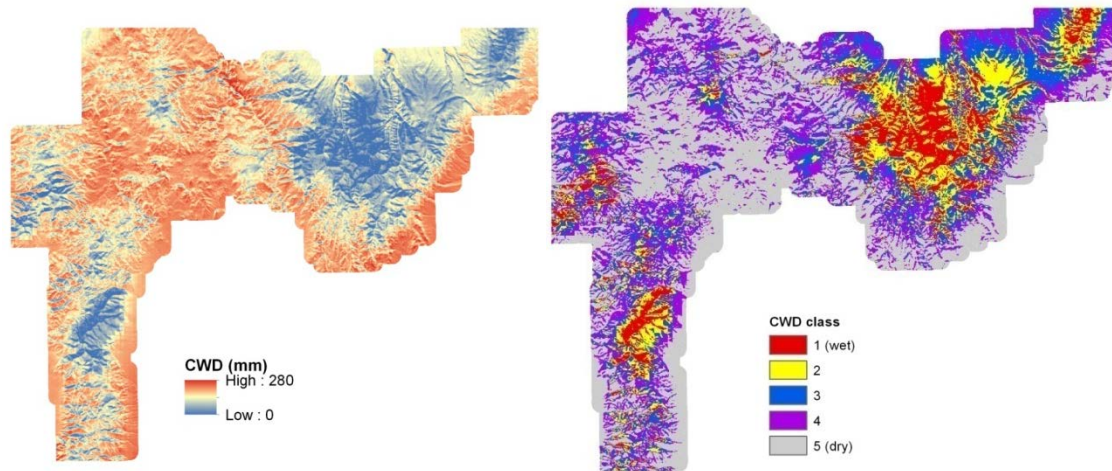
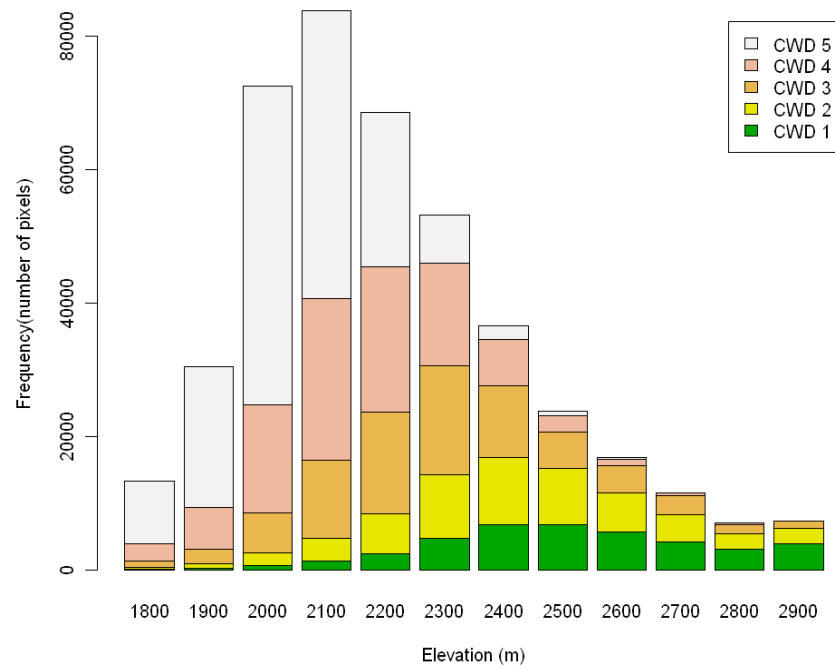


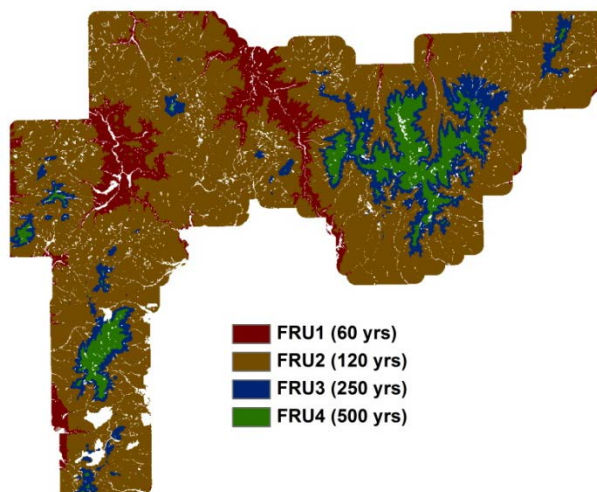
Appendices



Appendix S1. Spatial distribution of annual climatic water deficit (CWD) computed from PRISM 30-year normal data for this study area (left) and its reclassified 5-class map (right).



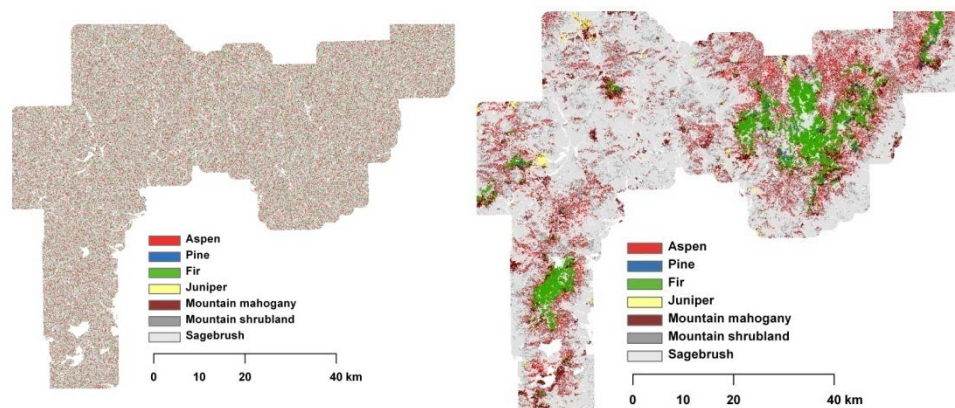
Appendix S2. Frequency of the 5 CWD classes across the 12 elevation bands.



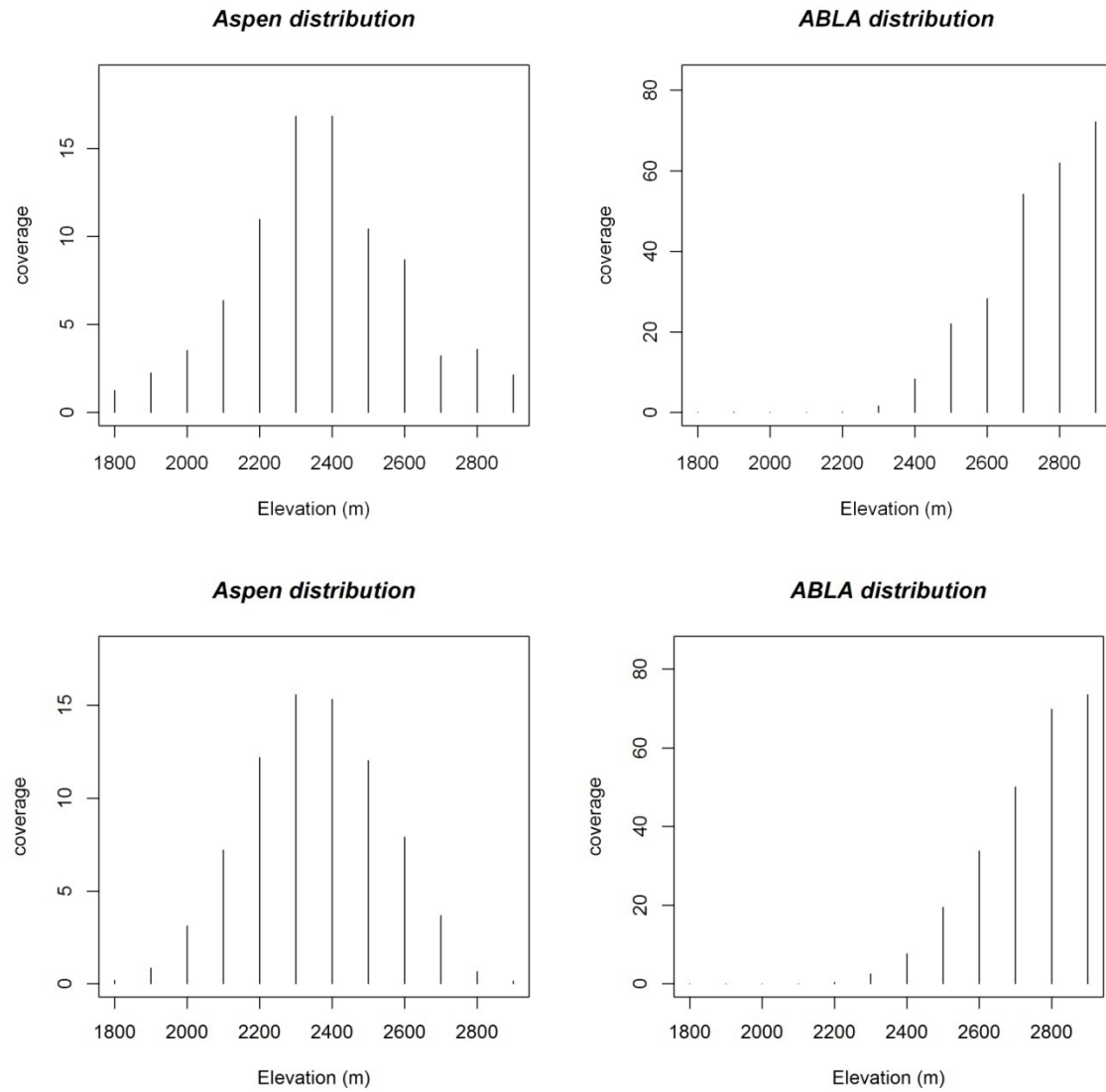
Appendix S3. Fire regime map with four active fire regime units (FRUs) delineated based on elevation (< 2000 m, $2000 - 2400$ m, $2500 - 2600$ m, and ≥ 2700 m).

Fire regime unit	Fire rotation period (yr)	Ignition probability	Mean fire size (ha)	Minimum fire size (ha)	Maximum fire size (ha)
FRU1	60	0.00206	810	5	4050
FRU2	120	0.00034	2430	5	8100
FRU3	250	0.00099	405	5	810
FRU4	500	0.00050	405	5	810

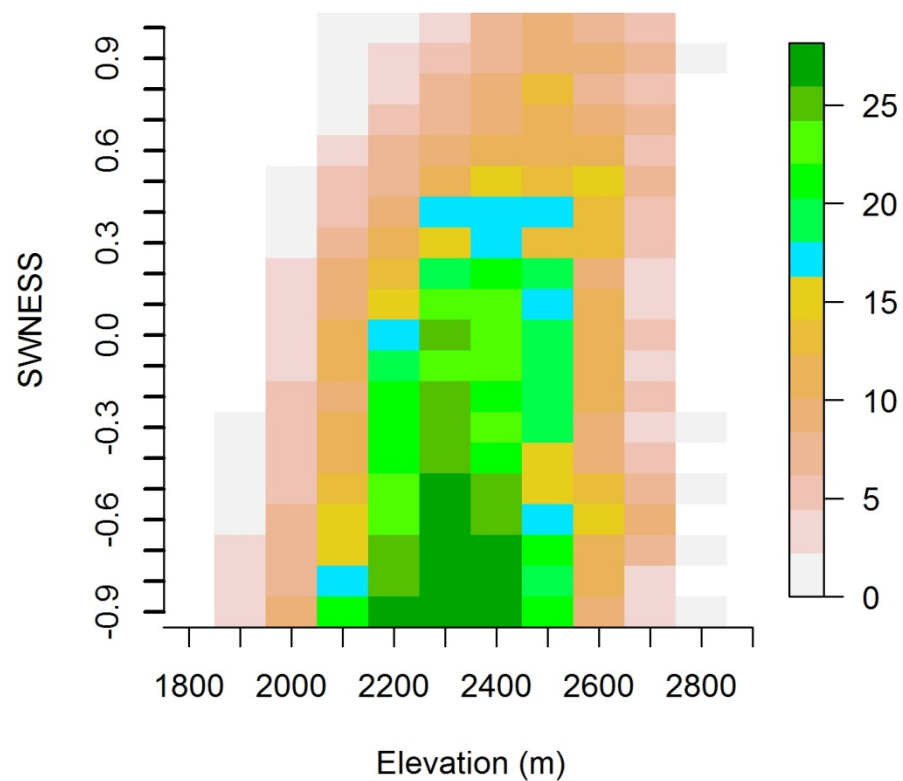
Appendix S4. Fire regime attributes used in LANDIS-II simulation. Fire regime units were shown in Appendix S3.



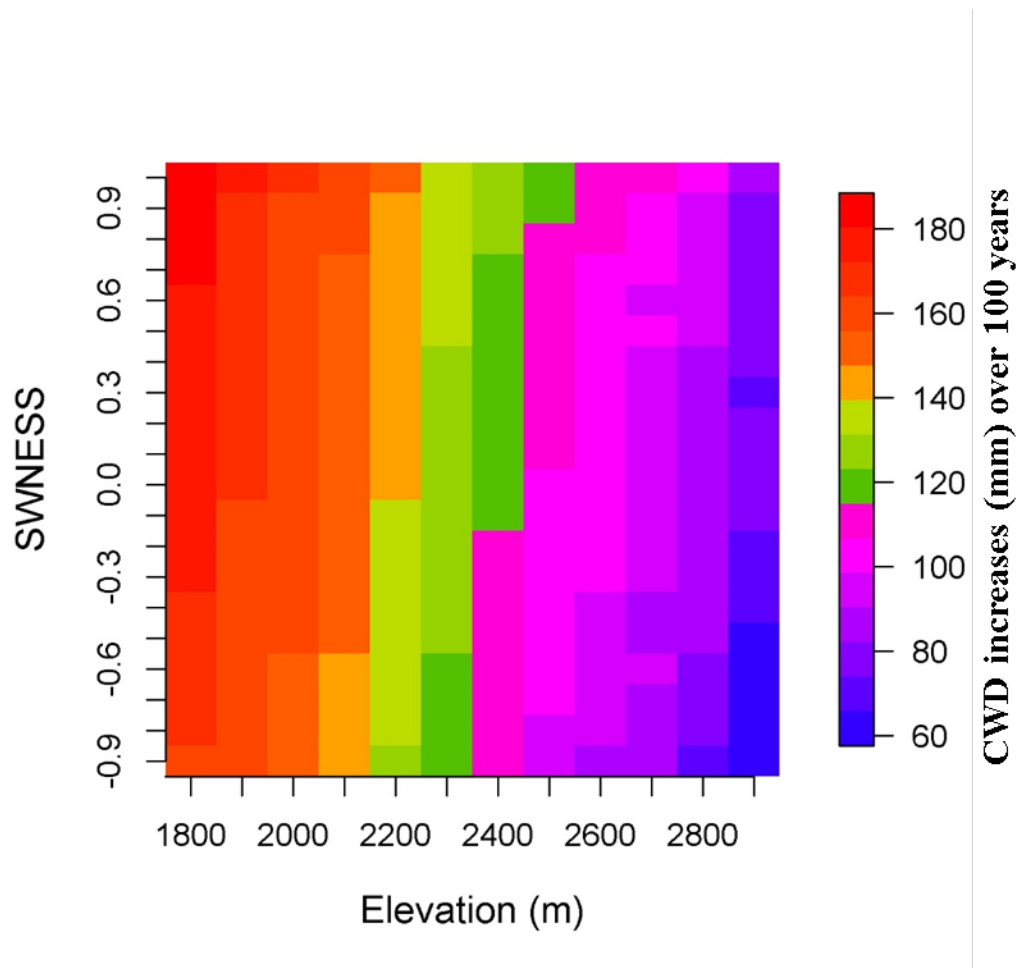
Appendix S5. Randomly generated initial vegetation map for the spin-up run (left) and the simulated vegetation map after a 1000-year simulation (right).



Appendix S6. Distribution of aspen and subalpine fir (ABLA) along the elevation gradient after 1000 years of simulation from a random landscape (above) and the ones derived from the existing vegetation map (below). P-value of t-test is 0.80 and 0.91 for aspen and subalpine fir, respectively, suggesting distribution patterns along the elevation gradient simulated from the spin-up run were similar to the observed ones.



Appendix S7. Current quaking aspen coverage (%) at each combination of 100-m elevational band and 0.1-interval SWNESS (with -1.0 indicating NE aspect and 1.0 indicating SW aspect) band. Only aspen coverage values > 1% are shown.



Appendix S8. The increase of climatic water deficit (CWD) over the next 100 years under the SRES A2 scenario at each combination of 100-m elevational band and 0.1-interval SWNESS (with -1.0 indicating NE aspect and 1.0 indicating SW aspect) band. The figure showed greater sensitivity of CWD to changes in temperature at warmer and drier sites at low elevations.