# Canadia Model for Peatlands Bulk Density Modelling - 2024

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## Header 1

## Header 2

```
## [1] ""      "bog"   "fen"   "swamp"
```

```
## [1] ""                "extremely rich"  "moderately rich" "poor"
## [5] "rich"
```

```
##  [1] ""                           "basin"
##  [3] "collapse scar"              "domed"
##  [5] "flat"                       "flat : basin"
##  [7] "flat : unconfined"          "horizontal"
##  [9] "lowland polygon"            "palsa"
## [11] "peat plateau"               "plateau"
## [13] "plateau : Atlantic plateau" "plateau : northern plateau"
## [15] "polygonal peat plateau"     "riparian : lacustrine"
## [17] "riparian : shore"           "riparian : stream"
## [19] "slope"                      "slope : peat margin"
## [21] "spring"                     "string"
## [23] "string : northern ribbed"
```

```
## [1] "bog"        "permafrost" "poor fen"   "rich fen"   "swamp"
```

```
##  [1] "Arctic Cordillera"  "Atlantic Maritime"  "Boreal Cordillera"
##  [4] "Boreal Plains"      "Boreal Shield"      "Hudson Plains"
##  [7] "Mixedwood Plains"   "Montane Cordillera" "Northern Arctic"
## [10] "Pacific Maritime"   "Prairies"           "Southern Arctic"
## [13] "Taiga Cordillera"   "Taiga Plains"       "Taiga Shield"
```

```
### map a map of peat type with the ecozones overlain and provinces too

##Also overlay against Pontone peat map
```

```
## # A tibble: 36 x 4
## # Groups:   ECOZONE_NAME_EN [15]
##    ECOZONE_NAME_EN  CaMPNutrient_2024 ORG_DEPTH     n
##    <chr>            <fct>                <dbl> <int>
##  1 ArcticCordillera permafrost             50      1
##  2 AtlanticMaritime bog                   450    231
```

```
##  3 AtlanticMaritime rich fen              290     15
##  4 AtlanticMaritime swamp                240      1
##  5 BorealCordillera permafrost            80      1
##  6 BorealPlains     bog                  200.    58
##  7 BorealPlains     permafrost           226     49
##  8 BorealPlains     poor fen             247     25
##  9 BorealPlains     rich fen             204    191
## 10 BorealPlains     swamp                173     14
## # i 26 more rows
```

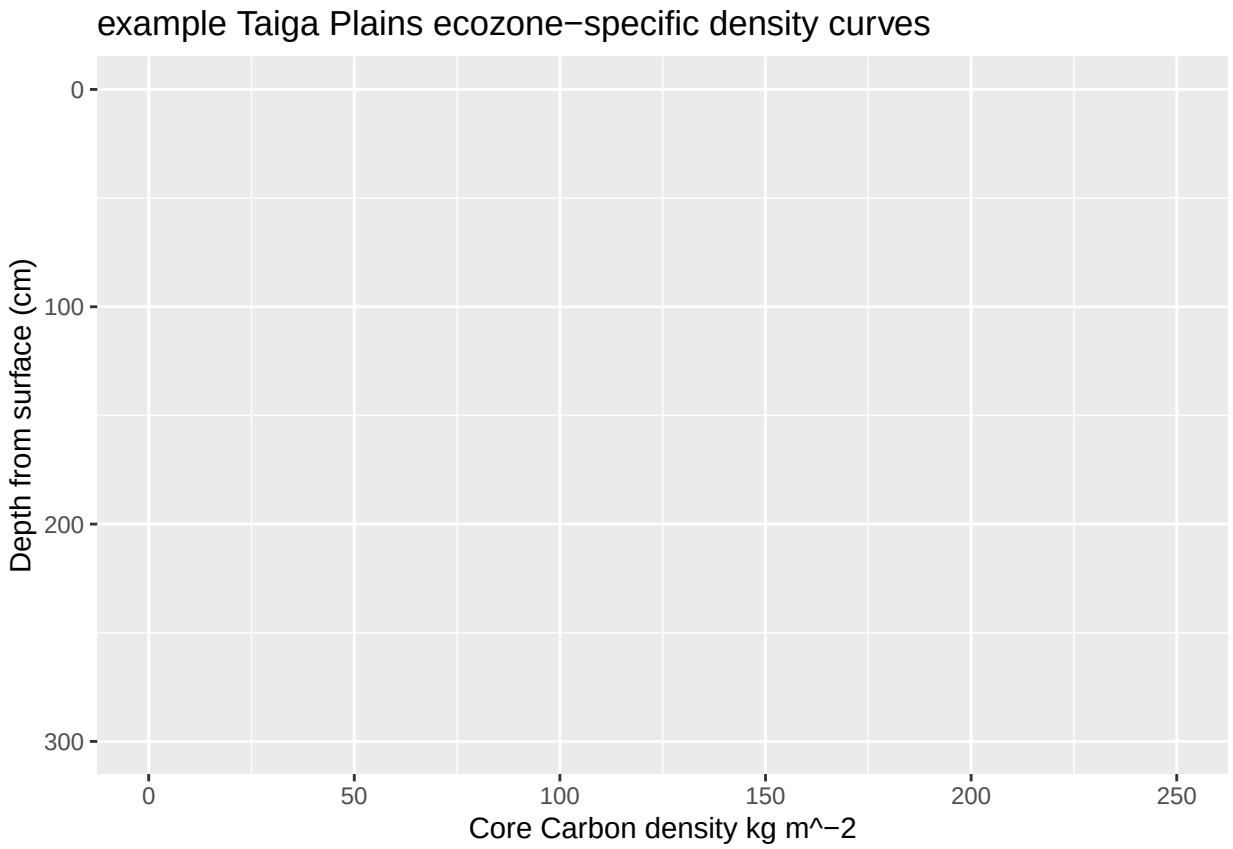
```
## # A tibble: 129 x 6
## # Groups:   ECOZONE_NAME_EN, CaMPNutrient_2024, TREED [77]
##    ECOZONE_NAME_EN  CaMPNutrient_2024 TREED PROV_TERR ORG_DEPTH     n
##    <chr>            <fct>             <chr> <chr>         <dbl> <int>
##  1 ArcticCordillera permafrost        U     NU              50      1
##  2 AtlanticMaritime bog               N     NB             450    219
##  3 AtlanticMaritime bog               N     NS             850      1
##  4 AtlanticMaritime bog               U     NB             250      3
##  5 AtlanticMaritime bog               Y     NB             380      8
##  6 AtlanticMaritime rich fen          N     NB             285     14
##  7 AtlanticMaritime rich fen          Y     NB             380      1
##  8 AtlanticMaritime swamp             N     NB             240      1
##  9 BorealCordillera permafrost        Y     YT              80      1
## 10 BorealPlains     bog               N     AB             232.     4
## # i 119 more rows
```

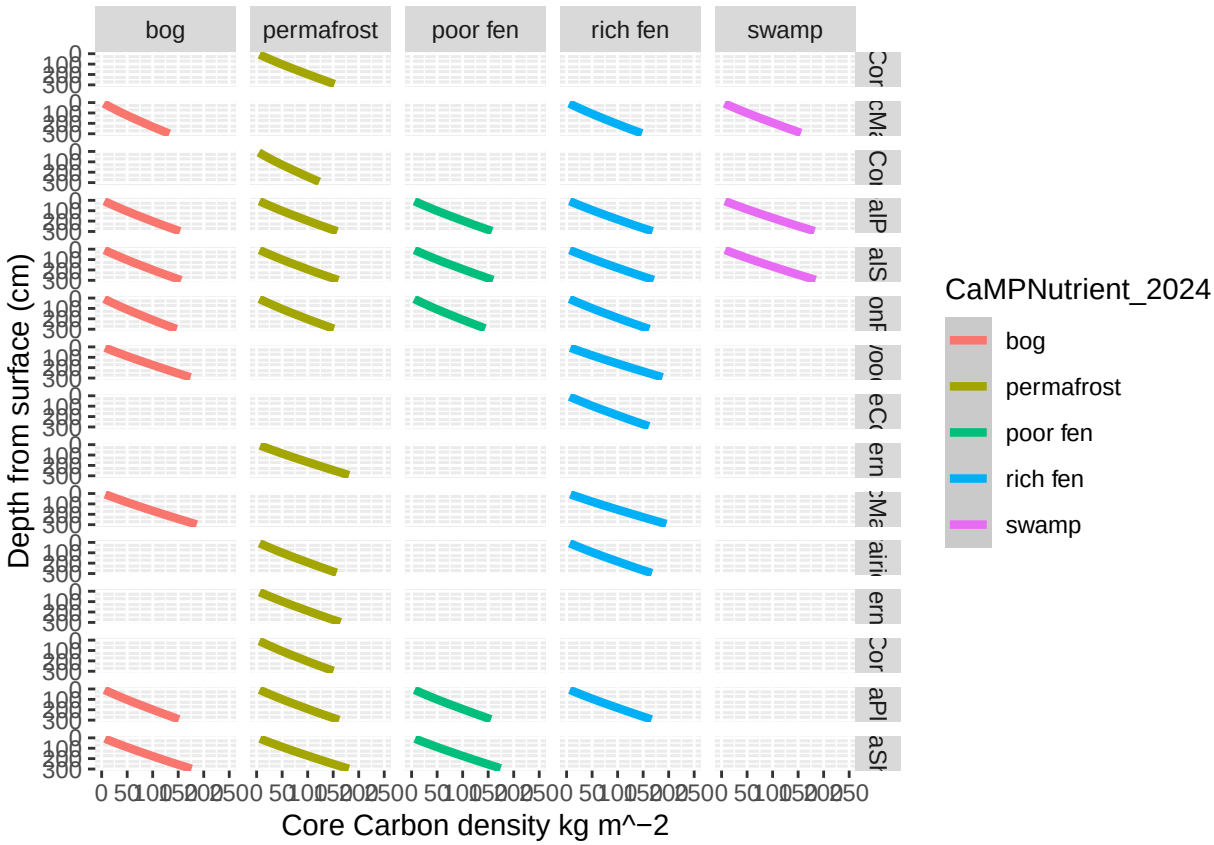
```
## # A tibble: 7 x 5
## # Groups:   CaMPNutrient_2024 [5]
##   CaMPNutrient_2024 PERMAFROST ACTIVE_DPT     n MODAL_SMPL_MONTH
##   <fct>             <chr>           <dbl> <int>            <dbl>
## 1 bog               N               NaN     495                7
## 2 bog               Y                54.9     5               NA
## 3 permafrost        N               NaN      25                7
## 4 permafrost        Y                37.3   282                7
## 5 poor fen          N               NaN      54                7
## 6 rich fen          N               NaN     309                7
## 7 swamp             N               NaN      24                7
```

```
## # A tibble: 8 x 2
##   ECOZONE_NAME_EN      n
##   <chr>            <int>
## 1 ArcticCordillera     1
## 2 BorealShield         1
## 3 HudsonPlains         1
## 4 NorthernArctic       2
## 5 SouthernArctic       6
## 6 TaigaCordillera      6
## 7 TaigaPlains         11
## 8 TaigaShield          1
```

```
## # A tibble: 27 x 4
## # Groups:   CWCS_FORM [23]
##    CWCS_FORM           PERMAFROST Mean_BD     n
```

```
##    <fct>               <chr>        <dbl> <int>
##  1 ""                  N             4.67   421
##  2 ""                  Y             6.16    10
##  3 "basin"             N             5.29   129
##  4 "collapse scar"     N             4.73    18
##  5 "domed"             N             4.20    24
##  6 "flat"              N             4.99    21
##  7 "flat : basin"      N             6.80     6
##  8 "flat : unconfined" N             5.73     1
##  9 "horizontal"        N             5.33    68
## 10 "horizontal"        Y             4.72    10
## # i 17 more rows
```






```
## # A tibble: 72 x 3
##    UniquePeatCombo              term  estimate
##    <chr>                        <chr>    <dbl>
##  1 ArcticCordillera-permafrost a        0.378
##  2 ArcticCordillera-permafrost b        1.06
##  3 AtlanticMaritime-bog        a        0.281
##  4 AtlanticMaritime-bog        b        1.08
##  5 AtlanticMaritime-rich fen   a        0.347
##  6 AtlanticMaritime-rich fen   b        1.06
##  7 AtlanticMaritime-swamp      a        0.391
##  8 AtlanticMaritime-swamp      b        1.05
##  9 BorealCordillera-permafrost a        0.259
## 10 BorealCordillera-permafrost b        1.08
## # i 62 more rows
```

Below are two code chunks used for gap-filling bulk density in the Bauer et al 2024 national peat core composite:

And an archive of the bulk density modelling from Bona et al 2020: