Ecography

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Supplementary material

Appendix A. Crosswalk between Landfire Biophysical setting (BpS) and the broad vegetation groups analyzed in this study.

BpS Name	Vegetation type
California Coastal Redwood Forest	mesic forest
East Cascades Mesic Montane Mixed-Conifer Forest and Woodland	mesic forest
Klamath-Siskiyou Lower Montane Serpentine Mixed Conifer Woodland	mesic forest
Klamath-Siskiyou Upper Montane Serpentine Mixed Conifer Woodland	mesic forest
Madrean Upper Montane Conifer-Oak Forest and Woodland	mesic forest
Mediterranean California Mesic Mixed Conifer Forest and Woodland	mesic forest
North Pacific Hypermaritime Sitka Spruce Forest	mesic forest
North Pacific Maritime Dry-Mesic Douglas-fir-Western Hemlock Forest	mesic forest
North Pacific Maritime Mesic Subalpine Parkland	mesic forest
North Pacific Maritime Mesic-Wet Douglas-fir-Western Hemlock Forest	mesic forest
North Pacific Mountain Hemlock Forest - Wet	mesic forest
North Pacific Mountain Hemlock Forest - Xeric	mesic forest
North Pacific Mesic Western Hemlock-Silver Fir Forest	mesic forest
Northern California Mesic Subalpine Woodland	mesic forest
Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest - Larch	mesic forest
Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest - Grand Fir	mesic forest
Northern Rocky Mountain Mesic Montane Mixed Conifer Forest	mesic forest
Northern Rocky Mountain Mesic Montane Mixed Conifer Forest	mesic forest
Northern Rocky Mountain Mesic Montane Mixed Conifer Forest - Cedar Groves	mesic forest
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	mesic forest
North Pacific Swamp Systems	mesic forest
North Pacific Montane Riparian Woodland and Shrubland - Wet	mesic forest
North Pacific Dry-Mesic Silver Fir-Western Hemlock-Douglas-fir Forest	mesic forest
California Coastal Closed-Cone Conifer Forest and Woodland	mesic forest
North Pacific Hypermaritime Western Red-cedar-Western Hemlock Forest	mesic forest
Inter-Mountain Basins Subalpine Limber-Bristlecone Pine Woodland	cold forest
Mediterranean California Red Fir Forest	cold forest
Mediterranean California Red Fir Forest - Cascades	cold forest
Mediterranean California Red Fir Forest - Southern Sierra	cold forest
Mediterranean California Subalpine Woodland	cold forest
Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest - Lodgepole Pine	cold forest
Northern Rocky Mountain Subalpine Woodland and Parkland	cold forest
Northwestern Great Plains Highland White Spruce Woodland	cold forest
Rocky Mountain Lodgepole Pine Forest	cold forest
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	cold forest
Rocky Mountain Subalpine Mesic-Wet Spruce-Fir Forest and Woodland	cold forest
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	cold forest
Sierra Nevada Subalpine Lodgepole Pine Forest and Woodland	cold forest
Sierra Nevada Subalpine Lodgepole Pine Forest and Woodland - Wet	cold forest
Sierra Nevada Subalpine Lodgepole Pine Forest and Woodland - Dry	cold forest

Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland - High Elevation	cold forest
Rocky Mountain Subalpine/Upper Montane Riparian Systems	cold forest
Northern Rocky Mountain Conifer Swamp	cold forest
Rocky Mountain Poor-Site Lodgepole Pine Forest	cold forest
North Pacific Wooded Volcanic Flowage	cold forest
North Pacific Oak Woodland	dry forest
Northwestern Great Plains Aspen Forest and Parkland	dry forest
Rocky Mountain Aspen Forest and Woodland	dry forest
Rocky Mountain Bigtooth Maple Ravine Woodland	dry forest
Western Great Plains Dry Bur Oak Forest and Woodland	dry forest
Central and Southern California Mixed Evergreen Woodland	dry forest
Colorado Plateau Pinyon-Juniper Woodland	dry forest
Columbia Plateau Western Juniper Woodland and Savanna	dry forest
Great Basin Pinyon-Juniper Woodland	dry forest
Madrean Encinal	dry forest
Madrean Lower Montane Pine-Oak Forest and Woodland	dry forest
Madrean Pinyon-Juniper Woodland	dry forest
Mediterranean California Dry-Mesic Mixed Conifer Forest and Woodland	dry forest
Mediterranean California Mixed Oak Woodland	dry forest
Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	dry forest
California Montane Jeffrey Pine(-Ponderosa Pine) Woodland	dry forest
North Pacific Dry Douglas-fir(-Madrone) Forest and Woodland	dry forest
Mediterranean California Mixed Evergreen Forest	dry forest
Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest	dry forest
Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest - Ponderosa Pine-Douglas-fir	dry forest
Rocky Mountain Foothill Limber Pine-Juniper Woodland	dry forest
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	dry forest
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	dry forest
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna - Mesic	dry forest
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna - Xeric	dry forest
Southern Rocky Mountain Ponderosa Pine Woodland	dry forest
Southern Rocky Mountain Ponderosa Pine Woodland - South	dry forest
Southern Rocky Mountain Ponderosa Pine Woodland - North	dry forest
Southern Rocky Mountain Pinyon-Juniper Woodland	dry forest
East Cascades Oak-Ponderosa Pine Forest and Woodland	dry forest
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	dry forest
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland - Low Elevation	dry forest
North Pacific Broadleaf Landslide Forest and Shrubland	dry forest
Colorado Plateau Pinyon-Juniper Shrubland	dry forest
California Central Valley Mixed Oak Savanna	dry forest
California Coastal Live Oak Woodland and Savanna	dry forest
California Lower Montane Blue Oak-Foothill Pine Woodland and Savanna	dry forest
Inter-Mountain Basins Juniper Savanna	dry forest
Madrean Juniper Savanna	dry forest

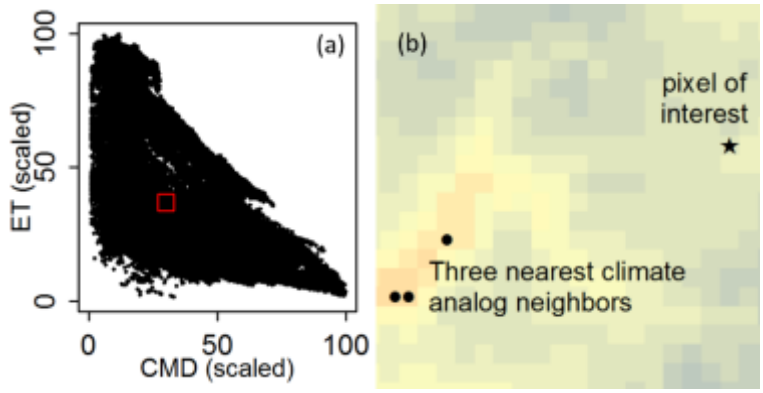
Southern Rocky Mountain Ponderosa Pine Savanna	dry forest
Southern Rocky Mountain Ponderosa Pine Savanna - South	dry forest
Southern Rocky Mountain Ponderosa Pine Savanna - North	dry forest
Southern California Oak Woodland and Savanna	dry forest
Southern Rocky Mountain Juniper Woodland and Savanna	dry forest
Willamette Valley Upland Prairie and Savanna	dry forest
California Central Valley Riparian Woodland and Shrubland	dry forest
California Montane Riparian Systems	dry forest
Inter-Mountain Basins Montane Riparian Systems	dry forest
North American Warm Desert Riparian Systems	dry forest
North American Warm Desert Riparian Systems	dry forest
North American Warm Desert Riparian Systems - Stringers	dry forest
North Pacific Lowland Riparian Forest and Shrubland	dry forest
North Pacific Montane Riparian Woodland and Shrubland - Dry	dry forest
Rocky Mountain Montane Riparian Systems	dry forest
Western Great Plains Floodplain Systems	dry forest
Northern Rocky Mountain Foothill Conifer Wooded Steppe	dry forest
Middle Rocky Mountain Montane Douglas-fir Forest and Woodland	dry forest
Middle Rocky Mountain Montane Douglas-fir Forest and Woodland	dry forest
Middle Rocky Mountain Montane Douglas-fir Forest and Woodland - Fire-maintained Savanna	dry forest
Klamath-Siskiyou Xeromorphic Serpentine Savanna and Chaparral	dry forest
Sierran-Intermontane Desert Western White Pine-White Fir Woodland	dry forest
Northwestern Great Plains-Black Hills Ponderosa Pine Woodland and Savanna	dry forest
Northwestern Great Plains-Black Hills Ponderosa Pine Woodland and Savanna - Low Elevation Woodland	dry forest
Northwestern Great Plains-Black Hills Ponderosa Pine Woodland and Savanna - Savanna	dry forest
Edwards Plateau Limestone Shrubland	dry forest
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	shrubland/grassland
Chihuahuan Gypsophilous Grassland and Steppe	shrubland/grassland
Columbia Plateau Steppe and Grassland	shrubland/grassland
California Central Valley and Southern Coastal Grassland	shrubland/grassland
California Mesic Serpentine Grassland	shrubland/grassland
California Northern Coastal Grassland	shrubland/grassland
Central Mixedgrass Prairie	shrubland/grassland
Chihuahuan Sandy Plains Semi-Desert Grassland	shrubland/grassland
Columbia Basin Foothill and Canyon Dry Grassland	shrubland/grassland
Inter-Mountain Basins Semi-Desert Grassland	shrubland/grassland
Mediterranean California Alpine Dry Tundra	shrubland/grassland
Mediterranean California Subalpine Meadow	shrubland/grassland
North Pacific Montane Grassland	shrubland/grassland
Northern Rocky Mountain Lower Montane-Foothill-Valley Grassland	shrubland/grassland
Northern Rocky Mountain Subalpine-Upper Montane Grassland	shrubland/grassland
Northwestern Great Plains Mixedgrass Prairie	shrubland/grassland
Columbia Basin Palouse Prairie	shrubland/grassland

Rocky Mountain Alpine Fell-Field	shrubland/grassland
Rocky Mountain Alpine Turf	shrubland/grassland
Rocky Mountain Subalpine-Montane Mesic Meadow	shrubland/grassland
Southern Rocky Mountain Montane-Subalpine Grassland	shrubland/grassland
Western Great Plains Foothill and Piedmont Grassland	shrubland/grassland
Western Great Plains Sand Prairie	shrubland/grassland
Western Great Plains Shortgrass Prairie	shrubland/grassland
Western Great Plains Tallgrass Prairie	shrubland/grassland
Pacific Coastal Marsh Systems	shrubland/grassland
North Pacific Alpine and Subalpine Dry Grassland	shrubland/grassland
Great Plains Prairie Pothole	shrubland/grassland
Western Great Plains Depressional Wetland Systems	shrubland/grassland
Western Great Plains Depressional Wetland Systems - Playa	shrubland/grassland
Western Great Plains Depressional Wetland Systems - Saline	shrubland/grassland
Chihuahuan Loamy Plains Desert Grassland	shrubland/grassland
Chihuahuan-Sonoran Desert Bottomland and Swale Grassland	shrubland/grassland
Chihuahuan-Sonoran Desert Bottomland and Swale Grassland - Tobosa Grassland	shrubland/grassland
Chihuahuan-Sonoran Desert Bottomland and Swale Grassland - Alkali Sacaton	shrubland/grassland
Mediterranean California Mesic Serpentine Woodland and Chaparral	shrubland/grassland
Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland	shrubland/grassland
Colorado Plateau Mixed Low Sagebrush Shrubland	shrubland/grassland
Columbia Plateau Scabland Shrubland	shrubland/grassland
Inter-Mountain Basins Mat Saltbush Shrubland	shrubland/grassland
Mediterranean California Alpine Fell-Field	shrubland/grassland
North Pacific Dry and Mesic Alpine Dwarf-Shrubland or Fell-field or Meadow	shrubland/grassland
Rocky Mountain Alpine Dwarf-Shrubland	shrubland/grassland
Sierra Nevada Alpine Dwarf-Shrubland	shrubland/grassland
Wyoming Basins Dwarf Sagebrush Shrubland and Steppe	shrubland/grassland
Chihuahuan Creosotebush Desert Scrub	shrubland/grassland
Chihuahuan Mixed Salt Desert Scrub	shrubland/grassland
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	shrubland/grassland
Chihuahuan Succulent Desert Scrub	shrubland/grassland
Colorado Plateau Blackbrush-Mormon-tea Shrubland	shrubland/grassland
Great Basin Xeric Mixed Sagebrush Shrubland	shrubland/grassland
Inter-Mountain Basins Big Sagebrush Shrubland	shrubland/grassland
Inter-Mountain Basins Big Sagebrush Shrubland - Basin Big Sagebrush	shrubland/grassland
Inter-Mountain Basins Big Sagebrush Shrubland - Wyoming Big Sagebrush	shrubland/grassland
Inter-Mountain Basins Mixed Salt Desert Scrub	shrubland/grassland
Inter-Mountain Basins Mixed Salt Desert Scrub - South	shrubland/grassland
Inter-Mountain Basins Mixed Salt Desert Scrub - North	shrubland/grassland
Mojave Mid-Elevation Mixed Desert Scrub	shrubland/grassland
North Pacific Avalanche Chute Shrubland	shrubland/grassland
North Pacific Montane Shrubland	shrubland/grassland
Northwestern Great Plains Shrubland	shrubland/grassland
Rocky Mountain Lower Montane-Foothill Shrubland	shrubland/grassland

Rocky Mountain Lower Montane-Foothill Shrubland - No True Mountain Mahogany	shrubland/grassland
Rocky Mountain Lower Montane-Foothill Shrubland - True Mountain Mahogany	shrubland/grassland
Sonora-Mojave Creosotebush-White Bursage Desert Scrub	shrubland/grassland
Sonora-Mojave Mixed Salt Desert Scrub	shrubland/grassland
Sonoran Granite Outcrop Desert Scrub	shrubland/grassland
Sonoran Mid-Elevation Desert Scrub	shrubland/grassland
Southern California Coastal Scrub	shrubland/grassland
Southern Colorado Plateau Sand Shrubland	shrubland/grassland
Western Great Plains Sandhill Steppe	shrubland/grassland
Apacherian-Chihuahuan Mesquite Upland Scrub	shrubland/grassland
California Maritime Chaparral	shrubland/grassland
California Mesic Chaparral	shrubland/grassland
California Montane Woodland and Chaparral	shrubland/grassland
California Xeric Serpentine Chaparral	shrubland/grassland
Chihuahuan Mixed Desert and Thorn Scrub	shrubland/grassland
Chihuahuan Mixed Desert Shrubland	shrubland/grassland
Chihuahuan Grama Grass-Creosote Steppe	shrubland/grassland
Madrean Oriental Chaparral	shrubland/grassland
Great Basin Semi-Desert Chaparral	shrubland/grassland
Mogollon Chaparral	shrubland/grassland
Northern and Central California Dry-Mesic Chaparral	shrubland/grassland
Northern Rocky Mountain Montane-Foothill Deciduous Shrubland	shrubland/grassland
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	shrubland/grassland
Rocky Mountain Gambel Oak-Mixed Montane Shrubland - Continuous	shrubland/grassland
Rocky Mountain Gambel Oak-Mixed Montane Shrubland - Patchy	shrubland/grassland
Sonora-Mojave Semi-Desert Chaparral	shrubland/grassland
Sonoran Paloverde-Mixed Cacti Desert Scrub	shrubland/grassland
Southern California Dry-Mesic Chaparral	shrubland/grassland
Western Great Plains Mesquite Woodland and Shrubland	shrubland/grassland
Columbia Plateau Low Sagebrush Steppe	shrubland/grassland
Inter-Mountain Basins Big Sagebrush Steppe	shrubland/grassland
Inter-Mountain Basins Montane Sagebrush Steppe	shrubland/grassland
Inter-Mountain Basins Montane Sagebrush Steppe - Mountain Big Sagebrush	shrubland/grassland
Inter-Mountain Basins Montane Sagebrush Steppe - Low Sagebrush	shrubland/grassland
Inter-Mountain Basins Semi-Desert Shrub-Steppe	shrubland/grassland
Northern California Coastal Scrub	shrubland/grassland
Inter-Mountain Basins Greasewood Flat	shrubland/grassland
Western Great Plains Wooded Draw and Ravine	shrubland/grassland
Perennial Ice/Snow	sparse/barren
Barren-Rock/Sand/Clay	sparse/barren
Inter-Mountain Basins Sparsely Vegetated Systems	sparse/barren
Mediterranean California Sparsely Vegetated Systems	sparse/barren
North Pacific Sparsely Vegetated Systems	sparse/barren
North American Warm Desert Sparsely Vegetated Systems	sparse/barren
Rocky Mountain Alpine/Montane Sparsely Vegetated Systems	sparse/barren

Western Great Plains Sparsely Vegetated Systems	sparse/barren
Northwestern Great Plains Canyon	sparse/barren

Appendix B. As an illustration of our methods, the red box in panel a shows the reference period climate space representing climate analogs for the pixel of interest mapped in panel b. The pixel of interest (b) is projected to have the following values in a future time period (scaled; see Methods): climatic moisture deficit (CMD)=30 and evapotranspiration (ET)=37. Consequently, the red box in panel a represents ±3.125 scaled units from the climate values for the pixel of interest (see Methods). The map in panel b also shows the locations of the three nearest neighbor pixels which have reference climate values equivalent to the future climate values for the pixel of interest; these represent the three closest pixels (geographic distance) of all climate analogs residing in the domain outlined by the red box in panel a. Fire return interval and percent replacement severity values for the three nearest neighbors are averaged and used to define the analog fire regime characteristics for the pixel of interest. The most common vegetation type among the three nearest climate analogs was used to quantify potential changes to vegetation (see Methods). The background in panel b represents CMD (cooler colors represent wetter pixels and warmer colors represent drier pixels).



Appendix C. Sensitivity analysis

Figure C1. Varying numbers of climate analogs (1, 3, 9, and 27) were used to characterize future fire regime characteristics along the climatic moisture deficit. Fitted splines of the fire return interval (a) and percent replacement severity (b) for the reference period, 2025, 2055, and 2085. We used the three nearest analogs to characterize future fire regime characteristics in the main paper.

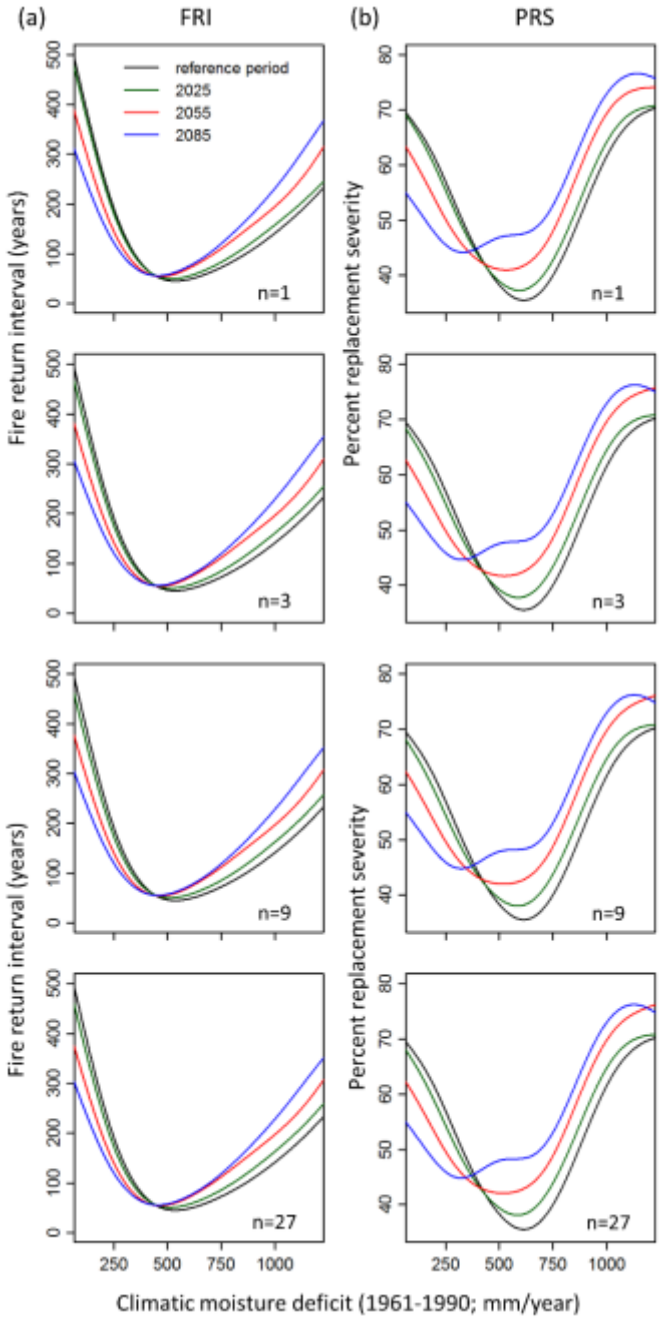


Figure C2. Varying numbers of climate analogs were used to characterize reverence period and future vegetation: one climate analog (a), three climate analogs (b), none climate analogs (c), and 27 climate analogs (d). We used the three nearest analogs to characterize future fire regime characteristics in the main paper. The color black represents sparse/barren vegetation.

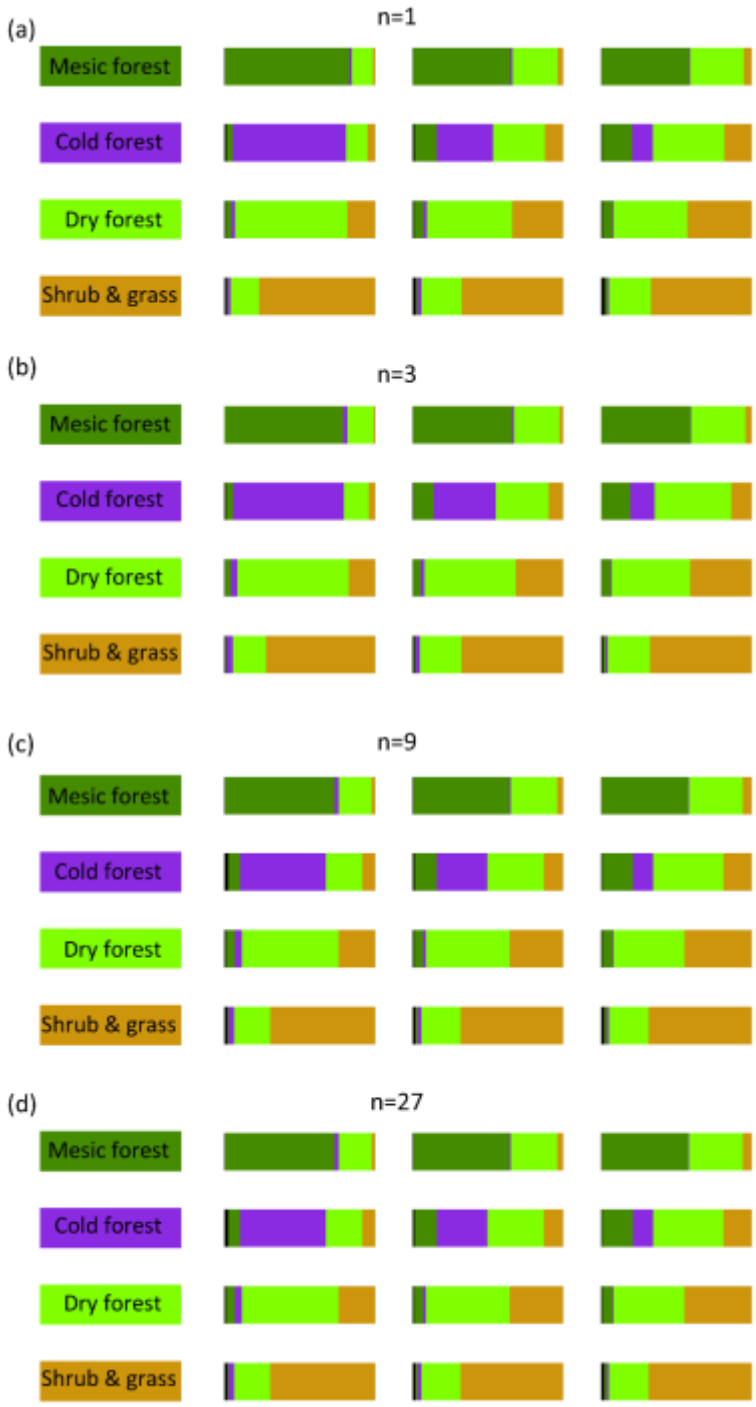


Figure C3. Varying bin widths were used to identify climate analogs in order to characterize future fire regime characteristics along a gradient represented by the climatic moisture deficit. These bin widths include 1/10th (a), 1/16th (b), 1/20th (c), and 1/25th (d) of the data range for CMD and ET. We used a bin width of 1/16 of the data range in the main paper.

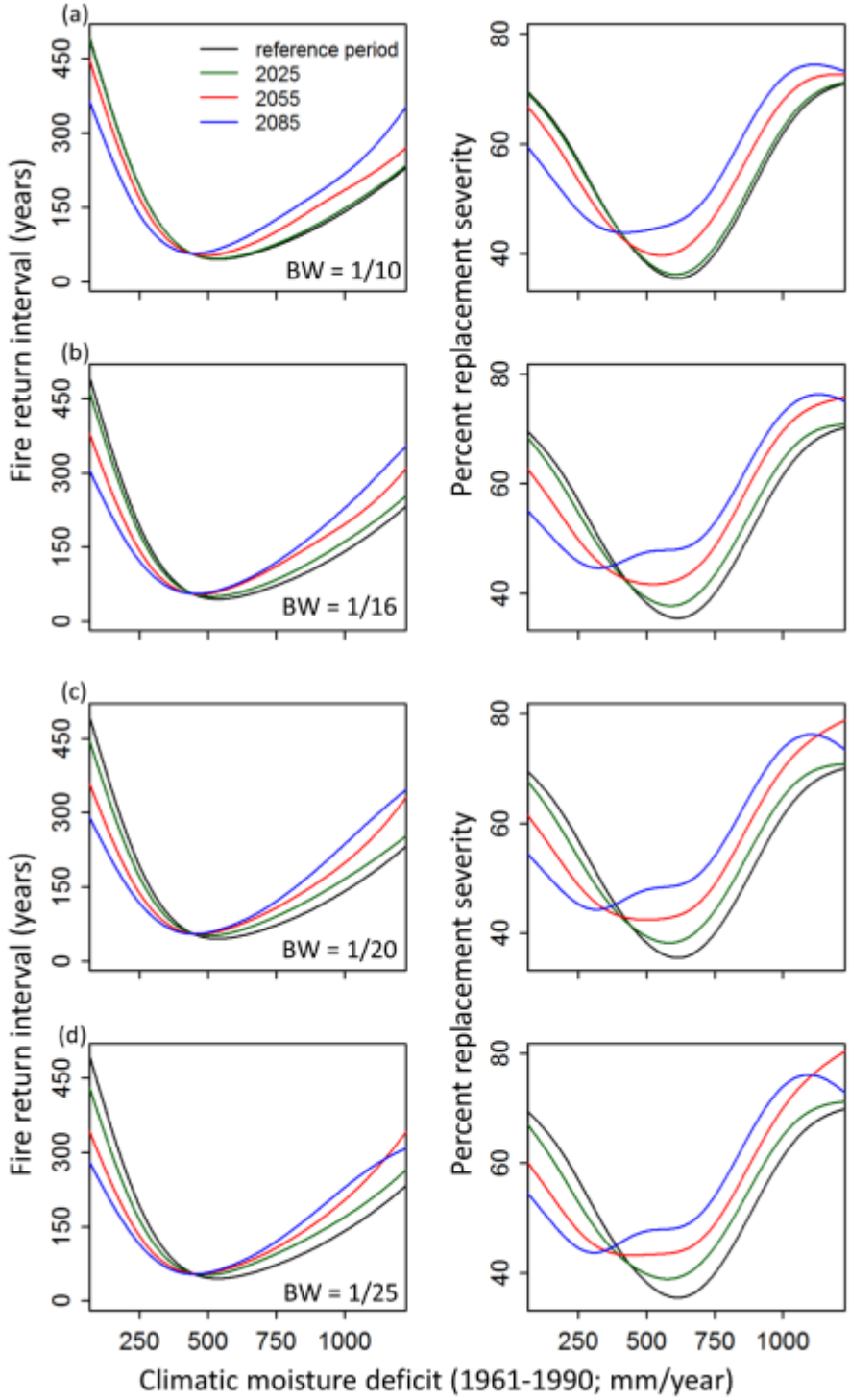


Figure C4. Varying bin widths were used to identify climate analogs and characterize potential vegetation shifts in mountainous regions of the western US. These bin widths include 1/10th (a), 1/16th (b), 1/20th (c), and 1/25th (d) of the data range for CMD and ET. We used a bin width of 1/16 of the data range in the main paper.

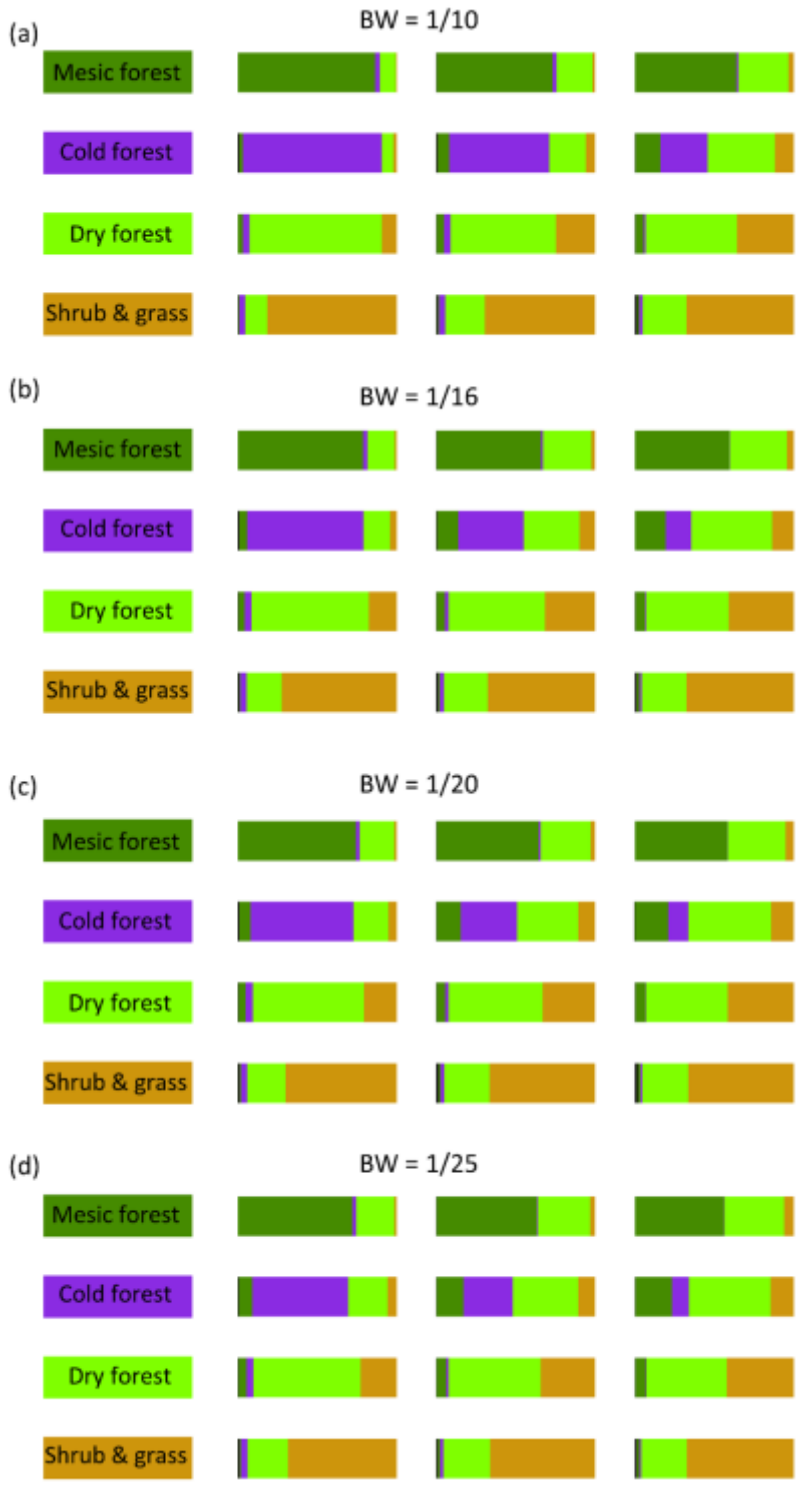


Figure C5. Comparison of results using two different approaches to identify climate analogs and characterize future fire regime characteristics along the climatic moisture deficit. Climate analogs were identified using the climatic moisture deficit and evapotranspiration (a) and using the first and second principal components of a PCA analysis (b). We identified climate analogs using the climatic moisture deficit and evapotranspiration (a) in the main paper.

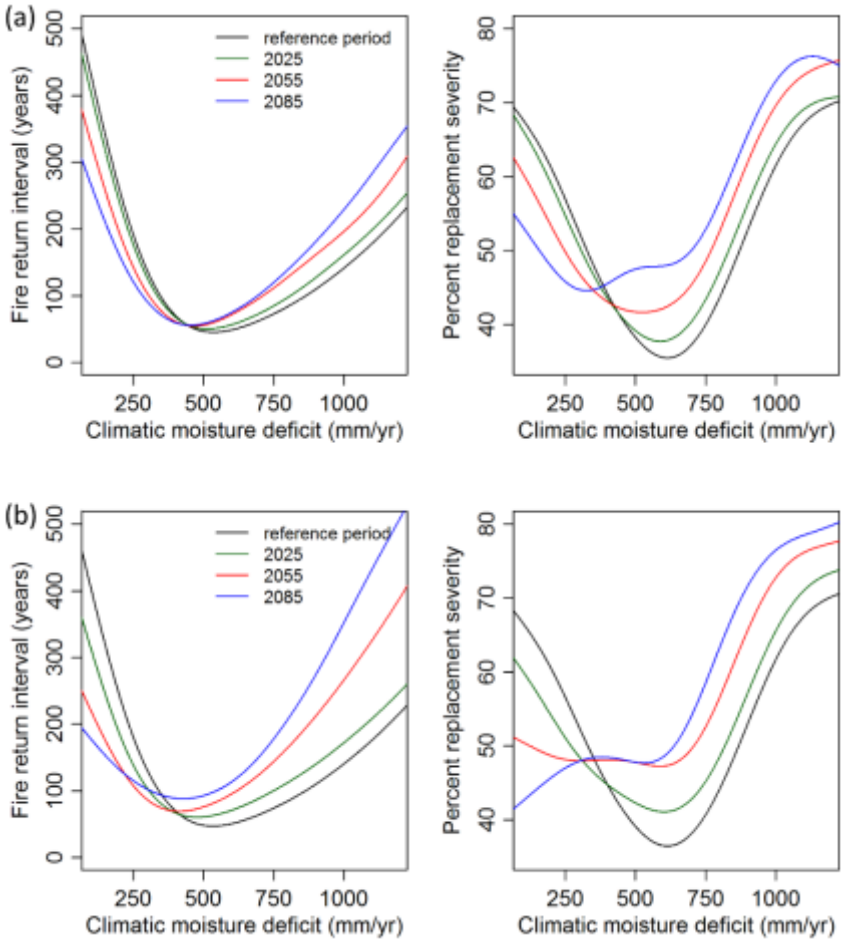
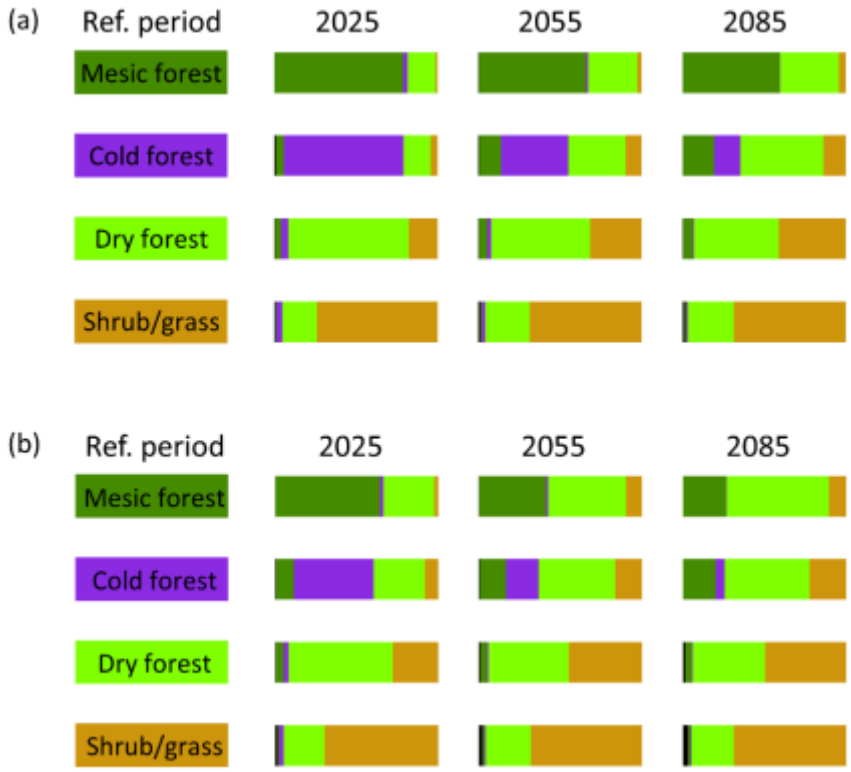


Figure C6. Comparison of results using two different approaches to identify climate analogs and characterize potential changes in reference period vegetation. Climate analogs were identified using the climatic moisture deficit and evapotranspiration (a) and using the first and second principal components of a PCA analysis (b). We identified climate analogs using the climatic moisture deficit and evapotranspiration (a) in the main paper.



Methods for figures C5 and CF6

Figures C5a and C6a were developed using methods described in the main paper and are identical Fig 3 and 5c, respectively. Figures C5b and C6b were developed using principal components analysis to characterize climate and identify climate analogs. Specifically, 26 climatic variables were obtained from Wang et al. (2016) (available at https://adaptwest.databasin.org/) for the reference period (1961-1990) and future time periods (2011-2040, 2041-2070, and 2070-2100). These variables (for the reference time period) were then incorporated into a principal components analysis (PCA). We used the first and second principal components (PC1 and PC1, respectively) to represent reference period climate. We then applied the PCA loadings for PC1 and PC2 to future climate data. PC1 and PC2 are used to characterize reference period climate and identify climate analogs in future time periods. The methods are exactly those described in the main paper, but PC1 and PC2 are used in place of climatic moisture deficit and evapotranspiration.

Appendix D. Table showing an example of how we incorporated 'overlapping climate bins'. In this example, the range of CMD values (i.e. the climate bin) for the reference time period (i.e. the climate analog) overlap even though the source pixel CMD values are different (compare among rows). This reduces boundary effects because pixels with incremental differences in climate values will never be associated with discretely different climate bins. This approach mimics that of Dobrowski and Parks (2016).

CMD[†] of source pixel for future time period	ET[†] of source pixel for future time period	CMD[†] range of climate analog for reference time period	ET[†] range of climate analog for reference time period
22	50	18.875 – 25.125	46.875 – 53.125
23	50	19.875 – 26.125	46.875 – 53.125
24	50	20.875 – 26.125	46.875 – 53.125

[†]Original CMD values are scaled from 1-100 (see Methods).

Appendix E. Maps of fire regime and vegetation shifts for 17 ecoregions in the western US.

Figure E1. Ecoregions in the western US for which we evaluated shifts to fire regimes and vegetation in response to climate change.

Figure E2. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the Pacific Northwest Coast ecoregion. See Fig D1 to reference the location of this ecoregion.

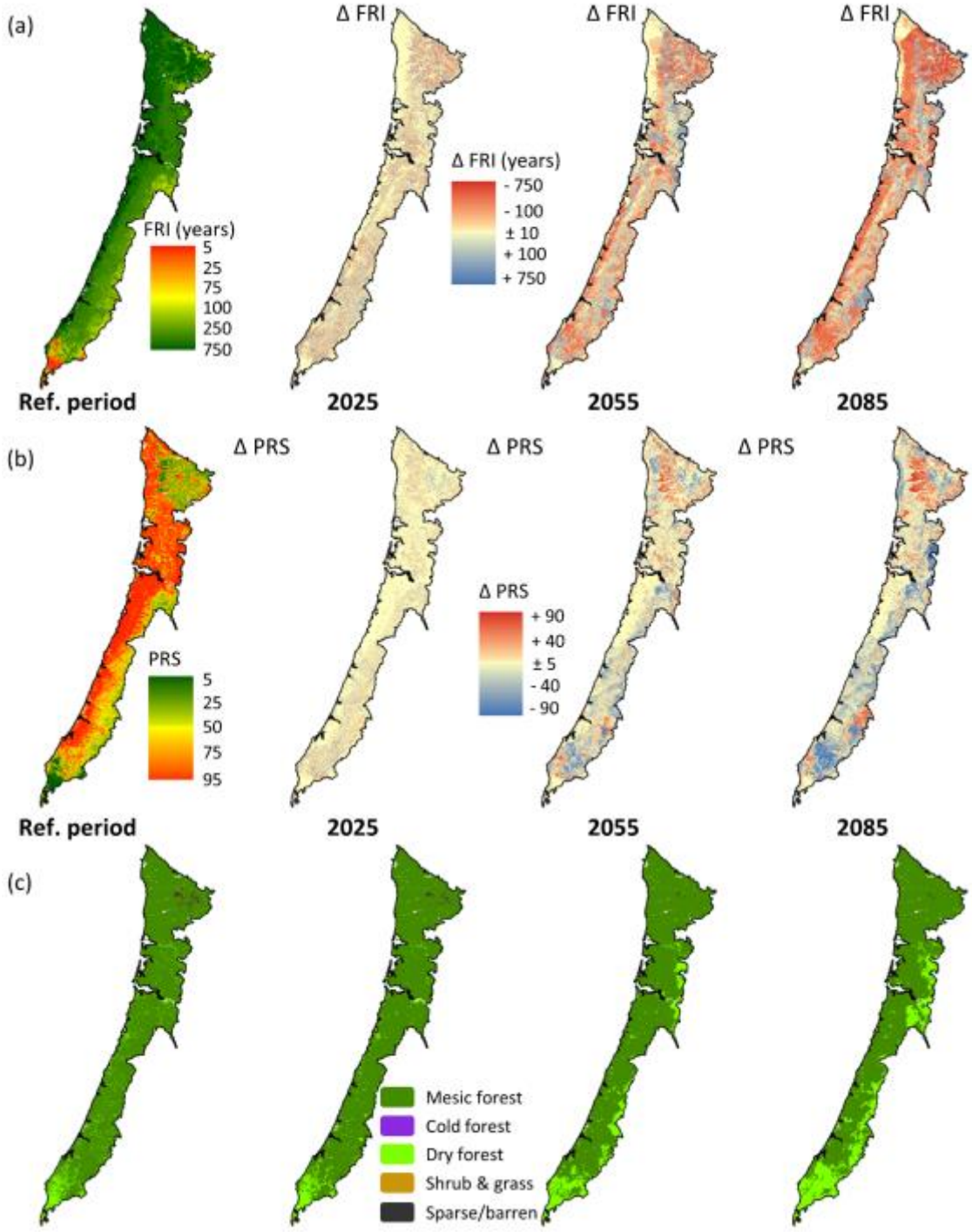


Figure E3. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the West Cascades ecoregion. See Fig D1 to reference the location of this ecoregion.

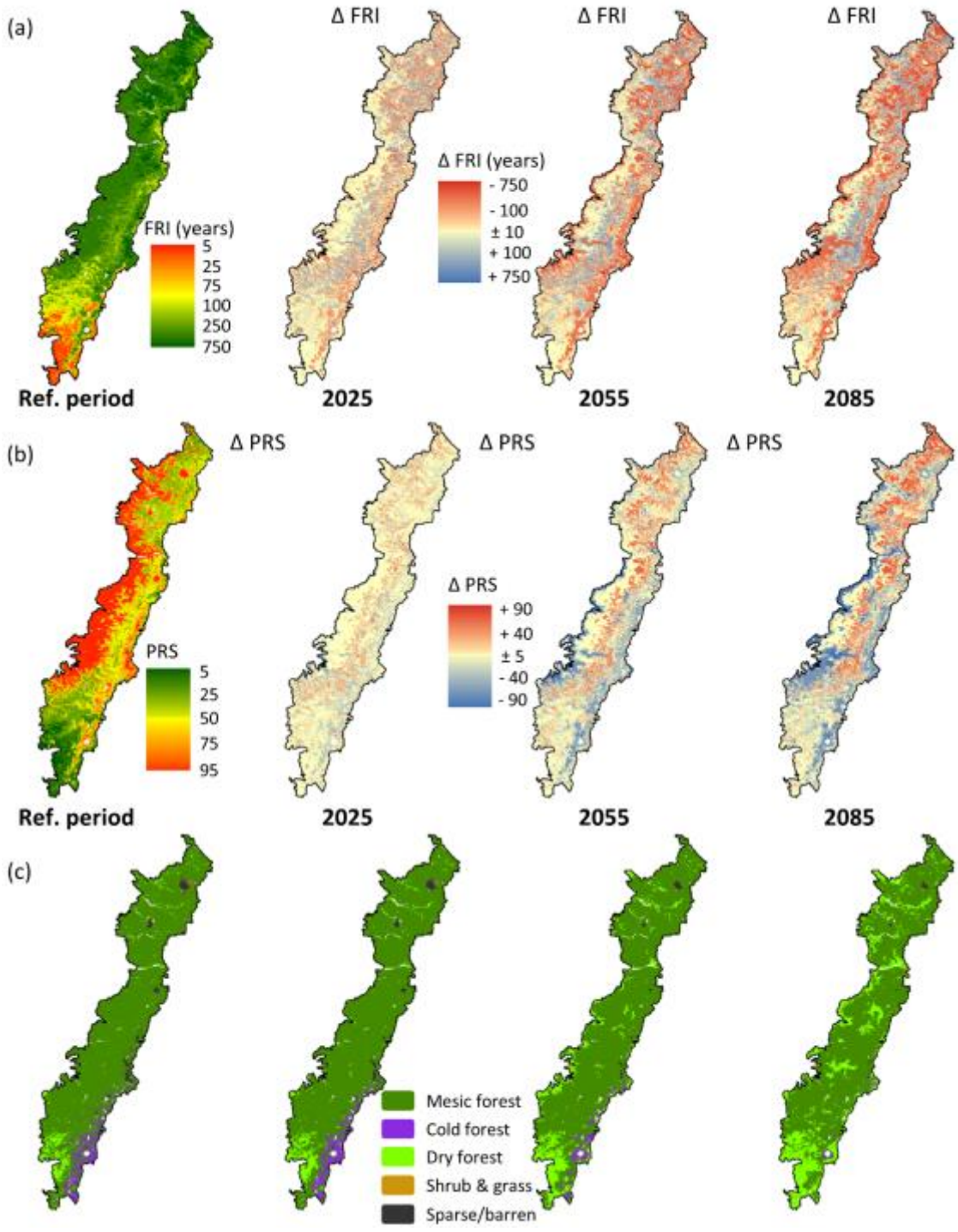


Figure E4. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the North Cascades ecoregion. See Fig D1 to reference the location of this ecoregion.

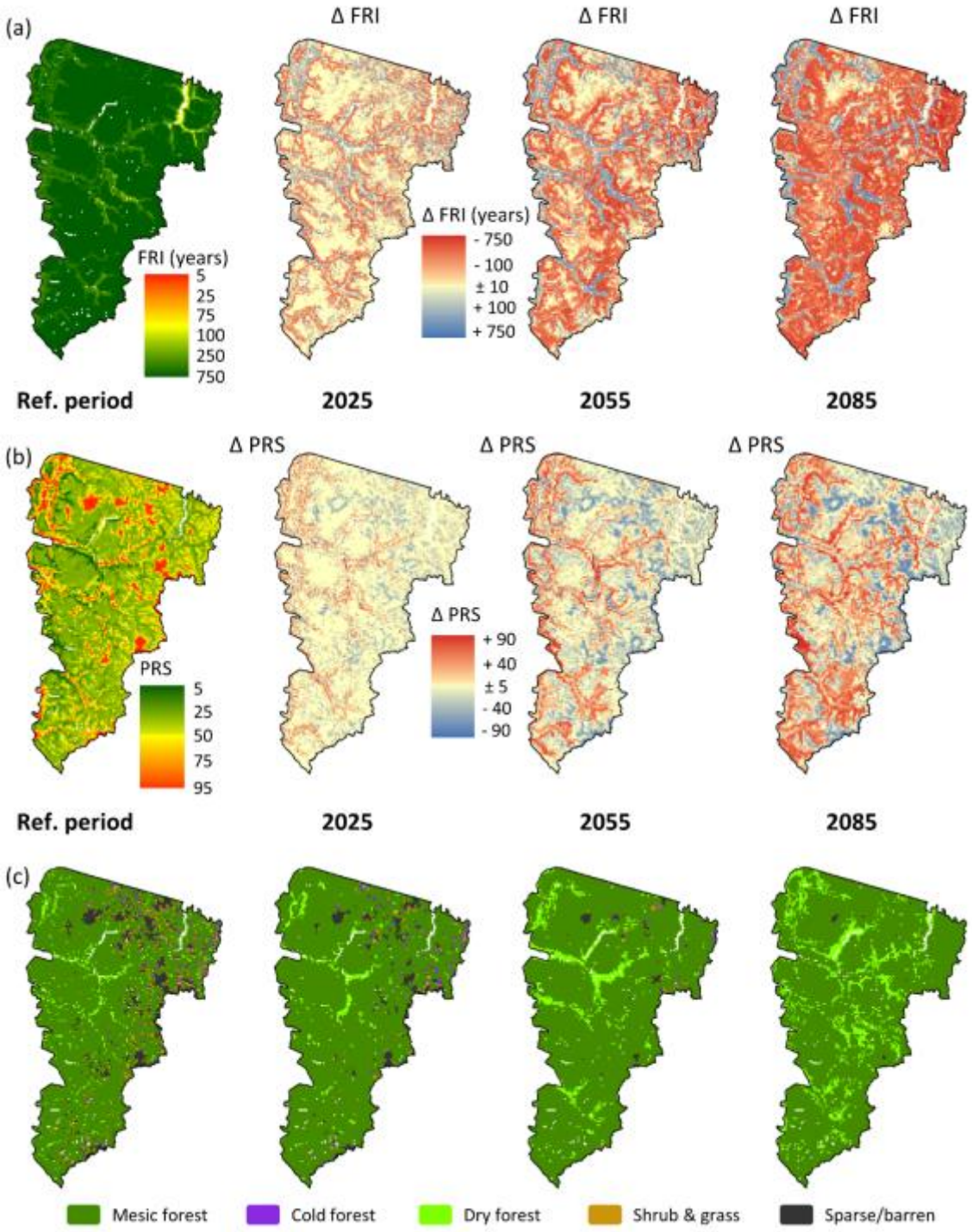


Figure E5. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the East Cascades ecoregion. See Fig D1 to reference the location of this ecoregion.

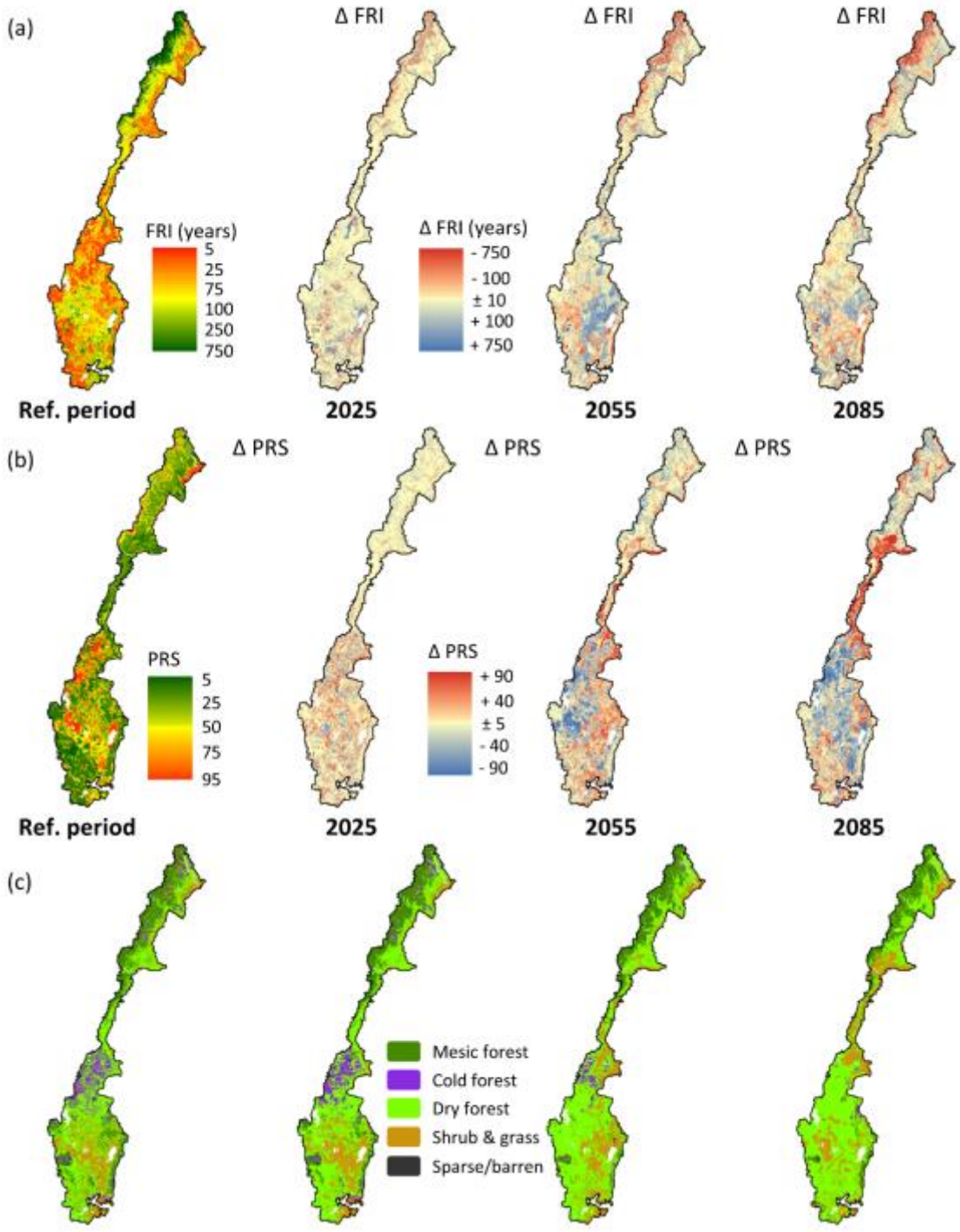


Figure E6. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the Okanagan ecoregion. See Fig D1 to reference the location of this ecoregion.

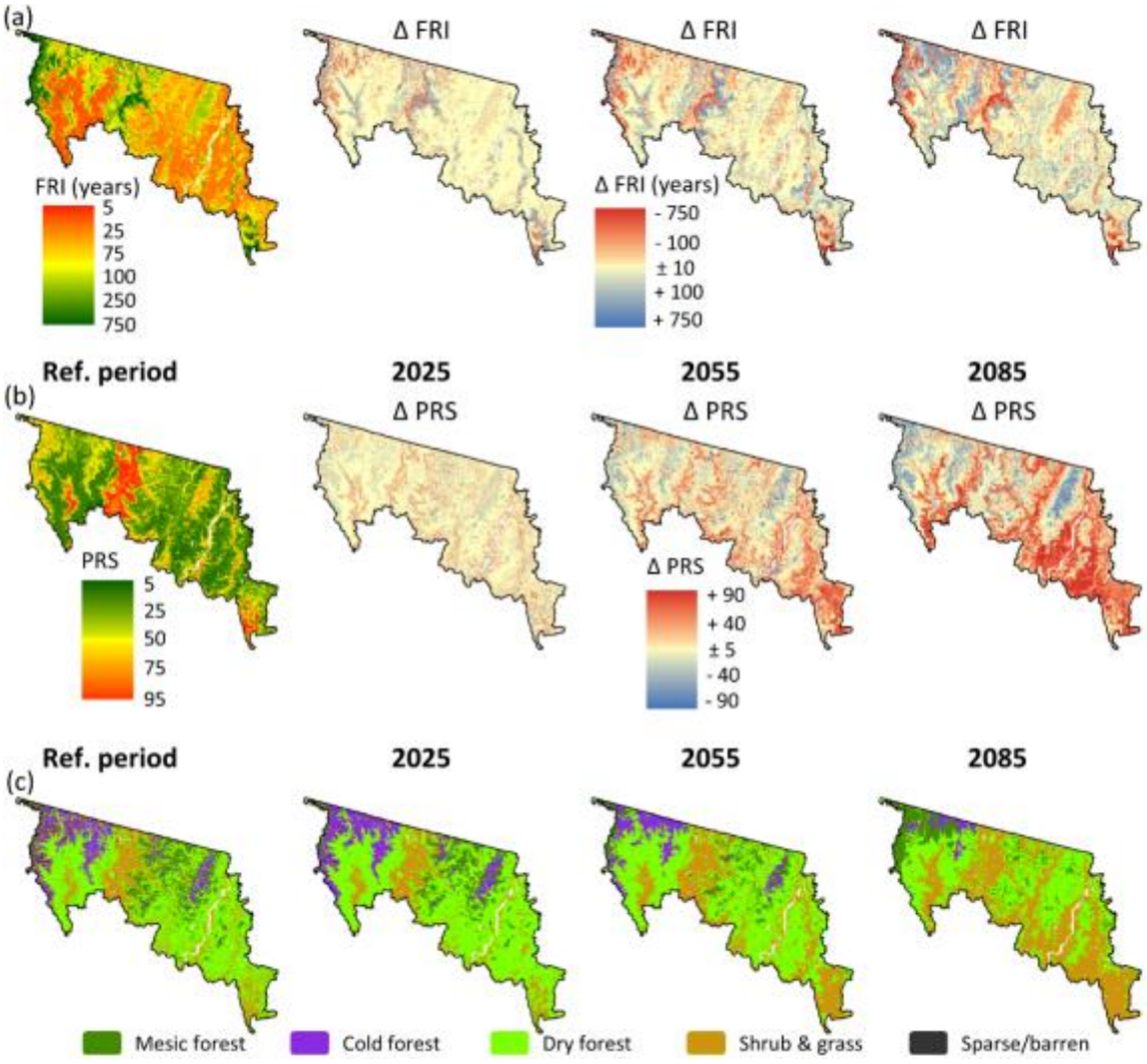


Figure E7. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the Canadian Rockies ecoregion. See Fig D1 to reference the location of this ecoregion.

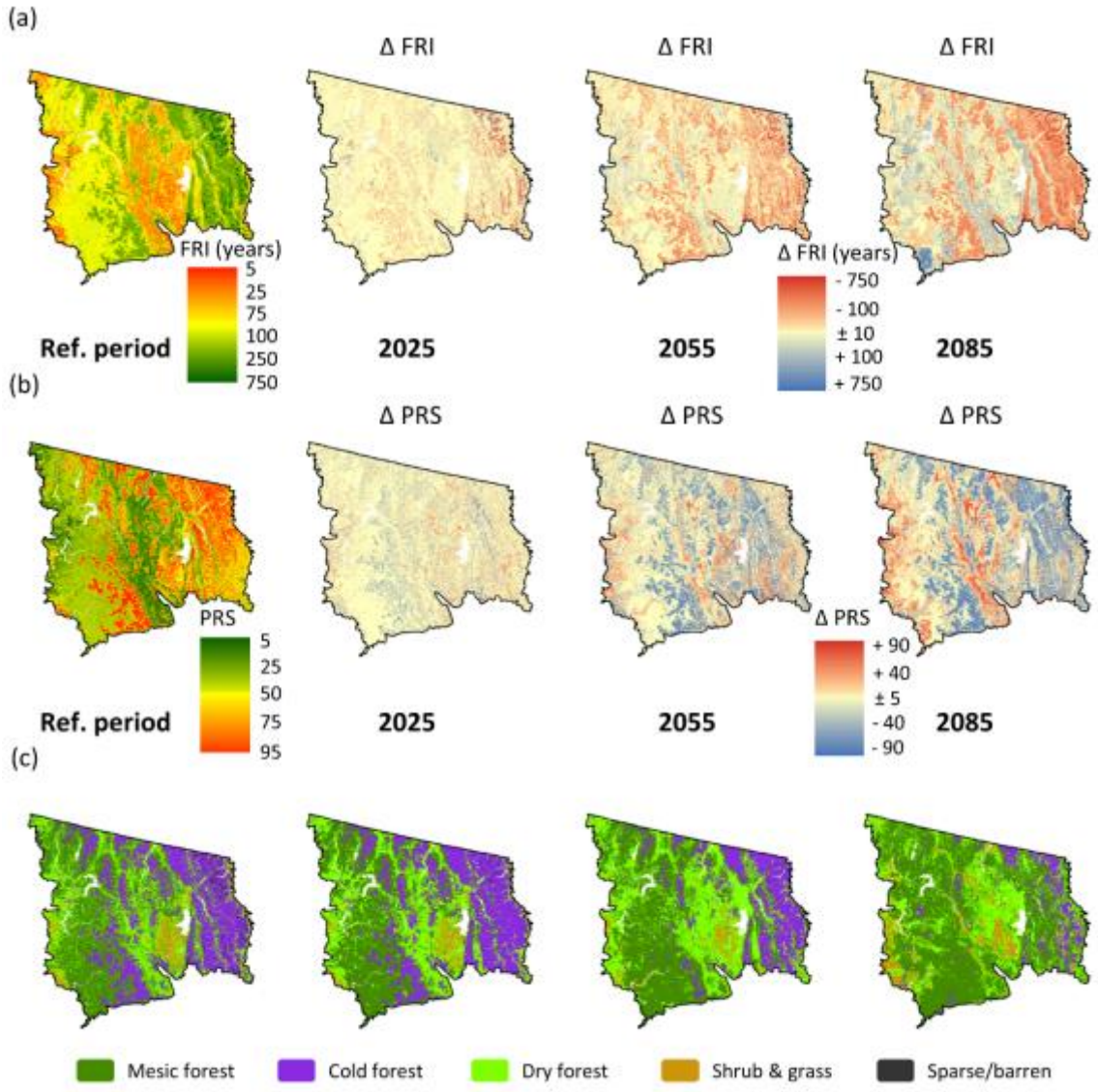


Figure E8. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the Middle Rockies ecoregion. See Fig D1 to reference the location of this ecoregion.

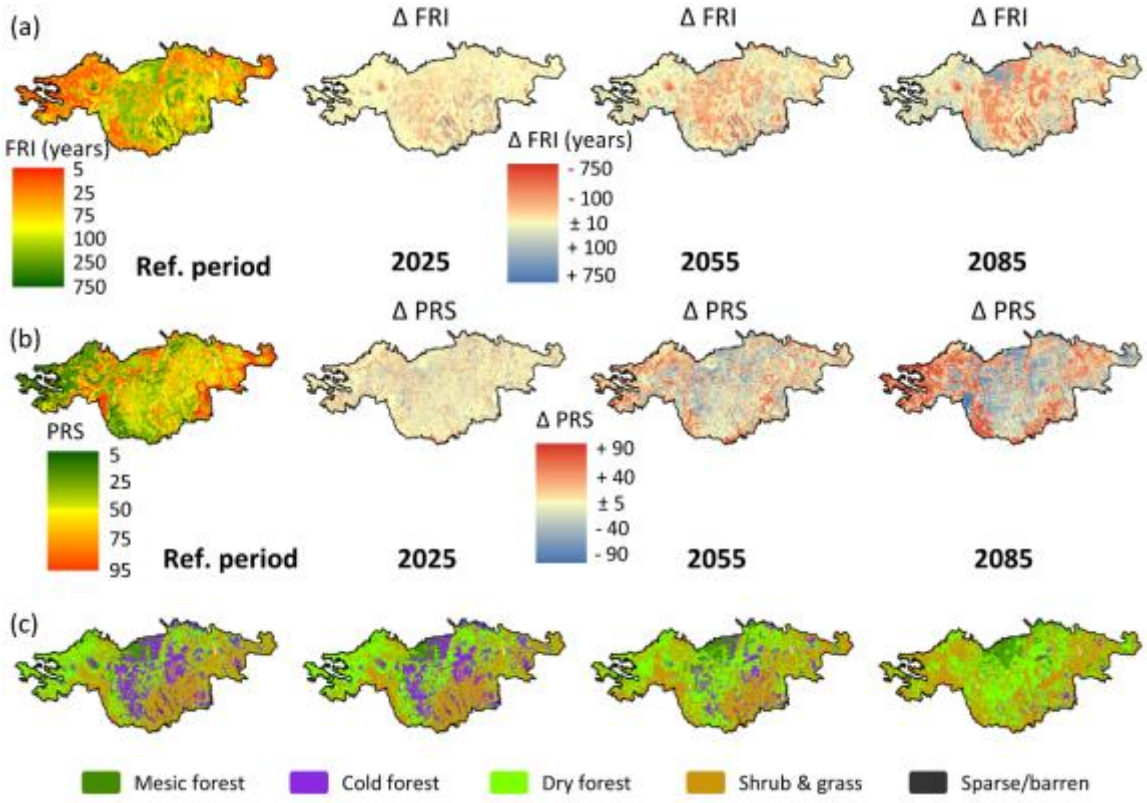


Figure E9. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the Utah-Wyoming Rockies ecoregion. See Fig D1 to reference the location of this ecoregion.

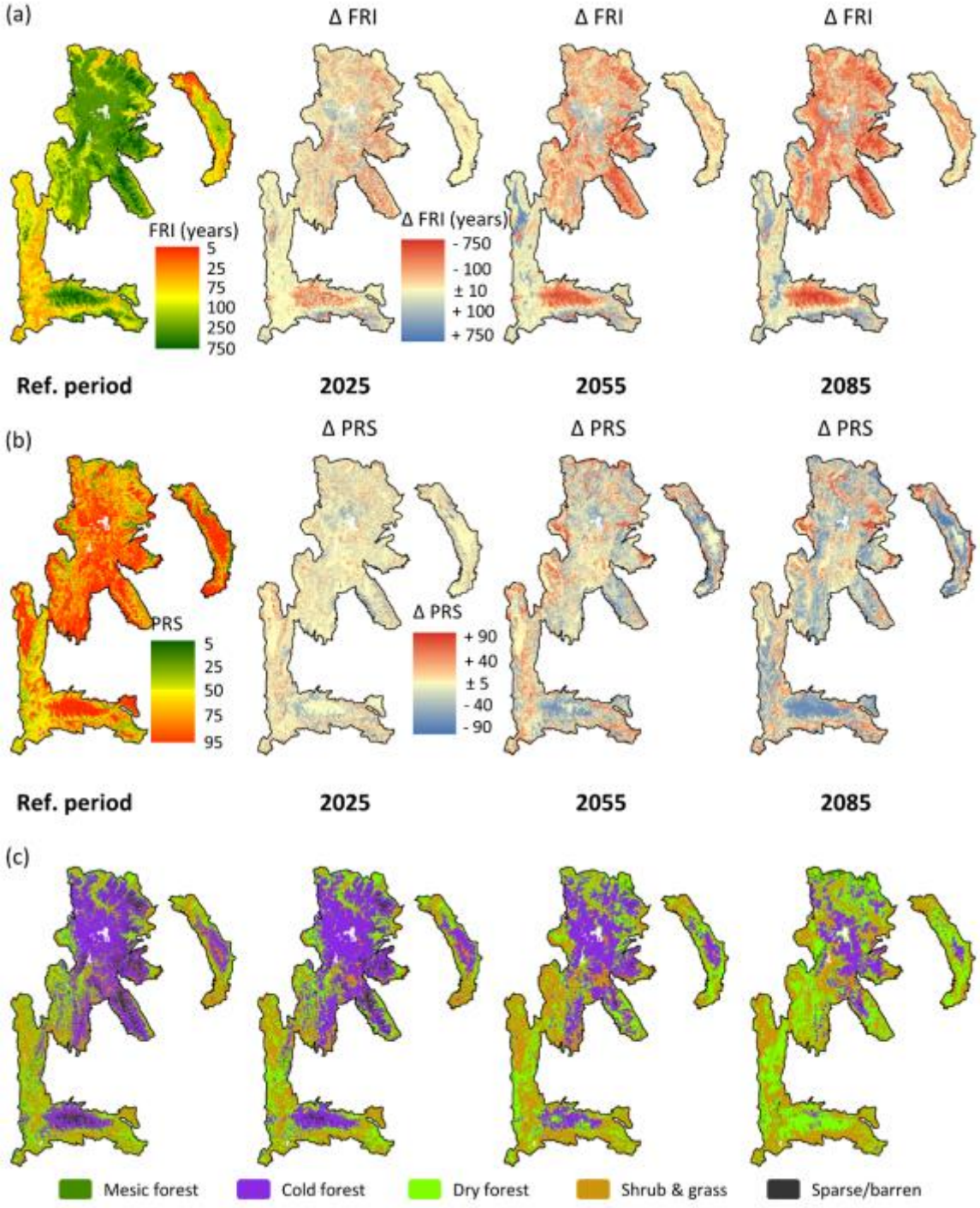


Figure E10. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the Utah High Plateaus ecoregion. See Fig D1 to reference the location of this ecoregion.

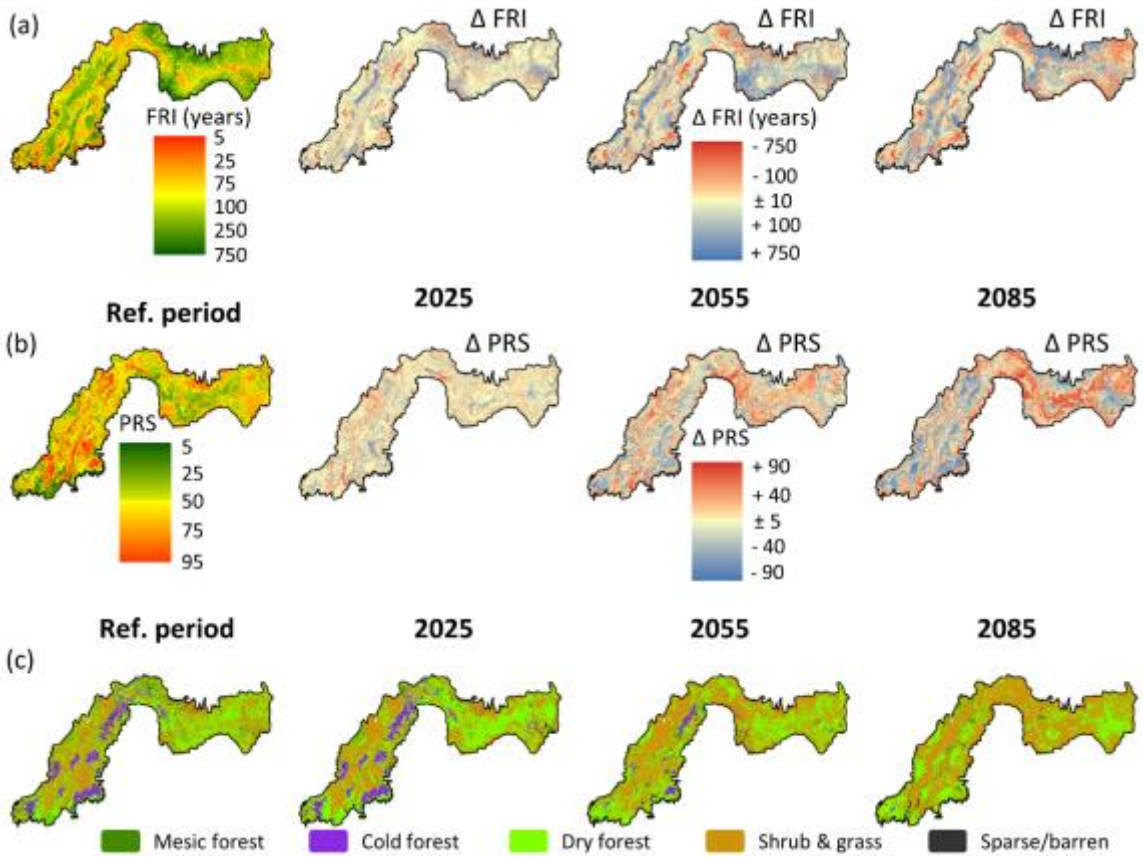


Figure E11. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the Southern Rockies ecoregion. See Fig D1 to reference the location of this ecoregion.

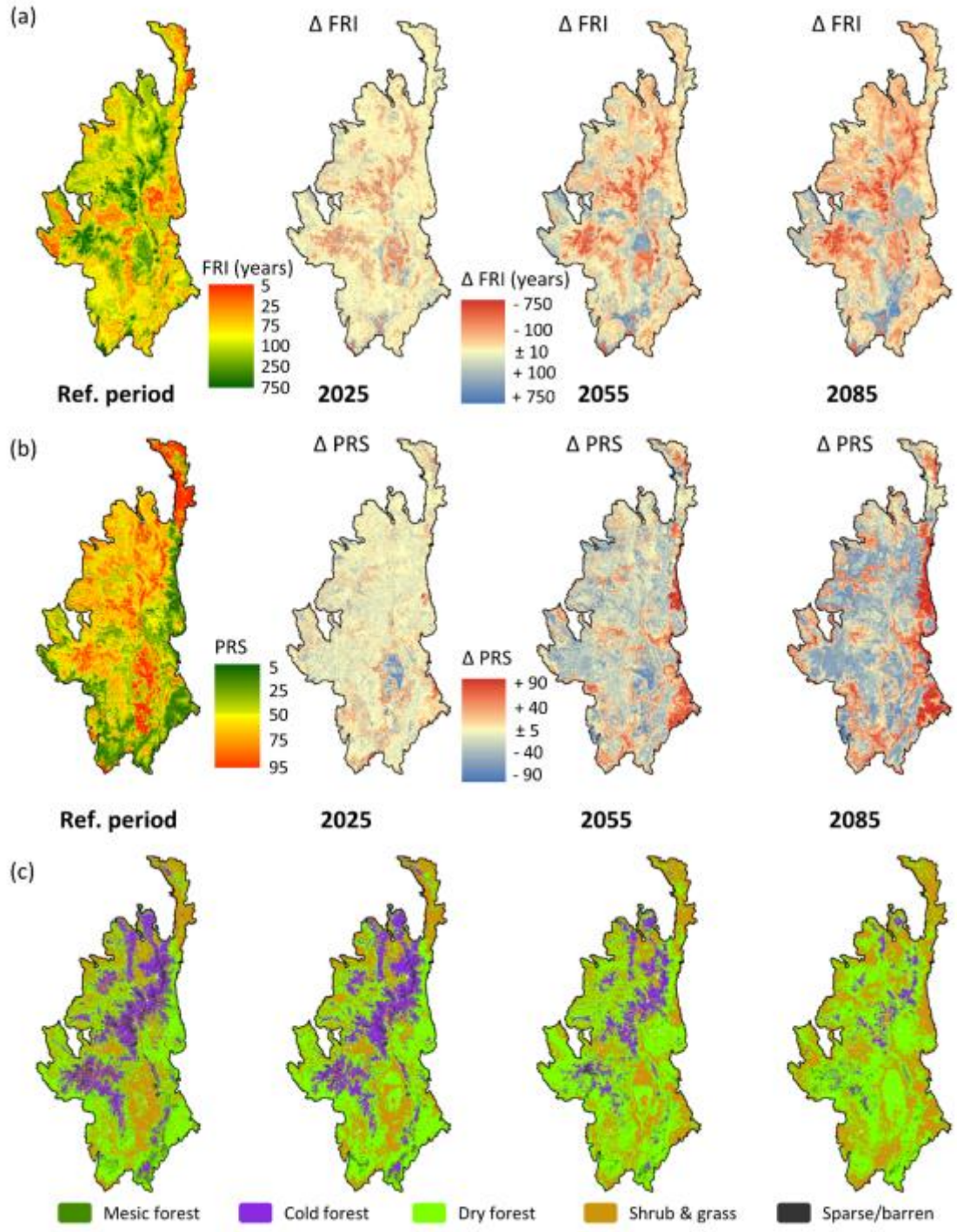


Figure E12. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the AZ-NM Mountains ecoregion. See Fig D1 to reference the location of this ecoregion.

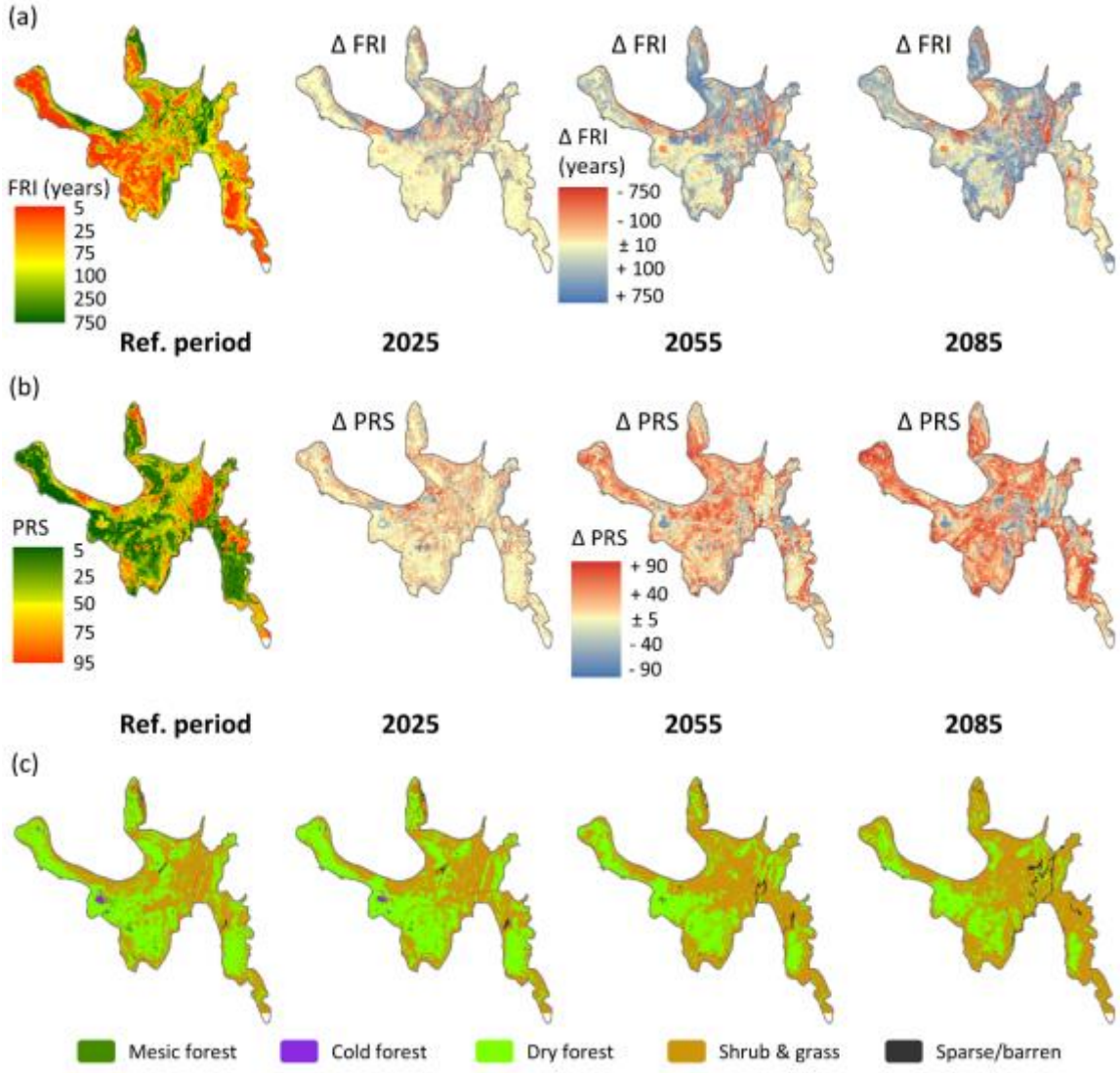


Figure E13. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the Apache Highlands ecoregion. See Fig D1 to reference the location of this ecoregion.

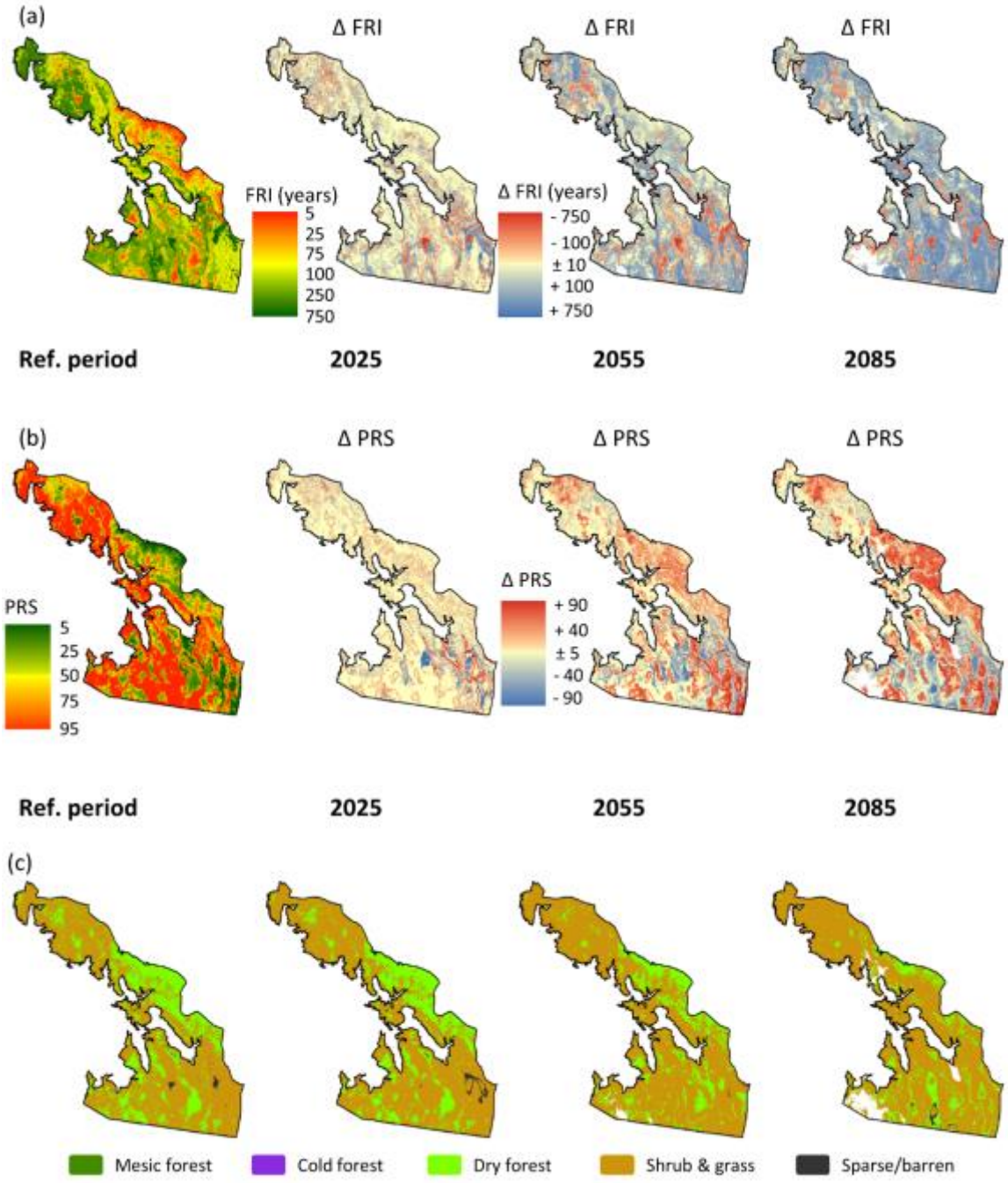


Figure E14. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the California South Coast ecoregion. See Fig D1 to reference the location of this ecoregion.

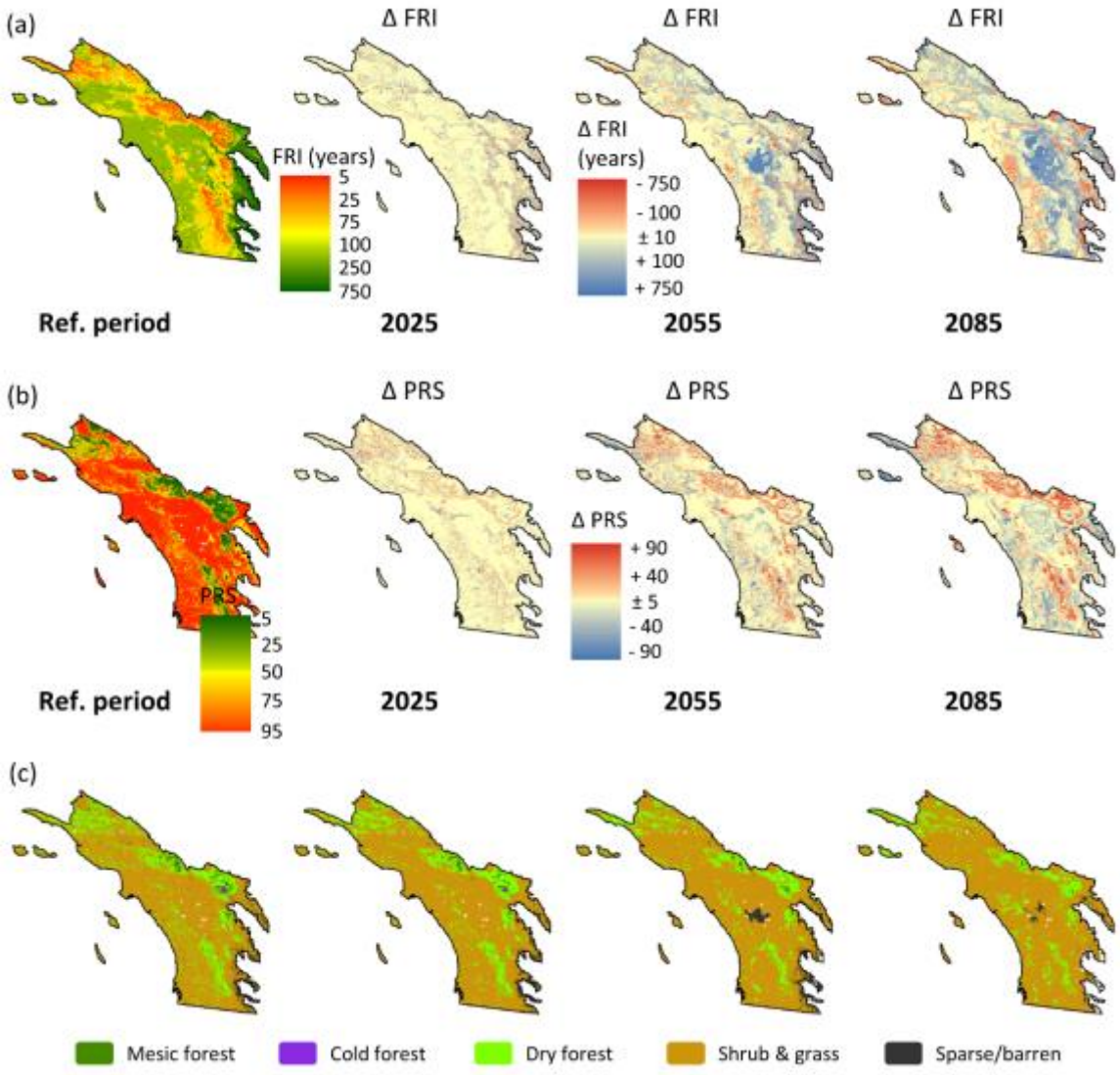


Figure E15. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the California Central Coast ecoregion. See Fig D1 to reference the location of this ecoregion.

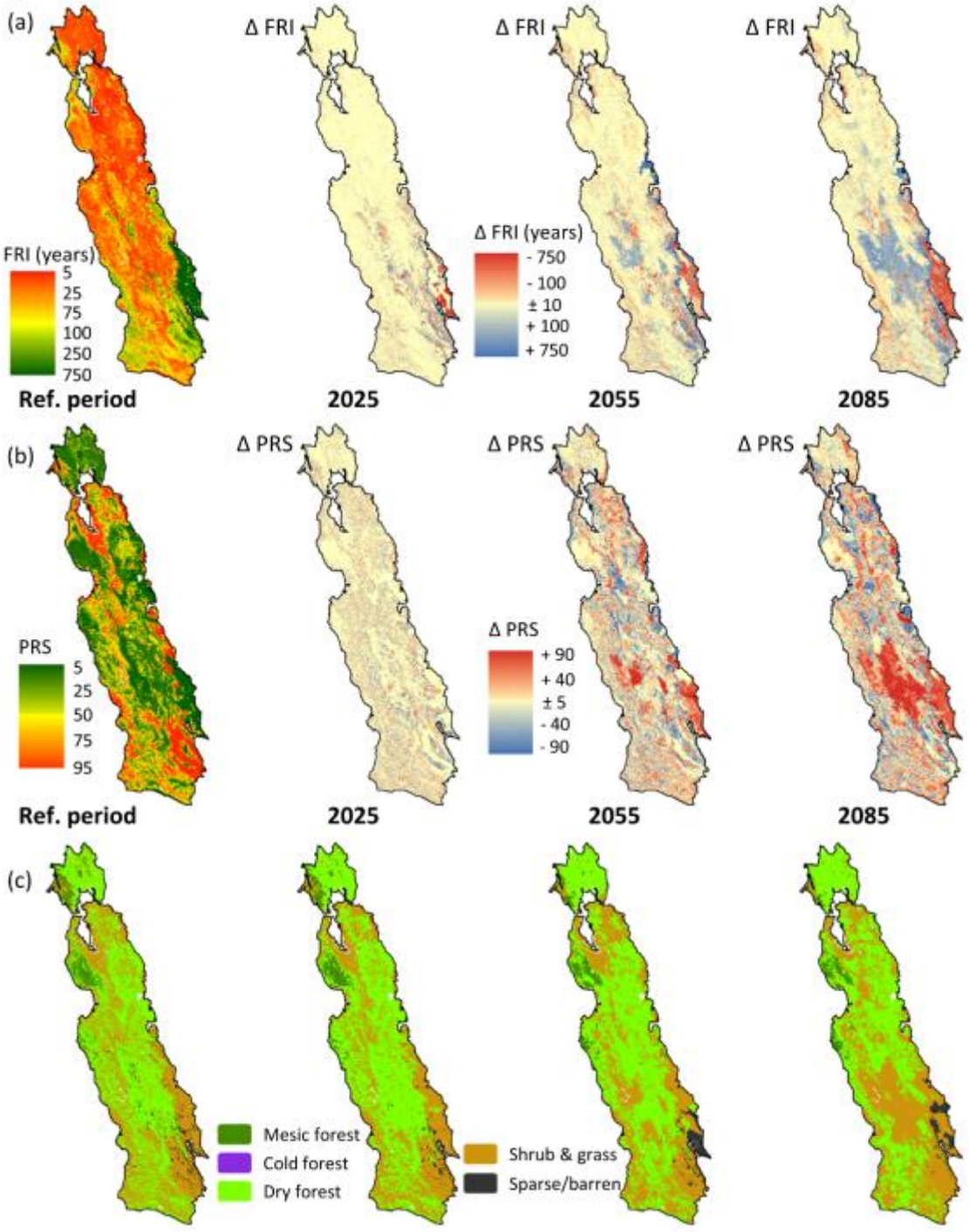


Figure E16. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the Sierra Nevada ecoregion. See Fig D1 to reference the location of this ecoregion.

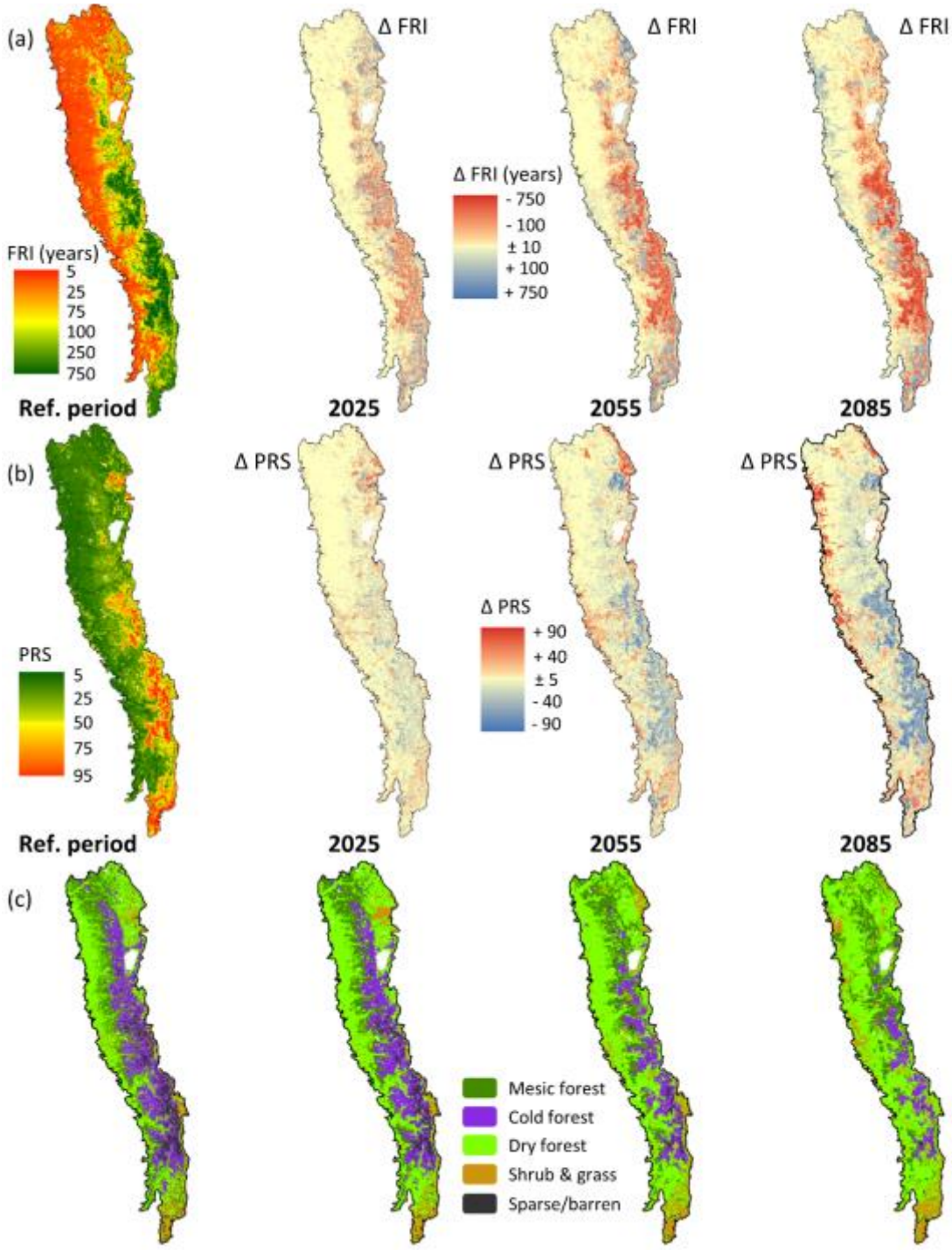


Figure E17. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the California North Coast ecoregion. See Fig D1 to reference the location of this ecoregion.

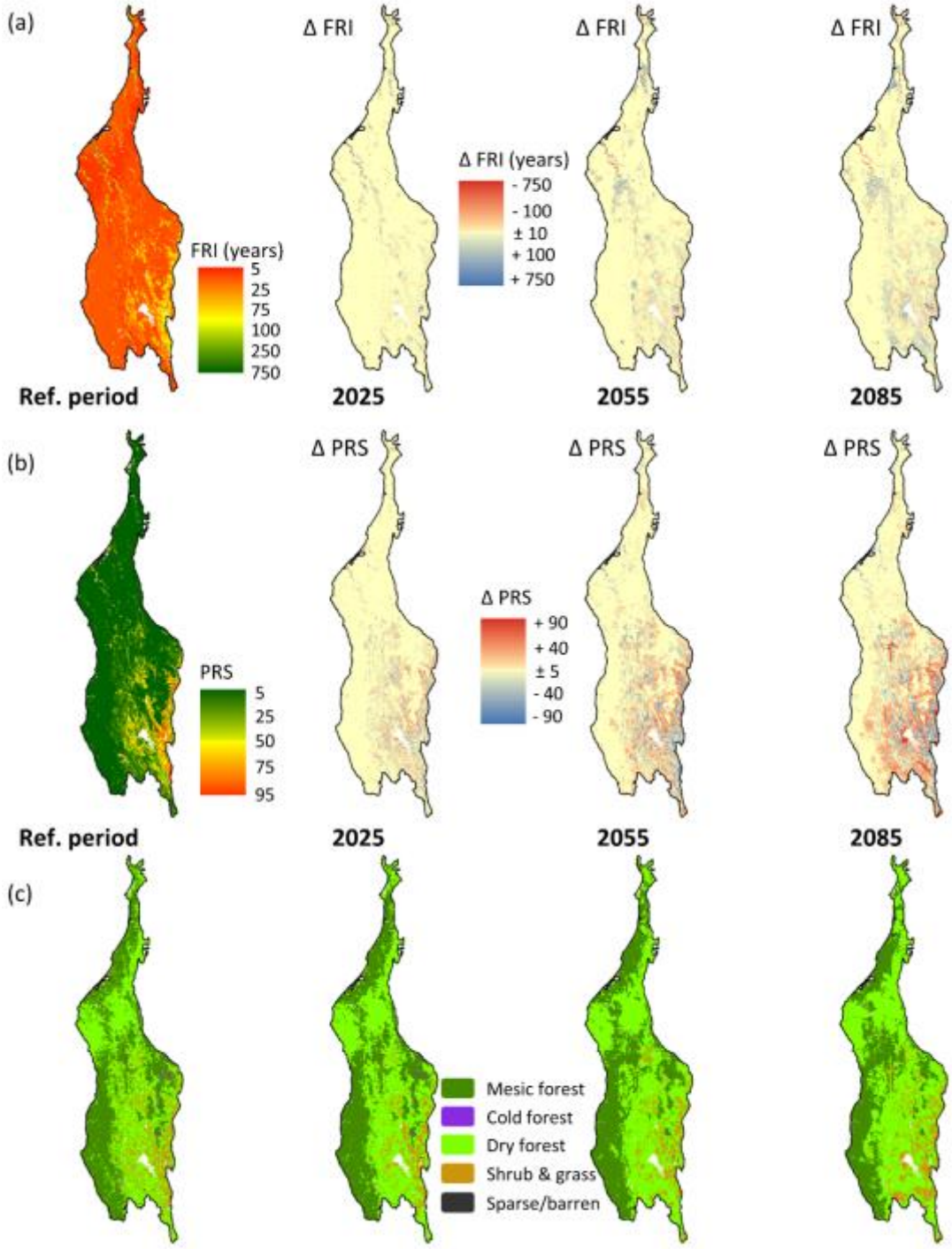
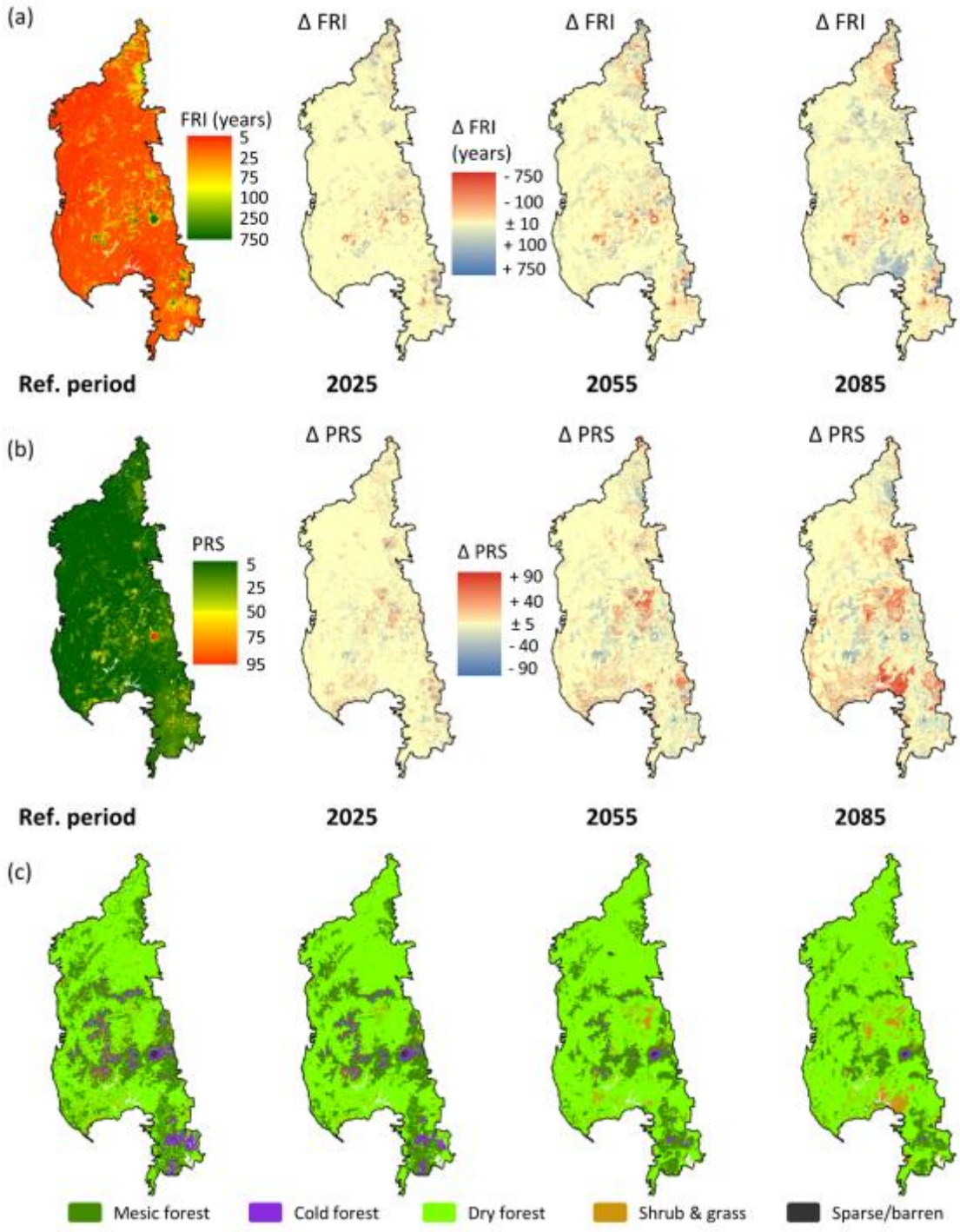


Figure E18. Maps depicting reference fire return interval and predicted changes through time (a), reference percent replacement severity and predicted changes through time (b), and reference period vegetation and potential distribution over time for the Klamath Mountains ecoregion. See Fig D1 to reference the location of this ecoregion.



Appendix F. Results indicating the total projected area (km^2) of each vegetation group.

Vegetation class	Reference period	2025	2055	2085
Sparse/barren	8,635	8,071	5,902	6,991
Mesic forest	187,361	177,112	174,322	178,384
Cold forest	177,508	171,289	99,469	39,132
Dry forest	439,240	468,484	488,558	492,281
Shrubland/grassland	364,961	352,749	409,454	460,717