ars_cold_model

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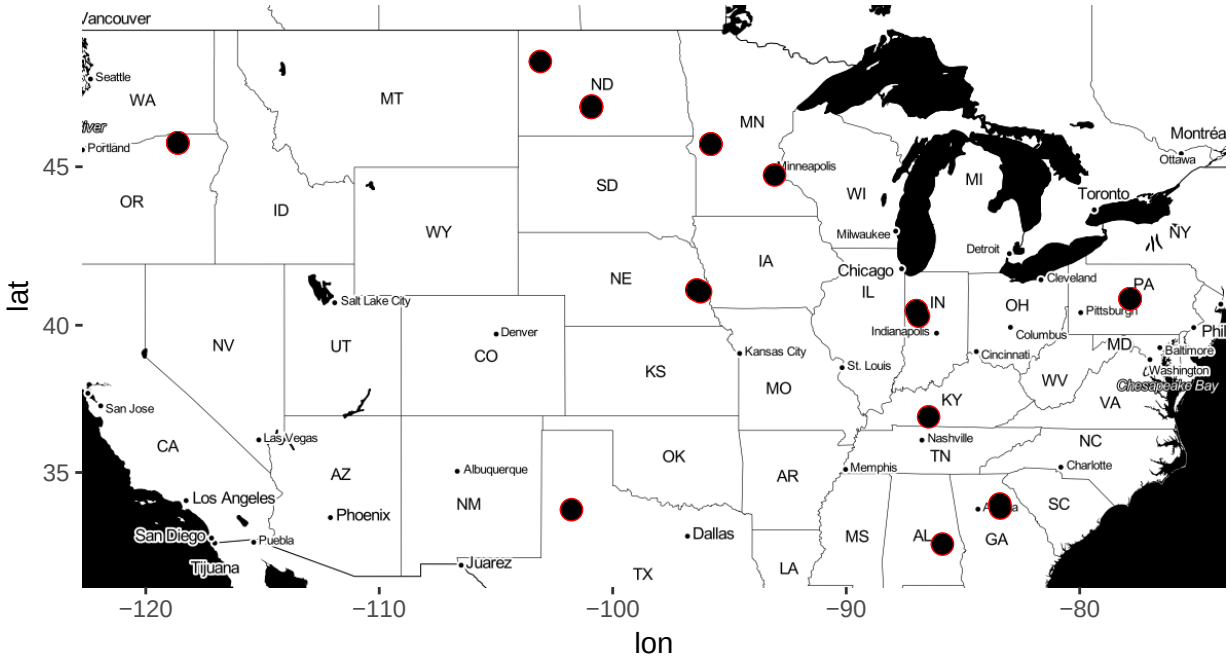
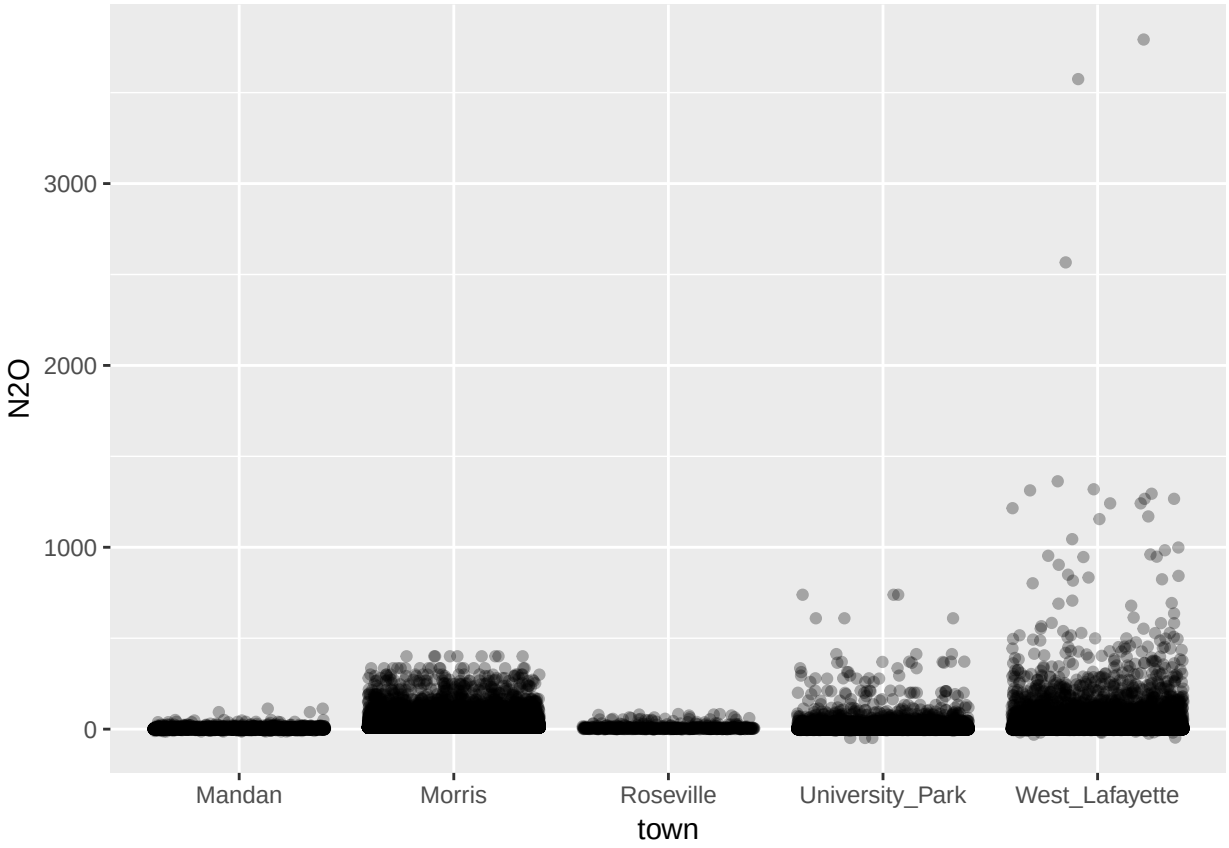
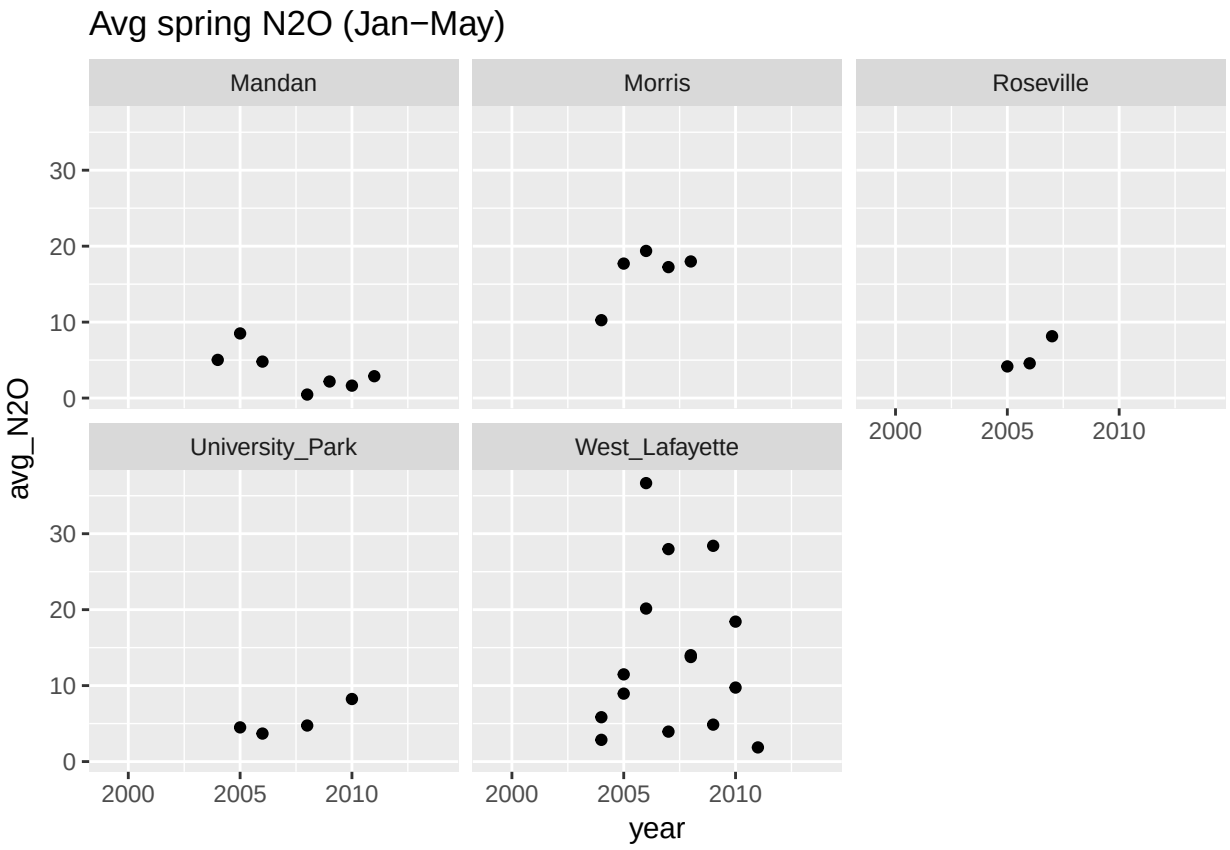
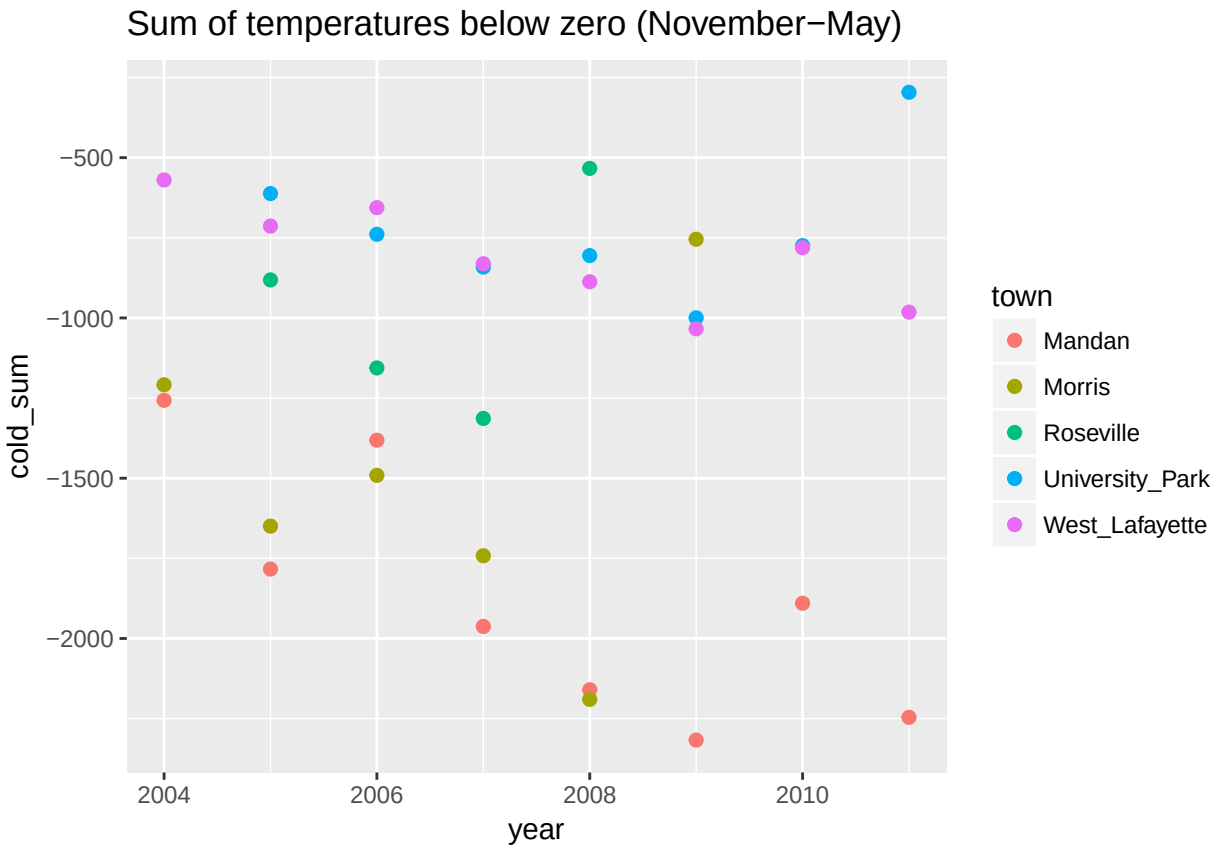


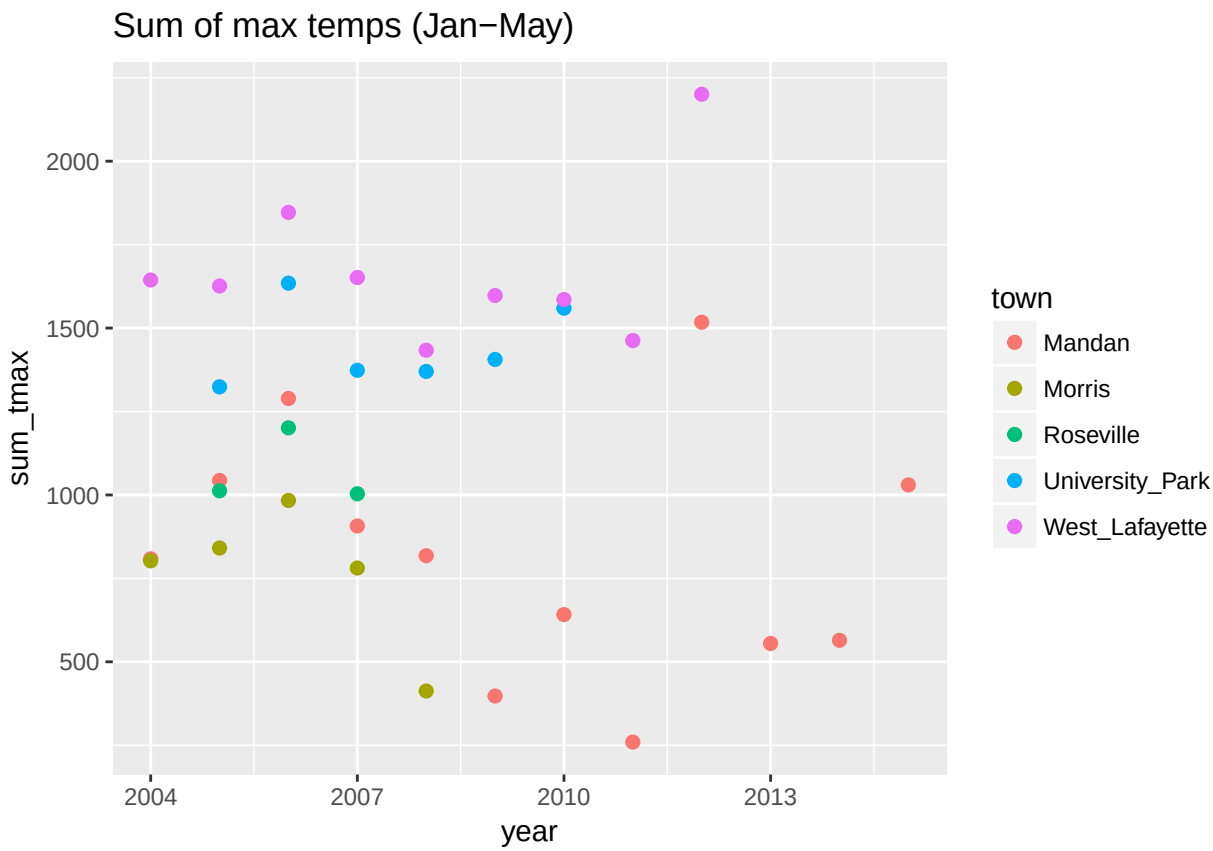
1. Read and select ARS flux data
2. Read and select ARS weather data
3. Read and select ARS longitude and latitude
4. Read and select DAYMET data for all the cold sites (Mandan, Morris, Roseville, University Park, West Lafayette)
5. Read and select soils series for each site
6. Get soil sand silt, clay, organic C, and pH from SSURGO
7. Join all the data together
8. Choose only the sites that freeze

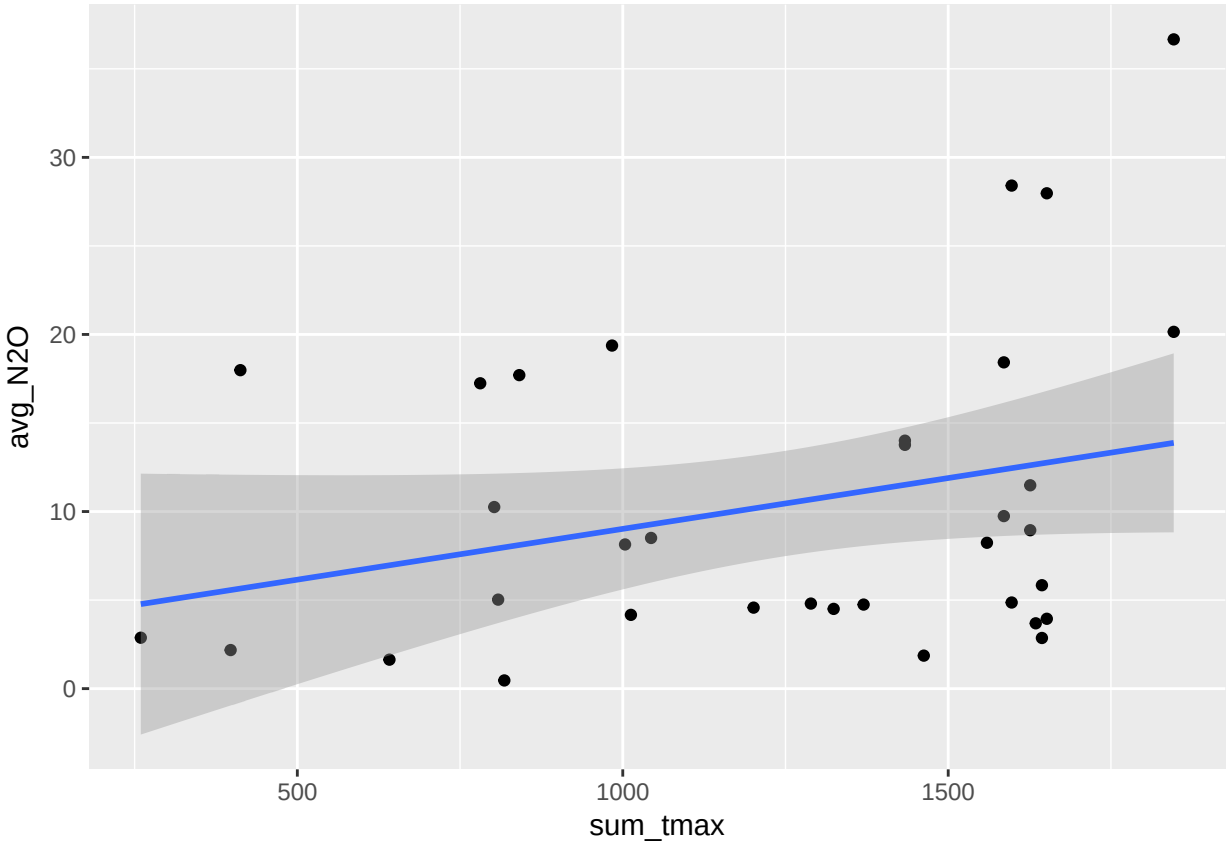

3000
2000
1000
0
N2O
Mandan
Morris
Roseville
University_Park
West_Lafayette
town

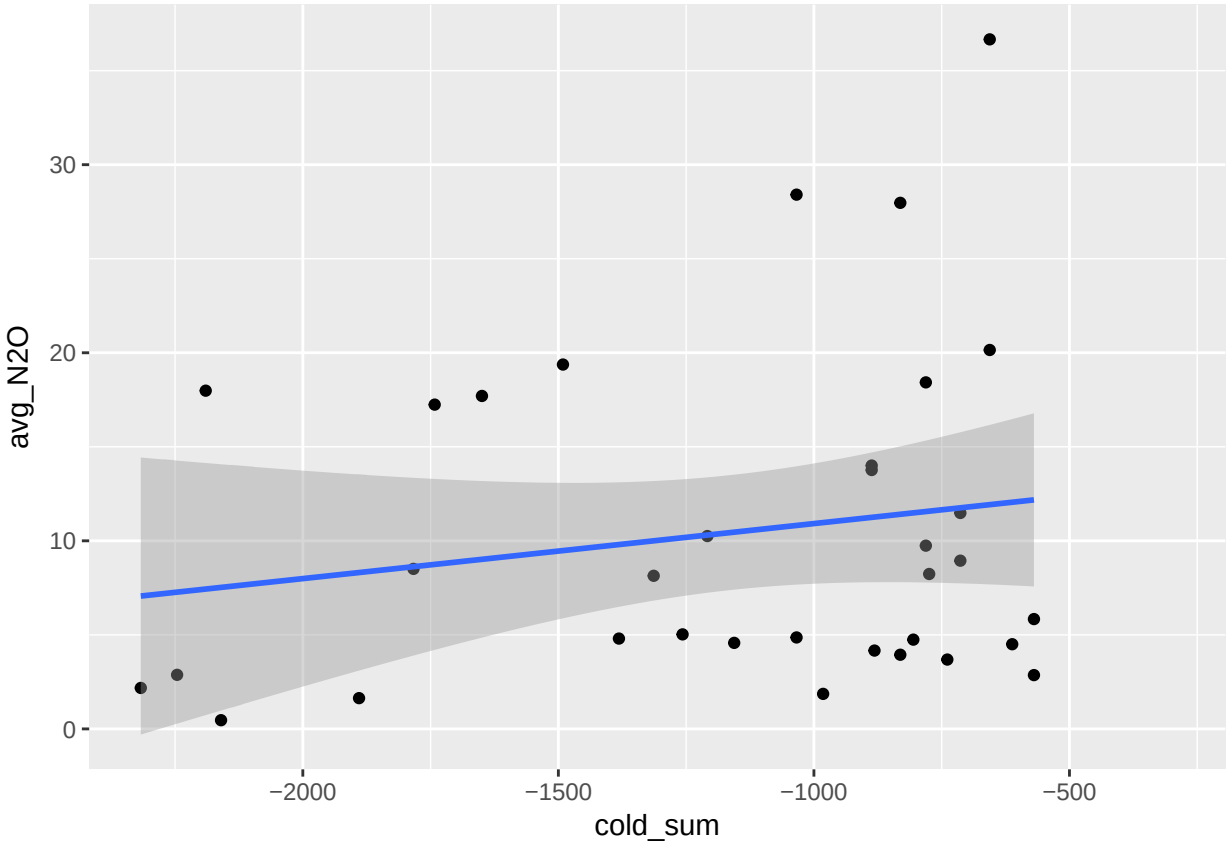
Make annual-based variables

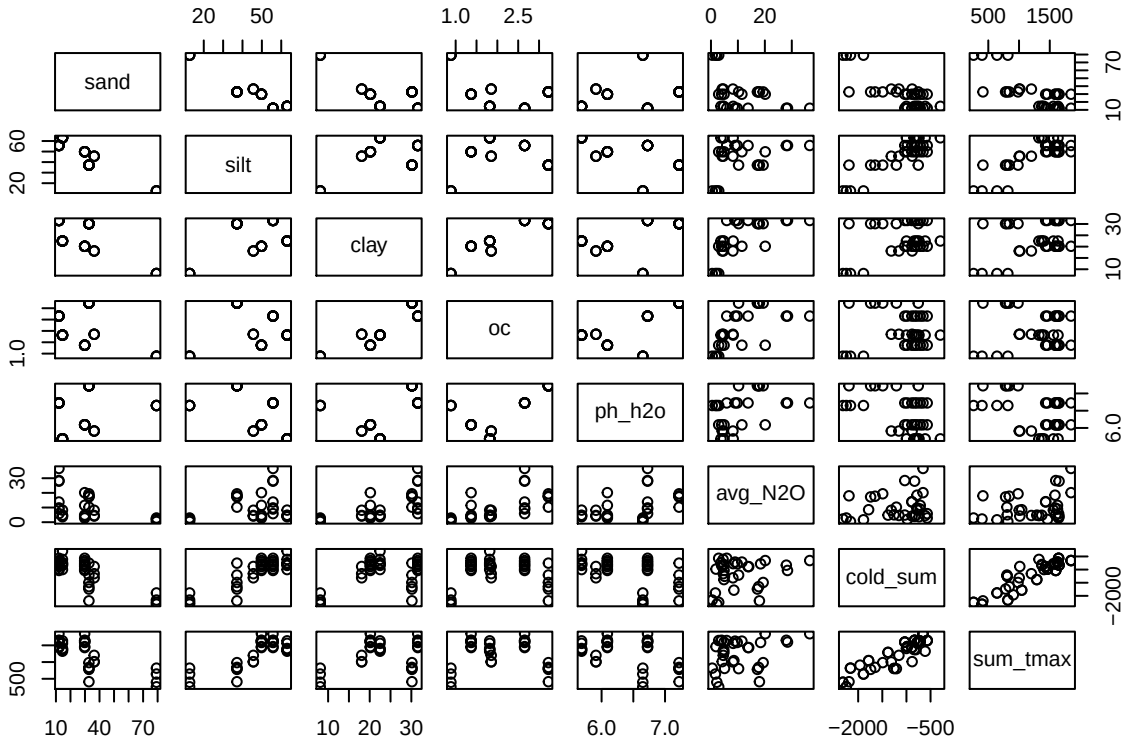



Sum of temperatures below zero (November−May)
cold_sum
−500
−1000
−1500
−2000
2004
2006
2008
2010
year
town
Mandan
Morris
Roseville
University_Park
West_Lafayette


Sum of max temps (Jan−May)
sum_tmax
2000
1500
1000
500
2004
2007
2010
2013
year
town
Mandan
Morris
Roseville
University_Park
West_Lafayette


avg_N2O
30
20
10
0
500
1000
1500
sum_tmax


avg_N2O
30
20
10
0
−2000
−1500
−1000
−500
cold_sum




```
## Start:  AIC=110.64
## avg_N2O ~ cold_sum + sum_tmax + oc + clay + ph_h2o
##
##            Df Sum of Sq     RSS    AIC
## - clay      1     0.734  949.57 108.67
## - ph_h2o    1    10.963  959.80 108.97
## - oc        1    30.984  979.82 109.55
## <none>                   948.84 110.64
## - cold_sum  1   136.877 1085.72 112.42
## - sum_tmax  1   214.450 1163.29 114.35
##
## Step:  AIC=108.67
## avg_N2O ~ cold_sum + sum_tmax + oc + ph_h2o
##
##            Df Sum of Sq     RSS    AIC
## - ph_h2o    1     10.24  959.81 106.97
## <none>                   949.57 108.67
## - cold_sum  1    143.65 1093.22 110.61
## + clay      1      0.73  948.84 110.64
## - oc        1    255.74 1205.31 113.34
## - sum_tmax  1    349.11 1298.69 115.43
##
## Step:  AIC=106.97
## avg_N2O ~ cold_sum + sum_tmax + oc
##
##            Df Sum of Sq     RSS    AIC
```

```
## <none>                   959.81 106.97
## + ph_h2o    1     10.24  949.57 108.67
## + clay      1      0.01  959.80 108.97
## - cold_sum  1    322.79 1282.60 113.08
## - sum_tmax  1    448.67 1408.47 115.71
## - oc        1   1019.91 1979.72 125.24
```

```
## Stepwise Model Path
## Analysis of Deviance Table
##
## Initial Model:
## avg_N2O ~ cold_sum + sum_tmax + oc + clay + ph_h2o
##
## Final Model:
## avg_N2O ~ cold_sum + sum_tmax + oc
##
##
##       Step Df   Deviance Resid. Df Resid. Dev      AIC
## 1                               22   948.8385 110.6450
## 2   - clay  1  0.7341046        23   949.5726 108.6666
## 3 - ph_h2o  1 10.2351845        24   959.8078 106.9668
```

```
## [1] NA NA
```