Introduction and Getting to grips with R in hydrology

Alexander Hurley

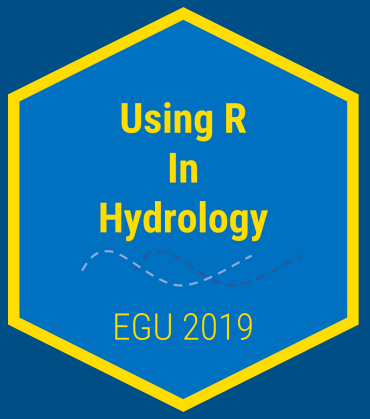
aglhurley.rbind.io

aglhurley

Ilaria Prosdocimi

https://github.com/ilapros

ilapros



Intro to:

Using R in Hydrology Short Course

(SC1.44 / HS12.5)

Session Organization

No need to follow on your computer - just listen. 🎧

All materials (and additional info) available on:

GitHub: github.com/hydrosoc/rhydro_EGU19/

Feel free to take pictures! 📷

Session Organization

- **16:15-16:20**: Welcome and introduction
- **16:20-16:25**: Getting to grips with R in hydrology

- **16:25-16:40**: Obtaining, cleaning and visualizing hydrological data
- **16:40-16:55**: Parallel and HPC computing for hydrologists

- **16:55-17:00**: Question time (#1)

- **17:00-17:15**: Staying up-to date: automating tasks from downloading data to reporting
- **17:15-17:30**: Developing apps for data exploration & analyses - a UK drought story
- **17:30-17:45**: Modelling the hydrological cycle in snow-dominated catchments

- **17:45-17:50**: Question time (#2)

- **17:50-18:00**: Closing remarks (community initiatives, future of R / new developments)

Session Organization

- **16:15-16:20**: Welcome and introduction
- **16:20-16:25**: Getting to grips with R in hydrology

- **16:25-16:40**: Obtaining, cleaning and visualizing hydrological data
- **16:40-16:55**: Parallel and HPC computing for hydrologists

- **16:55-17:00**: Question time (#1)

- **17:00-17:15**: Staying up-to date: automating tasks from downloading data to reporting
- **17:15-17:30**: Developing apps for data exploration & analyses - a UK drought story
- **17:30-17:45**: Modelling the hydrological cycle in snow-dominated catchments

- **17:45-17:50**: Question time (#2)

- **17:50-18:00**: Closing remarks (community initiatives, future of R / new developments)

General application of R and work flows for hydrology

Session Organization

- **16:15-16:20**: Welcome and introduction
- **16:20-16:25**: Getting to grips with R in hydrology

- **16:25-16:40**: Obtaining, cleaning and visualizing hydrological data
- **16:40-16:55**: Parallel and HPC computing for hydrologists

- **16:55-17:00**: Question time (#1)

- **17:00-17:15**: Staying up-to date: automating tasks from downloading data to reporting
- **17:15-17:30**: Developing apps for data exploration & analyses - a UK drought story
- **17:30-17:45**: Modelling the hydrological cycle in snow-dominated catchments

- **17:45-17:50**: Question time (#2)

- **17:50-18:00**: Closing remarks (community initiatives, future of R / new developments)

Domain-specific use-cases

Session Organization

- **16:15-16:20**: Welcome and introduction
- **16:20-16:25**: Getting to grips with R in hydrology

- **16:25-16:40**: Obtaining, cleaning and visualizing hydrological data
- **16:40-16:55**: Parallel and HPC computing for hydrologists

- **16:55-17:00**: Question time (#1)

- **17:00-17:15**: Staying up-to date: automating tasks from downloading data to reporting
- **17:15-17:30**: Developing apps for data exploration & analyses - a UK drought story
- **17:30-17:45**: Modelling the hydrological cycle in snow-dominated catchments

- **17:45-17:50**: Question time (#2)

- **17:50-18:00**: Closing remarks (community initiatives, future of R / new developments)

Questions?

Go to: www.sli.do and

enter event code **#rhydro2019**

Getting to grips with R in hydrology

Using R - some resources

R is ubiquitous in science and many other fields: lots of material/blogposts introducing R for all sorts of applications and data.

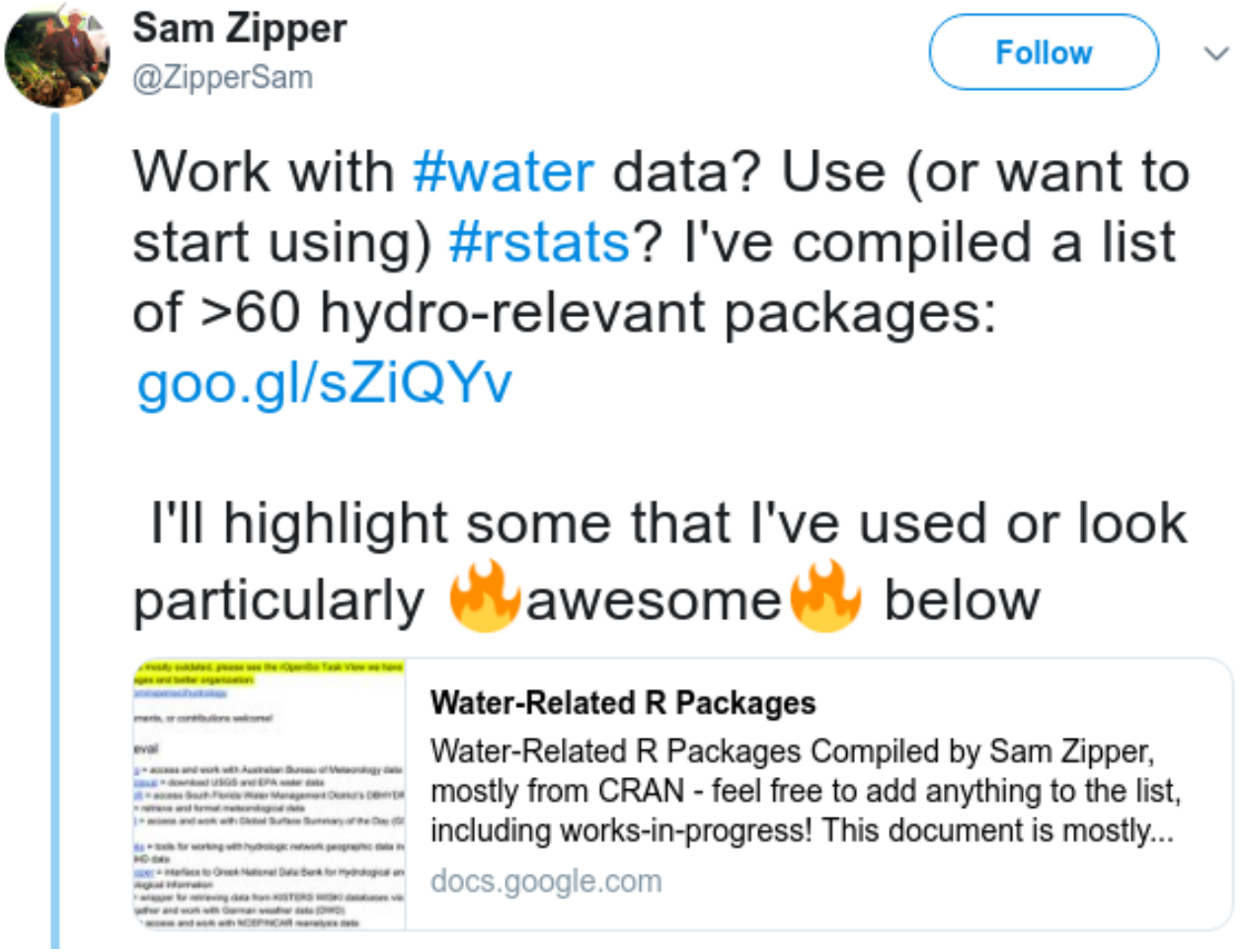
Some popular material (see also the suggestions at RStudio):

- Software carpentry: a set of introductory lessons - see also the other carpentry lessons/workshops near you
- An Introduction to R by the R Development Core Team
- R for data science by Garrett Grolemund and Hadley Wickham
- Stat 454: UBC course on Data wrangling, exploration, and analysis with R
- Packages vignettes
- Meet-ups, R User Groups, R-Ladies...
- R-bloggers, Stackoverflow, Twitter (#rstats), RWeekly...

Using R for hydrolgy - some resources

- CRAN Hydrology Taskview: a curated list of packages useful for all water-related investigations (and links to the Spatial/Environmetrics TV)
- USGS-R: a community of support for users of R
- Riccardo Rigon's blogpost: a list of tools useful to hydrologists
- Past EGU courses and Facebook Group (Hydrology in R)
- HESS Discussion paper
- R-bloggers, Stackoverflow, Twitter (#rstats)...

Origin of the Hydrology Taskview



Sam Zipper
@ZipperSam

Follow

Work with #water data? Use (or want to start using) #rstats? I've compiled a list of >60 hydro-relevant packages: goo.gl/sZiQYv

I'll highlight some that I've used or look particularly 🔥awesome🔥 below

Water-Related R Packages

Water-Related R Packages Compiled by Sam Zipper, mostly from CRAN - feel free to add anything to the list, including works-in-progress! This document is mostly...

docs.google.com

Origin of the Hydrology Taskview

Ilaria Prosdocimi
@ilapros

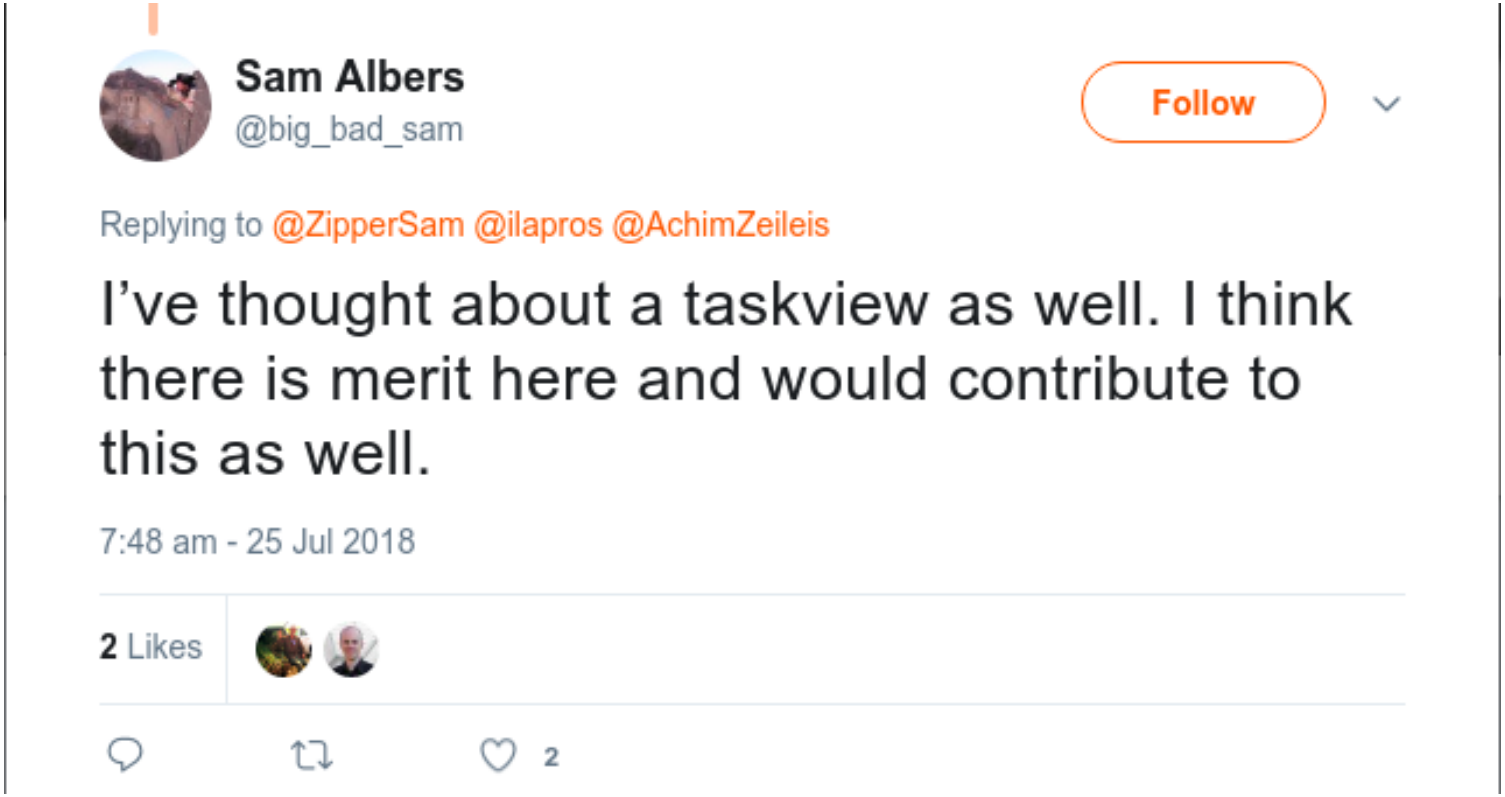
Follow

Would this list be worth to be transformed into a Taskview? Many hydrologists use R - so it could be useful to collect all the info in one place - cc: @AchimZeileis

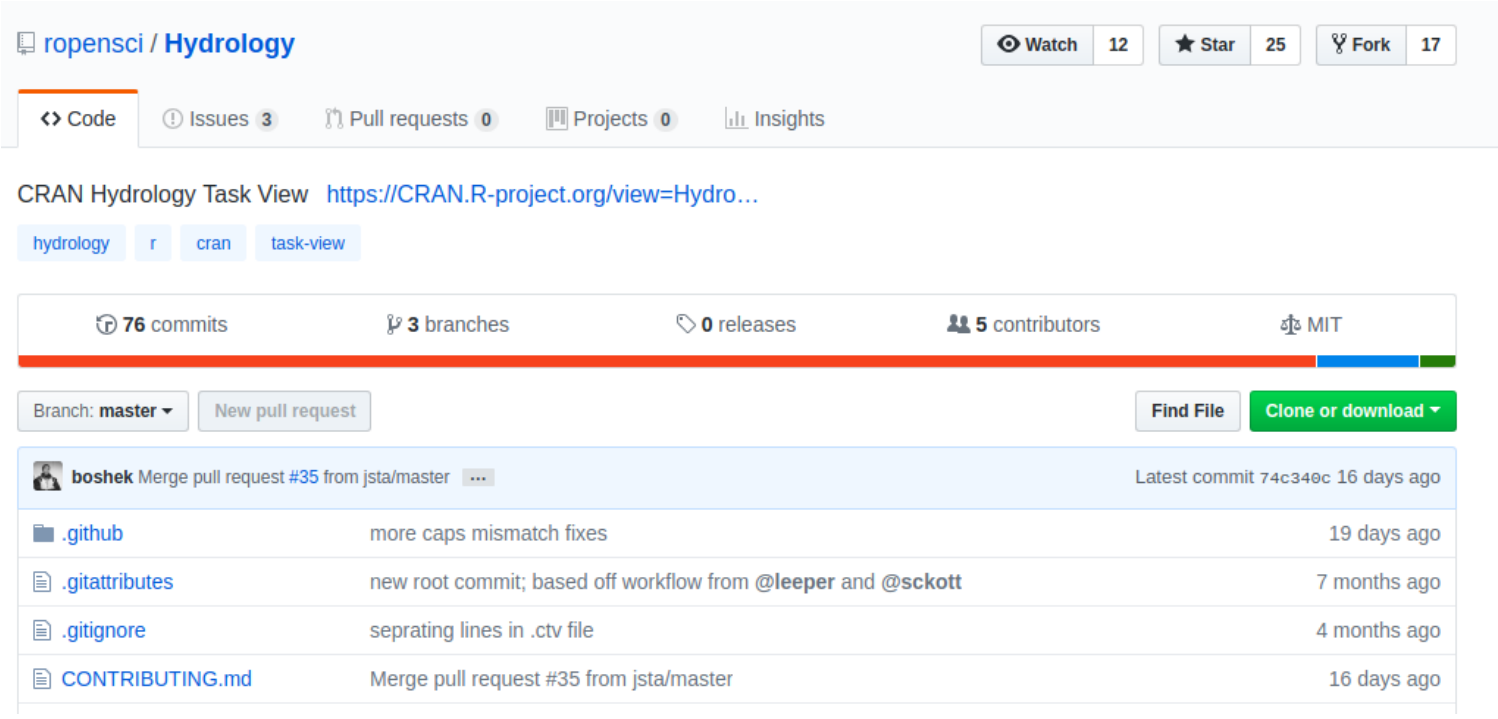
> **Sam Zipper** @ZipperSam
> Work with #water data? Use (or want to start using) #rstats? I've compiled a list of >60 hydro-relevant packages: goo.gl/sZiQYv
>
> I'll highlight some that I've used or look particularly 🔥awesome🔥 below
>
> Show this thread

6:54 am - 25 Jul 2018

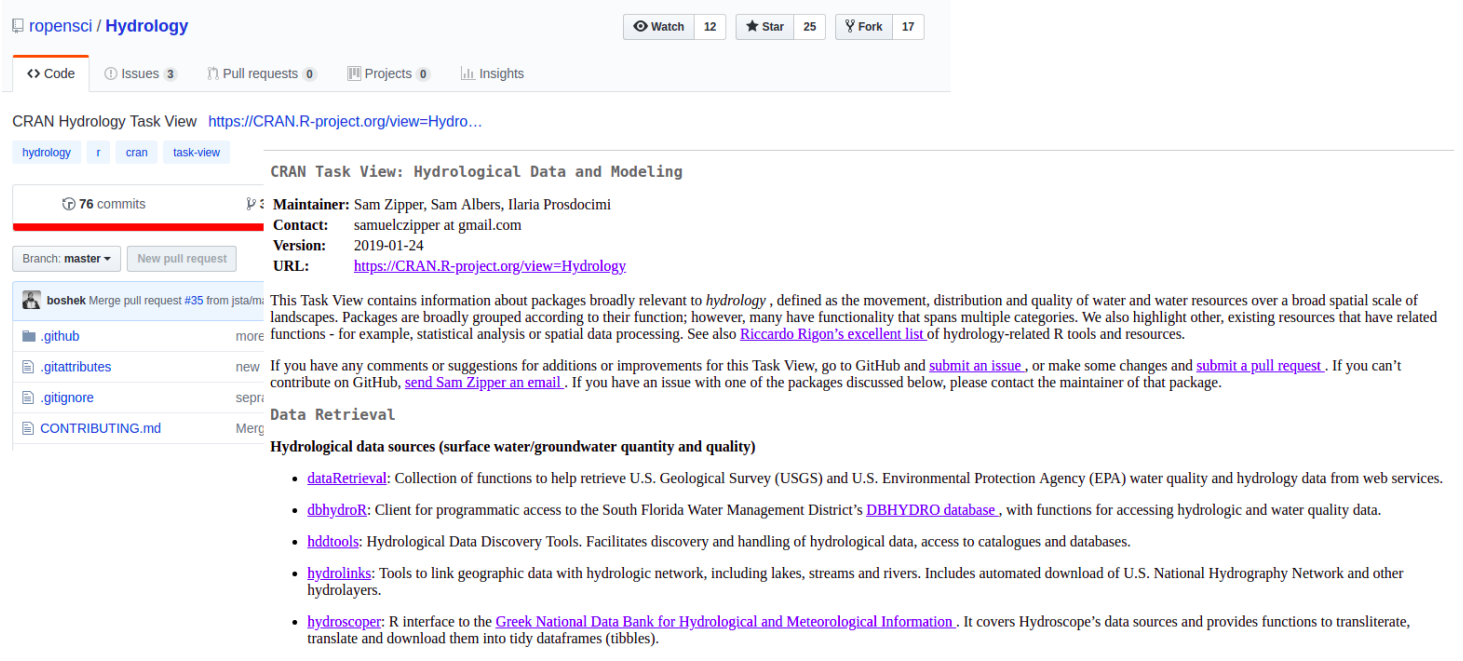
Origin of the Hydrology Taskview



From Talk to Action



From Talk to Action



ropensci / **Hydrology**

Watch 12 | Star 25 | Fork 17

Code | Issues 3 | Pull requests 0 | Projects 0 | Insights

CRAN Hydrology Task View https://CRAN.R-project.org/view=Hydro…

hydrology | r | cran | task-view

76 commits

Branch: master | New pull request

boshek Merge pull request #35 from jsta/m

.github more

.gitattributes new

.gitignore sepa

CONTRIBUTING.md Merg

CRAN Task View: Hydrological Data and Modeling

Maintainer: Sam Zipper, Sam Albers, Ilaria Prosdocimi
Contact: samuelczipper at gmail.com
Version: 2019-01-24
URL: https://CRAN.R-project.org/view=Hydrology

This Task View contains information about packages broadly relevant to *hydrology* , defined as the movement, distribution and quality of water and water resources over a broad spatial scale of landscapes. Packages are broadly grouped according to their function; however, many have functionality that spans multiple categories. We also highlight other, existing resources that have related functions - for example, statistical analysis or spatial data processing. See also Riccardo Rigon's excellent list of hydrology-related R tools and resources.

If you have any comments or suggestions for additions or improvements for this Task View, go to GitHub and submit an issue , or make some changes and submit a pull request . If you can't contribute on GitHub, send Sam Zipper an email . If you have an issue with one of the packages discussed below, please contact the maintainer of that package.

Data Retrieval

Hydrological data sources (surface water/groundwater quantity and quality)

- dataRetrieval: Collection of functions to help retrieve U.S. Geological Survey (USGS) and U.S. Environmental Protection Agency (EPA) water quality and hydrology data from web services.
- dbhydroR: Client for programmatic access to the South Florida Water Management District's DBHYDRO database , with functions for accessing hydrologic and water quality data.
- hddtools: Hydrological Data Discovery Tools. Facilitates discovery and handling of hydrological data, access to catalogues and databases.
- hydrolinks: Tools to link geographic data with hydrologic network, including lakes, streams and rivers. Includes automated download of U.S. National Hydrography Network and other hydrolayers.
- hydroscoper: R interface to the Greek National Data Bank for Hydrological and Meteorological Information . It covers Hydroscope's data sources and provides functions to transliterate, translate and download them into tidy dataframes (tibbles).