Forest Biodiversity

2024-08-12

```
library(terra)        # For spatial data manipulation
```

```
## terra 1.7.78
```

```
library(raster)       # For handling raster data
```

```
## Loading required package: sp
```

```
library(tidyverse)    # For data manipulation and visualization
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v dplyr     1.1.4     v readr     2.1.5
## v forcats   1.0.0     v stringr   1.5.1
## v ggplot2   3.5.1     v tibble    3.2.1
## v lubridate 1.9.3     v tidyr     1.3.1
## v purrr     1.0.2
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x tidyr::extract() masks raster::extract(), terra::extract()
## x dplyr::filter()  masks stats::filter()
## x dplyr::lag()     masks stats::lag()
## x dplyr::select()  masks raster::select()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
library(fasterize)    # For fast rasterization of spatial data
```

```
##
## Attaching package: 'fasterize'
##
## The following object is masked from 'package:graphics':
##
##     plot
##
## The following object is masked from 'package:base':
##
##     plot
```

```
library(exactextractr) # For fast exact extraction of raster values using polygons
library(sf)           # For handling simple features (spatial vector data)
```

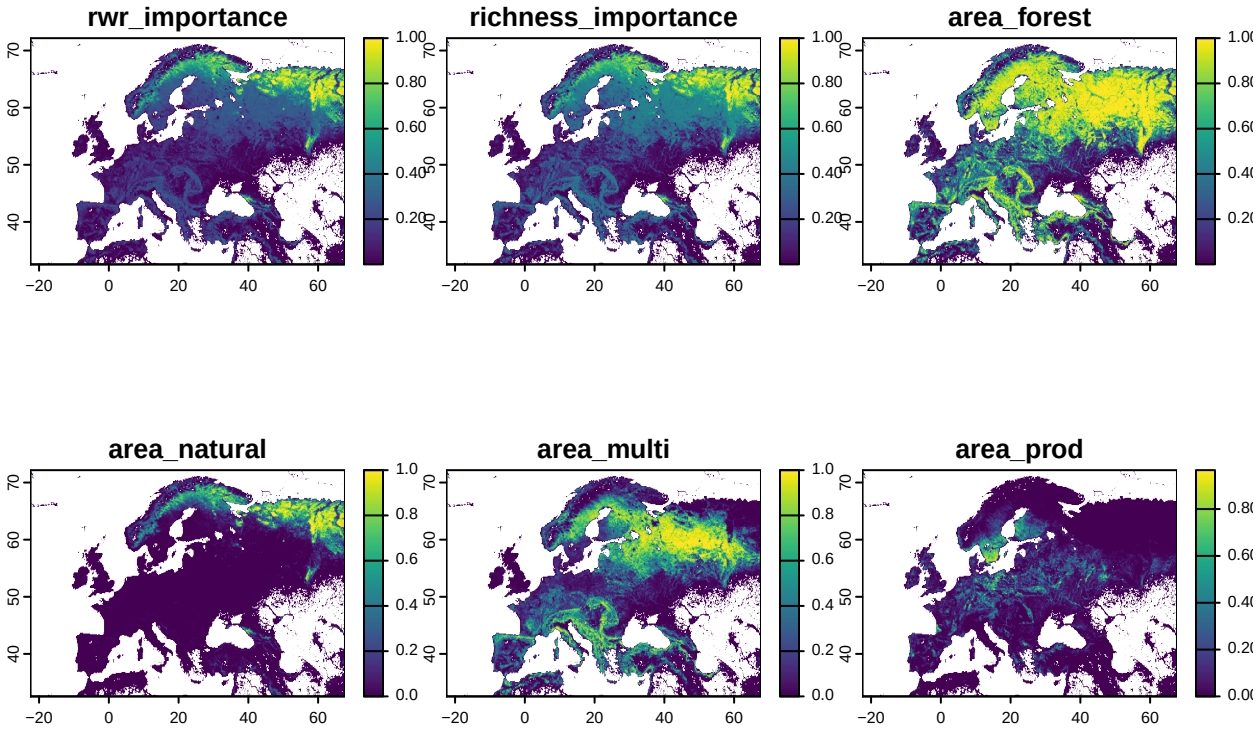
```
## Linking to GEOS 3.10.2, GDAL 3.4.1, PROJ 8.2.1; sf_use_s2() is TRUE
```

```
forest_spp_richness <- read_csv("../data/forest_spp_importance.csv")
```

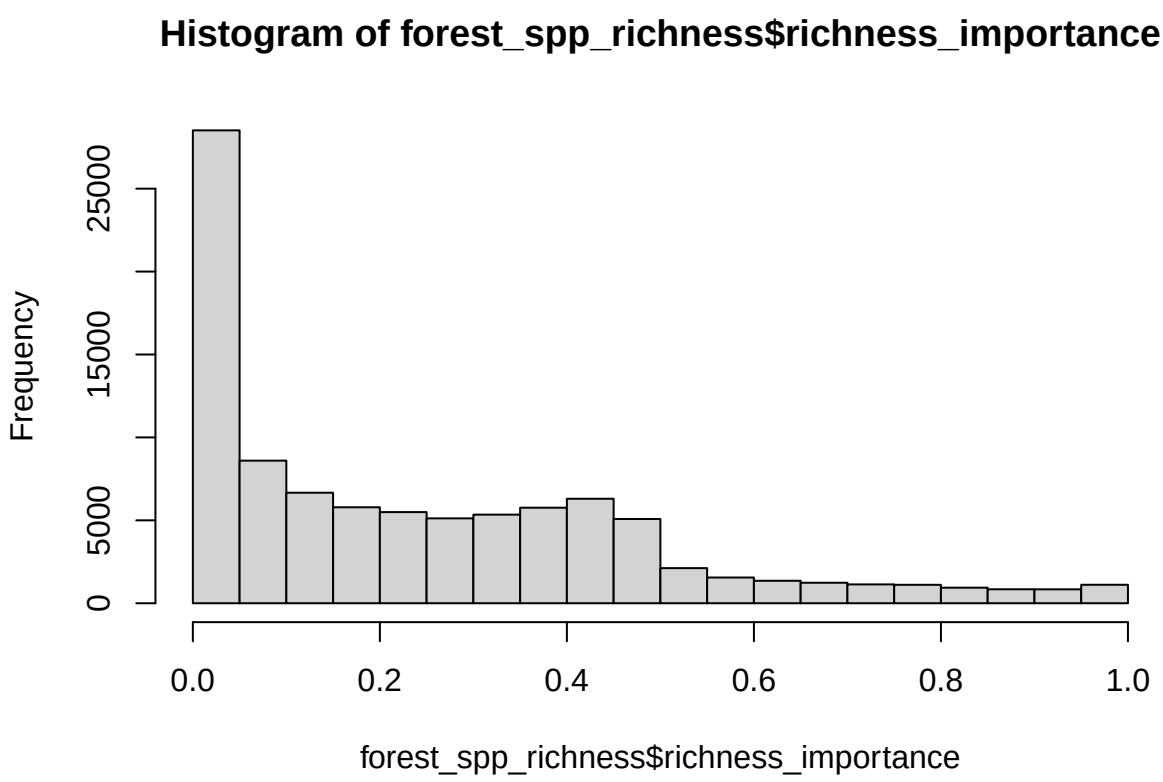
```
## Rows: 94921 Columns: 8
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## dbl (8): x, y, rwr_importance, richness_importance, area_forest, area_natura...
##
```

```
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

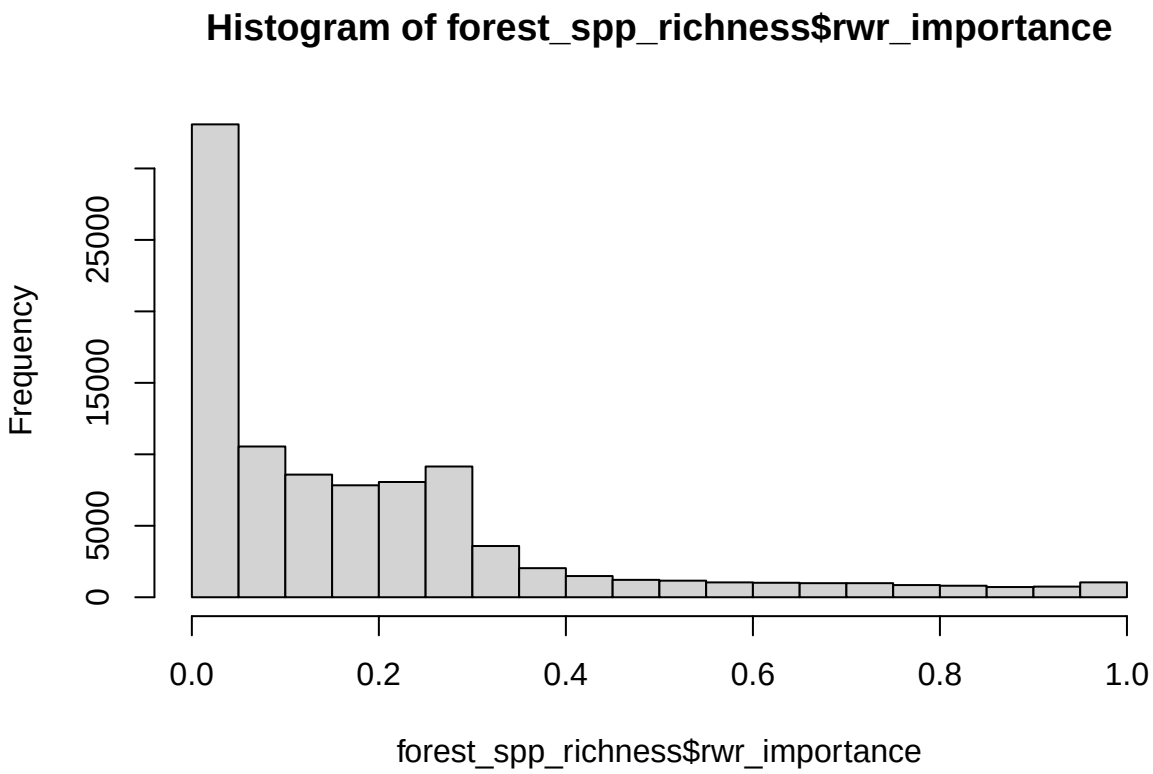
```
# Plot the resulting raster of forest species richness
plot(rast(forest_spp_richness))
```




```
# Plot histograms of richness importance and rwr importance
hist(forest_spp_richness$richness_importance)
```

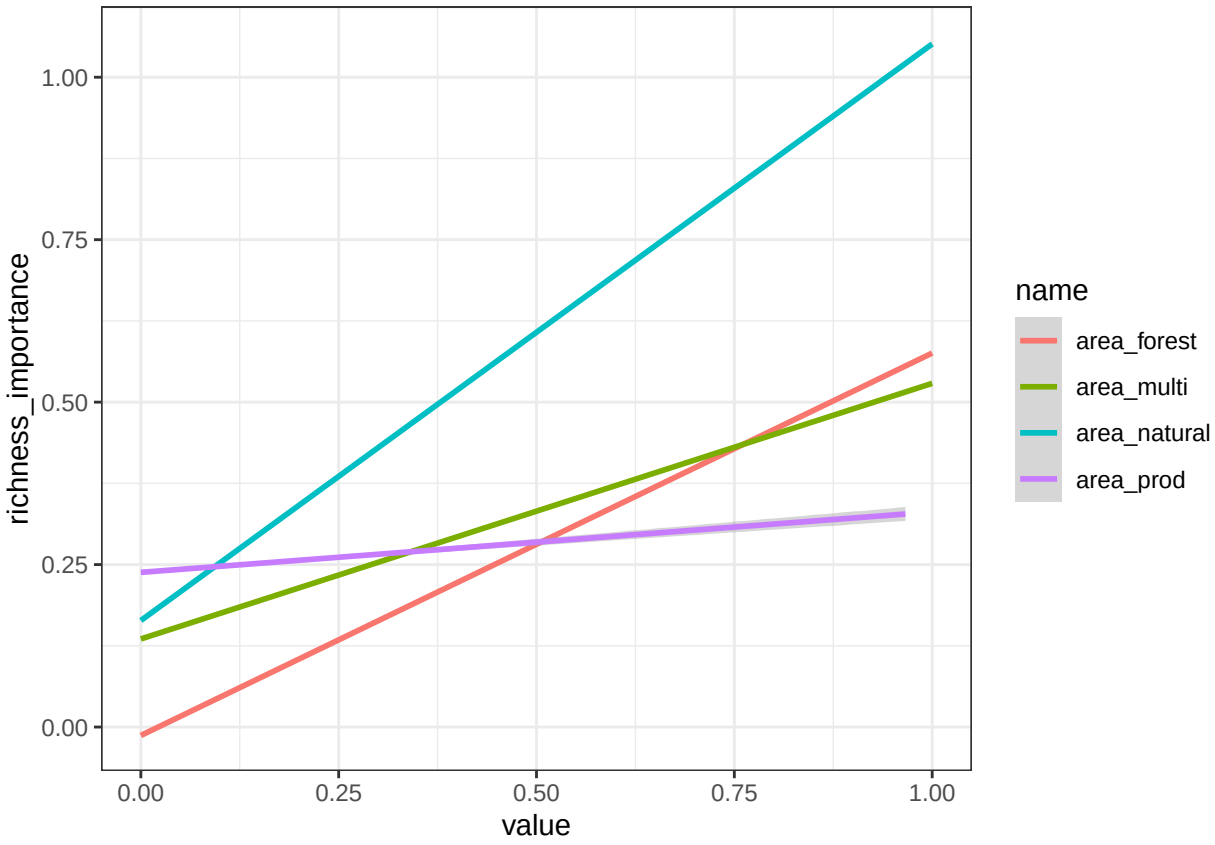



```
hist(forest_spp_richness$rwr_importance)
```




```
# Plot linear models of richness importance against other variables
forest_spp_richness |>
  pivot_longer(-c(x, y, rwr_importance, richness_importance)) |>
  ggplot(aes(x = value, y = richness_importance, color = name)) +
  geom_smooth(method = "lm", se = TRUE) +
  theme_bw()
```

```
## `geom_smooth()` using formula = 'y ~ x'
```


1.00
0.75
0.50
0.25
0.00
richness_importance
0.00
0.25
0.50
0.75
1.00
value
name
area_forest
area_multi
area_natural
area_prod