

## Supplementary material

### Evaluating ecological resilience across wildfire suppression levels under climate and fuel treatment scenarios using landscape simulation modelling

Robert E. Keane<sup>A,D,E</sup>, Kathy Gray<sup>B</sup>, Brett Davis<sup>C</sup>, Lisa M. Holsinger<sup>A</sup> and Rachel Loehman<sup>D</sup>

<sup>A</sup>US Forest Service, Rocky Mountain Research Station, Missoula Fire Sciences Laboratory, 5775 Highway 10 West, Missoula, MT 59808, USA.

<sup>B</sup>California State University at Chico, Department of Math and Statistics, 400 West 1st Avenue, Chico, CA 95929-052, USA.

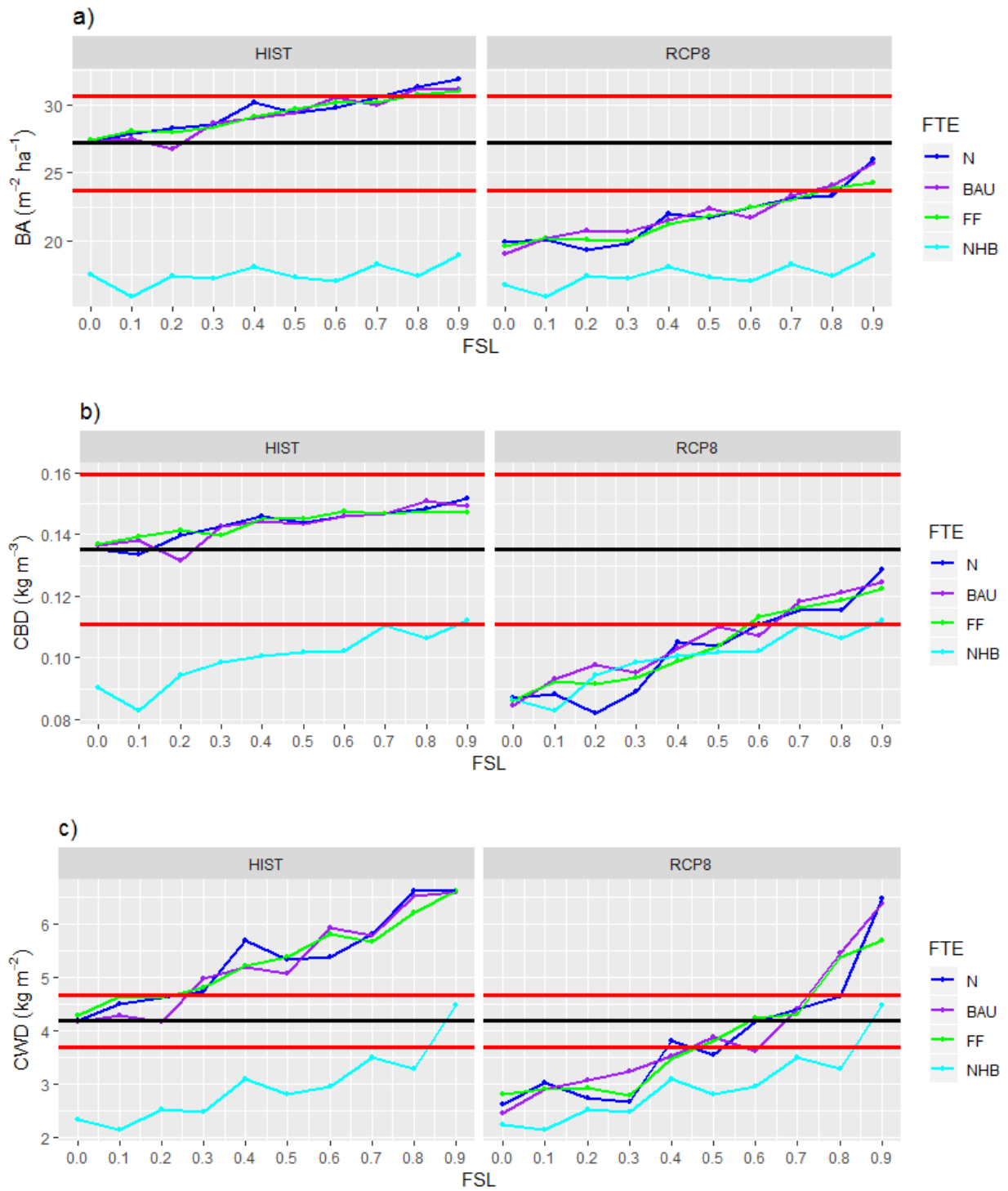
<sup>C</sup>US Forest Service, Pacific Northwest Research Station, Resource Monitoring and Assessment Program, 620 SW Main Street Suite 502, Portland, OR 97205, USA.

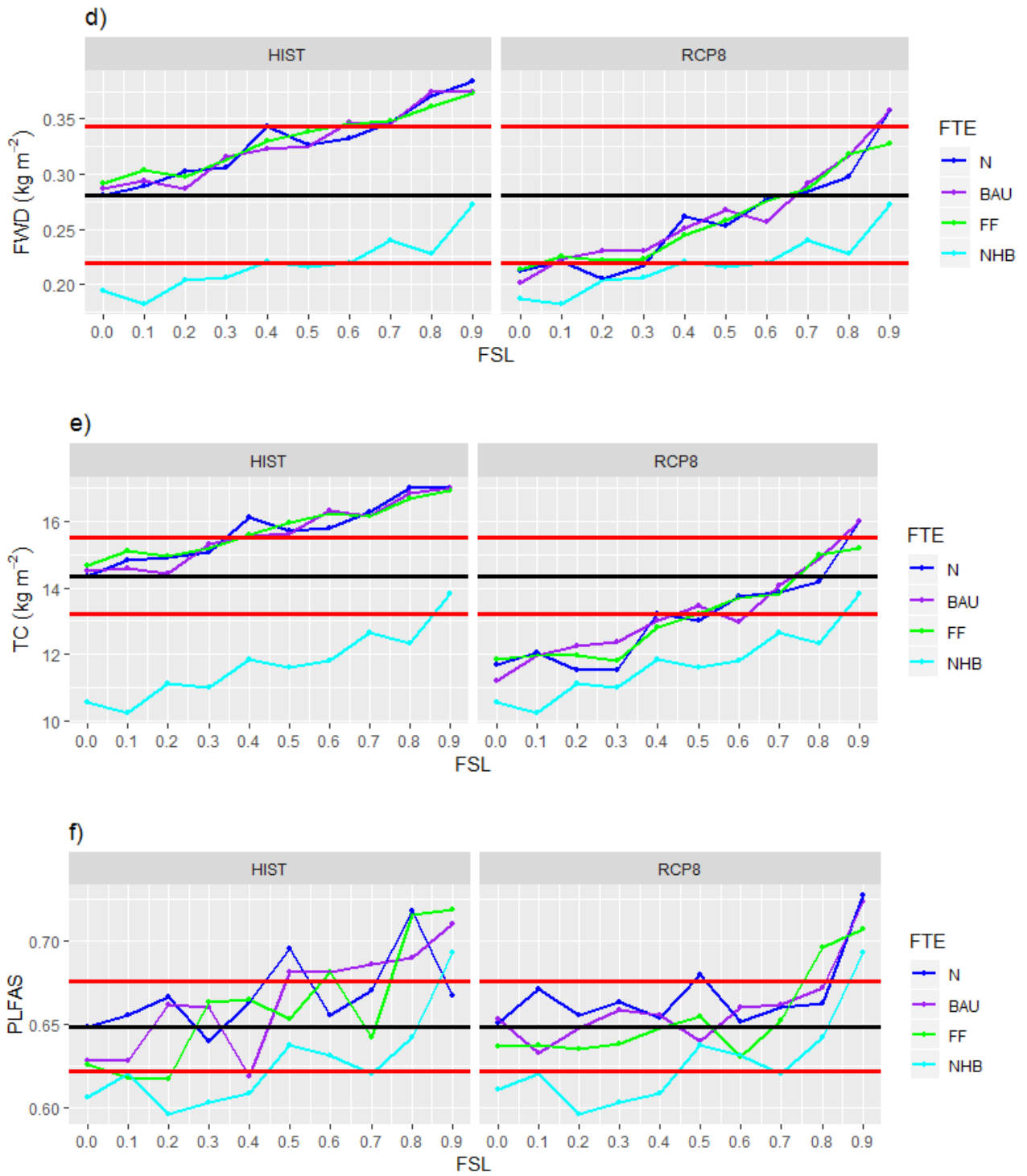
<sup>D</sup>US Geological Survey, Alaska Science Center, 333 Broadway SE Suite 115, Albuquerque, NM 87102, USA.

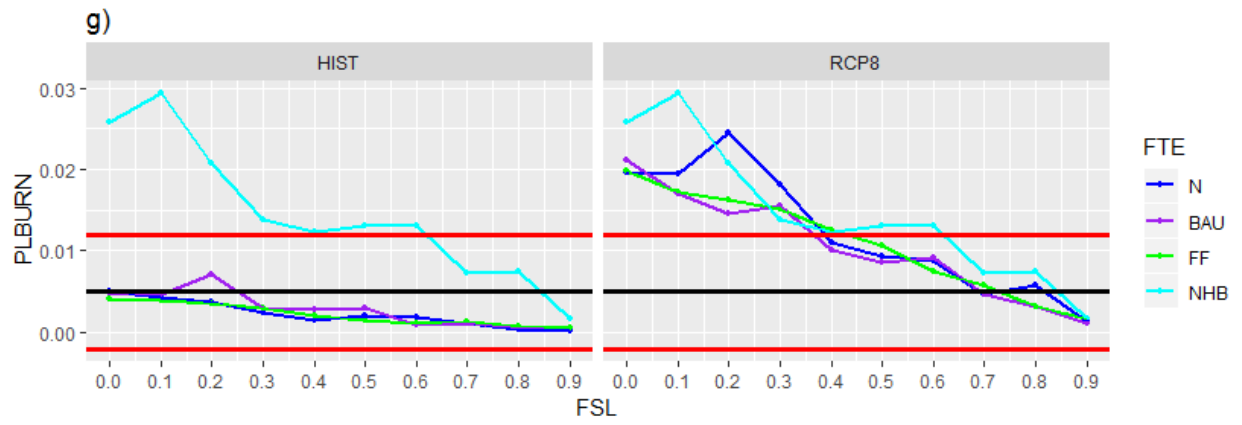
<sup>E</sup>Corresponding author. Email: rkeane@fs.fed.us

## SUPPLEMENTARY MATERIAL

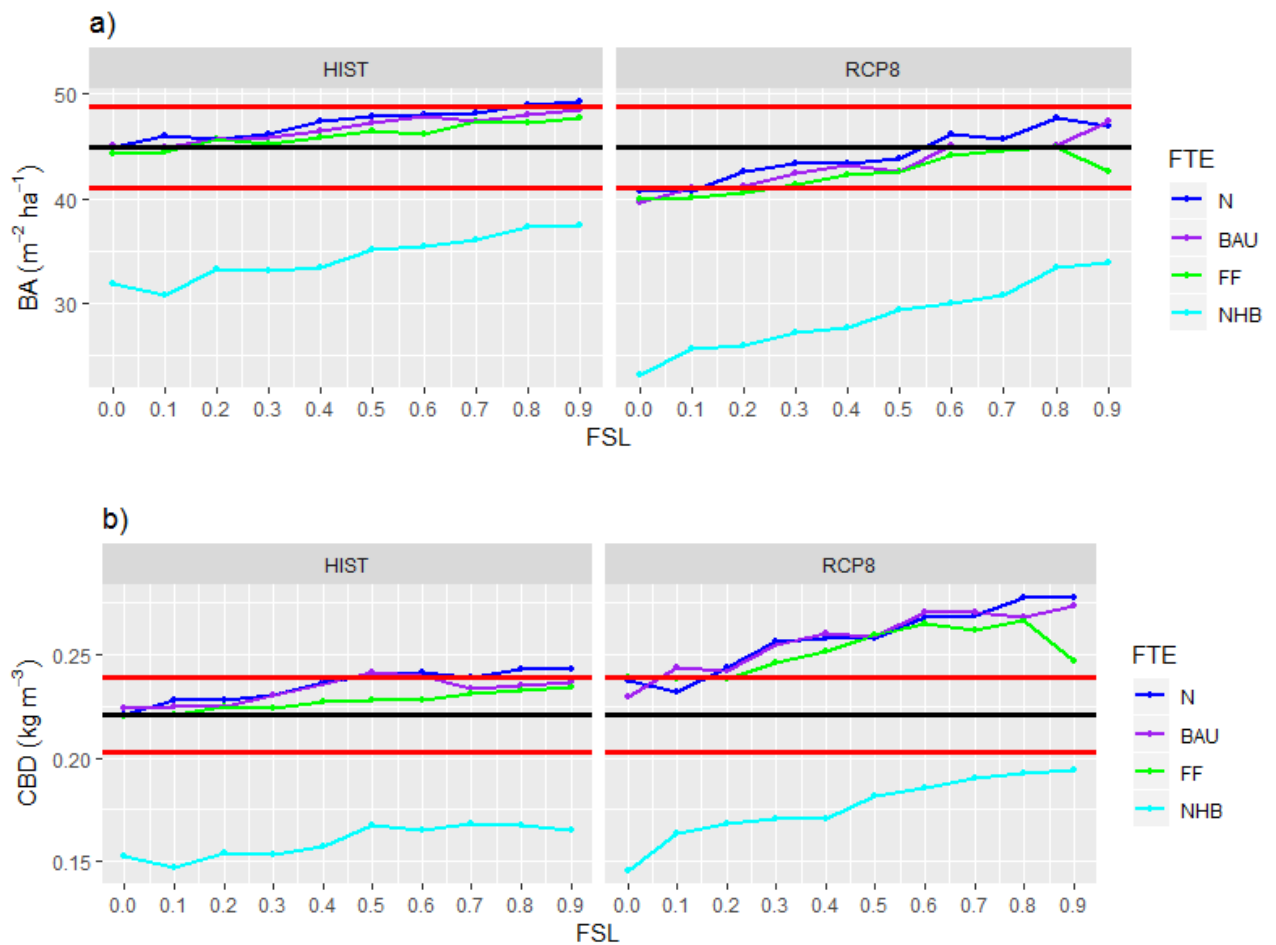
**Figure S1.** Shewhart Quality Control charts (Shewhart QCC) for the **East Fork of the Bitterroot River (EFBR)** for all seven response variables in Table 1 for the two climate scenarios (HIST-historical, RCP8-future climate under RCP8.5 scenario) and four fuel treatment scenarios (N-no treatments=blue line, BAU-business as usual = purple, FF-fully funded=green line, and NHB-no holes barred=light blue; Table 1). The black line represents the average for HRV conditions for each response variable and the red lines represent three standard deviations above or below this baseline value. BA is average basal area of all forested stands on the landscape; CBD is average canopy bulk density for all forested stands; CWD is average coarse woody fuel (>10 cm diameter) loading for all stands; FWD is average fine woody fuel (<10 cm) of all stands; TC is total aboveground carbon averaged across entire landscape; PLFAS is the percent of the landscape in fire-adapted species; and PLBURN is percent of landscape burned annually.

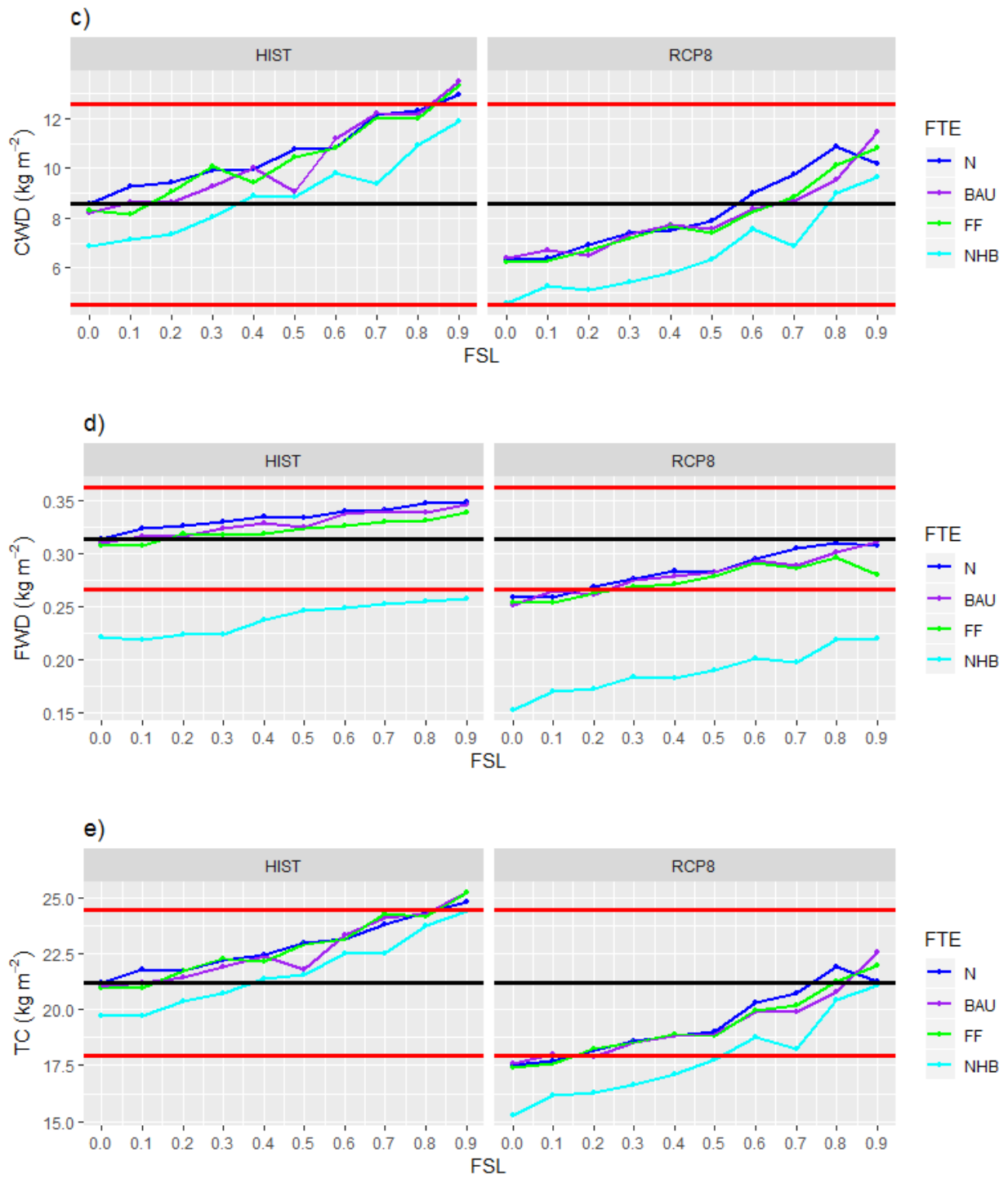


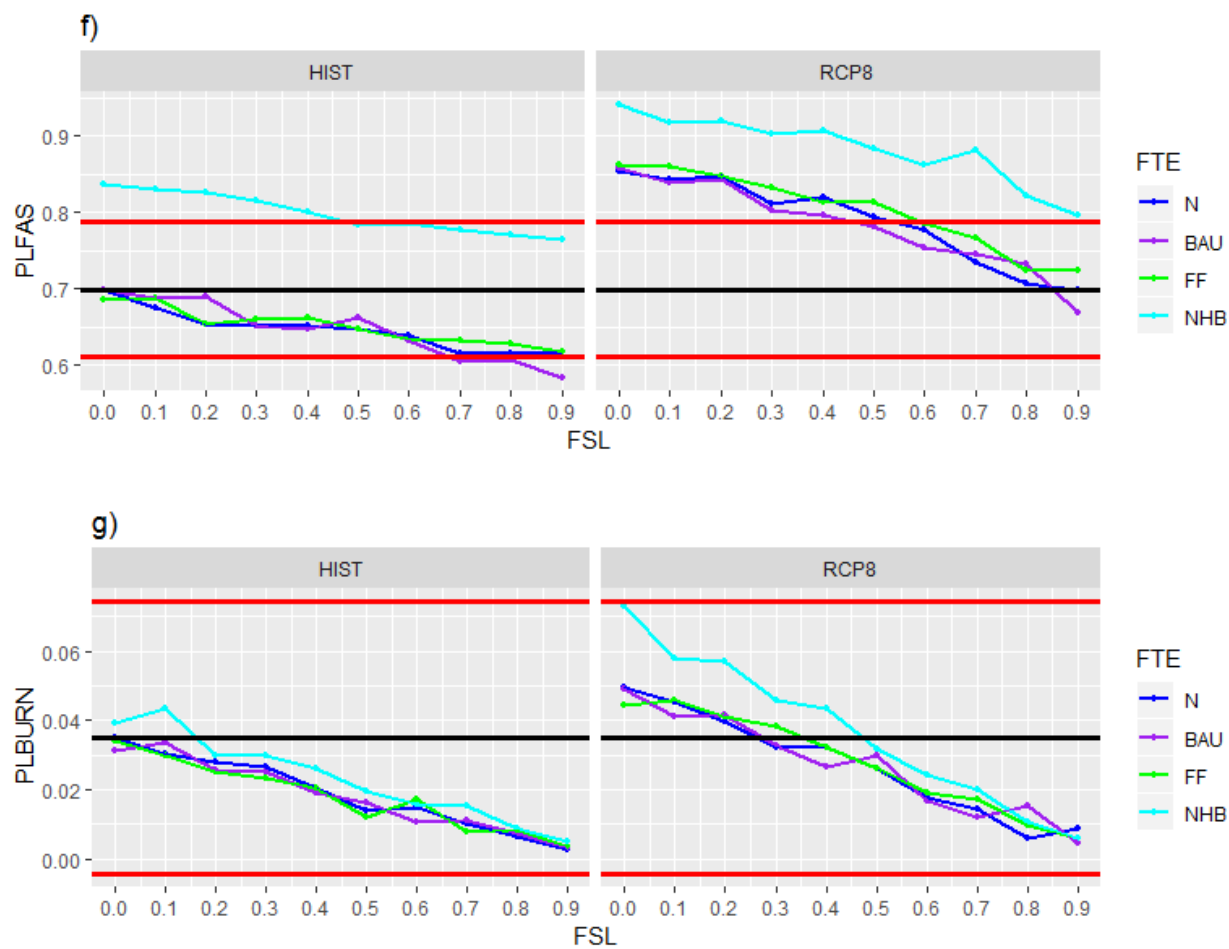




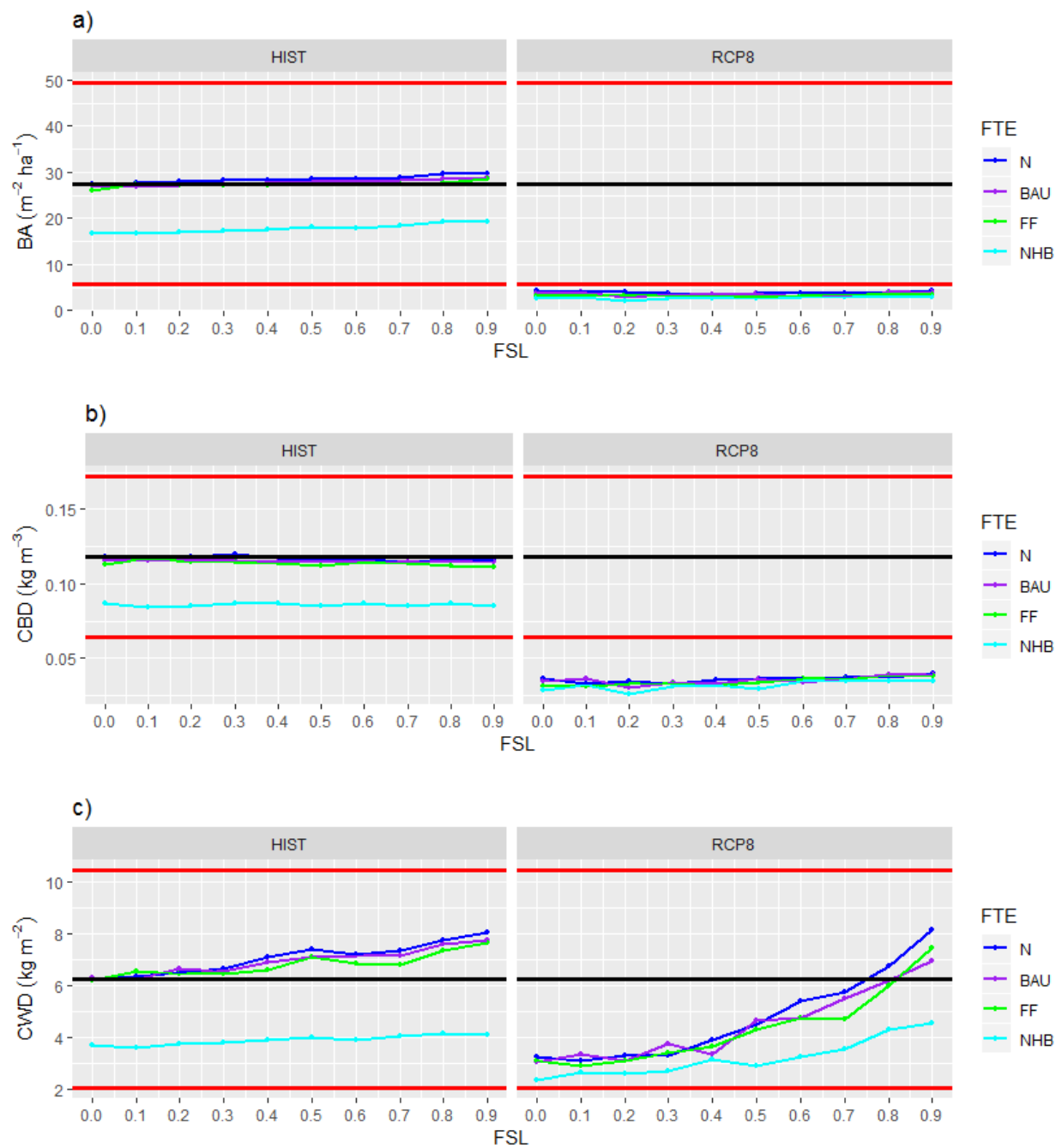
**Figure S2.** Shewhart Quality Control charts (Shewhart QCC) for the **Crown of the Continent (CROWN)** for all seven response variables in Table 1 for the two climate scenarios (HIST-historical, RCP8-future climate under RCP8.5 scenario) and four fuel treatment scenarios (N-no treatments=blue line, BAU-business as usual = purple, FF-fully funded=green line, and NHB-no holes barred=light blue; Table 1). The black line represents the average for HRV conditions for each response variable and the red lines represent three standard deviations above or below this baseline value. BA is average basal area of all forested stands on the landscape; CBD is average canopy bulk density for all forested stands; CWD is average coarse woody fuel (>10 cm diameter) loading for all stands; FWD is average fine woody fuel (<10 cm) of all stands; TC is total aboveground carbon averaged across entire landscape; PLFAS is the percent of the landscape in fire-adapted species; and PLBURN is percent of landscape burned annually.



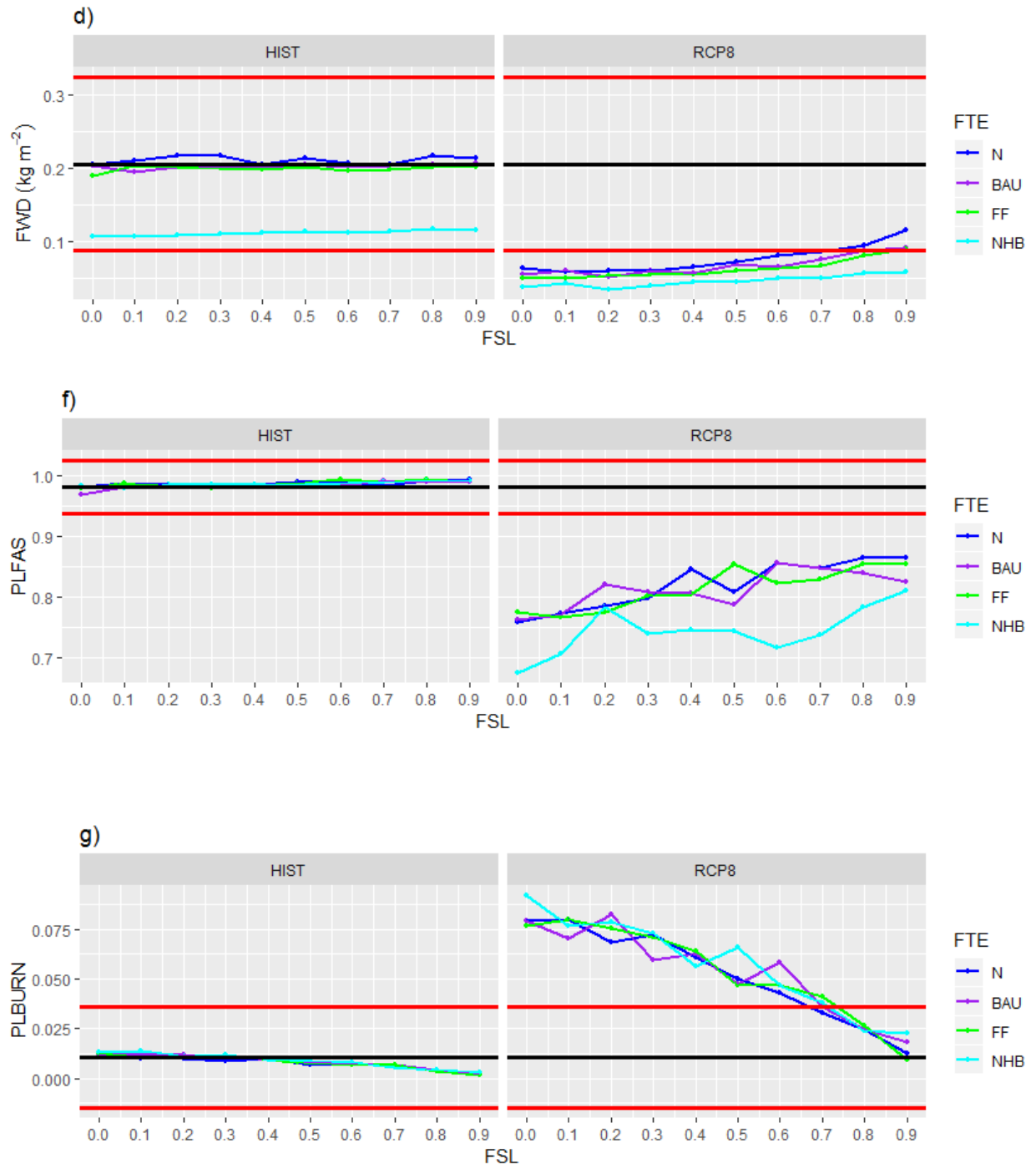




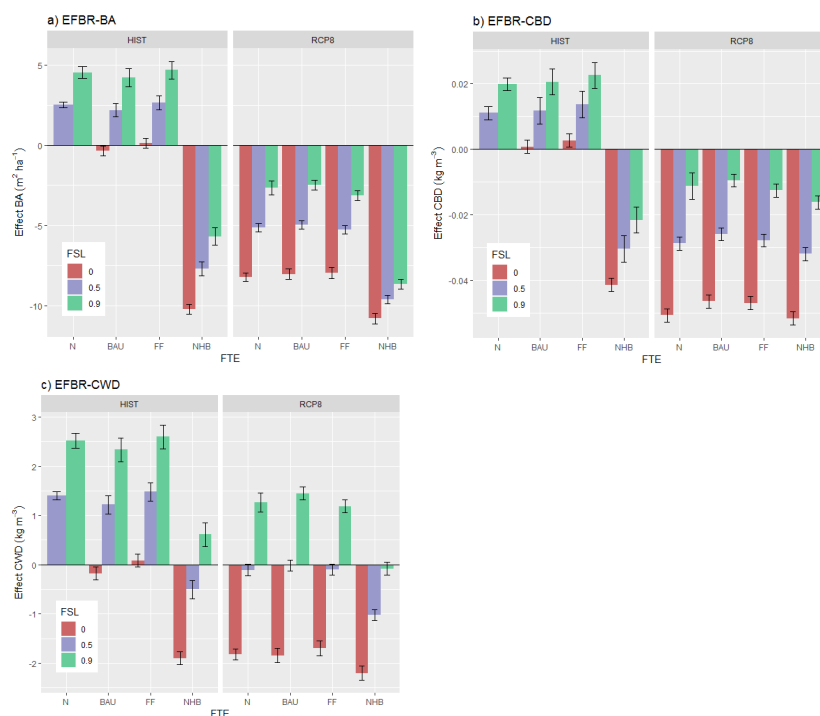
**Figure S3.** Shewhart Quality Control charts (Shewhart QCC) for the **Yellowstone Central Plateau (YCP)** for all seven response variables in Table 1 for the two climate scenarios (HIST-historical, RCP8-future climate under RCP8.5 scenario) and four fuel treatment scenarios (N-no treatments=blue line, BAU-business as usual = purple, FF-fully funded=green line, and NHB-no holes barred=light blue; Table 1). The black line represents the average for HRV conditions for each response variable and the red lines represent three standard deviations above or below this baseline value. BA is average basal area of all forested stands on the landscape; CBD is average canopy bulk density for all forested stands; CWD is average coarse woody fuel (>10 cm diameter) loading for all stands; FWD is average fine woody fuel (<10 cm) of all stands; TC is total aboveground carbon averaged across entire landscape; PLFAS is the percent of the landscape in fire-adapted species; and PLBURN is percent of landscape burned annually.





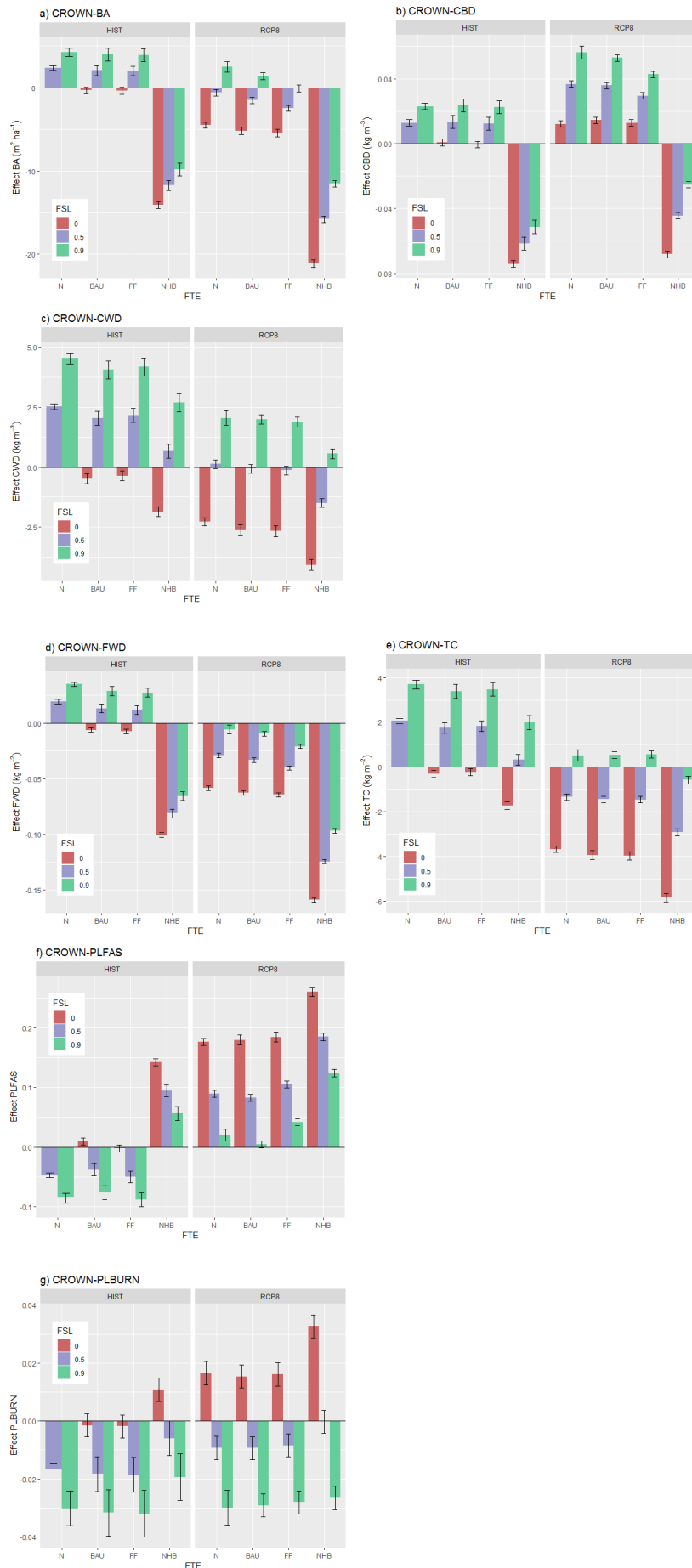


**Figure S4.** Differences between HRV and each climate scenario (HIST-historical climate, RCP8-future climate under RCP8.5 scenario) and four fuel treatment efforts (FTE; BAU-business as usual, FF-fully funded, N-no treatments, and NHB-no holes barred; Table 1) for a combination of three fire suppression levels (FSL) of 0.0, 0.5, and 0.9 for the seven reponse variables (Table 1) **for East Fork Bitterroot River (EFBR) landscape.** The error bars are calculated as twice the standard error. Positive differences imply that HRV values were less than the FTE/Climate/FTE combination. BA is average basal area of all forested stands on the landscape; CBD is average canopy bulk density for all forested stands; CWD is average coarse woody fuel (>10 cm diameter) loading for all stands; FWD is average fine woody fuel (<10 cm) of all stands; TC is total aboveground carbon averaged across entire landscape; PLFAS is the percent of the landscape in fire-adapted species; and PLBURN is percent of landscape burned annually.





**Figure S5.** Differences between HRV and each climate scenario (HIST-historical climate, RCP8-future climate under RCP8.5 scenario) and four fuel treatment efforts (FTE; BAU-business as usual, FF-fully funded, N-no treatments, and NHB-no holes barred; Table 1) for a combination of three fire suppression levels (FSL) of 0.0, 0.5, and 0.9 for the response variables (Table 1) for **Crown of Continent (CROWN)** landscape. The error bars are calculated as twice the standard error. Positive differences imply that HRV values were less than the FTE/Climate/FTE combination. BA is average basal area of all forested stands on the landscape; CBD is average canopy bulk density for all forested stands; CWD is average coarse woody fuel (>10 cm diameter) loading for all stands; FWD is average fine woody fuel (<10 cm) of all stands; TC is total aboveground carbon averaged across entire landscape; PLFAS is the percent of the landscape in fire-adapted species; and PLBURN is percent of landscape burned annually.



**Figure S6.** Differences between HRV and each climate scenario (HIST-historical climate, RCP8-future climate under RCP8.5 scenario) and four fuel treatment efforts (FTE; BAU-business as usual, FF-fully funded, N-no treatments, and NHB-no holes barred; Table 1) for a combination of three fire suppression levels (FSL) of 0.0, 0.5, and 0.9 for the response variables (Table 1) for the Yellowstone Central Plateau (YCP) landscape. The error bars are calculated as twice the standard error. Positive differences imply that HRV values were less than the FTE/Climate/FTE combination. BA is average basal area of all forested stands on the landscape; CBD is average canopy bulk density for all forested stands; CWD is average coarse woody fuel (>10 cm diameter) loading for all stands; FWD is average fine woody fuel (<10 cm) of all stands; TC is total aboveground carbon averaged across entire landscape; PLFAS is the percent of the landscape in fire-adapted species; and PLBURN is percent of landscape burned annually.



