R PROGRAMMING

for environmental health research

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Today's goals

LEARN principles of a key R plotting framework

UNDERSTAND what R can do for visualizations

KNOW what to do next to learn more

Homework?!

https://bit.ly/2WQV6XT

Today's plan

ORGANIZE

TRACK

PACKAGE

COLLECT

PROCESS

PREREQUISITES

Setting up

Install RStudio Desktop

https://www.rstudio.com/

Install git

https://git-scm.com/downloads

Create GitHub account

https://github.com/

Download example project

[project url]

ORGANIZE

RStudio's **R Projects** for organizing

Common project subdirectories

data-raw Raw data and R scripts to clean the raw data.

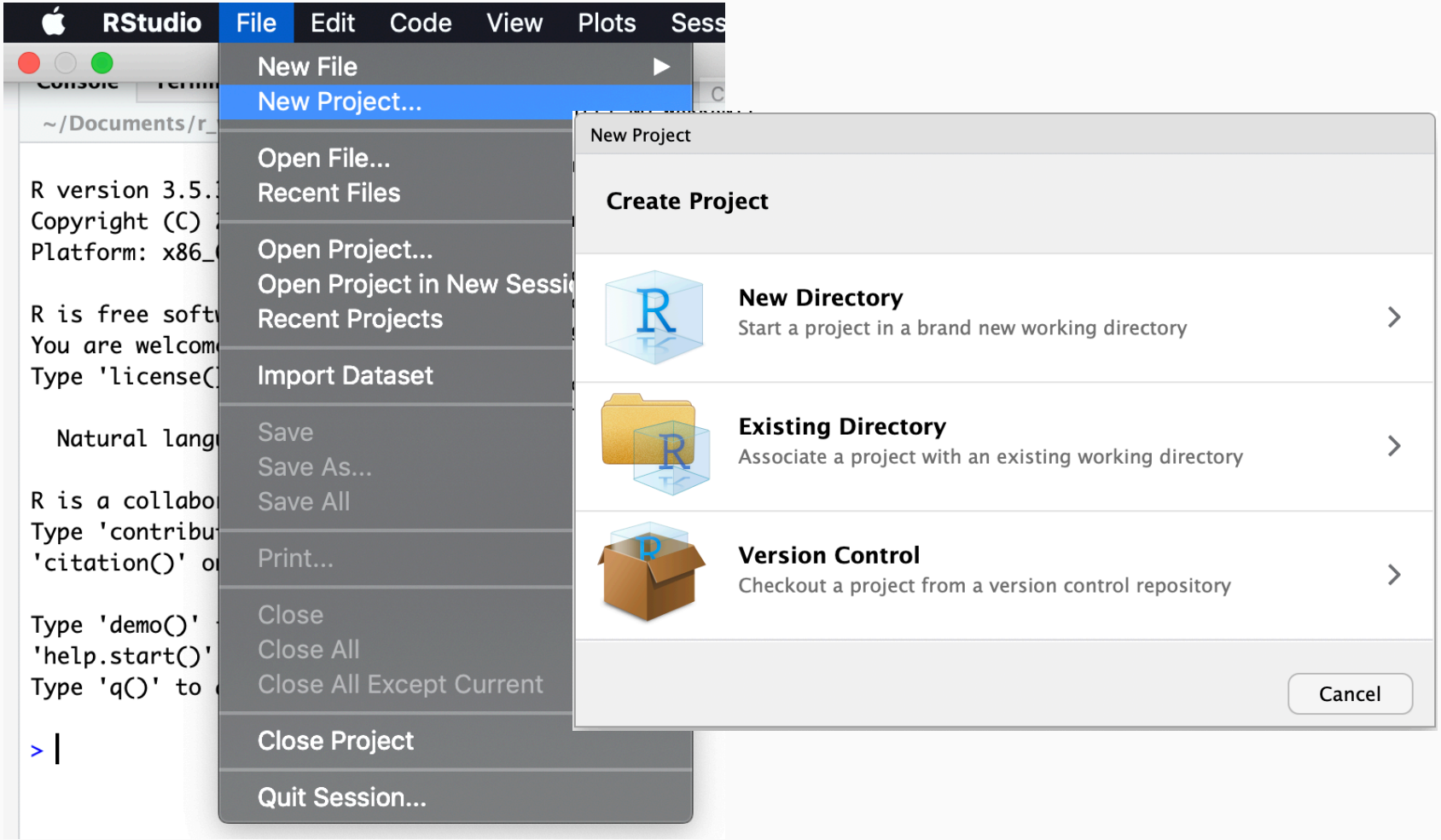
data Cleaned data, often saved as `.RData` after being generated by a script in `data-raw`.

R Code for any functions used in analysis.

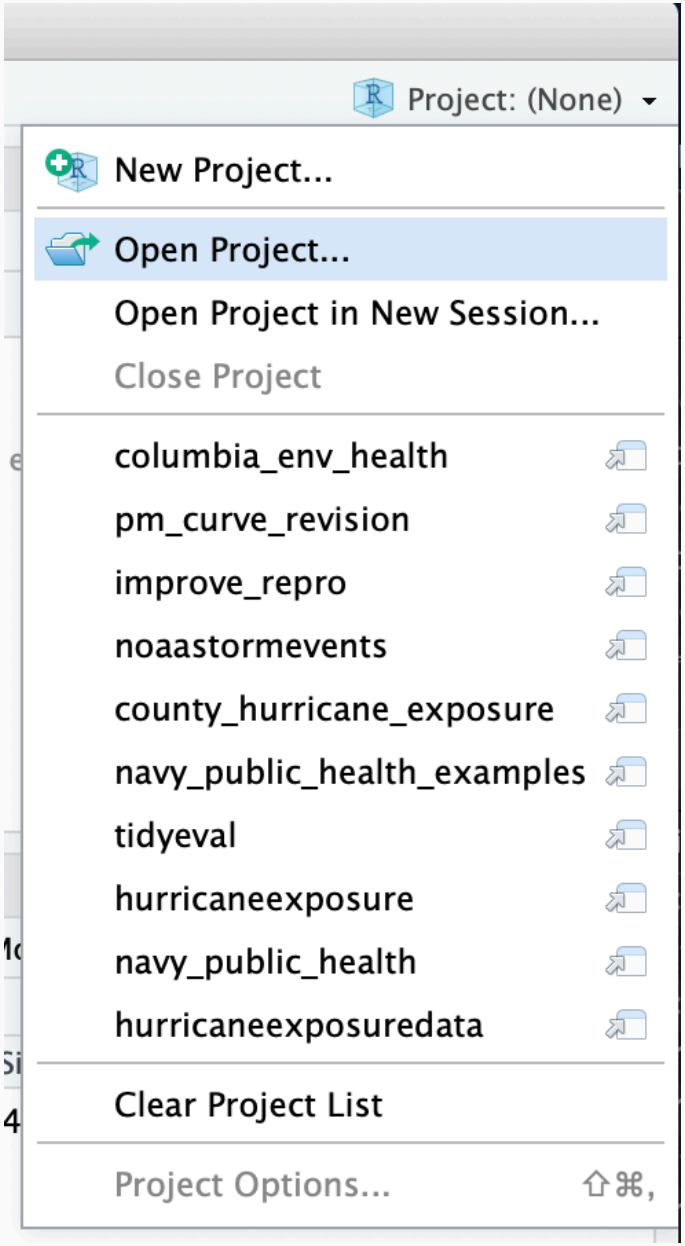
figures Figures created from R code.

reports R Markdown files and products rendered from those files (e.g., paper drafts, presentations).

Create R project



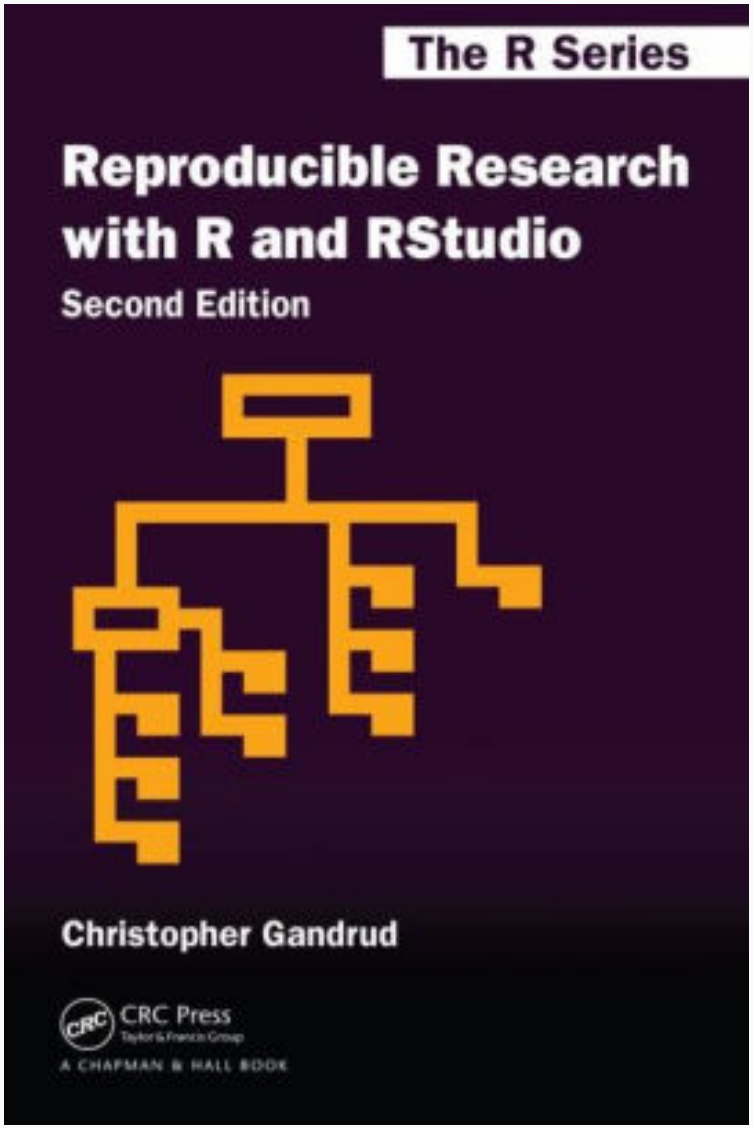
Resources


Project: (None)
New Project...
Open Project...
Open Project in New Session...
Close Project
columbia_env_health
pm_curve_revision
improve_repro
noaastormevents
county_hurricane_exposure
navy_public_health_examples
tidyeval
hurricaneexposure
navy_public_health
hurricaneexposuredata
Clear Project List
Project Options... ⇧⌘,

```
Georgianas-MacBook-Pro:columbia_env_health georgianaanderson$ ls -a
.                                   _output.yml
..                                  _workshop_slides
.DS_Store                           book.bib
.Rproj.user                         columbia_env_health.log
.git                                data
.gitignore                          docs
.nojekyll                           flexdashboard
01-organize.Rmd                     images
02-track.Rmd                        index.Rmd
03-package.Rmd                      irma_fatalities.pdf
04-collect.Rmd                      navy_public_health.Rproj
05-process.Rmd                      navy_public_health.log
06-summary.Rmd                      now.json
DESCRIPTION                         old_data
LICENSE                             packages.bib
R                                   preamble.tex
README.md                           skeleton.bib
_bookdown.yml                       style.css
_bookdown_files                     toc.css
_build.sh
```

.Rproj/

Resources


The R Series
Reproducible Research with R and RStudio
Second Edition
Christopher Gandrud
CRC Press
A CHAPMAN & HALL BOOK

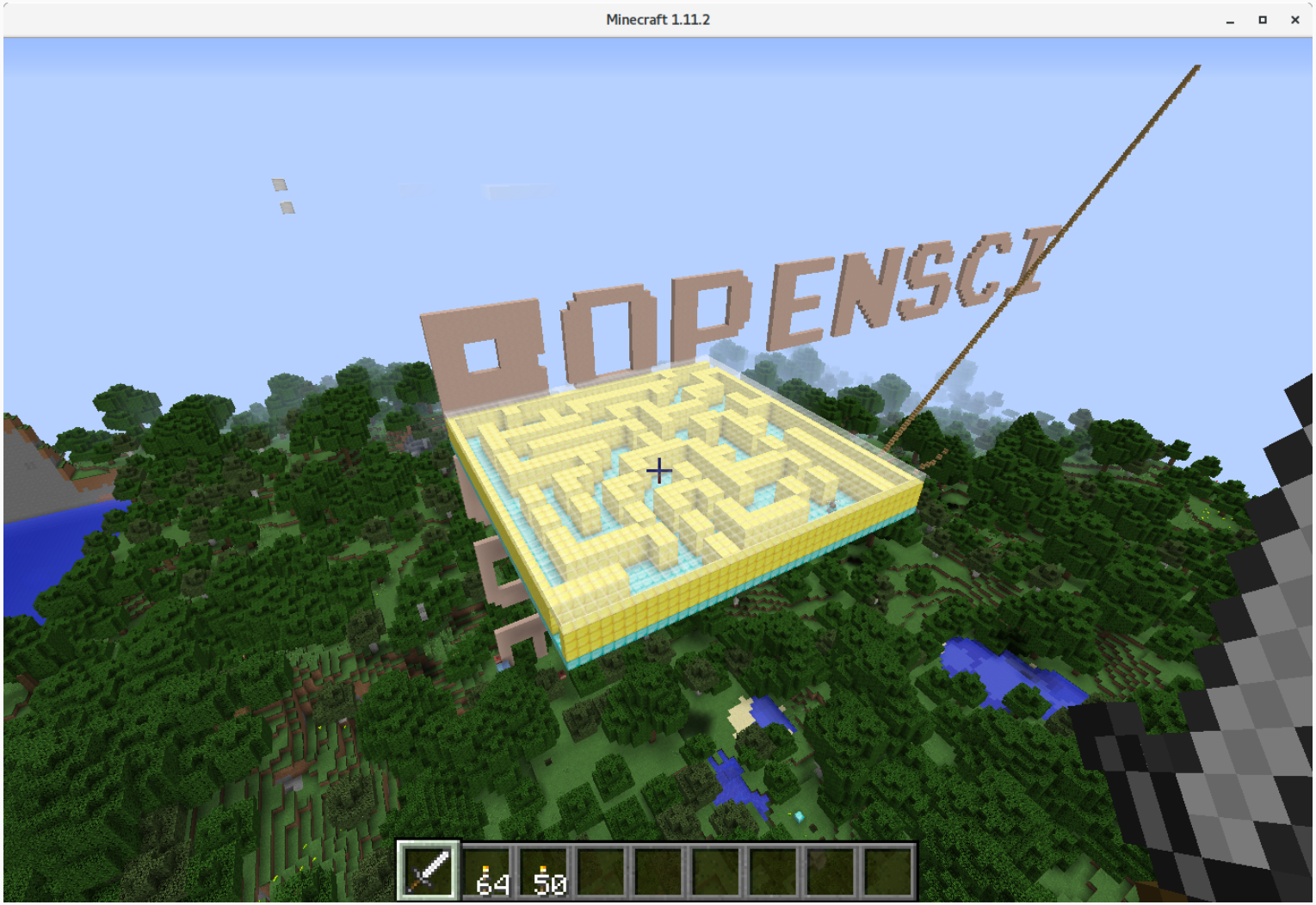
[Live coding example]

TRACK

git and GitHub for version control

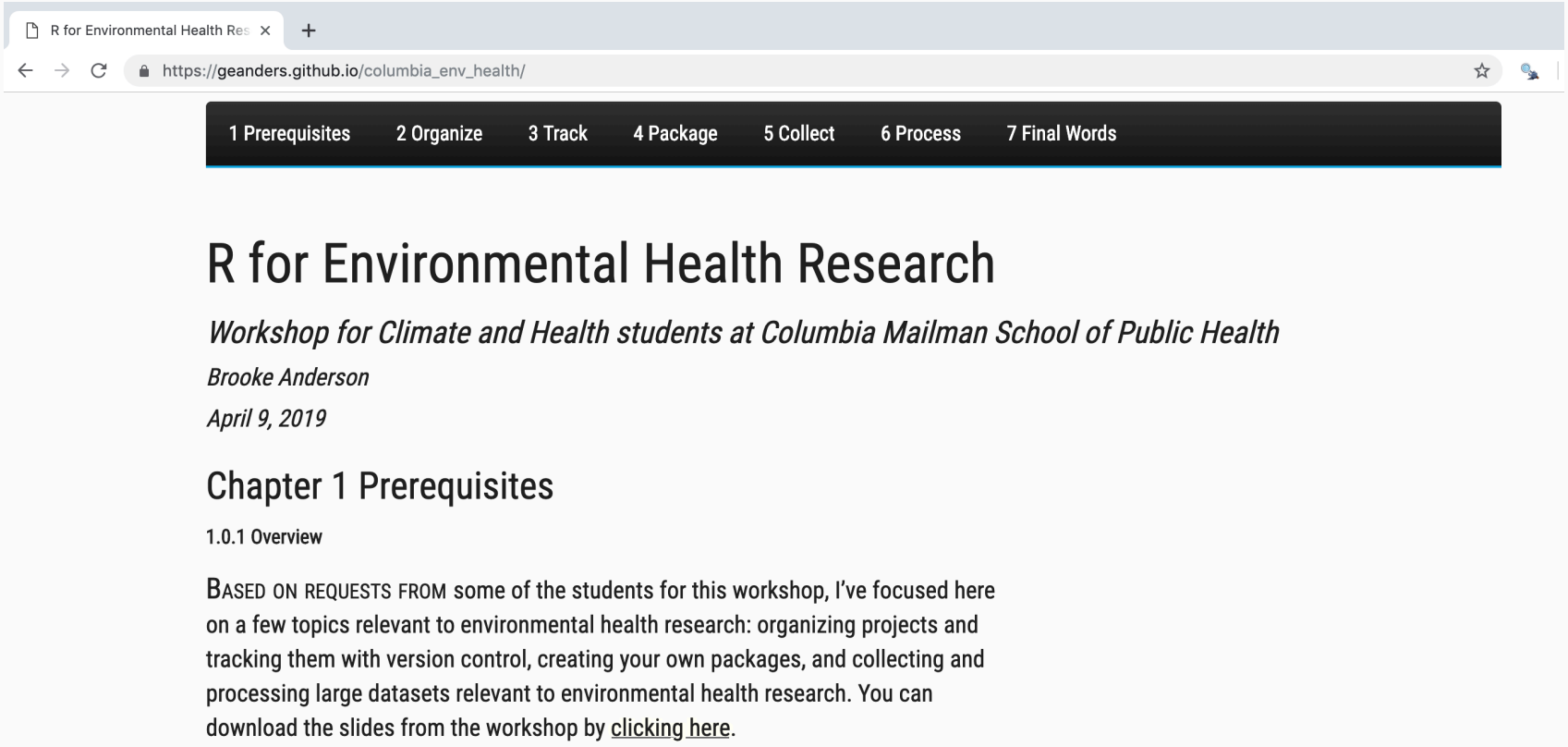
```
Georgianas-MacBook-Pro:columbia_env_health georgianaanderson$ ls -a
.                                   _output.yml
..                                  _workshop_slides
.DS_Store                           book.bib
.Rproj.user                         columbia_env_health.log
.git                                data
.gitignore                          docs
.nojekyll                           flexdashboard
01-organize.Rmd                     images
02-track.Rmd                        index.Rmd
03-package.Rmd                      irma_fatalities.pdf
04-collect.Rmd                      navy_public_health.Rproj
05-process.Rmd                      navy_public_health.log
06-summary.Rmd                      now.json
DESCRIPTION                         old_data
LICENSE                             packages.bib
R                                   preamble.tex
README.md                           skeleton.bib
_bookdown.yml                       style.css
_bookdown_files                     toc.css
_build.sh
```

Using GitHub to collaborate



https://github.com/ropenscilabs/miner

Hosting content with GitHub Pages



[Live coding example]

PACKAGE

Collect R functions in **packages**

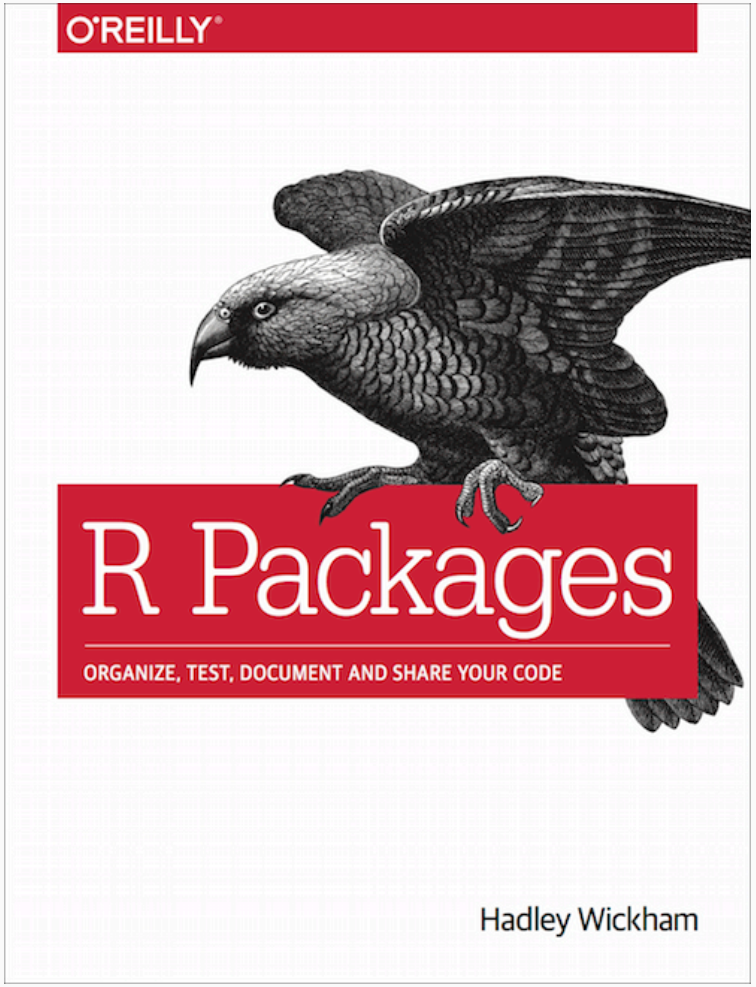
Dirk Eddelbuettel @eddelbuettel · 27 Jan 2017

Big congratulations to @gbwanderson whose new package 'hurricaneexposure' just became package 10,000 on CRAN !!

> **CRAN Package Updates** @CRANberriesFeed
> 9999 packages on CRAN right now, so imagine dozens of R nerds hanging in suspense waiting for the package to make it 10k ...

2 35 93

Resources



http://r-pkgs.had.co.nz/

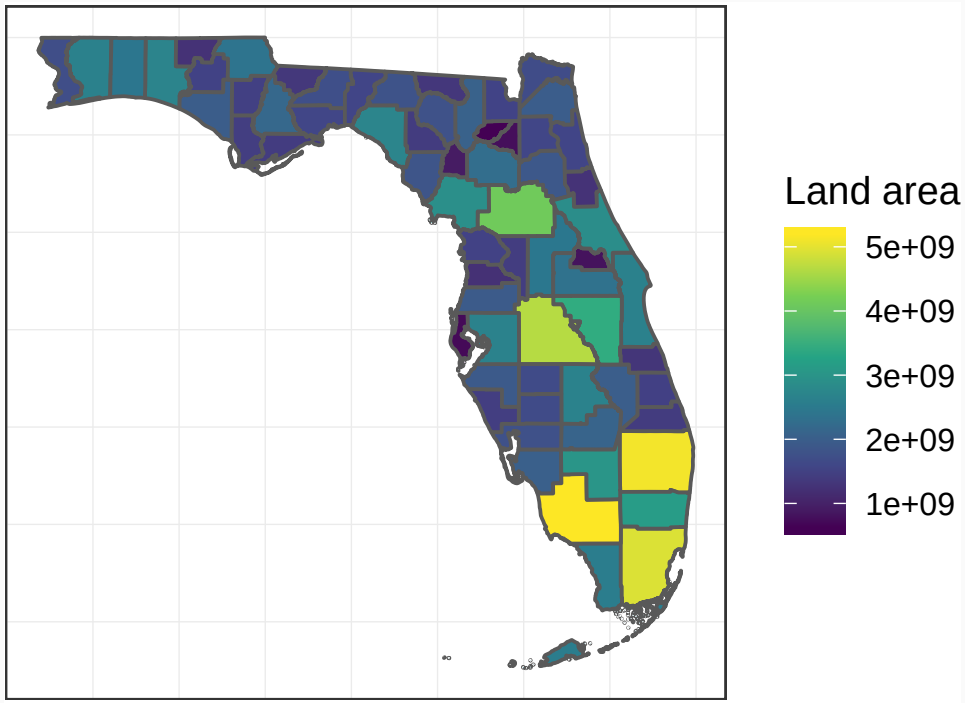
[Live coding example]

COLLECT

Leverage **open data** tools for collecting data

Open Data APIs

```
library(tigris)
fl_counties <- counties(state = "FL",
                        class = "sf")
```



[Live coding example]

PROCESS

Find and make **R packages** for processing data

[Live coding example]

Homework!!

https://bit.ly/2WQV6XT