SoilGrids250 — Import tiles and combine to a raster stack

D G Rossiter

[david.rossiter@wur.nl](mailto:david.rossiter@wur.nl)

12-January-2025

Table of Contents

[Introduction 1](#_Toc187576736)

[Directories 1](#_Toc187576737)

[Packages 1](#_Toc187576738)

[Source files 1](#_Toc187576739)

[Raster stack 2](#_Toc187576740)

# Introduction

This script combines SG250 tiles into a raster stack that can be used for (among other things) pattern analysis.

# Directories

Set the base directory where the imported tiles are stored, specific to the local file system. This is the same as used in R Markdown file SoilGrids250\_WCS\_Import.Rmd.

(base.dir <- path.expand("~/ds\_reference/DSM2025"))

[1] "/Users/rossiter/ds\_reference/DSM2025"

These are the base of destination directories built [below](#dest)

# Packages

library(terra) # raster data, replaces `raster`

# Source files

# directory for this AOI  
AOI.dir.prefix <- paste0("lat", params$lrc\_lat, params$lrc\_lat+params$size,   
 "\_lon", params$lrc\_long-params$size,  
 params$lrc\_long)  
(files.dir <- paste0(base.dir, "/", AOI.dir.prefix))

[1] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778"

length(files.list <- list.files(files.dir, pattern = "\*.tif"))

[1] 42

# Raster stack

Make a stack from the set of TIF images.

rs <- rast(paste0(files.dir, "/", files.list))  
sources(rs)

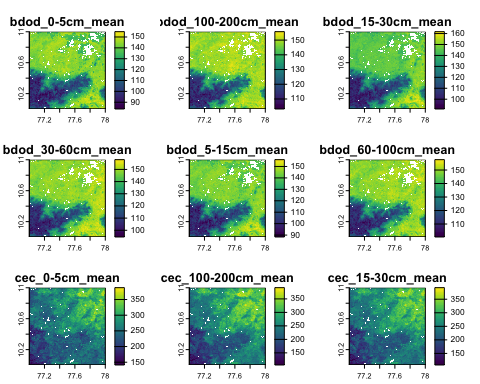
[1] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/bdod\_0-5cm\_mean.tif"   
 [2] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/bdod\_100-200cm\_mean.tif"   
 [3] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/bdod\_15-30cm\_mean.tif"   
 [4] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/bdod\_30-60cm\_mean.tif"   
 [5] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/bdod\_5-15cm\_mean.tif"   
 [6] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/bdod\_60-100cm\_mean.tif"   
 [7] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/cec\_0-5cm\_mean.tif"   
 [8] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/cec\_100-200cm\_mean.tif"   
 [9] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/cec\_15-30cm\_mean.tif"   
[10] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/cec\_30-60cm\_mean.tif"   
[11] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/cec\_5-15cm\_mean.tif"   
[12] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/cec\_60-100cm\_mean.tif"   
[13] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/cfvo\_0-5cm\_mean.tif"   
[14] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/cfvo\_100-200cm\_mean.tif"   
[15] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/cfvo\_15-30cm\_mean.tif"   
[16] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/cfvo\_30-60cm\_mean.tif"   
[17] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/cfvo\_5-15cm\_mean.tif"   
[18] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/cfvo\_60-100cm\_mean.tif"   
[19] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/clay\_0-5cm\_mean.tif"   
[20] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/clay\_100-200cm\_mean.tif"   
[21] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/clay\_15-30cm\_mean.tif"   
[22] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/clay\_30-60cm\_mean.tif"   
[23] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/clay\_5-15cm\_mean.tif"   
[24] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/clay\_60-100cm\_mean.tif"   
[25] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/phh2o\_0-5cm\_mean.tif"   
[26] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/phh2o\_100-200cm\_mean.tif"  
[27] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/phh2o\_15-30cm\_mean.tif"   
[28] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/phh2o\_30-60cm\_mean.tif"   
[29] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/phh2o\_5-15cm\_mean.tif"   
[30] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/phh2o\_60-100cm\_mean.tif"   
[31] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/silt\_0-5cm\_mean.tif"   
[32] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/silt\_100-200cm\_mean.tif"   
[33] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/silt\_15-30cm\_mean.tif"   
[34] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/silt\_30-60cm\_mean.tif"   
[35] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/silt\_5-15cm\_mean.tif"   
[36] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/silt\_60-100cm\_mean.tif"   
[37] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/soc\_0-5cm\_mean.tif"   
[38] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/soc\_100-200cm\_mean.tif"   
[39] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/soc\_15-30cm\_mean.tif"   
[40] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/soc\_30-60cm\_mean.tif"   
[41] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/soc\_5-15cm\_mean.tif"   
[42] "/Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778/soc\_60-100cm\_mean.tif"

summary(rs)

bdod\_0.5cm\_mean bdod\_100.200cm\_mean bdod\_15.30cm\_mean bdod\_30.60cm\_mean  
 Min. : 83.66 Min. :103.8 Min. : 91.0 Min. : 94.91   
 1st Qu.:122.11 1st Qu.:136.0 1st Qu.:129.1 1st Qu.:133.04   
 Median :140.24 Median :147.7 Median :144.2 Median :147.30   
 Mean :131.72 Mean :141.1 Mean :136.8 Mean :139.65   
 3rd Qu.:144.36 3rd Qu.:149.8 3rd Qu.:147.2 3rd Qu.:149.94   
 Max. :153.95 Max. :155.7 Max. :161.7 Max. :158.00   
 NA's :4832 NA's :4832 NA's :4832 NA's :4832   
 bdod\_5.15cm\_mean bdod\_60.100cm\_mean cec\_0.5cm\_mean cec\_100.200cm\_mean  
 Min. : 88.32 Min. :100.4 Min. :141.4 Min. :105.0   
 1st Qu.:125.30 1st Qu.:134.2 1st Qu.:233.2 1st Qu.:219.3   
 Median :141.41 Median :147.9 Median :257.4 Median :252.9   
 Mean :133.64 Mean :140.7 Mean :260.4 Mean :253.8   
 3rd Qu.:144.99 3rd Qu.:150.1 3rd Qu.:286.9 3rd Qu.:293.8   
 Max. :155.94 Max. :157.7 Max. :384.4 Max. :394.7   
 NA's :4832 NA's :4832 NA's :1302 NA's :1302   
 cec\_15.30cm\_mean cec\_30.60cm\_mean cec\_5.15cm\_mean cec\_60.100cm\_mean  
 Min. :107.6 Min. :108.3 Min. :114.3 Min. :108.0   
 1st Qu.:220.8 1st Qu.:219.6 1st Qu.:221.9 1st Qu.:219.5   
 Median :249.6 Median :250.6 Median :249.7 Median :253.9   
 Mean :252.2 Mean :253.0 Mean :252.0 Mean :257.0   
 3rd Qu.:287.8 3rd Qu.:291.6 3rd Qu.:284.0 3rd Qu.:299.8   
 Max. :390.8 Max. :392.4 Max. :388.8 Max. :401.3   
 NA's :1302 NA's :1302 NA's :1302 NA's :1302   
 cfvo\_0.5cm\_mean cfvo\_100.200cm\_mean cfvo\_15.30cm\_mean cfvo\_30.60cm\_mean  
 Min. : 41.38 Min. : 75.84 Min. : 39.57 Min. : 56.14   
 1st Qu.: 82.52 1st Qu.:156.50 1st Qu.: 94.39 1st Qu.:124.73   
 Median : 95.98 Median :175.16 Median :108.86 Median :141.07   
 Mean : 99.85 Mean :175.28 Mean :113.04 Mean :142.10   
 3rd Qu.:114.01 3rd Qu.:193.87 3rd Qu.:129.10 3rd Qu.:158.45   
 Max. :219.21 Max. :301.49 Max. :227.36 Max. :250.22   
 NA's :1302 NA's :1302 NA's :1302 NA's :1302   
 cfvo\_5.15cm\_mean cfvo\_60.100cm\_mean clay\_0.5cm\_mean clay\_100.200cm\_mean  
 Min. : 43.46 Min. : 71.0 Min. :192.9 Min. :280.3   
 1st Qu.: 84.87 1st Qu.:139.3 1st Qu.:284.1 1st Qu.:346.6   
 Median : 97.81 Median :157.5 Median :305.0 Median :361.6   
 Mean :103.53 Mean :158.2 Mean :303.6 Mean :363.6   
 3rd Qu.:118.71 3rd Qu.:175.8 3rd Qu.:323.4 3rd Qu.:378.9   
 Max. :222.27 Max. :280.2 Max. :399.3 Max. :472.3   
 NA's :1302 NA's :1302 NA's :1302 NA's :1302   
 clay\_15.30cm\_mean clay\_30.60cm\_mean clay\_5.15cm\_mean clay\_60.100cm\_mean  
 Min. :228.4 Min. :264.3 Min. :193.5 Min. :268.4   
 1st Qu.:324.3 1st Qu.:349.2 1st Qu.:294.2 1st Qu.:356.4   
 Median :339.3 Median :365.3 Median :312.9 Median :372.3   
 Mean :339.7 Mean :366.5 Mean :312.5 Mean :373.8   
 3rd Qu.:355.0 3rd Qu.:382.8 3rd Qu.:331.0 3rd Qu.:389.8   
 Max. :437.3 Max. :468.2 Max. :412.9 Max. :476.3   
 NA's :1302 NA's :1302 NA's :1302 NA's :1302   
 phh2o\_0.5cm\_mean phh2o\_100.200cm\_mean phh2o\_15.30cm\_mean phh2o\_30.60cm\_mean  
 Min. :50.00 Min. :52.00 Min. :50.10 Min. :51.04   
 1st Qu.:62.59 1st Qu.:63.70 1st Qu.:62.55 1st Qu.:63.00   
 Median :69.24 Median :71.00 Median :69.97 Median :70.82   
 Mean :66.96 Mean :68.38 Mean :67.50 Mean :68.18   
 3rd Qu.:72.00 3rd Qu.:73.72 3rd Qu.:73.00 3rd Qu.:74.00   
 Max. :79.82 Max. :79.00 Max. :80.00 Max. :82.02   
 NA's :1302 NA's :1302 NA's :1302 NA's :1302   
 phh2o\_5.15cm\_mean phh2o\_60.100cm\_mean silt\_0.5cm\_mean silt\_100.200cm\_mean  
 Min. :50.05 Min. :51.50 Min. :146.4 Min. :156.0   
 1st Qu.:62.61 1st Qu.:63.38 1st Qu.:258.7 1st Qu.:240.4   
 Median :69.73 Median :71.00 Median :273.9 Median :255.6   
 Mean :67.24 Mean :68.30 Mean :278.1 Mean :259.7   
 3rd Qu.:72.49 3rd Qu.:73.76 3rd Qu.:292.7 3rd Qu.:274.4   
 Max. :79.95 Max. :80.00 Max. :399.5 Max. :369.5   
 NA's :1302 NA's :1302 NA's :1302 NA's :1302   
 silt\_15.30cm\_mean silt\_30.60cm\_mean silt\_5.15cm\_mean silt\_60.100cm\_mean  
 Min. :146.4 Min. :148.4 Min. :149.4 Min. :155.4   
 1st Qu.:247.7 1st Qu.:238.0 1st Qu.:254.1 1st Qu.:235.8   
 Median :263.5 Median :252.3 Median :268.6 Median :249.0   
 Mean :267.9 Mean :257.7 Mean :274.2 Mean :255.8   
 3rd Qu.:283.8 3rd Qu.:272.3 3rd Qu.:289.3 3rd Qu.:269.3   
 Max. :375.8 Max. :365.9 Max. :393.9 Max. :376.8   
 NA's :1302 NA's :1302 NA's :1302 NA's :1302   
 soc\_0.5cm\_mean soc\_100.200cm\_mean soc\_15.30cm\_mean soc\_30.60cm\_mean  
 Min. : 170.3 Min. : 20.61 Min. : 64.44 Min. : 42.23   
 1st Qu.: 262.9 1st Qu.: 37.98 1st Qu.: 99.31 1st Qu.: 67.40   
 Median : 330.0 Median : 57.51 Median :135.84 Median : 92.73   
 Mean : 388.6 Mean : 72.12 Mean :169.29 Mean :114.26   
 3rd Qu.: 478.6 3rd Qu.: 99.22 3rd Qu.:210.15 3rd Qu.:147.51   
 Max. :1163.8 Max. :337.78 Max. :723.99 Max. :460.49   
 NA's :1342 NA's :1342 NA's :1342 NA's :1342   
 soc\_5.15cm\_mean soc\_60.100cm\_mean  
 Min. :101.3 Min. : 27.35   
 1st Qu.:150.6 1st Qu.: 50.04   
 Median :191.6 Median : 72.64   
 Mean :241.9 Mean : 85.37   
 3rd Qu.:295.1 3rd Qu.:111.49   
 Max. :811.8 Max. :386.13   
 NA's :1342 NA's :1342

Plot the first nine layers to check the stack:

plot(rs[[1:9]])



Save the stack in R format.

print(paste("file name:",  
 file.out <- paste0(base.dir, "/", AOI.dir.prefix, "\_stack.tif")))

[1] "file name: /Users/rossiter/ds\_reference/DSM2025/lat1011\_lon7778\_stack.tif"

writeRaster(rs, filename = file.out,  
 datatype="FLT4S",  
 overwrite=TRUE,  
 gdal ="TFW=YES")