# Appendix B

Climate Drivers, Development of Simulated Fire Disturbance

and Additional Results on Forest Development

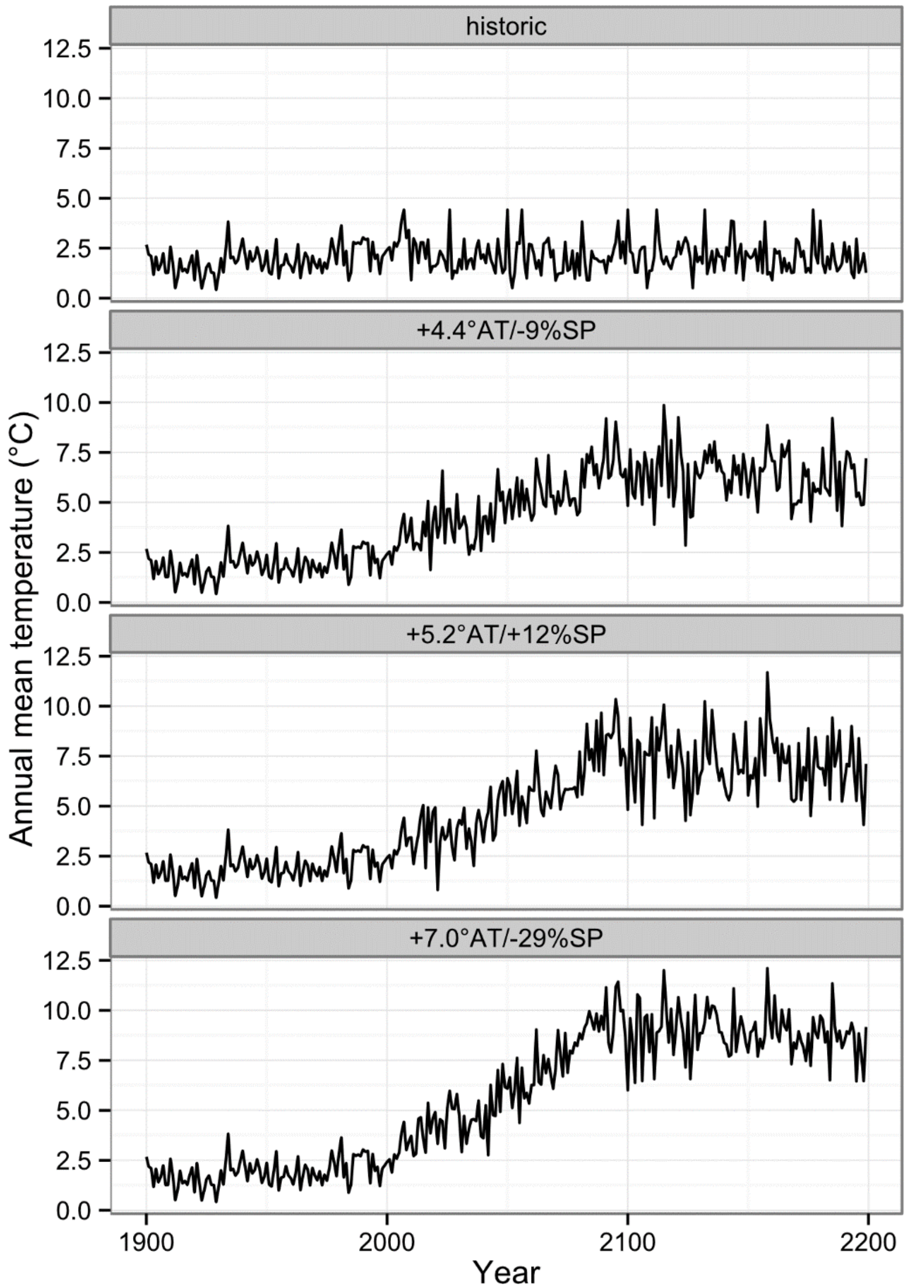


FIG. B1: Development of annual mean temperature at a central grid point in the case study area at 2745 m a.s.l. calculated from the monthly data used as simulation input for one of the 20 replicate simulations. Panels show developments for the historical and three climate change scenarios based on the IPCC AR4 A2 emission scenario. For the 1900–2009 period the historical climate time-series was used for all replicates. For years 2010–2099 the time-series was constructed by adding the year- and month-specific anomalies from the climate scenarios to the monthly temperatures from randomly selected years from the 1961–1990 normal period. For years 2100–2199, random draws from the 2070–2099 anomalies were added to random draws from the 1961–1990 normal period. The seed of the random number generator was varied, such that climate time series varied among the simulation replicates.

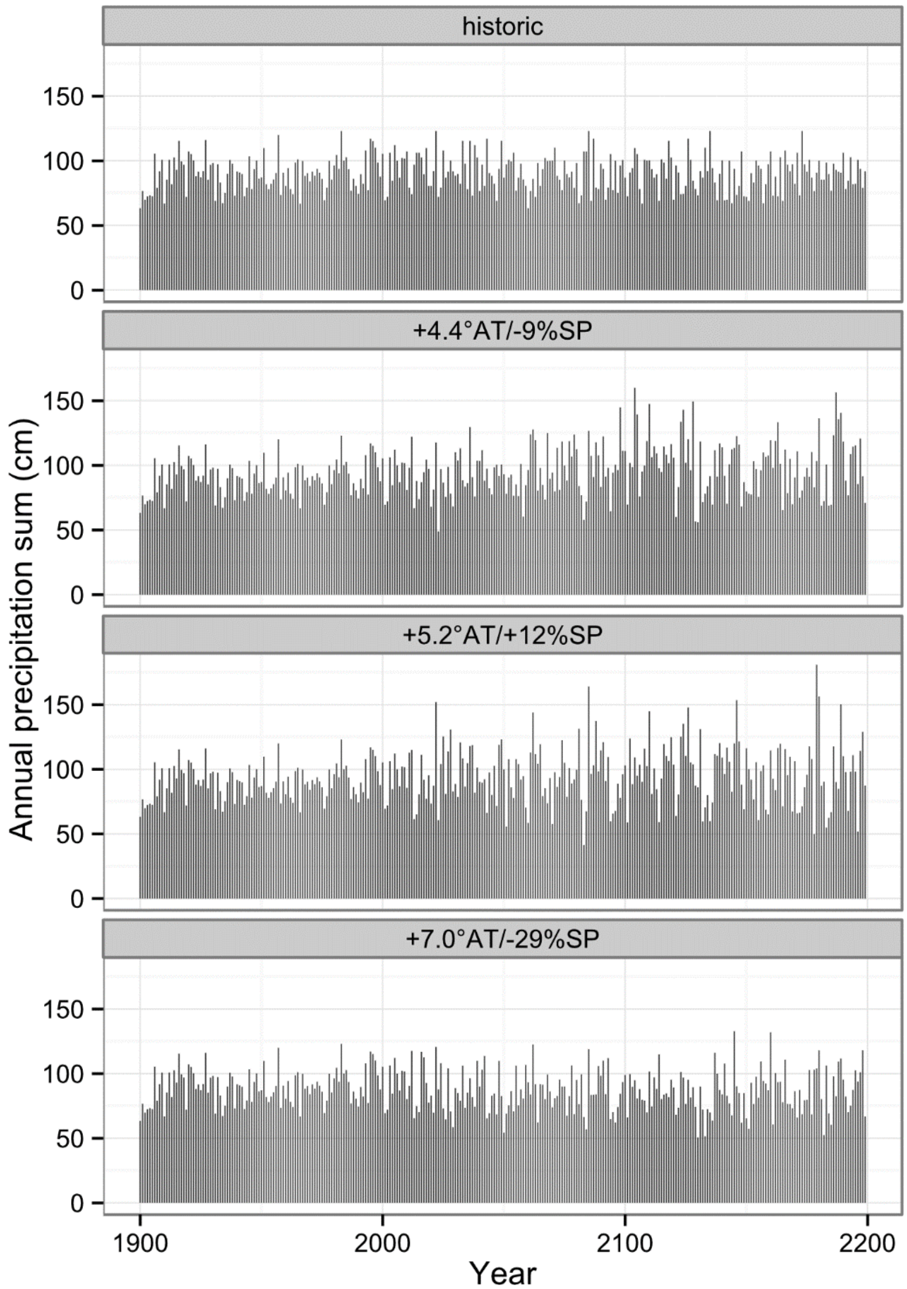


FIG. B2: Development of annual precipitation sum at a central PRISM grid point in the case study area at 2745 m a.s.l. calculated from the monthly data used as simulation input for one of the 20 replicate simulations. Panels show developments for the historical and three climate change scenarios based on the IPCC AR4 A2 emission scenario. The precipitation time series were constructed based on historical data and the anomalies of the climate scenario analogously to the temperature time series as described in the caption of Figure B1.

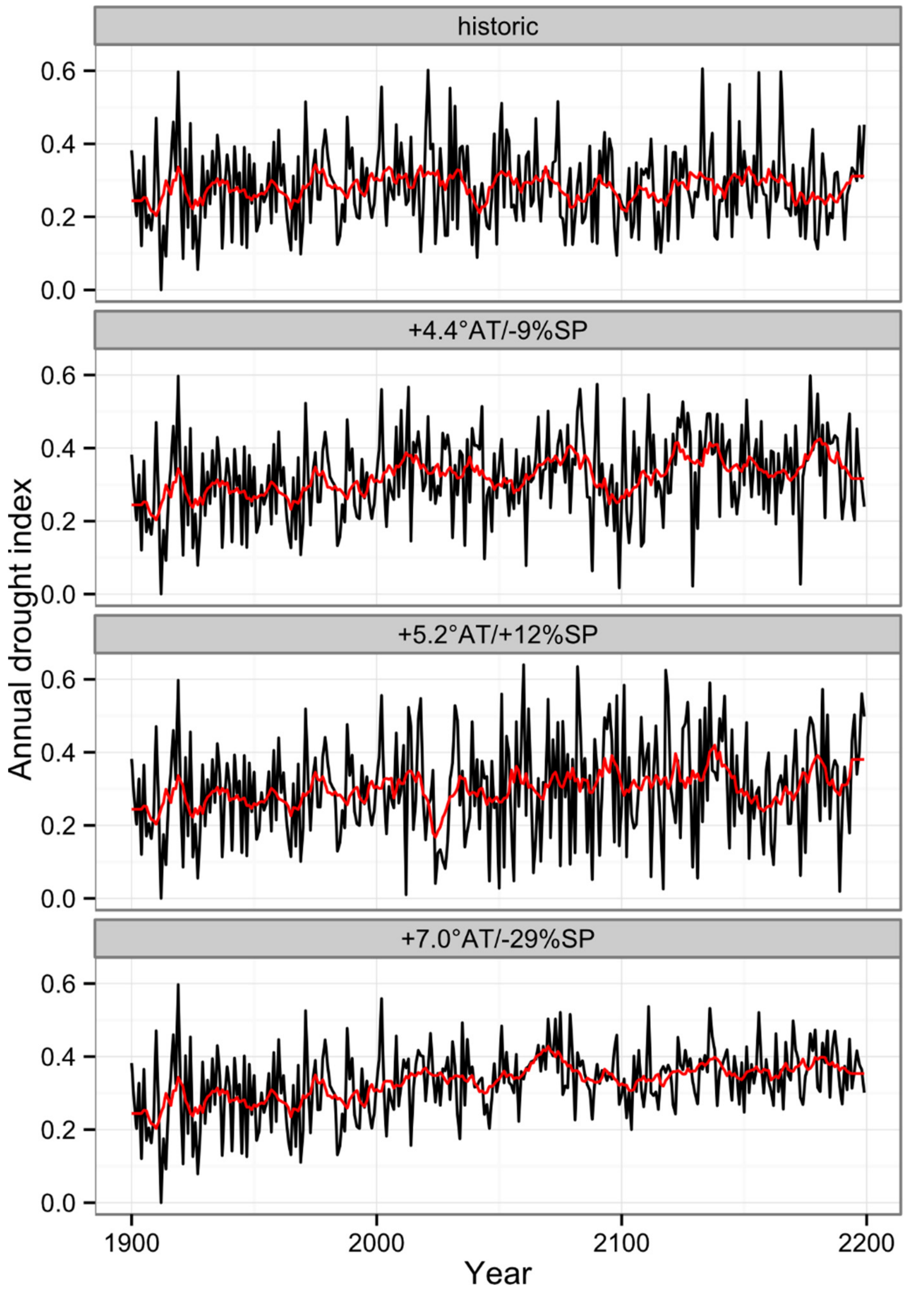


FIG. B3: Development of the LandClim drought index calculated using the climate scenario data shown in Figure B1 and B2 at an exemplary simulation cell at 2802 m a.s.l. The red line shows a 10-year running mean.

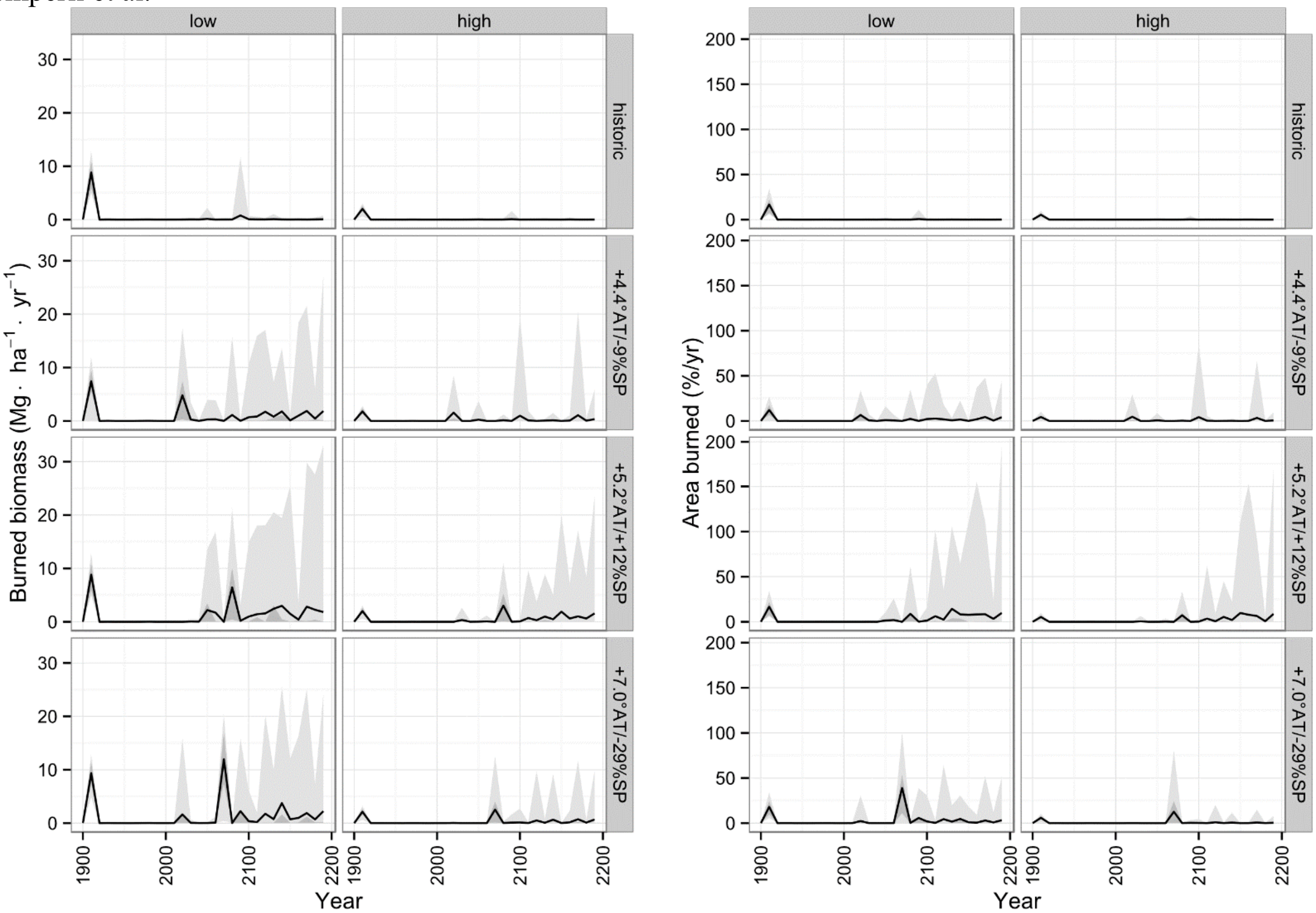


FIG. B4: Development of fire-killed (burned) biomass (left) and percent area burned (right) by elevation (low: ≤2800, high >2800 m a.s.l) and climate scenario. The black line indicates the mean, light shaded uncertainty ribbons indicate minima and maxima and darker shaded ribbons lower and upper quartiles of 20 replicate simulations.

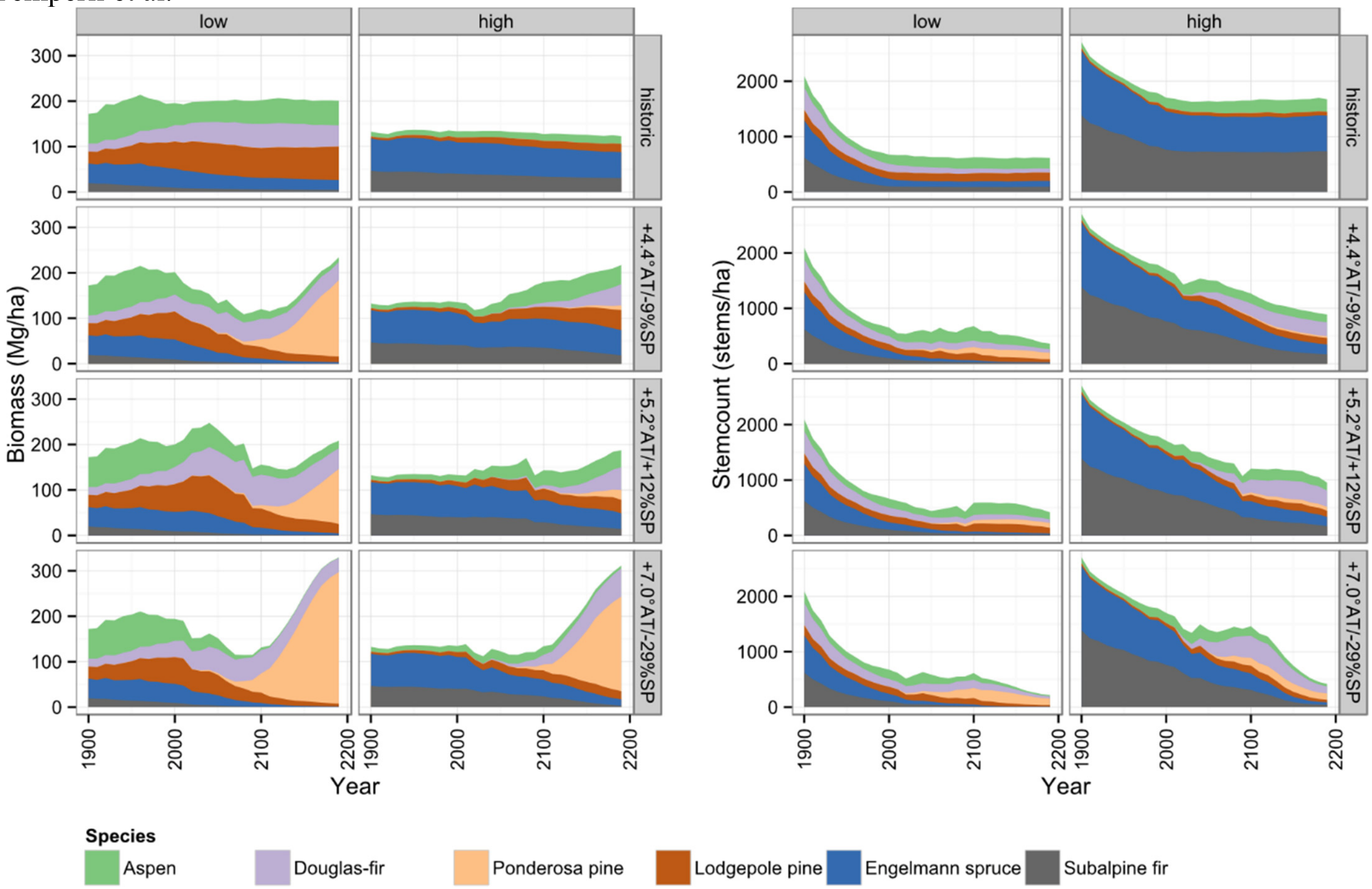


FIG. B5: Development of species-specific live biomass (left) and stem counts (right) at low (≤2800 m a.s.l.) and high (>2800 m a.s.l.) elevation and under four climate scenarios that are labeled at the right side of panels. Biomass and stem counts were averaged over 20 replicate simulations and refer to simulations that include wind and spruce beetle disturbance but no fire.

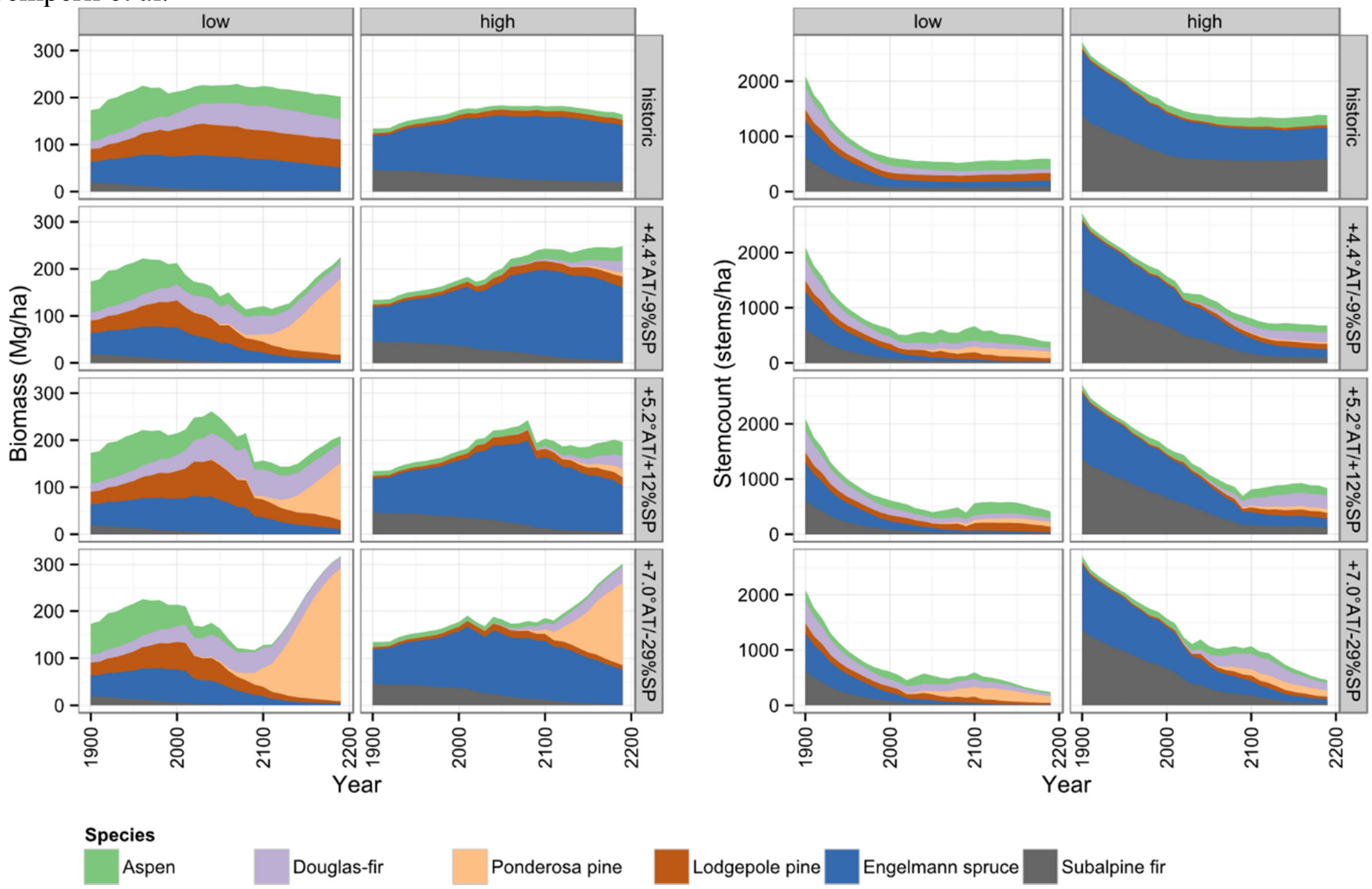


FIG. B6: Development of species-specific live biomass (left) and stem counts (right) at low (≤2800 m a.s.l.) and high (>2800 m a.s.l.) elevation and under four climate scenarios that are labeled at the right side of panels. Biomass and stem counts were averaged over 20 replicate simulations and refer to simulations including wind but no spruce beetle and no fire disturbance.

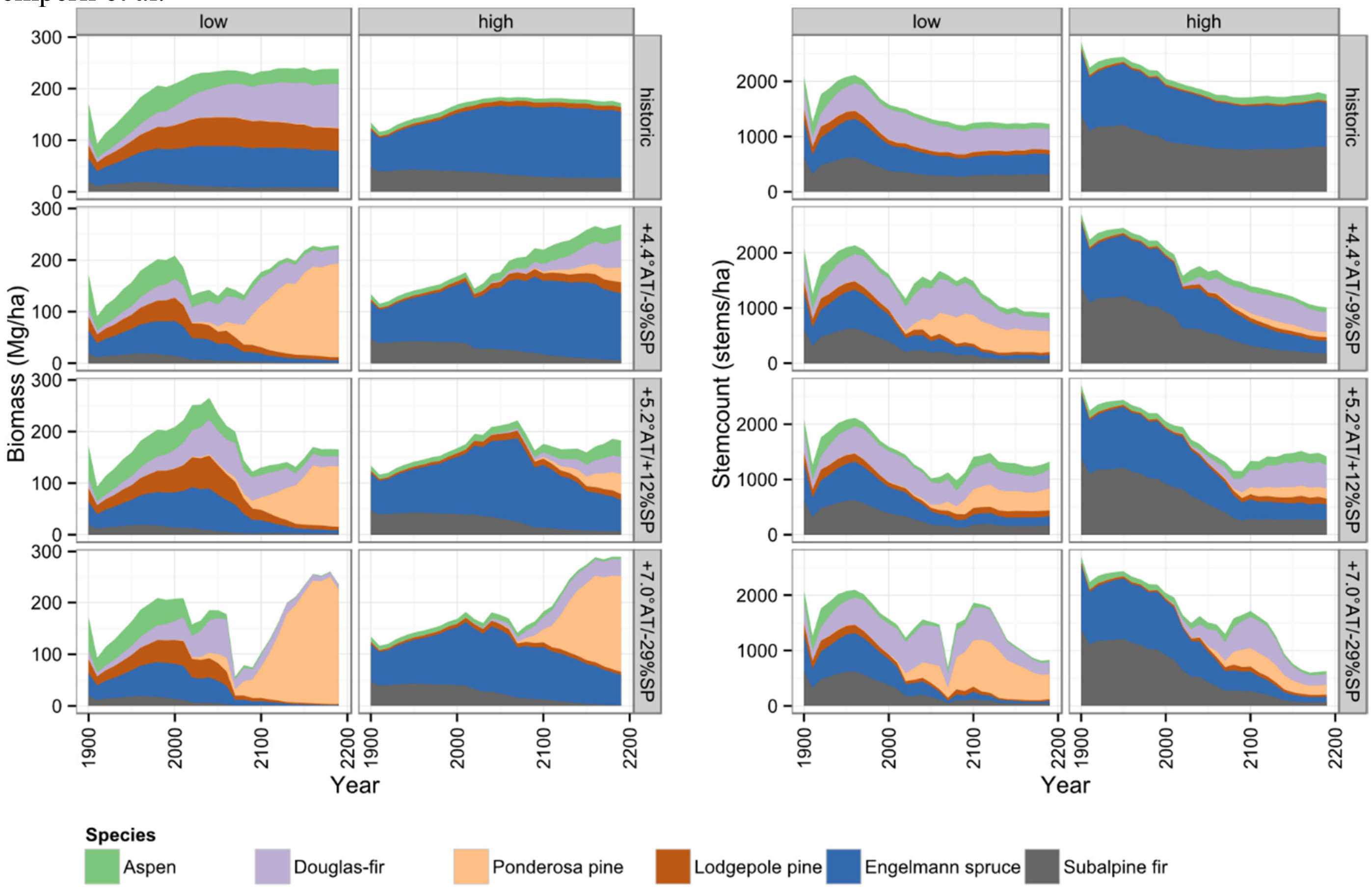


FIG. B7: Development of species-specific live biomass (left) and stem counts (right) at low (≤2800 m a.s.l.) and high (>2800 m a.s.l.) elevation and under four climate scenarios that are labeled at the right side of panels. Biomass and stem counts were averaged over 20 replicate simulations and refer to simulations including fire and wind disturbance but no spruce beetle disturbance.