**GS25RMB0008 Shrub Growth Response Draft Report - ADDENDUM -**

April 25, 2025

# Response variables

*(provided by Laura Smit – pers.comm.)*

Species Cover (%) – As measured (estimated) in the field.

Observed Berry Density (berries/100m2)

The observed berry density at the scale of the 100m2 plot, i.e., a value generated from the field measurements of species cover, fruiting plant cover, and fruit productivity. Berry counts occurred within hoops (ie., considered a “site”) along transects and extrapolated to the scale of an area of 100m2.

# Site variables

*(provided by Laura Smit – pers.comm.)*

Latitude (decimal degrees)

Longitude (decimal degrees)

Slope (%)

Canopy Cover (% tree canopy cover)

Aspect (degrees)

Aspect converted to a 1-180° scale

(i.e., “folded aspect”; McCune, 2007)

(*collected from additional sources*)

Elevation (m) Retrieved from Amazon Terrain Tiles (2017)

BEC Biogeoclimatic ecosystem classification – zone with subzone and variant (see <https://www.for.gov.bc.ca/hre/becweb/index.html>). The BEC classification was obtained using the BEC Map published by the Forest Analysis and Inventory Branch, accessed from the Data Catalogue (2024).

# Climate variables

Climate variable data was provided by ClimateBC (v7.50, April 25, 2024; Wang et al., 2016). Each climate variable was included at the current year of sampling, and 1 year (marked with ending “\_1”) and 2 years (marked with “\_2”) prior to sampling (*n*=248 for each year; total *n*=744).

**1) Annual variables**

*Directly calculated annual variables:*

MAT mean annual temperature (°C)

MWMT mean warmest month temperature (°C)

MCMT mean coldest month temperature (°C)

TD temperature difference between MWMT and MCMT, or continentality (°C)

MAP mean annual precipitation (mm)

MSP mean annual summer (May to Sept.) precipitation (mm)

AHM annual heat-moisture index (MAT+10)/(MAP/1000))

SHM summer heat-moisture index ((MWMT)/(MSP/1000))

*Derived annual variables:*

DD\_0 (DD<0) degree-days below 0°C, chilling degree-days

DD5 (DD>5) degree-days above 5°C, growing degree-days

DD\_18 (DD<18) degree-days below 18°C, heating degree-days

DD18 (DD>18) degree-days above 18°C, cooling degree-days

NFFD the number of frost-free days

FFP frost-free period

bFFP the day of the year on which FFP begins

eFFP the day of the year on which FFP ends

PAS precipitation as snow (mm). For individual years, the PAS covers the period between August in the previous year and July in the current year

EMT extreme minimum temperature over 30 years

EXT extreme maximum temperature over 30 years

Eref Hargreaves reference evaporation (mm)

CMD Hargreaves climatic moisture deficit (mm)

RH mean annual relative humidity (%)

CMI Hogg’s climate moisture index (mm)

DD1040 (10<DD<40) degree-days above 10°C and below 40°C

**2) Seasonal variables**

*Seasons:*

Winter (\_wt) Dec. (prev. yr) - Feb for annual, Jan, Feb, Dec for normals

Spring (\_sp) March, April and May

Summer (\_sm) June, July and August

Autumn (\_at) September, October and November

*Directly calculated seasonal variables:*

Tave\_wt winter mean temperature (°C)

Tave\_sp spring mean temperature (°C)

Tave\_sm summer mean temperature (°C)

Tave\_at autumn mean temperature (°C)

Tmax\_wt winter mean maximum temperature (°C)

Tmax\_sp spring mean maximum temperature (°C)

Tmax\_sm summer mean maximum temperature (°C)

Tmax\_at autumn mean maximum temperature (°C)

Tmin\_wt winter mean minimum temperature (°C)

Tmin\_sp spring mean minimum temperature (°C)

Tmin\_sm summer mean minimum temperature (°C)

Tmin\_at autumn mean minimum temperature (°C)

PPT\_wt winter precipitation (mm)

PPT\_sp spring precipitation (mm)

PPT\_sm summer precipitation (mm)

PPT\_at autumn precipitation (mm)

*Derived seasonal variables:*

DD\_0\_wt winter degree-days below 0°C

DD\_0\_sp spring degree-days below 0°C

DD\_0\_sm summer degree-days below 0°C

DD\_0\_at autumn degree-days below 0°C

DD5\_wt winter degree-days above 5°C

DD5\_sp spring degree-days above 5°C

DD5\_sm summer degree-days above 5°C

DD5\_at autumn degree-days above 5°C

DD\_18\_wt winter degree-days below 18°C

DD\_18\_sp spring degree-days below 18°C

DD\_18\_sm summer degree-days below 18°C

DD\_18\_at autumn degree-days below 18°C

DD18\_wt winter degree-days above 18°C

DD18\_sp spring degree-days above 18°C

DD18\_sm summer degree-days above 18°C

DD18\_at autumn degree-days above 18°C

NFFD\_wt winter number of frost-free days

NFFD\_sp spring number of frost-free days

NFFD\_sm summer number of frost-free days

NFFD\_at autumn number of frost-free days

PAS\_wt winter precipitation as snow (mm)

PAS\_sp spring precipitation as snow (mm)

PAS\_sm summer precipitation as snow (mm)

PAS\_at autumn precipitation as snow (mm)

Eref\_wt winter Hargreaves reference evaporation (mm)

Eref\_sp spring Hargreaves reference evaporation (mm)

Eref\_sm summer Hargreaves reference evaporation (mm)

Eref\_at autumn Hargreaves reference evaporation (mm)

CMD\_wt winter Hargreaves climatic moisture deficit (mm)

CMD\_sp spring Hargreaves climatic moisture deficit (mm)

CMD\_sm summer Hargreaves climatic moisture deficit (mm)

CMD\_at autumn Hargreaves climatic moisture deficit (mm)

RH\_wt winter relative humidity (%)

RH\_sp winter relative humidity (%)

RH\_sm winter relative humidity (%)

RH\_at winter relative humidity (%)

CMI\_wt winter Hogg’s climate moisture index (mm)

CMI\_sp spring Hogg’s climate moisture index (mm)

CMI\_sm summer Hogg’s climate moisture index (mm)

CMI\_at autumn Hogg’s climate moisture index (mm)

**3) Monthly variables**

*Primary monthly variables:*

Tave01 – Tave12 January - December mean temperatures (°C)

TMX01 – TMX12 January - December maximum mean temperatures (°C)

TMN01 – TMN12 January - December minimum mean temperatures (°C)

PPT01 – PPT12 January - December precipitation (mm)

*Derived monthly variables:*

DD\_0\_01 – DD\_0\_12 January - December degree-days below 0°C

DD5\_01 – DD5\_12 January - December degree-days above 5°C

DD\_18\_01 – DD\_18\_12 January - December degree-days below 18°C

DD18\_01 – DD18\_12 January - December degree-days above 18°C

NFFD01 – NFFD12 January - December number of frost-free days

PAS01 – PAS12 January – December precipitation as snow (mm)

Eref01 – Eref12 January – December Hargreaves reference evaporation (mm)

CMD01 – CMD12 January – December Hargreaves climatic moisture deficit (mm)

RH01 – RH12 January – December relative humidity (%)

CMI01 – CMI12 January – December Hogg’s climate moisture index (mm)

# References

Amazon (2017) Terrain Tiles on AWS. <https://registry.opendata.aws/terrain-tiles>

British Columbia Data Catalogue. Forest Analysis and Inventory Branch issued under the *Open Government Licence - British Columbia*. Last Modified: 2025-01-28, 06:04 AM. Retrieved November 27, 2024 from: [BEC Map - Datasets - Data Catalogue](https://catalogue.data.gov.bc.ca/dataset/f358a53b-ffde-4830-a325-a5a03ff672c3)

McCune, B. (2007). Improved estimates of incident radiation and heat load using non‐parametric regression against topographic variables. *Journal of Vegetation Science*, *18*(5), 751-754.

Wang T, Hamann A, Spittlehouse D, Carroll C (2016) [Locally Downscaled and Spatially Customizable Climate Data for Historical and Future Periods for North Americ](https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0156720)a. PLoS ONE 11(6): e0156720. doi:10.1371/journal.pone.0156720