

SUPPORTING INFORMATION

Spatiotemporal patterns of rising annual plant abundance in grasslands of the Willamette Valley, Oregon (USA).

Landscape Ecology

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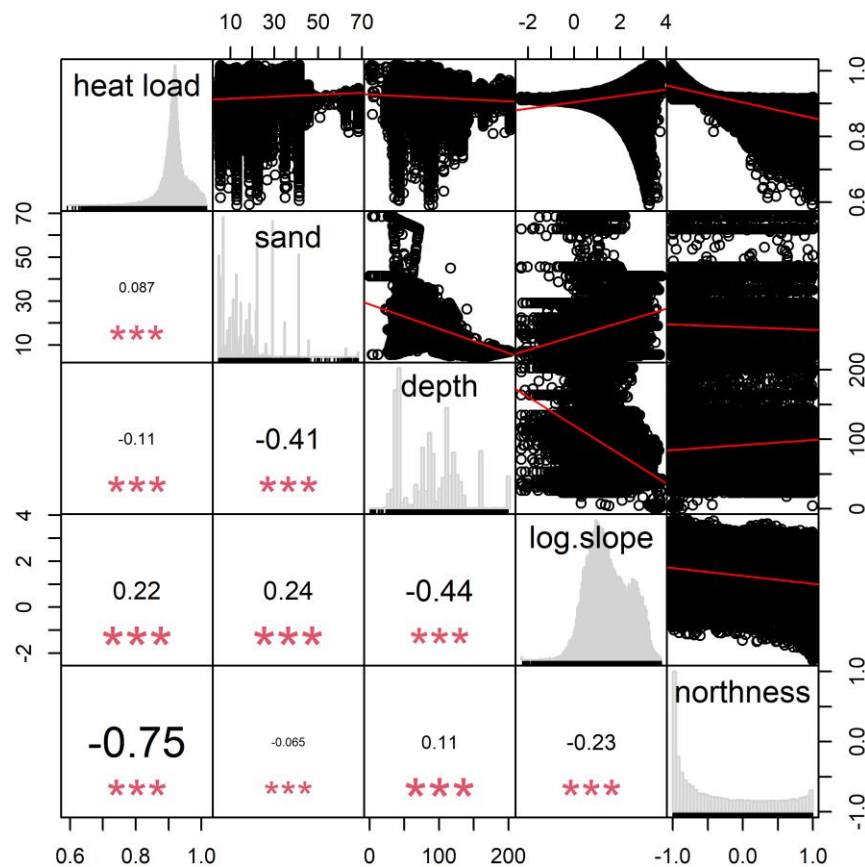


Figure S1. Scatterplot matrix of landscape predictor variables used in the quantile regression models (heat load, percent sand, and soil depth), along with slope and aspect (northness) to visualize relationships to heat load. Slope was natural log-transformed. “Northness” is a linear index of aspect, calculated using the cosine of aspect (in radians, θ), where -1 indicates due south, +1 indicates due north, and 0 indicates due east/west.

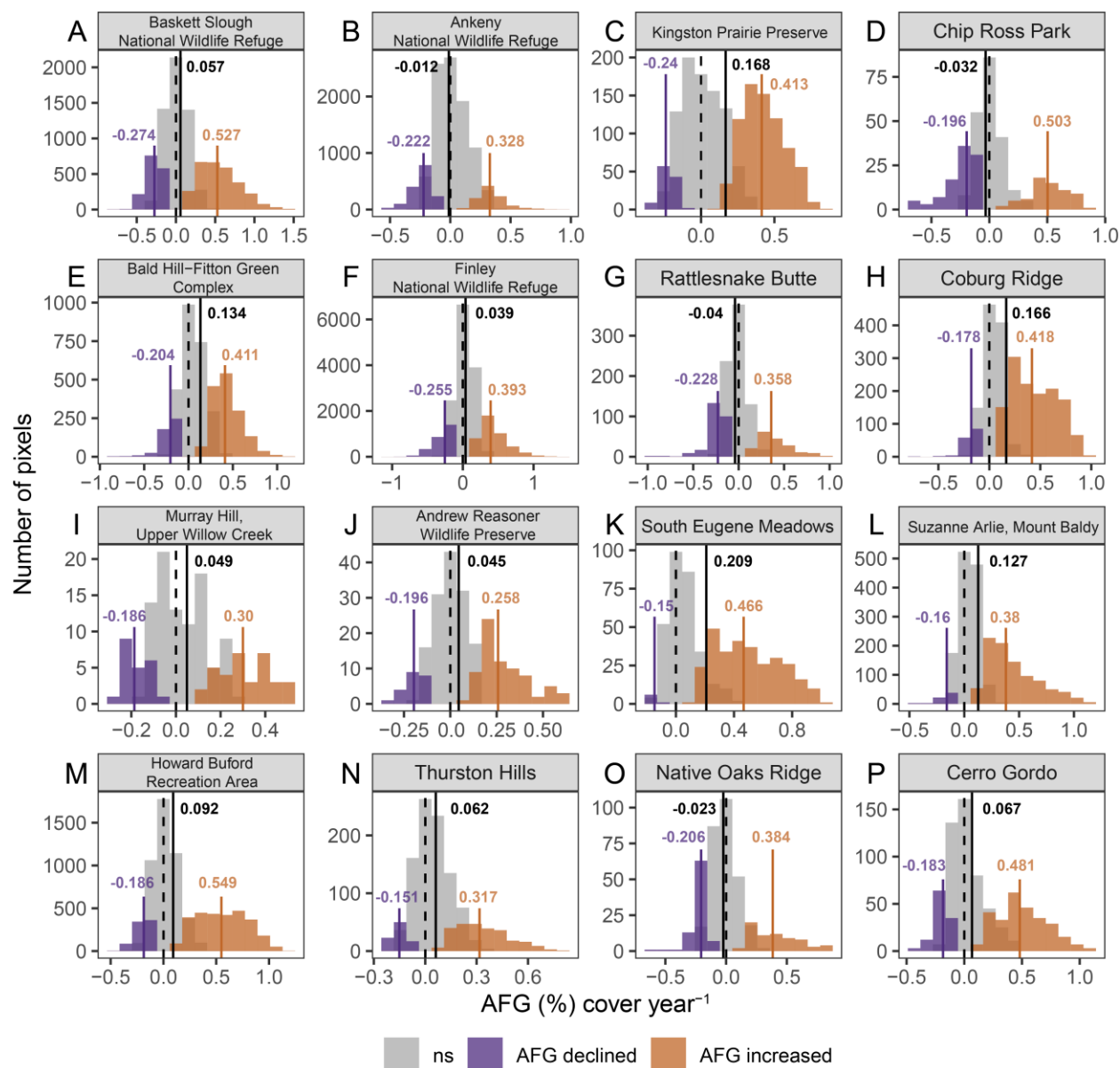


Figure S2. Distribution of coefficient values for each site in the pixel-by-pixel regressions of AFG (%) cover against year. Grey bins denote pixels that did not exhibit a significant change in AFG cover ($p > 0.05$), purple bins exhibited a significant decline while orange bins exhibited a significant increase. The solid black vertical lines display the site median value, while the purple and orange vertical lines display the median values among pixels in which AFG significantly declined and increased, respectively.

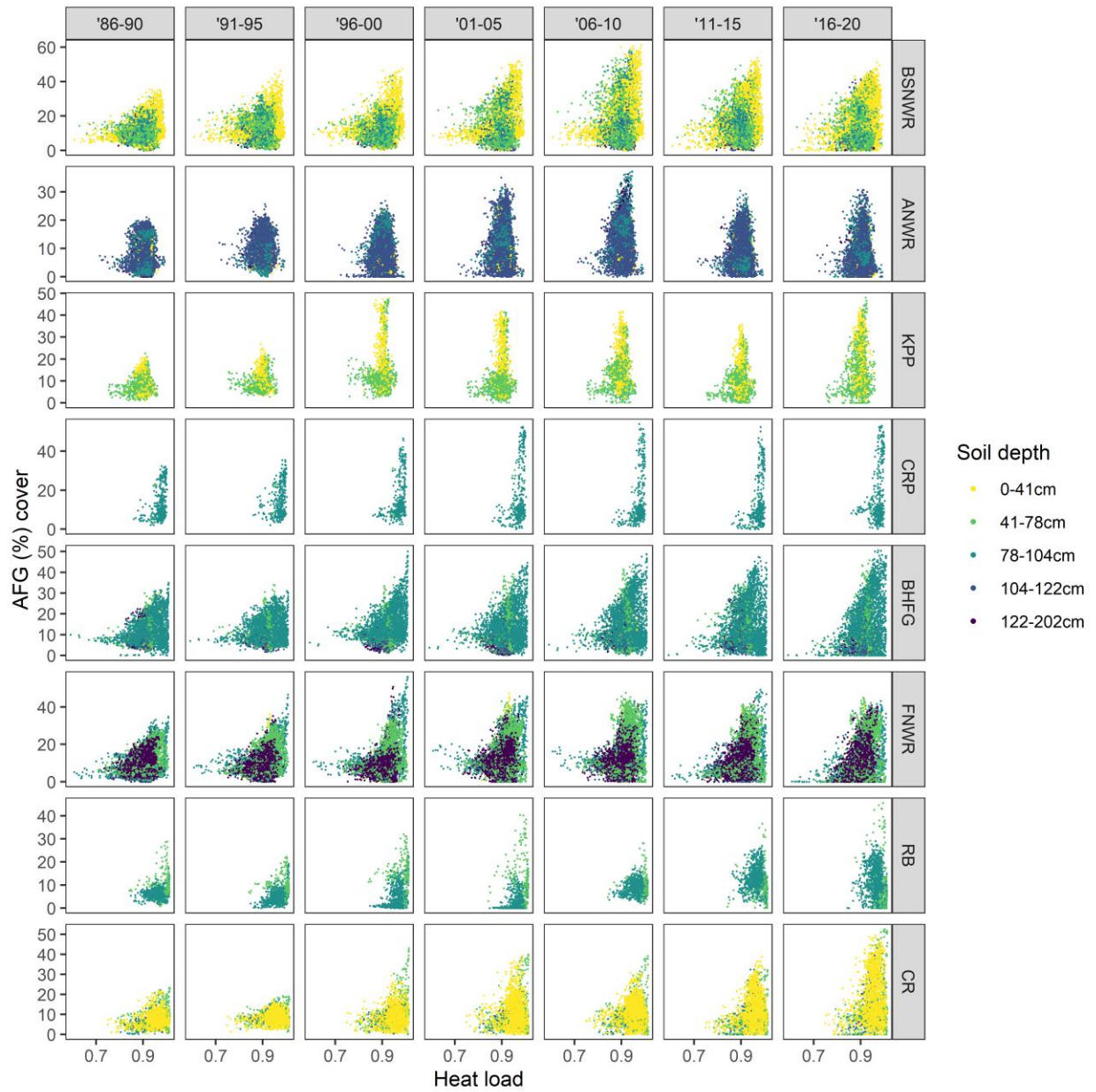


Figure S3A. AFG (%) cover against heat load within each half-decade time interval (columns) for each individual site (rows) for sites 1-8. BSNWR = Baskett Slough National Wildlife Refuge; ANWR = Ankeny National Wildlife Refuge; KPP = Kingston Prairie Preserve; CRP = Chip Ross Park; BHFG = Bald Hill-Fitton Green Complex; FNWR = Finley National Wildlife Refuge; RB = Rattlesnake Butte; CR = Coburg Ridge.

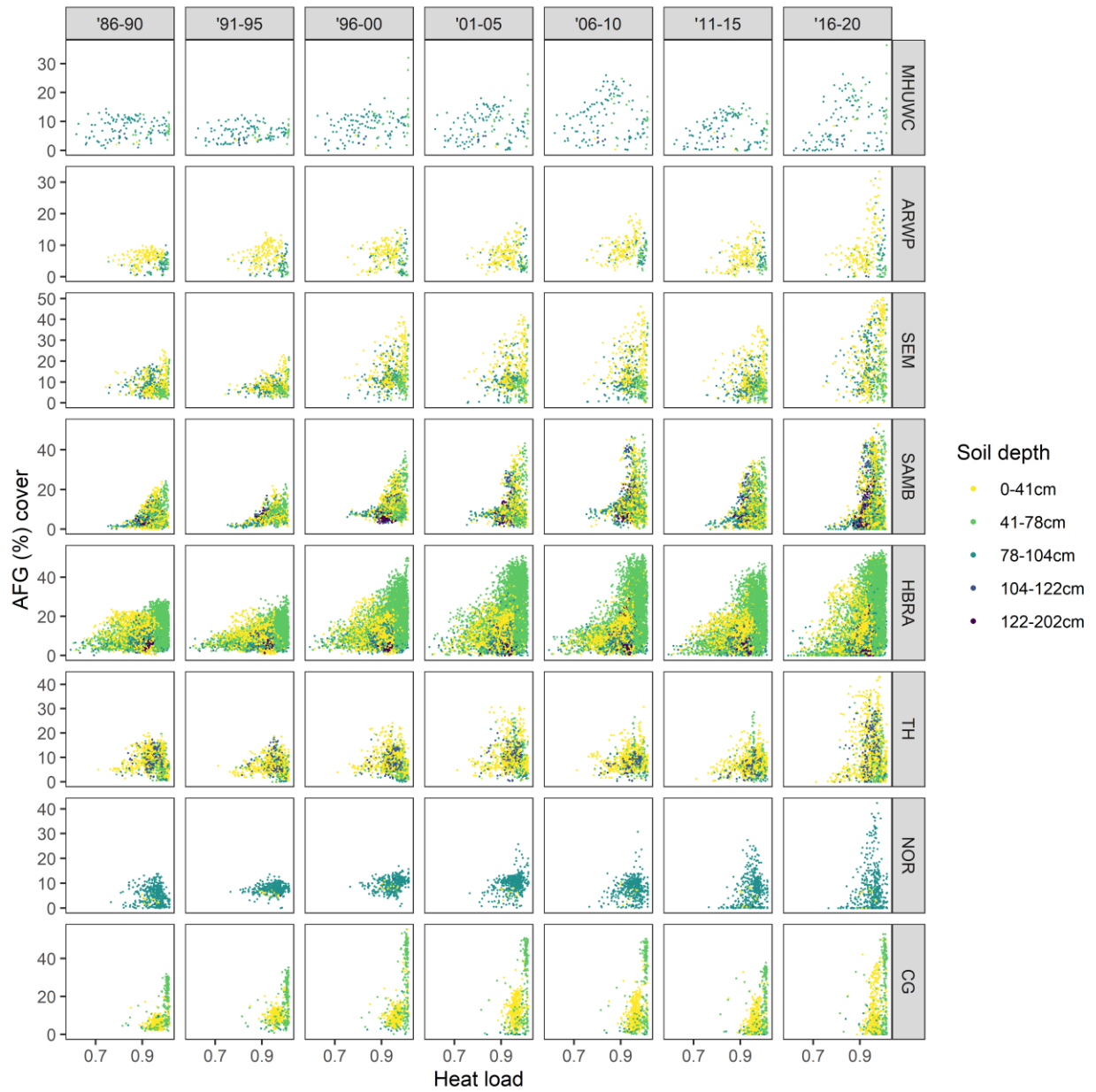


Figure S3B. AFG (%) cover against heat load within each half-decade time interval (columns) for each individual site (rows) for sites 9-16. MHUWC = Murray Hill, Upper Willow Creek; ARWP = Andrew Reasoner Wildlife Preserve; SEM = South Eugene Meadows; SAMB = Suzanne Arlie, Mount Baldy; HBRA = Howard Buford Recreation Area; TH = Thurston Hills; NOR = Native Oaks Ridge; CG = Cerro Gordo.

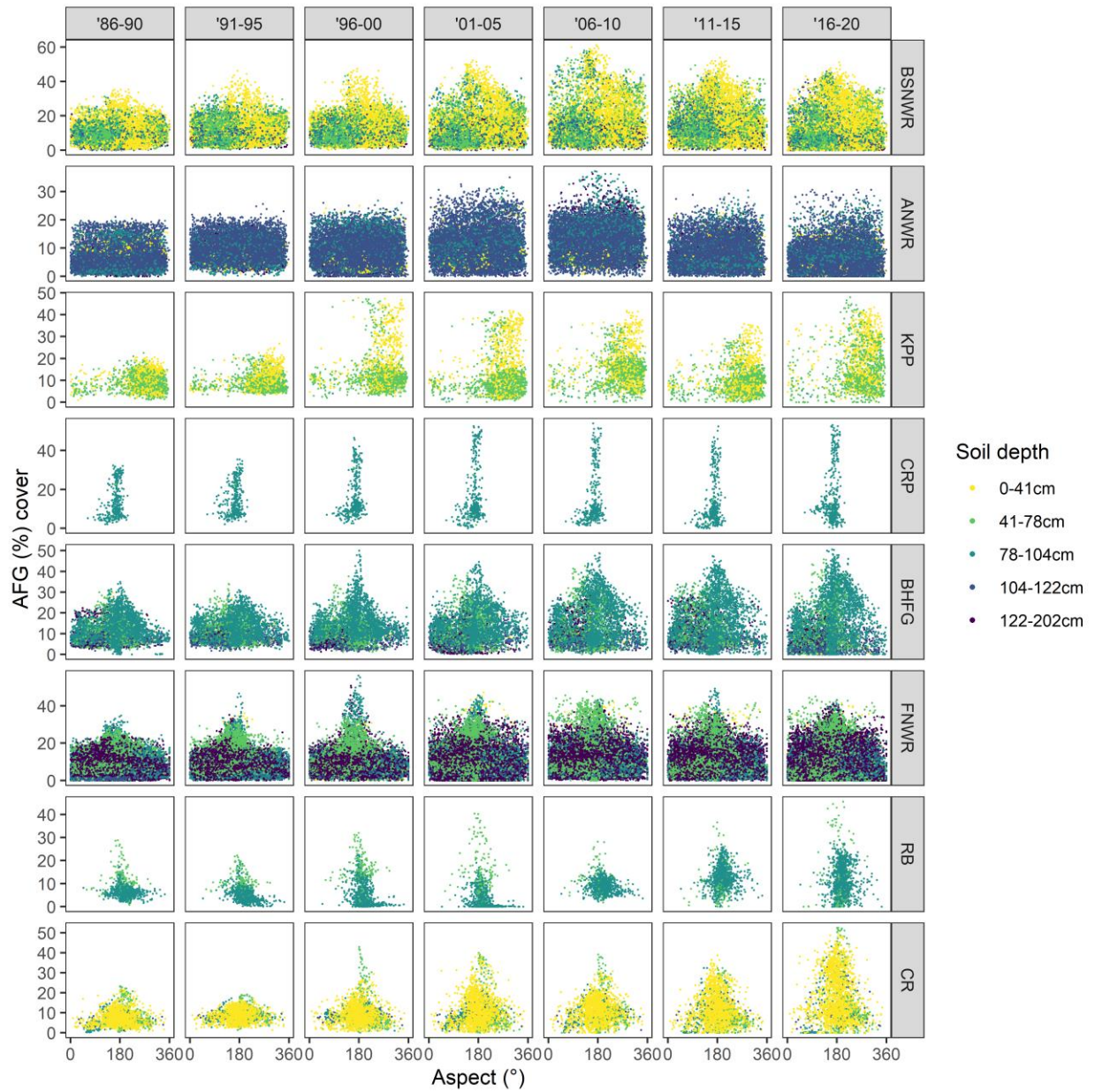


Figure S4A. AFG (%) cover against aspect within each half-decade time interval (columns) for each individual site (rows) for sites 1-8. BSNWR = Baskett Slough National Wildlife Refuge; ANWR = Ankeny National Wildlife Refuge; KPP = Kingston Prairie Preserve; CRP = Chip Ross Park; BHFG = Bald Hill-Fitton Green Complex; FNWR = Finley National Wildlife Refuge; RB = Rattlesnake Butte; CR = Coburg Ridge.

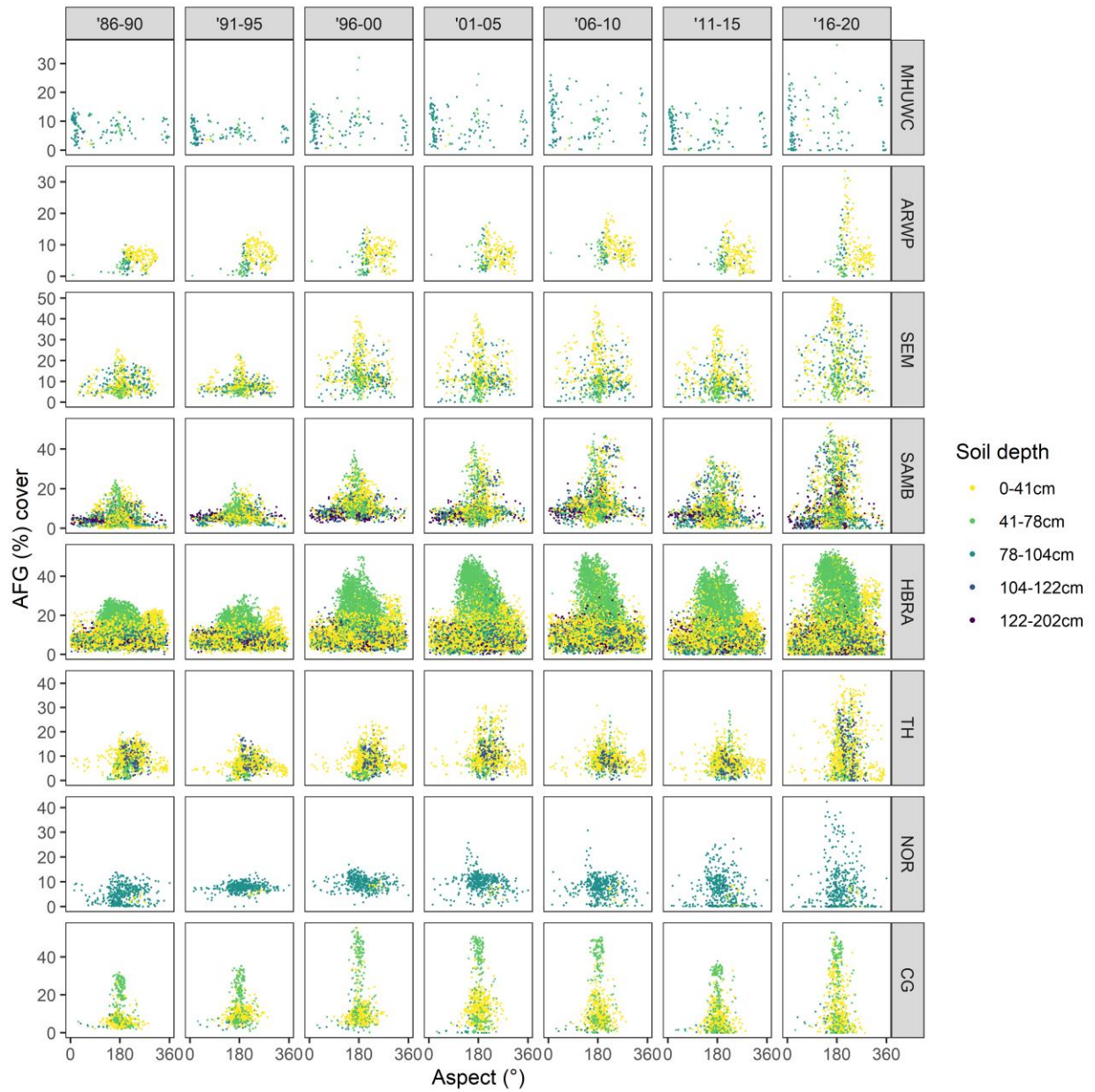


Figure S4B. AFG (%) cover against aspect within each half-decade time interval (columns) for each individual site (rows) for sites 9-16. MHUWC = Murray Hill, Upper Willow Creek; ARWP = Andrew Reasoner Wildlife Preserve; SEM = South Eugene Meadows; SAMB = Suzanne Arlie, Mount Baldy; HBRA = Howard Buford Recreation Area; TH = Thurston Hills; NOR = Native Oaks Ridge; CG = Cerro Gordo.

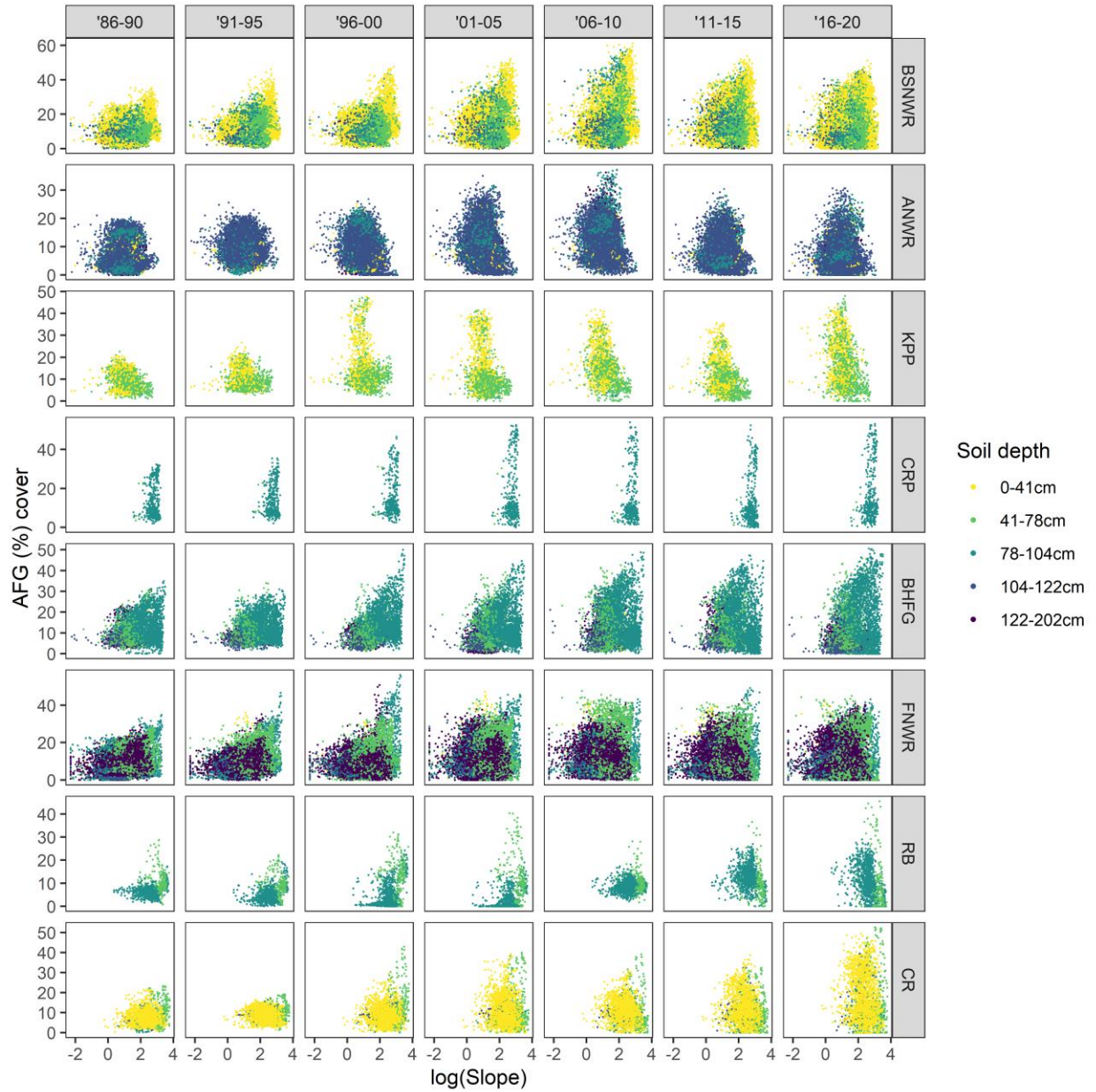


Figure S5A. AFG (%) cover against the natural log of slope within each half-decade time interval (columns) for each individual site (rows) for sites 1-8. BSNWR = Baskett Slough National Wildlife Refuge; ANWR = Ankeny National Wildlife Refuge; KPP = Kingston Prairie Preserve; CRP = Chip Ross Park; BHFG = Bald Hill-Fitton Green Complex; FNWR = Finley National Wildlife Refuge; RB = Rattlesnake Butte; CR = Coburg Ridge.

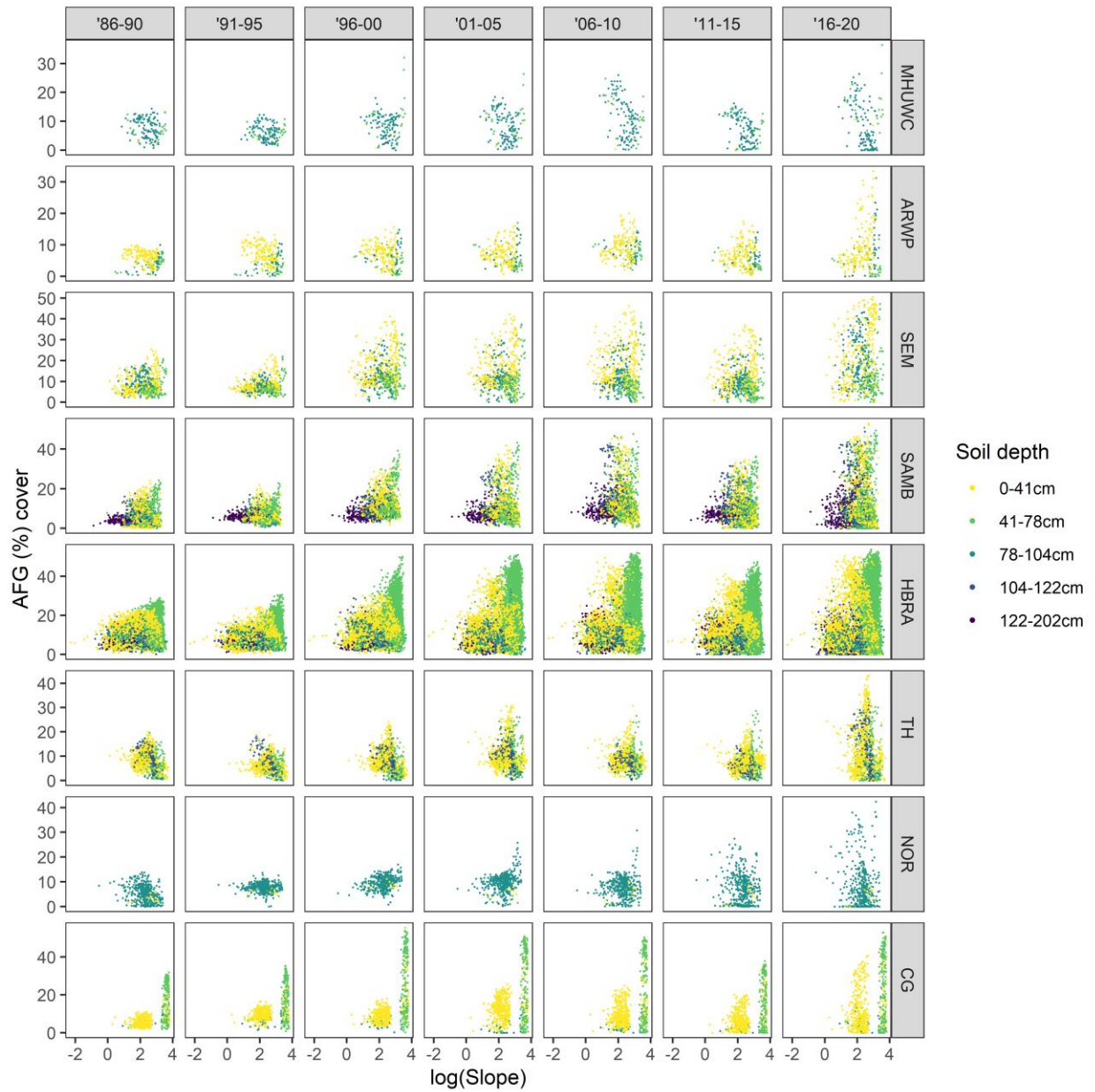


Figure S5B. AFG (%) cover against the natural log of slope within each half-decade time interval (columns) for each individual site (rows) for sites 9-16. MHUWC = Murray Hill, Upper Willow Creek; ARWP = Andrew Reasoner Wildlife Preserve; SEM = South Eugene Meadows; SAMB = Suzanne Arlie, Mount Baldy; HBRA = Howard Buford Recreation Area; TH = Thurston Hills; NOR = Native Oaks Ridge; CG = Cerro Gordo.

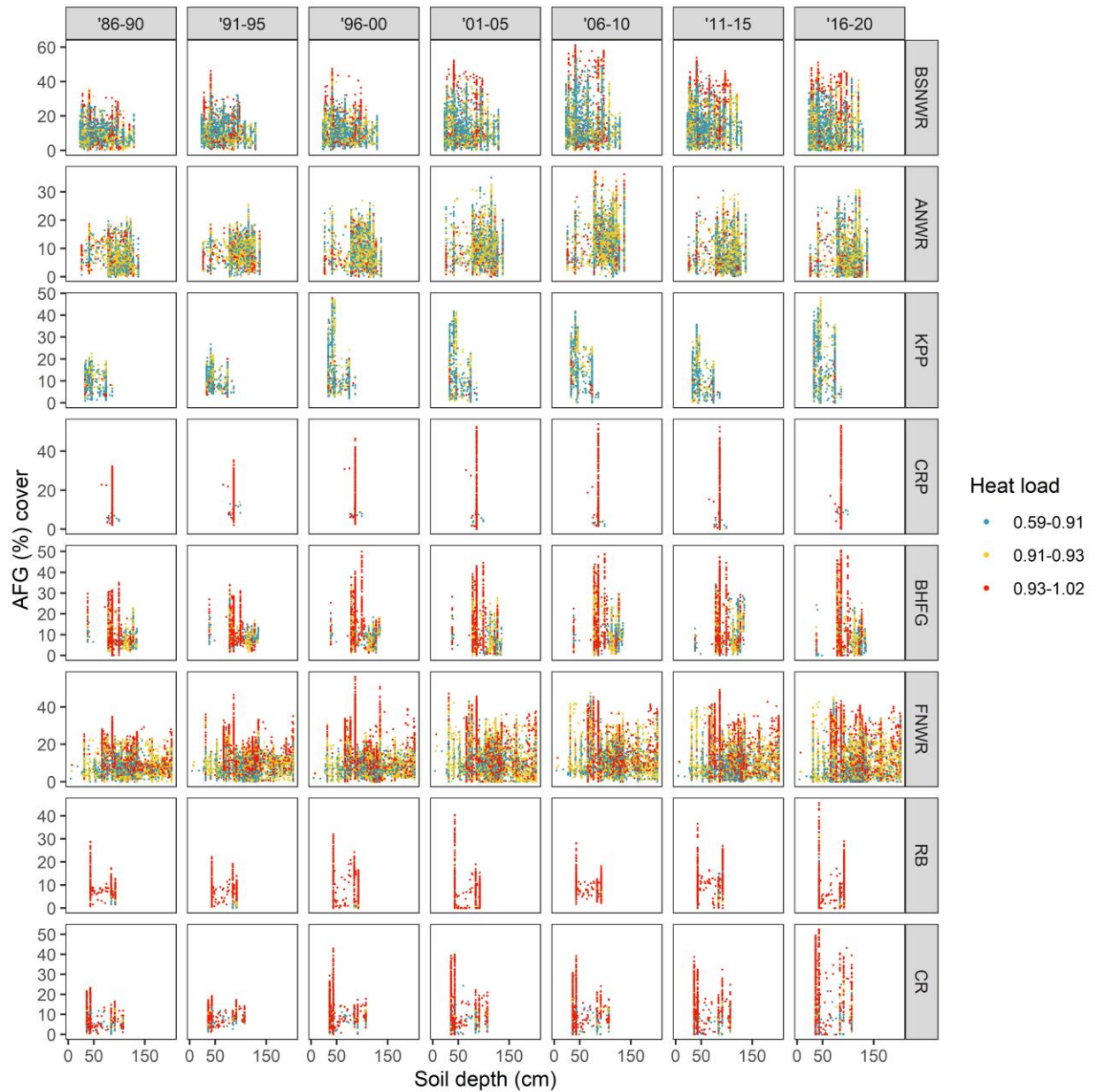


Figure S6A. AFG (%) cover against soil depth within each half-decade time interval (columns) for each individual site (rows) for sites 1-8. BSNWR = Baskett Slough National Wildlife Refuge; ANWR = Ankeny National Wildlife Refuge; KPP = Kingston Prairie Preserve; CRP = Chip Ross Park; BHFG = Bald Hill-Fitton Green Complex; FNWR = Finley National Wildlife Refuge; RB = Rattlesnake Butte; CR = Coburg Ridge.

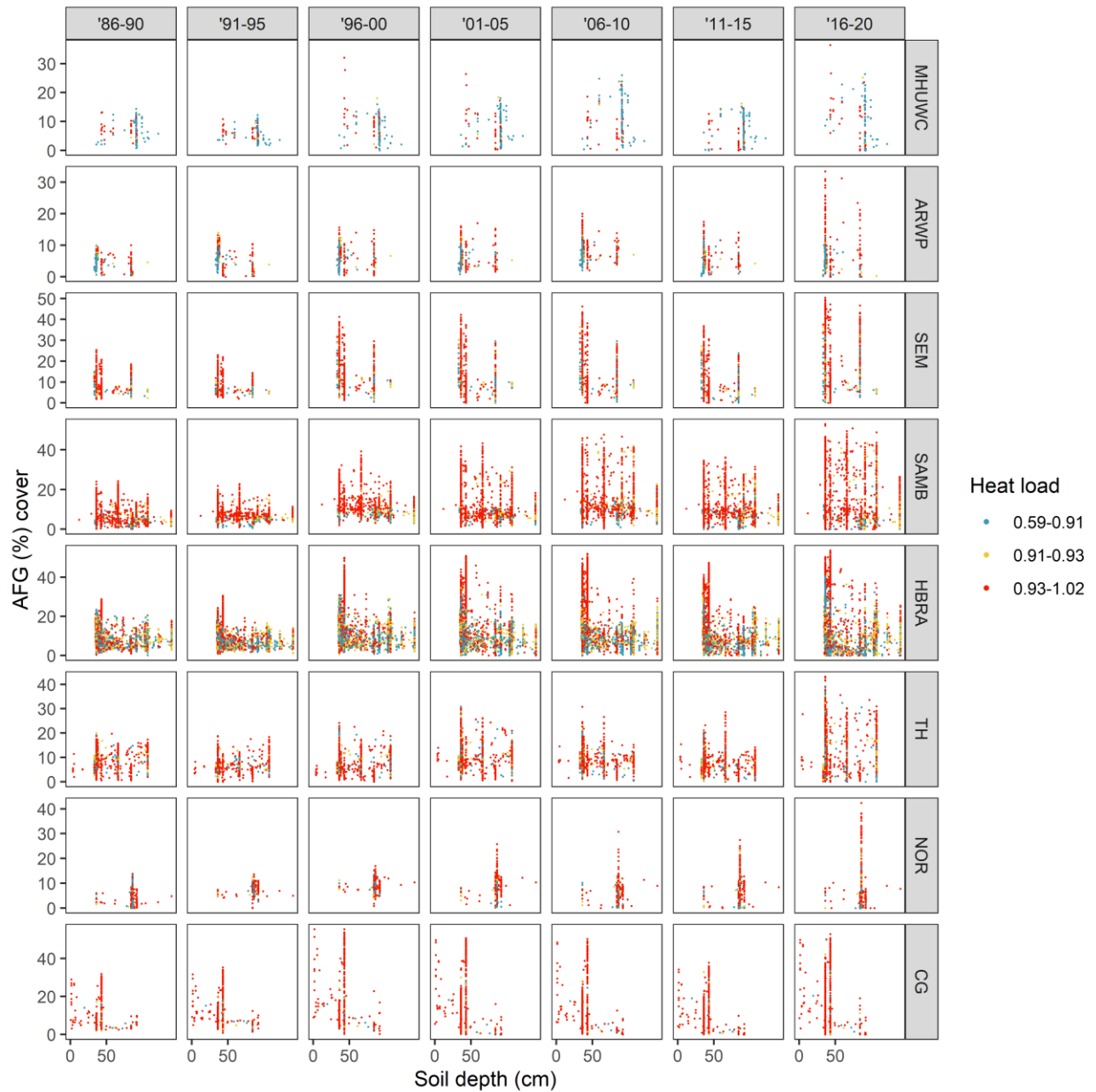


Figure S6B. AFG (%) cover against soil depth within each half-decade time interval (columns) for each individual site (rows) for sites 9-16. MHUWC = Murray Hill, Upper Willow Creek; ARWP = Andrew Reasoner Wildlife Preserve; SEM = South Eugene Meadows; SAMB = Suzanne Arlie, Mount Baldy; HBRA = Howard Buford Recreation Area; TH = Thurston Hills; NOR = Native Oaks Ridge; CG = Cerro Gordo.

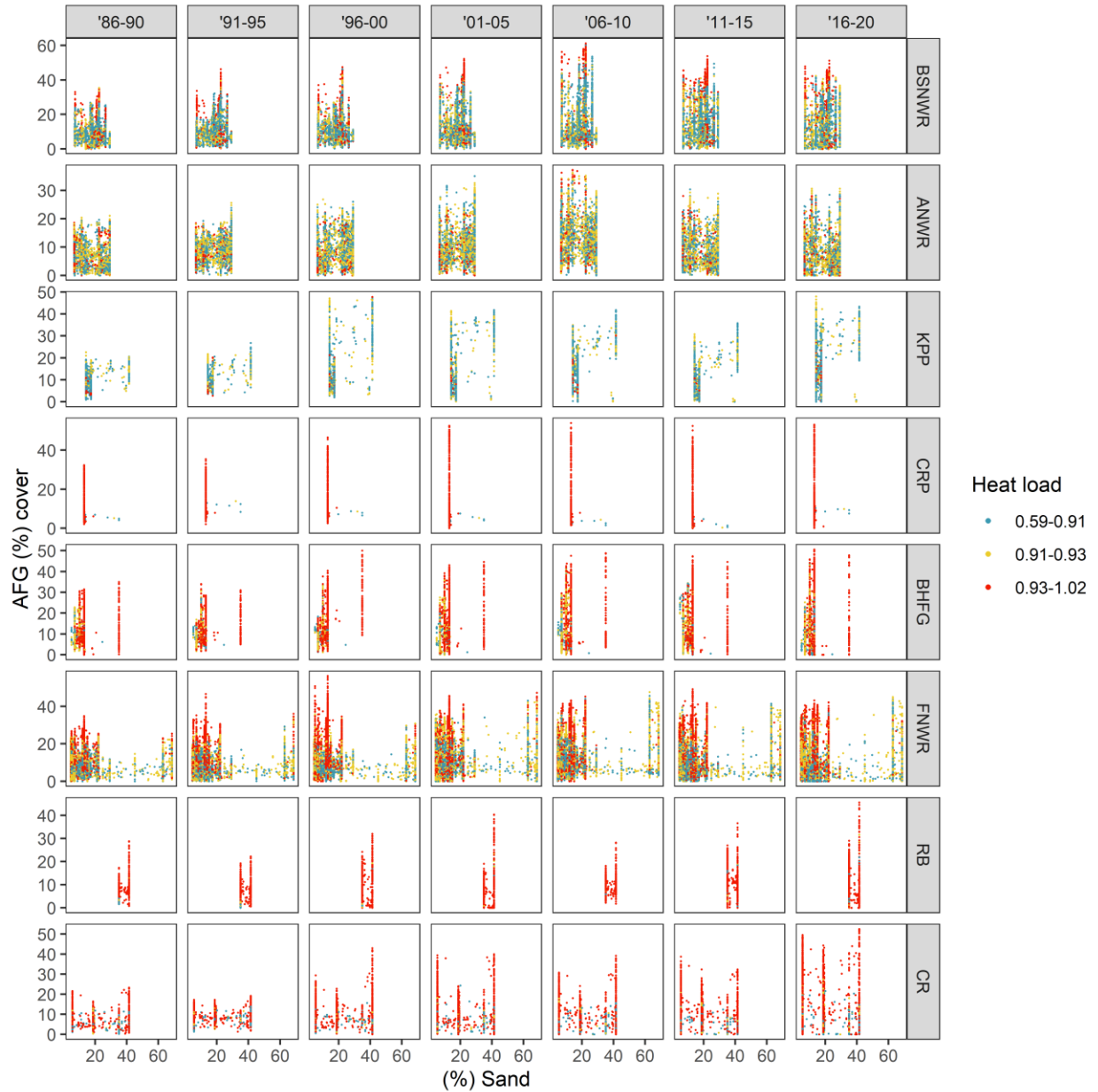


Figure S7A. AFG (%) cover against percent sand within each half-decade time interval (columns) for each individual site (rows) for sites 1-8. BSNWR = Baskett Slough National Wildlife Refuge; ANWR = Ankeny National Wildlife Refuge; KPP = Kingston Prairie Preserve; CRP = Chip Ross Park; BHFG = Bald Hill-Fitton Green Complex; FNWR = Finley National Wildlife Refuge; RB = Rattlesnake Butte; CR = Coburg Ridge.

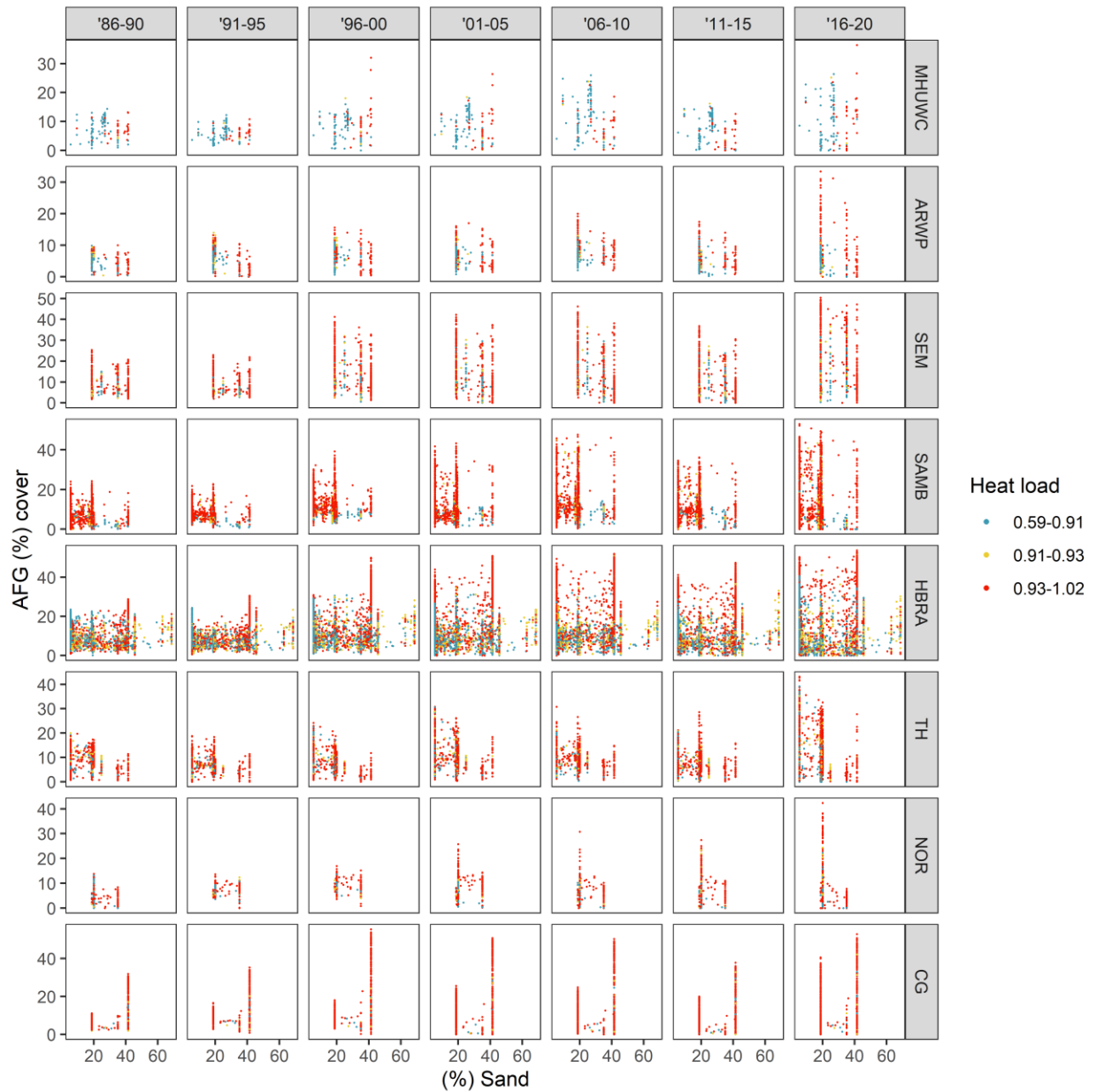


Figure S7B. AFG (%) cover against percent sand within each half-decade time interval (columns) for each individual site (rows) for sites 9-16. MHUWC = Murray Hill, Upper Willow Creek; ARWP = Andrew Reasoner Wildlife Preserve; SEM = South Eugene Meadows; SAMP = Suzanne Arlie, Mount Baldy; HBRA = Howard Buford Recreation Area; TH = Thurston Hills; NOR = Native Oaks Ridge; CG = Cerro Gordo.

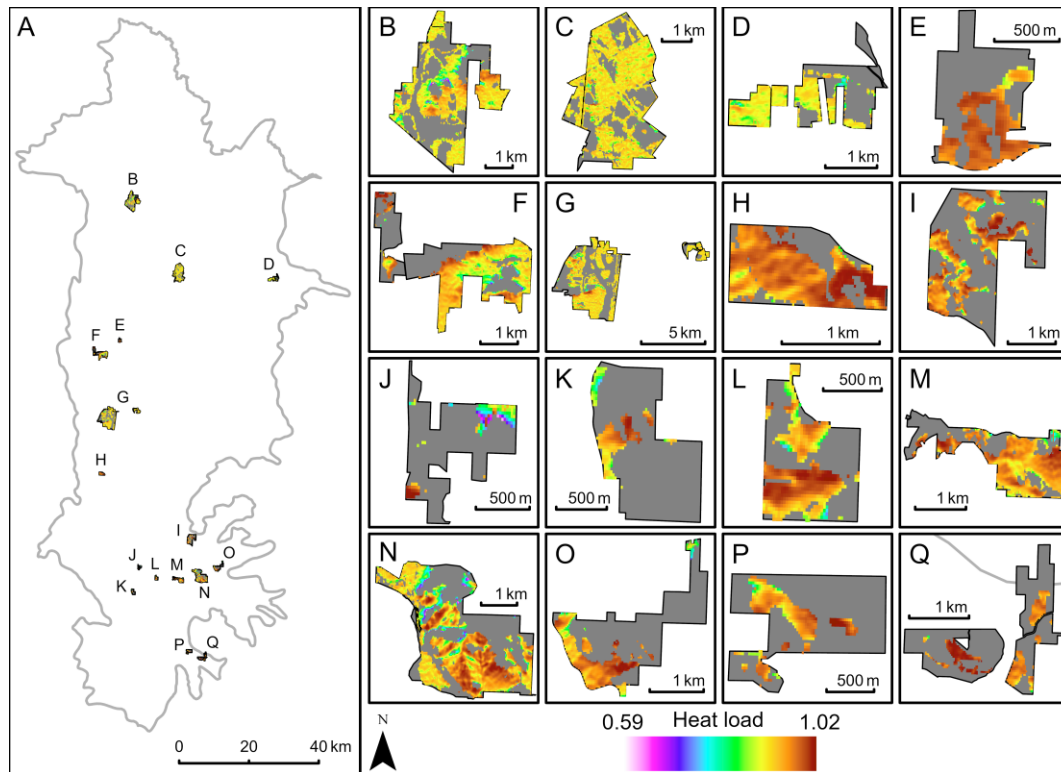


Figure S8. Map of the Willamette Valley in Oregon (A) and individual sites (B-Q) depicting heat load of pixels. (B) Baskett Slough National Wildlife Refuge; (C) Ankeny National Wildlife Refuge; (D) Kingston Prairie Preserve; (E) Chip Ross Park; (F) Bald Hill-Fitton Green Complex; (G) Finley National Wildlife Refuge; (H) Rattlesnake Butte; (I) Coburg Ridge; (J) Murray Hill, Upper Willow Creek; (K) Andrew Reasoner Wildlife Preserve; (L) South Eugene Meadows; (M) Suzanne Arlie, Mount Baldy; (N) Howard Buford Recreation Area; (O) Thurston Hills; (P) Native Oaks Ridge; (Q) Cerro Gordo.

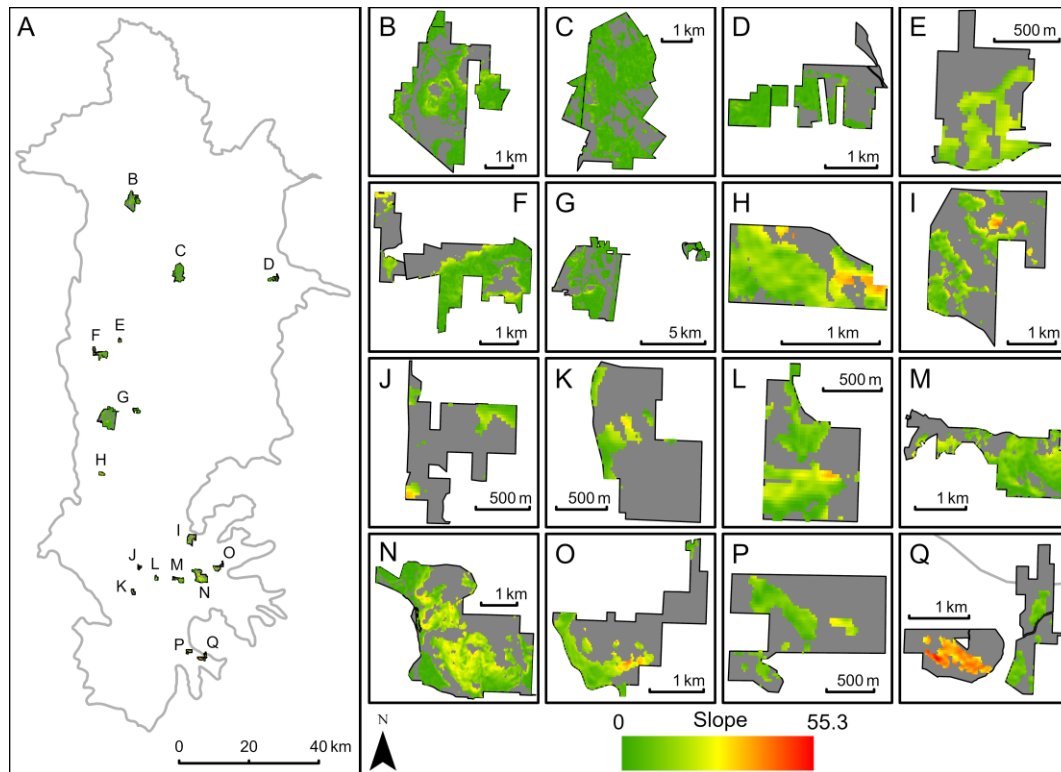


Figure S9. Map of the Willamette Valley in Oregon (A) and individual sites (B-Q) depicting slope of pixels. (B) Baskett Slough National Wildlife Refuge; (C) Ankeny National Wildlife Refuge; (D) Kingston Prairie Preserve; (E) Chip Ross Park; (F) Bald Hill-Fitton Green Complex; (G) Finley National Wildlife Refuge; (H) Rattlesnake Butte; (I) Coburg Ridge; (J) Murray Hill, Upper Willow Creek; (K) Andrew Reasoner Wildlife Preserve; (L) South Eugene Meadows; (M) Suzanne Arlie, Mount Baldy; (N) Howard Buford Recreation Area; (O) Thurston Hills; (P) Native Oaks Ridge; (Q) Cerro Gordo.

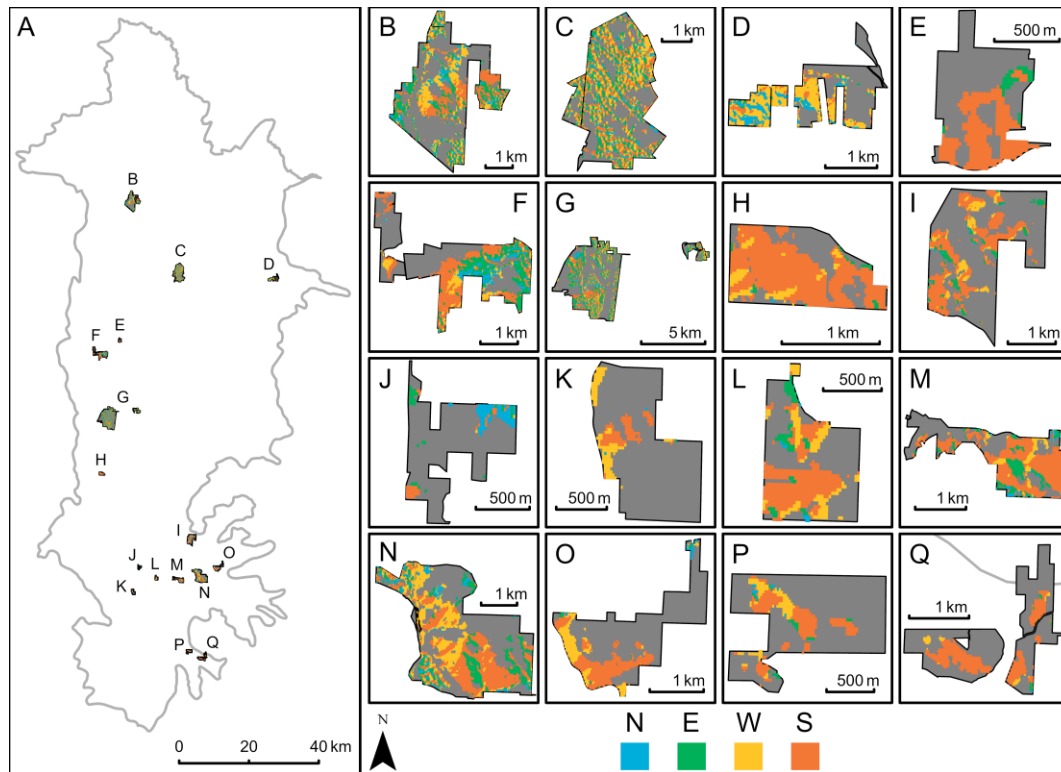


Figure S10. Map of the Willamette Valley in Oregon (A) and individual sites (B-Q) depicting the predominant aspect (North, East, West, and South) of pixels. (B) Baskett Slough National Wildlife Refuge; (C) Ankeny National Wildlife Refuge; (D) Kingston Prairie Preserve; (E) Chip Ross Park; (F) Bald Hill-Fitton Green Complex; (G) Finley National Wildlife Refuge; (H) Rattlesnake Butte; (I) Coburg Ridge; (J) Murray Hill, Upper Willow Creek; (K) Andrew Reasoner Wildlife Preserve; (L) South Eugene Meadows; (M) Suzanne Arlie, Mount Baldy; (N) Howard Buford Recreation Area; (O) Thurston Hills; (P) Native Oaks Ridge; (Q) Cerro Gordo.

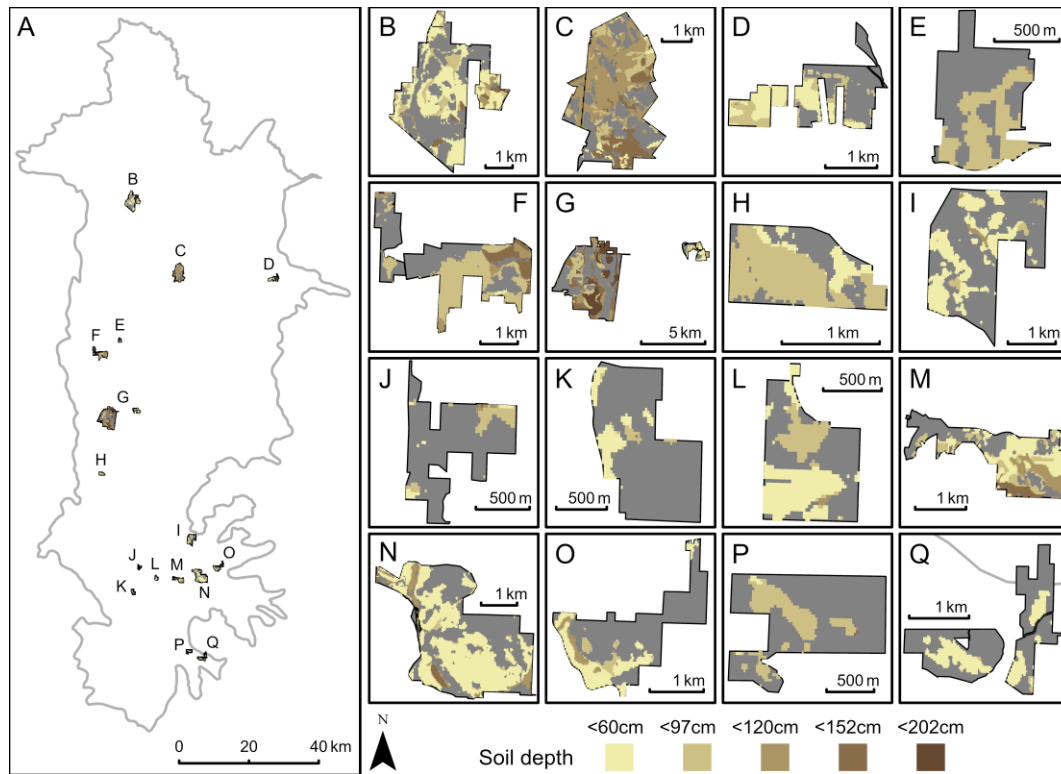


Figure S11. Map of the Willamette Valley in Oregon (A) and individual sites (B-Q) depicting soil depth of pixels. (B) Baskett Slough National Wildlife Refuge; (C) Ankeny National Wildlife Refuge; (D) Kingston Prairie Preserve; (E) Chip Ross Park; (F) Bald Hill-Fitton Green Complex; (G) Finley National Wildlife Refuge; (H) Rattlesnake Butte; (I) Coburg Ridge; (J) Murray Hill, Upper Willow Creek; (K) Andrew Reasoner Wildlife Preserve; (L) South Eugene Meadows; (M) Suzanne Arlie, Mount Baldy; (N) Howard Buford Recreation Area; (O) Thurston Hills; (P) Native Oaks Ridge; (Q) Cerro Gordo.

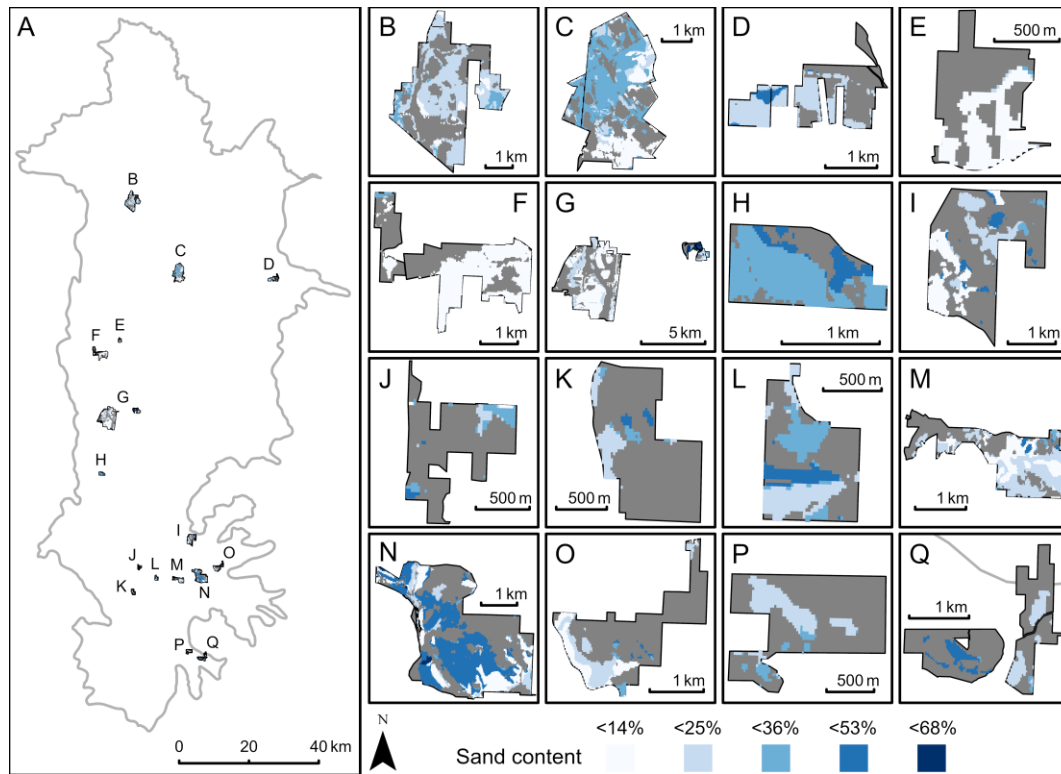


Figure S12. Map of the Willamette Valley in Oregon (A) and individual sites (B-Q) depicting sand content of pixels. (B) Baskett Slough National Wildlife Refuge; (C) Ankeny National Wildlife Refuge; (D) Kingston Prairie Preserve; (E) Chip Ross Park; (F) Bald Hill-Fitton Green Complex; (G) Finley National Wildlife Refuge; (H) Rattlesnake Butte; (I) Coburg Ridge; (J) Murray Hill, Upper Willow Creek; (K) Andrew Reasoner Wildlife Preserve; (L) South Eugene Meadows; (M) Suzanne Arlie, Mount Baldy; (N) Howard Buford Recreation Area; (O) Thurston Hills; (P) Native Oaks Ridge; (Q) Cerro Gordo.