libs <- c(

"giscoR", "terra", "elevatr",

"png", "rayshader", "magick"

)

installed\_libs <- libs %in% rownames(

installed.packages()

)

if(any(installed\_libs == F)){

install.packages(

libs[!installed\_libs]

)

}

invisible(lapply(

libs, library,

character.only = T

))

country\_sf <- giscoR::gisco\_get\_countries(

country= "SI",

resolution = "1"

)

url <-"https://s3-eu-west-1.amazonaws.com/vito.landcover.global/v3.0.1/2019/E000N60/E000N60\_PROBAV\_LC100\_global\_v3.0.1\_2019-nrt\_Forest-Type-layer\_EPSG-4326.tif"

download.file(

url = url,

destfile = basename(url),

mode= "wb"

)

forest\_type <- terra::rast(

basename(url)

)

vals <- terra::values(

forest\_type,

dataframe = T

)

names(vals)

names(vals)[1] <- "value"

unique(vals$value)

crs\_lambert <-

"+proj=laea +lat\_0=52 +lon\_0=10 +x\_0=4321000 +y\_0=3210000 +datum=WGS84 +units=m +no\_frfs"

country\_forest\_type <- terra::crop(

forest\_type,

terra::vect(country\_sf),

snap = "in",

mask = T

) |>

terra::project(crs\_lambert)

terra::plot(country\_forest\_type)

cols <- c(

"#073b4c",

"#7cd8ff",

"#ffcf6a",

"#e73f69"

)

from <- c(0:1,4:5)

to <- t(col2rgb(

cols

))

forest\_terra <- na.omit(

country\_forest\_type

)

forest\_type\_image <- terra::subst(

forest\_terra,

from,

to,

names = cols

)

terra::plotRGB(forest\_type\_image)

img\_file <- "Slovenia-forest-image.png"

terra::writeRaster(

forest\_type\_image,

img\_file,

overwrite = T,

NAflag = 255

)

img <- png::readPNG(img\_file)

elev <- elevatr::get\_elev\_raster(

locations = country\_sf,

z = 10, clip = "locations"

)

elev\_lambert <- elev |>

terra::rast() |>

terra::project(crs\_lambert)

elmat <- rayshader::raster\_to\_matrix(

elev\_lambert

)

h <- nrow(elev\_lambert)

w <- ncol(elev\_lambert)

elmat |>

rayshader::height\_shade(

texture = colorRampPalette(

"white"

)(512)

) |>

rayshader::add\_overlay(

img,

alphalayer = .9,

alphacolor = "white"

) |>

rayshader::add\_shadow(

rayshader::lamb\_shade(

elmat,

zscale = 50,

sunaltitude = 90,

sunangle = 315

), max\_darken = .25

) |>

rayshader::add\_shadow(

rayshader::texture\_shade(

elmat,

detail = .95,

brightness = 90,

contrast = 80

), max\_darken = .1

) |>

rayshader::plot\_3d(

elmat,

zscale = 5,

solid = F,

shadow = T,

shadow\_darkness = 1,

background = "White",

windowsize = c(

w / 5, h / 5

),

zoom = .5,

phi = 85,

theta = 0

)

rayshader::render\_highquality(

filename = "forest-type-slovenia-3d.png",

preview = T,

light = F,

environment\_light = "air\_museum\_playground\_4k.hdr",

intensity\_env = 2,

)