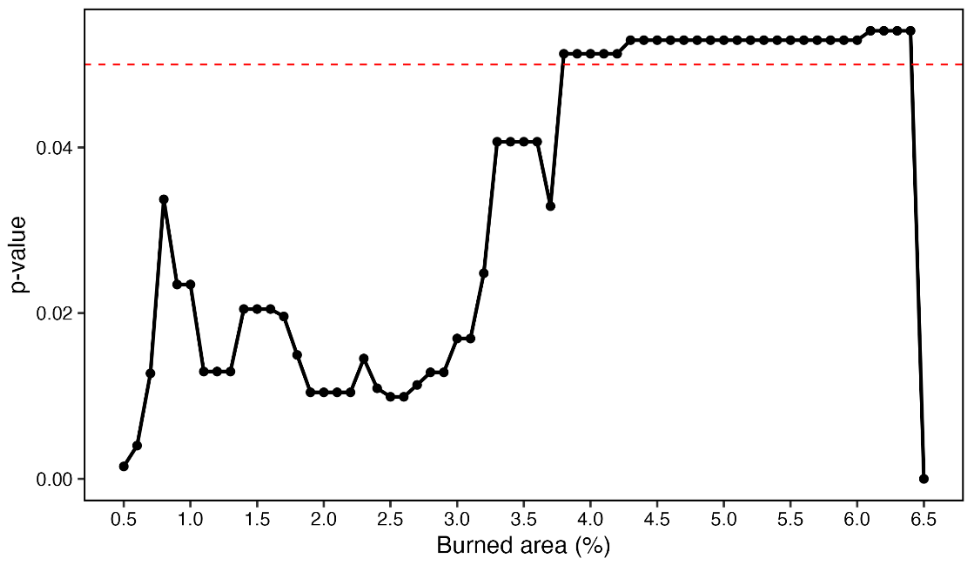
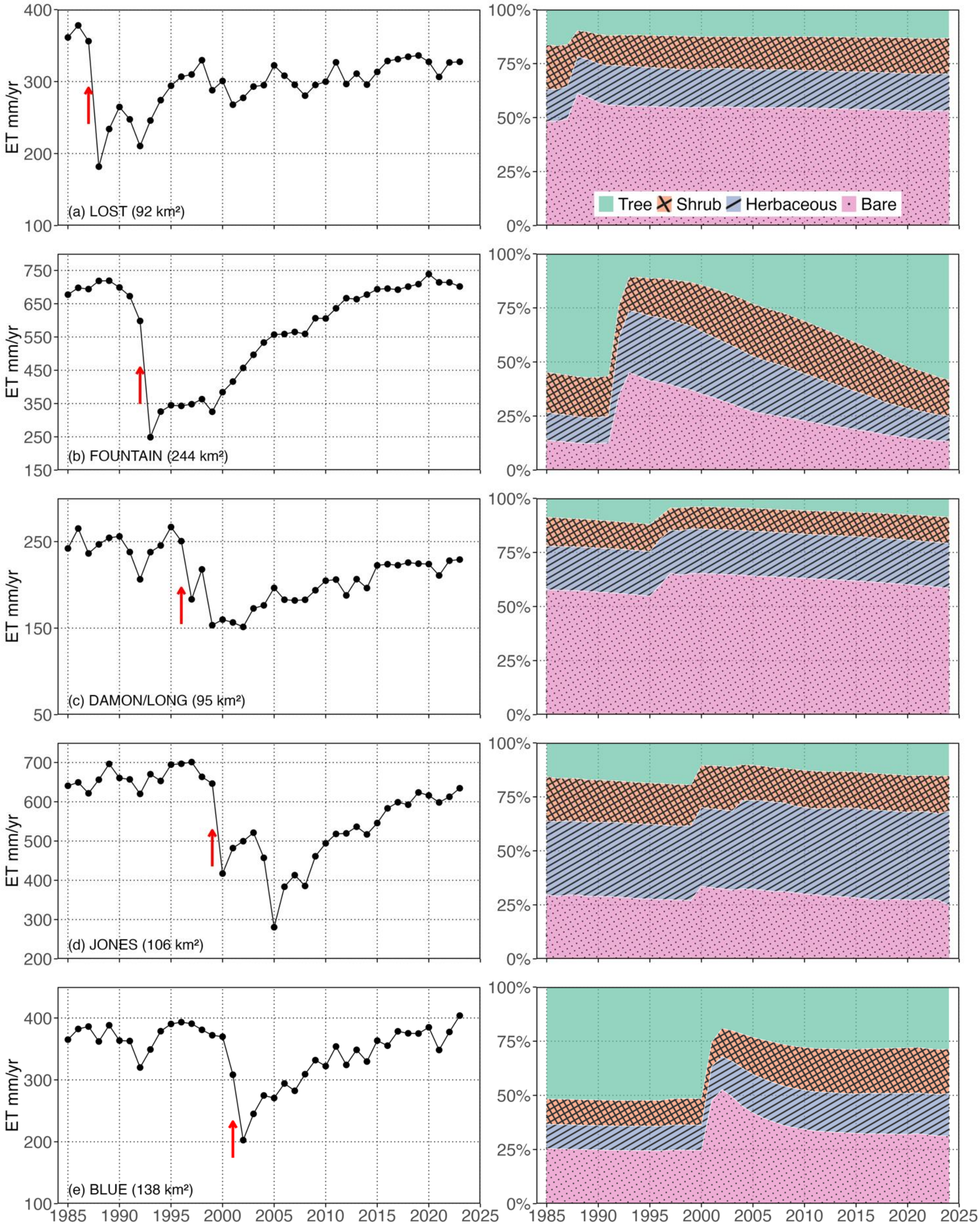
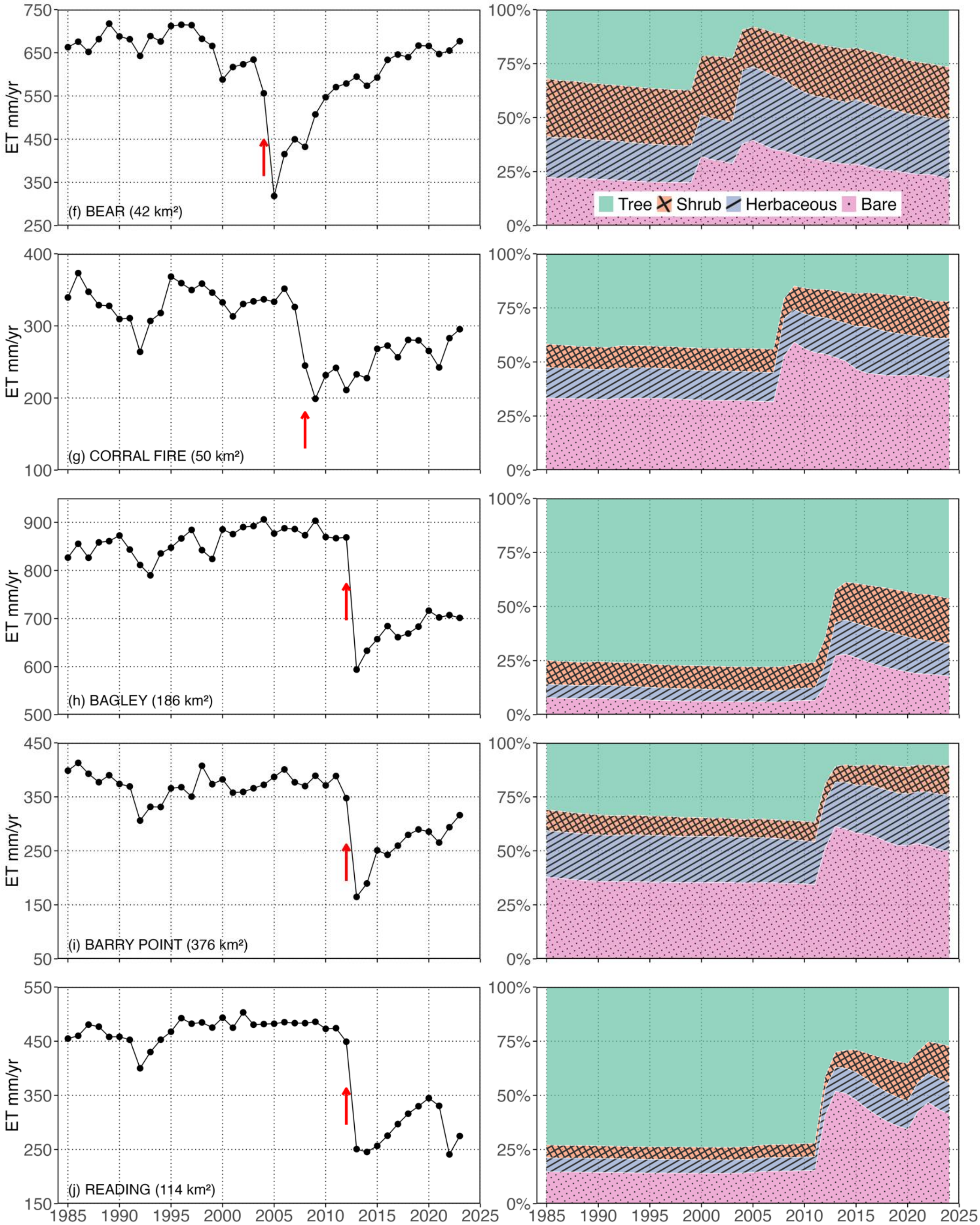


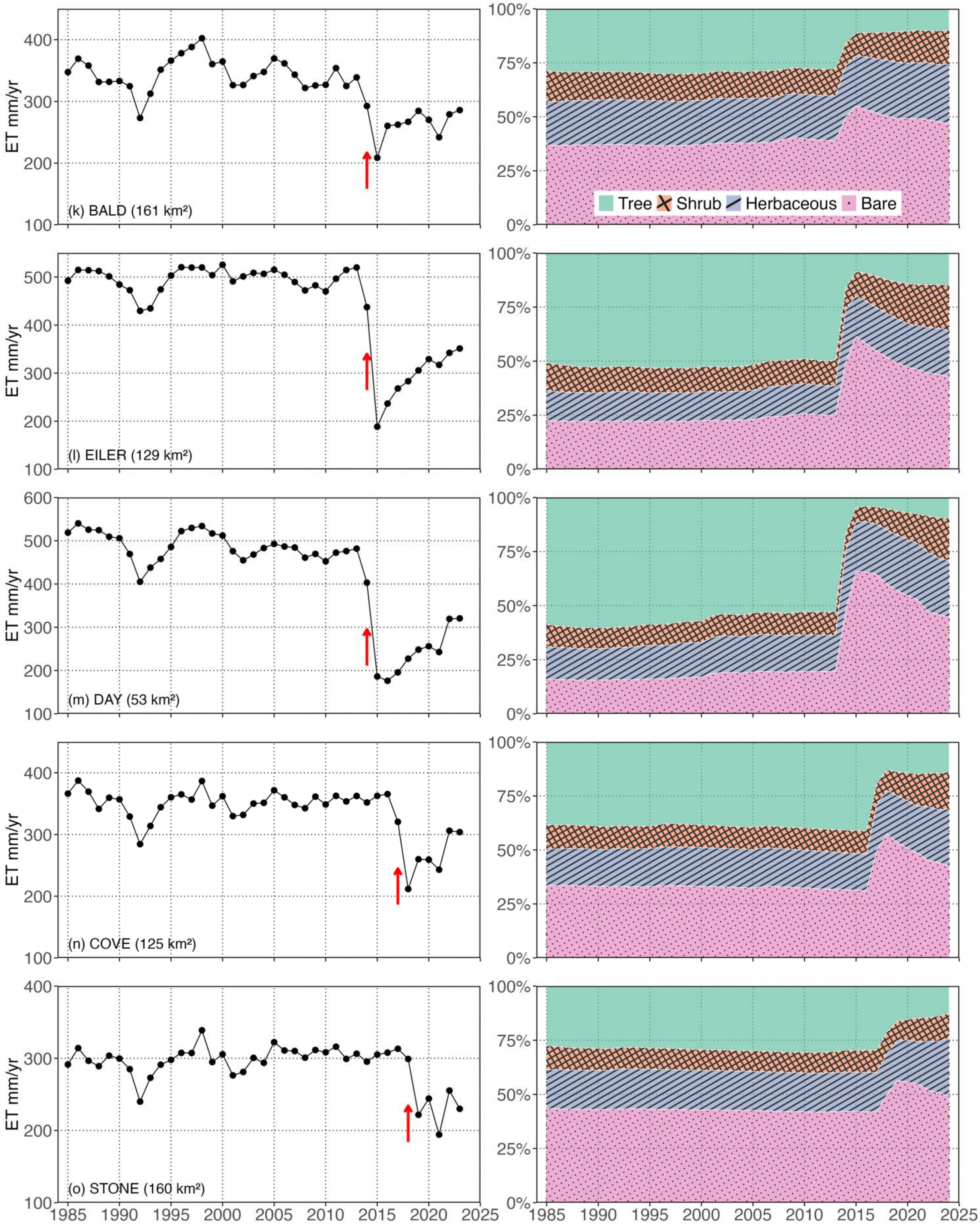
Figure S2. Sensitivity analysis of the selection of the threshold for the percentage of area burned defined as high-fire years with Welch's two-sample t-test. The effect is statistically significant when the threshold ranges from 0.5% to 3.8%. However, when the threshold exceeds 3.8%, the number of remaining wildfire events becomes too small (fewer than three), resulting in insufficient sample size for robust statistical inference.



(a) LOST (92 km²)
(b) FOUNTAIN (244 km²)
(c) DAMON/LONG (95 km²)
(d) JONES (106 km²)
(e) BLUE (138 km²)
ET mm/yr
Tree
Shrub
Herbaceous
Bare



ET mm/yr
(f) BEAR (42 km²)
(g) CORRAL FIRE (50 km²)
(h) BAGLEY (186 km²)
(i) BARRY POINT (376 km²)
(j) READING (114 km²)
Tree
Shrub
Herbaceous
Bare
1985 1990 1995 2000 2005 2010 2015 2020 2025
0% 25% 50% 75% 100%


ET mm/yr
(k) BALD (161 km²)
(l) EILER (129 km²)
(m) DAY (53 km²)
(n) COVE (125 km²)
(o) STONE (160 km²)
Tree
Shrub
Herbaceous
Bare
1985 1990 1995 2000 2005 2010 2015 2020 2025
0% 25% 50% 75% 100%

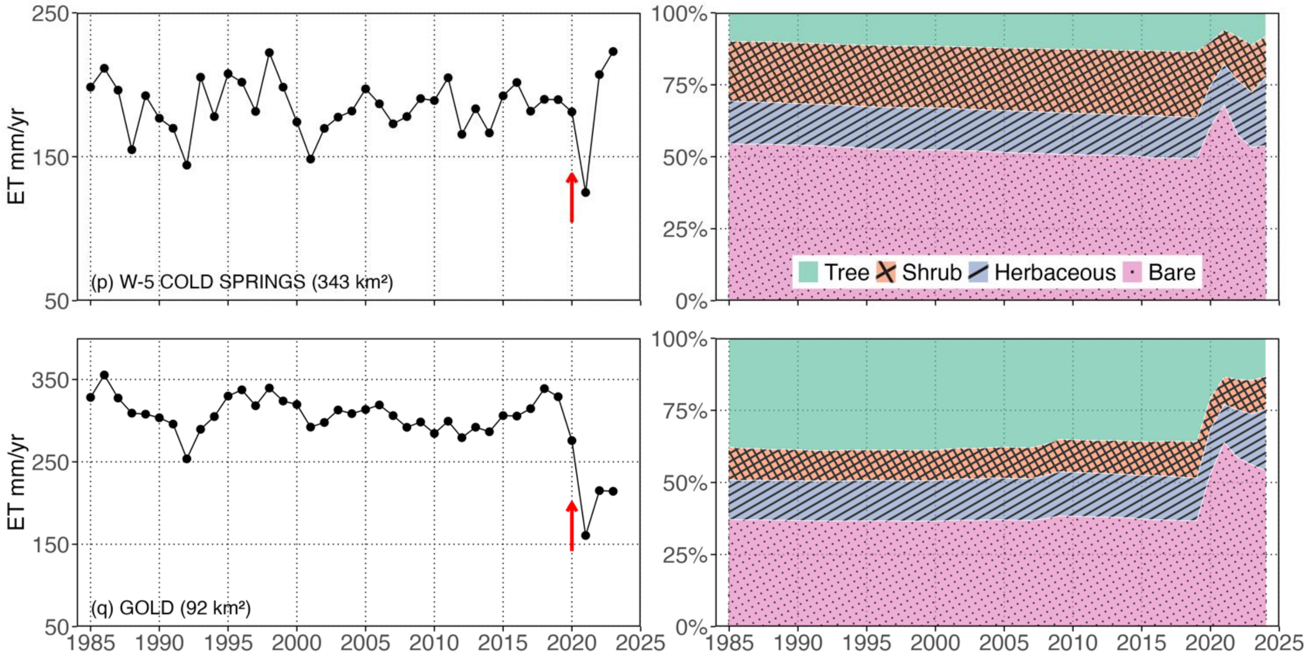
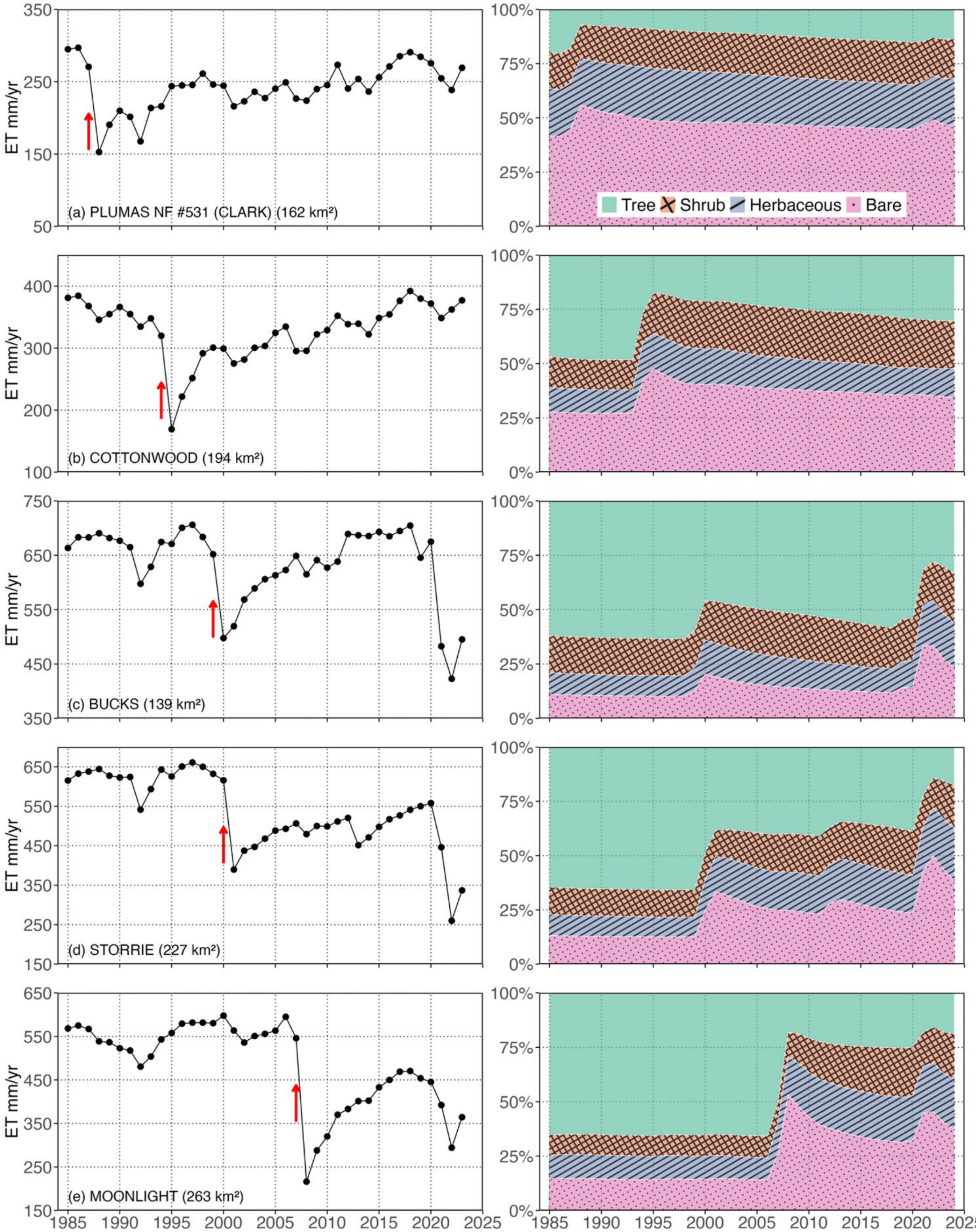
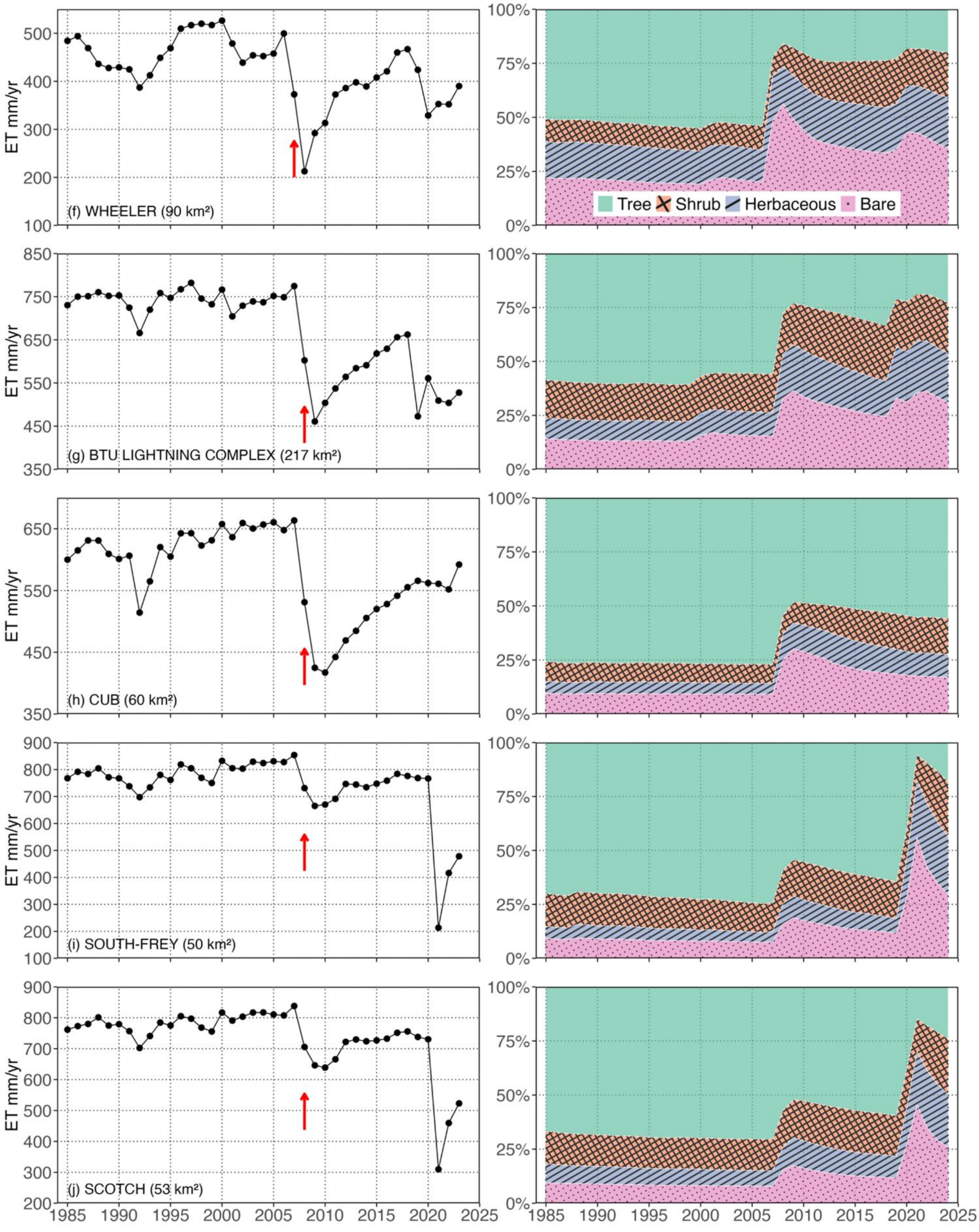


Figure S3. Postfire ET and vegetation-structure trajectories in the Pit watershed.


ET mm/yr
(a) PLUMAS NF #531 (CLARK) (162 km²)
(b) COTTONWOOD (194 km²)
(c) BUCKS (139 km²)
(d) STORRIE (227 km²)
(e) MOONLIGHT (263 km²)
Tree
Shrub
Herbaceous
Bare


ET mm/yr
(f) WHEELER (90 km²)
(g) BTU LIGHTNING COMPLEX (217 km²)
(h) CUB (60 km²)
(i) SOUTH-FREY (50 km²)
(j) SCOTCH (53 km²)
Tree
Shrub
Herbaceous
Bare
1985
1990
1995
2000
2005
2010
2015
2020
2025
0%
25%
50%
75%
100%

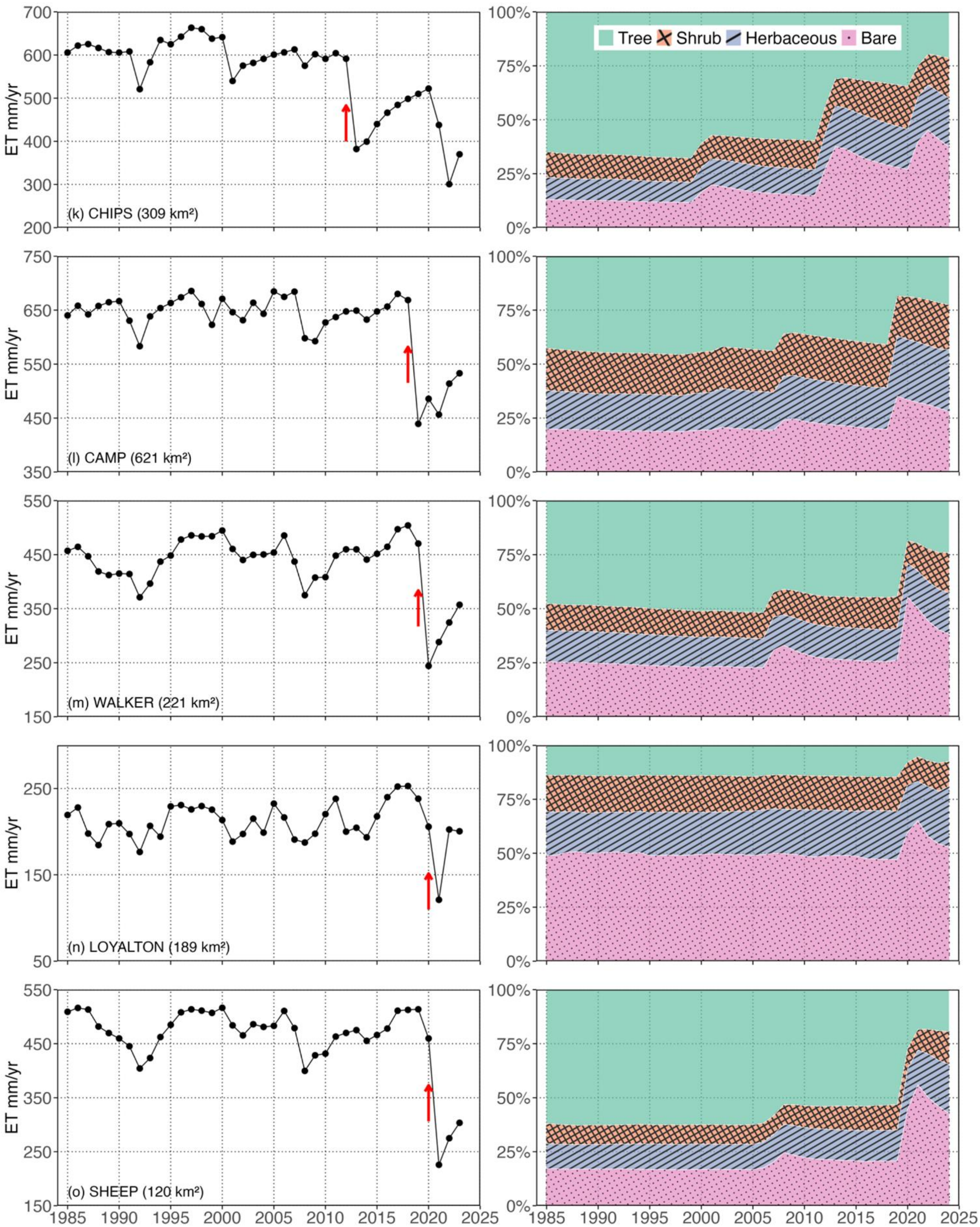


Figure S4. Postfire ET and vegetation-structure trajectories in the Feather watershed.

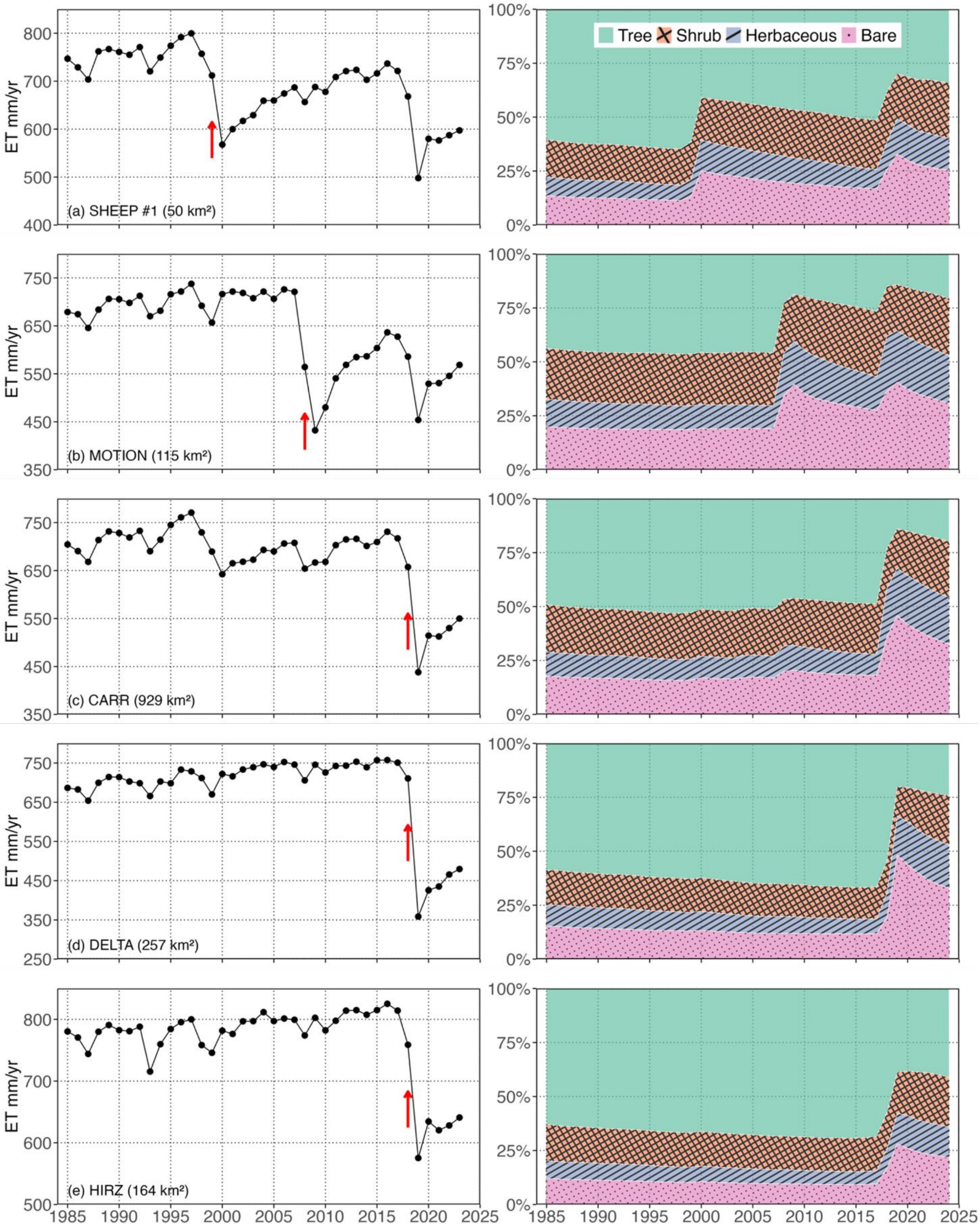


Figure S5. Postfire ET and vegetation-structure trajectories in the MTUS watershed.

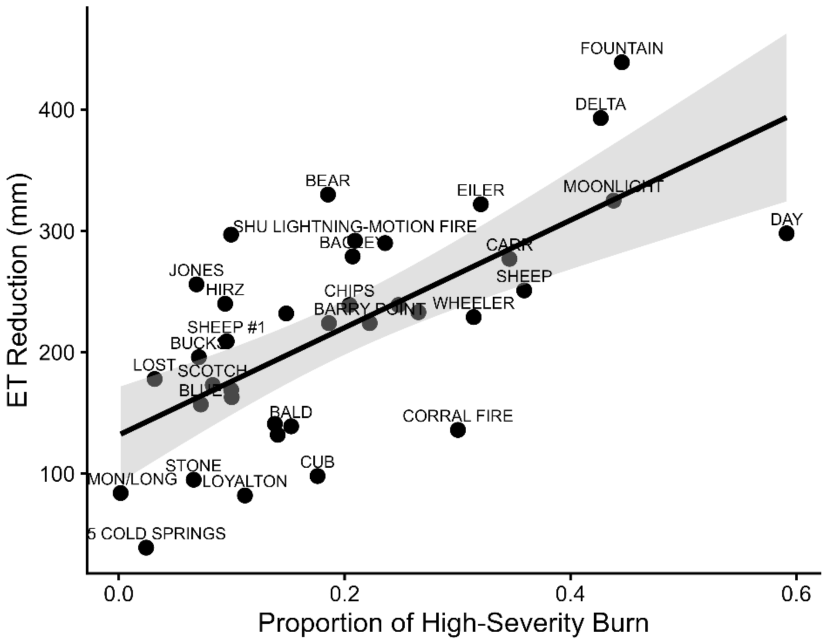


Figure S6. Relationship between burn severity and first-year evapotranspiration (ET) reduction across fires. First-year ET reduction (mm yr^{-1}) is plotted against the proportion of high-severity burn area within each fire perimeter. Each point represents an individual fire. The solid line shows the linear regression fit, and the shaded region indicates the 95% confidence interval.

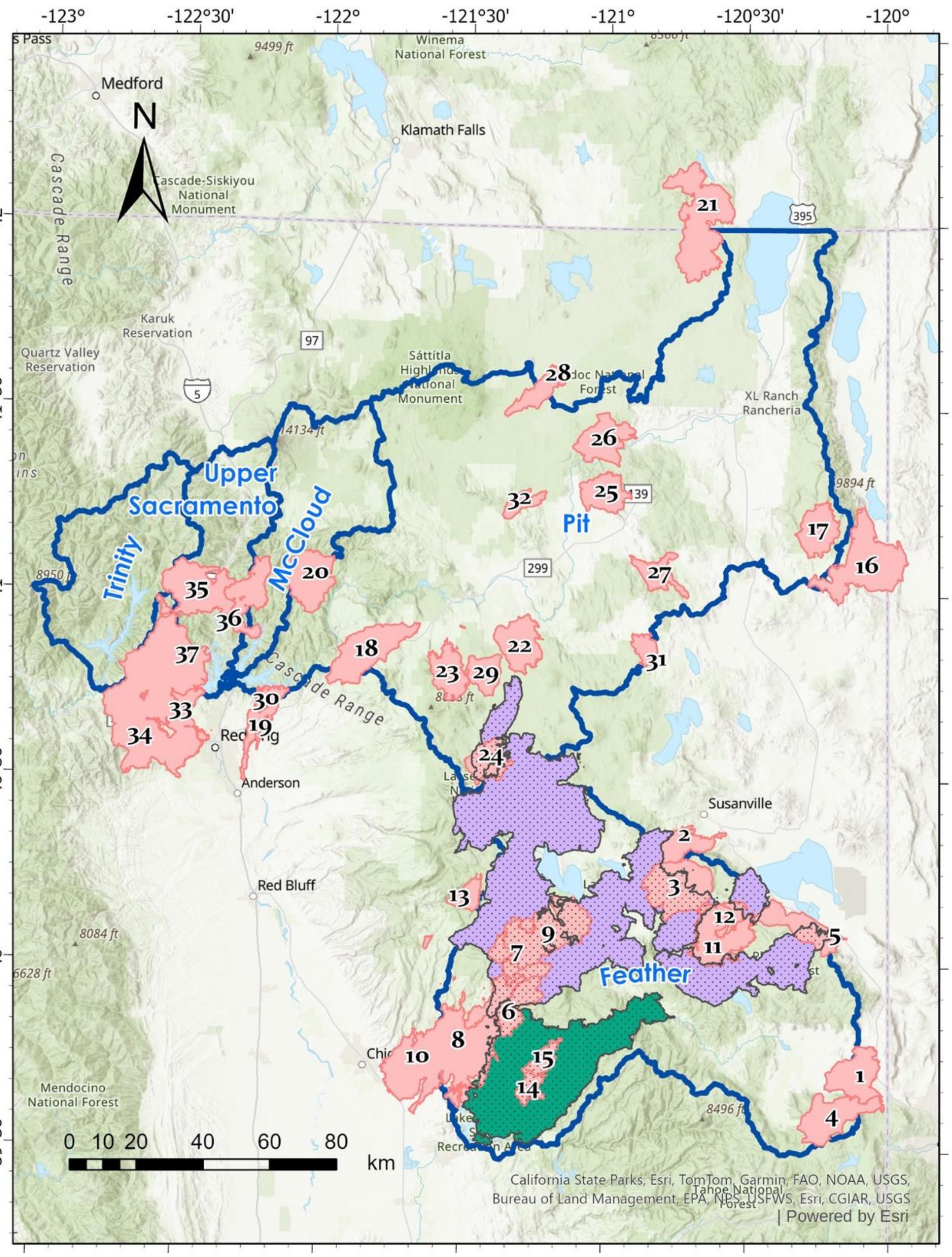


Figure S7.

The dots on the map indicate the Dixie and North Complex fires, with Dixie in purple and North Complex in green.

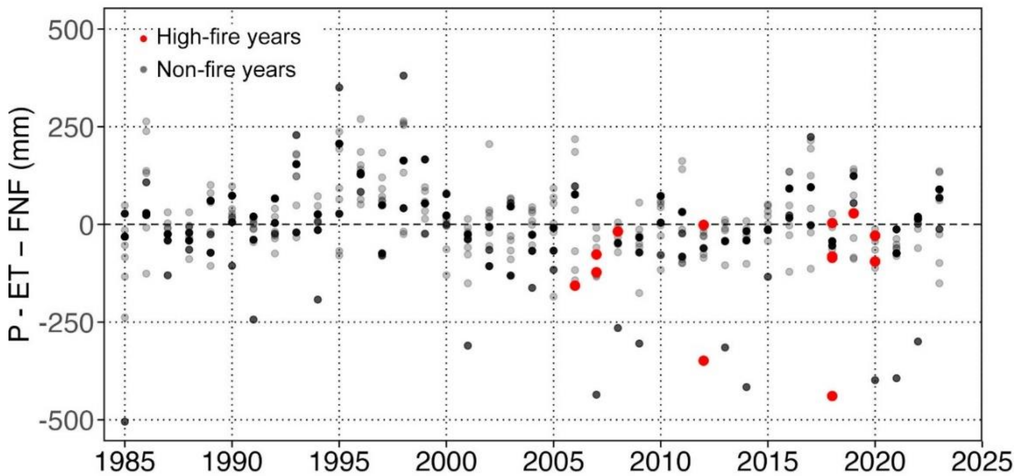


Figure S8. Annual water-balance residuals (P − ET − FNF) across all watersheds from 1985 to 2023

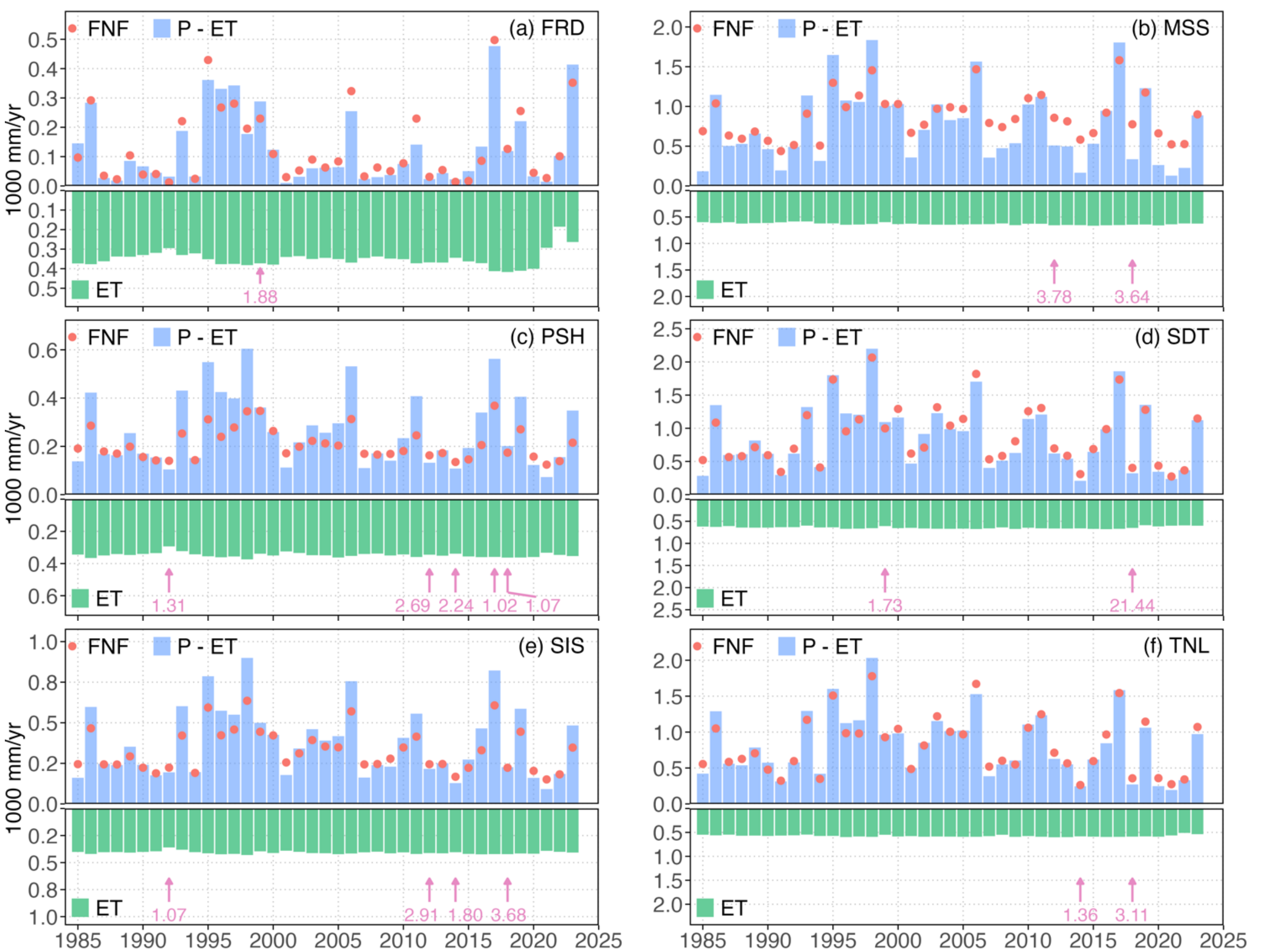


Figure S9. Changes in precipitation, evapotranspiration, full natural flow, and burned area from 1985 to 2023 for additional sites.

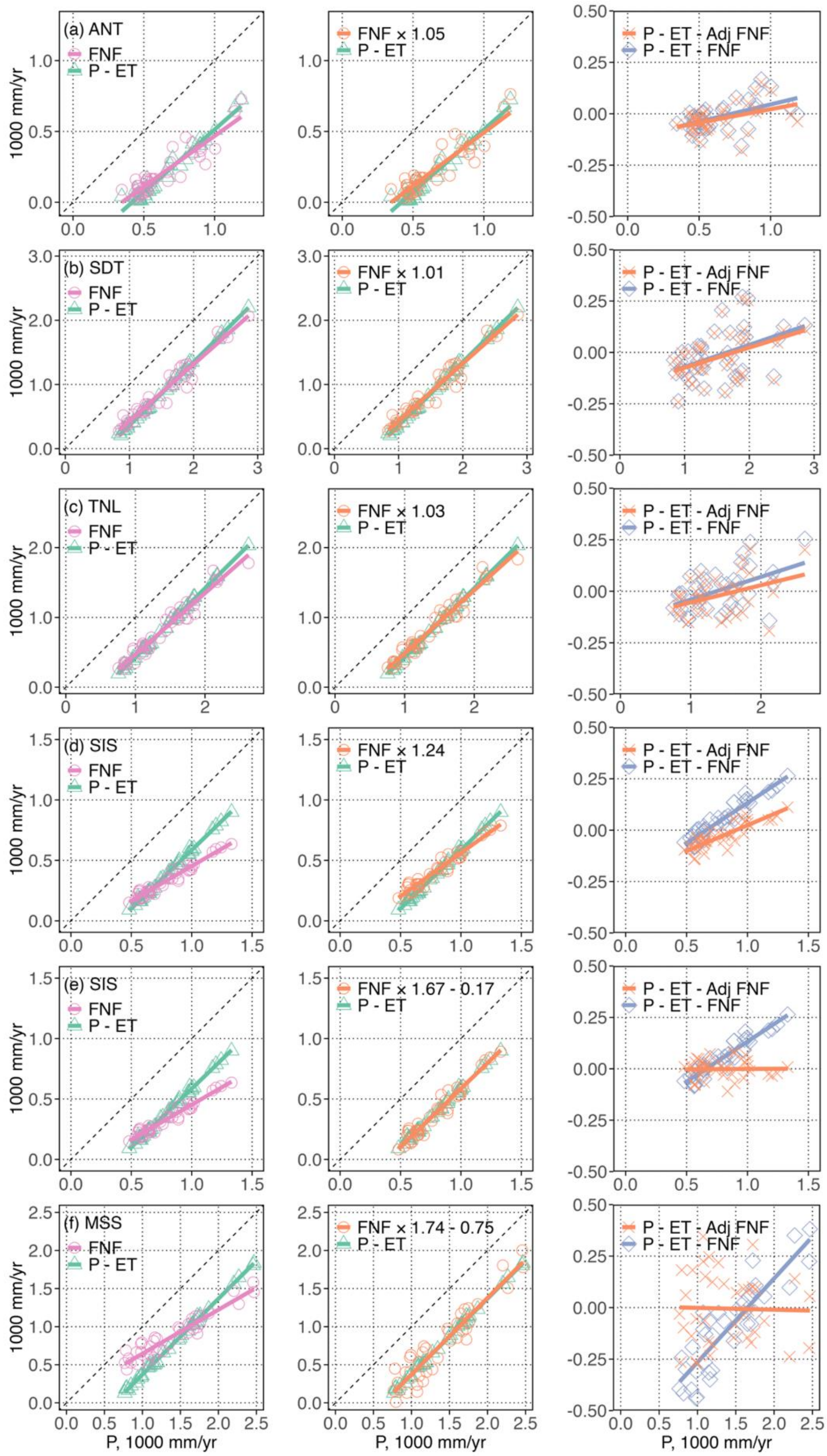


Figure S10. Additional sites for the water balance analysis of representative watersheds.

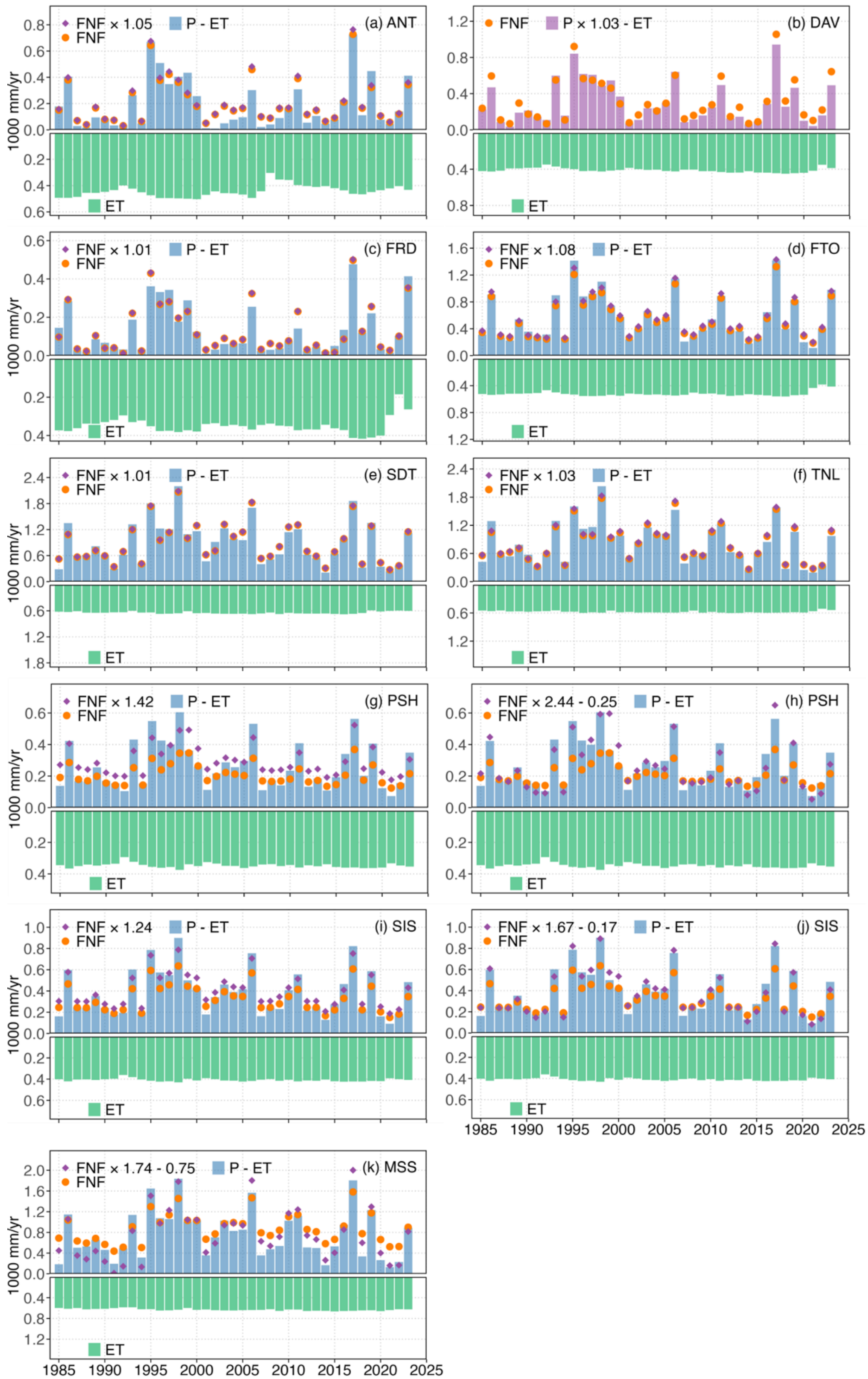


Figure S11. Water balance analysis of representative watersheds, showing P-ET, FNF and the adjustment of FNF