code-sample

General outline

This code sample is intended to be a reproducible example of downloading, processing, and visualizing climate time series for the state of Colorado.

First we need to setup our environment

```
packages <- c("tidyverse", "magrittr", "raster", "RCurl", "sf", "assertthat", 'lubridate')
if (length(setdiff(packages, rownames(installed.packages()))) > 0) {
  install.packages(setdiff(packages, rownames(installed.packages())))
  lapply(packages, library, character.only = TRUE, quietly = TRUE)
} else {
  lapply(packages, library, character.only = TRUE, quietly = TRUE)
}
```

Now lets create some folders to store our raw and processed data in...

```
prefix <- "data"
raw_dir <- file.path(prefix, "raw")
us_dir <- file.path(raw_dir, "cb_2016_us_state_20m")
climate_dir <- file.path(raw_dir, "climate")
# Check if directory exists for all variable aggregate outputs, if not then create
var_dir <- list(prefix, raw_dir, us_dir, climate_dir)
lapply(var_dir, function(x) if(!dir.exists(x)) dir.create(x, showWarnings = FALSE))
```

Now we can start to download the time series and ancillary data, but first let's create a small function to download the data more easily.

```
download_data <- function(url, dir) {
  file_extension <- url %>%
    basename %>%
    strsplit(., '[.]') %>%
    unlist
  file_extension_name <- file_extension[1]
  file_extension_ext <- file_extension[2]

  download.file(url, destfile = file.path(dir, paste0(file_extension_name, ".", file_extension_ext)))
  if(file_extension_ext == 'zip'){
    unzip(paste0(dir, ".", file_extension_ext),
        exdir = dir)
  unlink(paste0(dir, ".", file_extension_ext))
  }
}
```

```
# USA states shapefile
if(!file.exists(file.path(us_dir, "cb_2016_us_state_20m.shp"))) {
  download_data("https://www2.census.gov/geo/tiger/GENZ2016/shp/cb_2016_us_state_20m.zip", us_dir)
  }

# Monthly Precipitation from 1979-2017
# if(!file.exists(file.path(climate_dir, ''))) { #checks if we have already downloaded the data
  download_data("https://www.northwestknowledge.net/metdata/data/monthly/pr_gridMET.nc", climate_dir)
  # }
```