W10-1: The how-to you always wanted

This worksheet introduces you to your first R Markdown project and recaps the last session on map-type figures.

After completing this worksheet you should have gained some experience in using Rmd for a combined coding/documentation session.

Things you need for this worksheet

- R — the interpreter can be installed on any operation system. For Linux, you should use the r-cran packages supplied for your Linux distribution. If you use Ubuntu, this is one of many starting points. If you use windows, you could install R from the official CRAN web page.
- R Studio — we recommend to use R Studio for (interactive) programming with R. You can download R Studio from the official web page.
- Fogo field survey 2014 - a subset of the BIS-Fogo field survey data from 2014 can be downloaded from an internal university server.
- Fogo Landsat 11/2014 - a subset of a Landsat scene from 11/24/2014 over Fogo, Cape Verde, can be downloaded from an internal university server.

Learning log assignments

😎 As always, please add these entries to your today's learning log at teachwiki:

- Favorite aspect of the session (if any)
- Superfluous aspect of the session (if any)
- Eureka effect (if any)
- Links to what I've learned so far (if any)
- Questions (if any)

For more information see this short howto.

As today's special, please complete the following assignment:

😕 Please create a short tutorial on how to write a function that visualizes a spatial point vector attribute over a contrast stretched raster image. A discrete legend for the attribute values and a continuous legend for the raster image should be part of the plot. Show how it works by visualizing the number of natural vegetation species over a greyscale image of Landsat band 3 from the Fogo dataset. The tutorial should include the R code, an explanation of the code and the result of the code (i.e. it should be something like the examples you find in this course).

The data source is exactly the same as in W08-1. Hence, the Landsat data is provided as GeoTiff and the vegetation data as CSV file. The number of natural species is stored in column “NAT”.

😕 Please upload the R Markdown generated html content to your learning log (see this short howto).

This worksheet focuses on R Markdown and functions, not on coming up with a completely new type of visualization. The data set is already known from your last learning log assignment and some code examples for the contrast stretch can already be found in E09-1 - Map-type figures. The map-type figure you should create is based on the same code as the third figure from below which visualizes the vegetation coverage instead of the number of natural species.

While a function should fit a special purpose, it should also allow some flexibility. In the present context it might be a good idea to define the function in such a way so you can pass the name of the raster and vector dataset, the attribute of the vector and the color to use. While default values for the names of the datasets do not make sense, default color schemes should be included. Of course you can also allow the setting of a specific contrast stretch with another function variable.

Have a look at E-05-5 Functions to recap how one can write a function.