



VRIJE
UNIVERSITEIT
BRUSSEL

Sharing software, tools & research with Github in hydrosciences

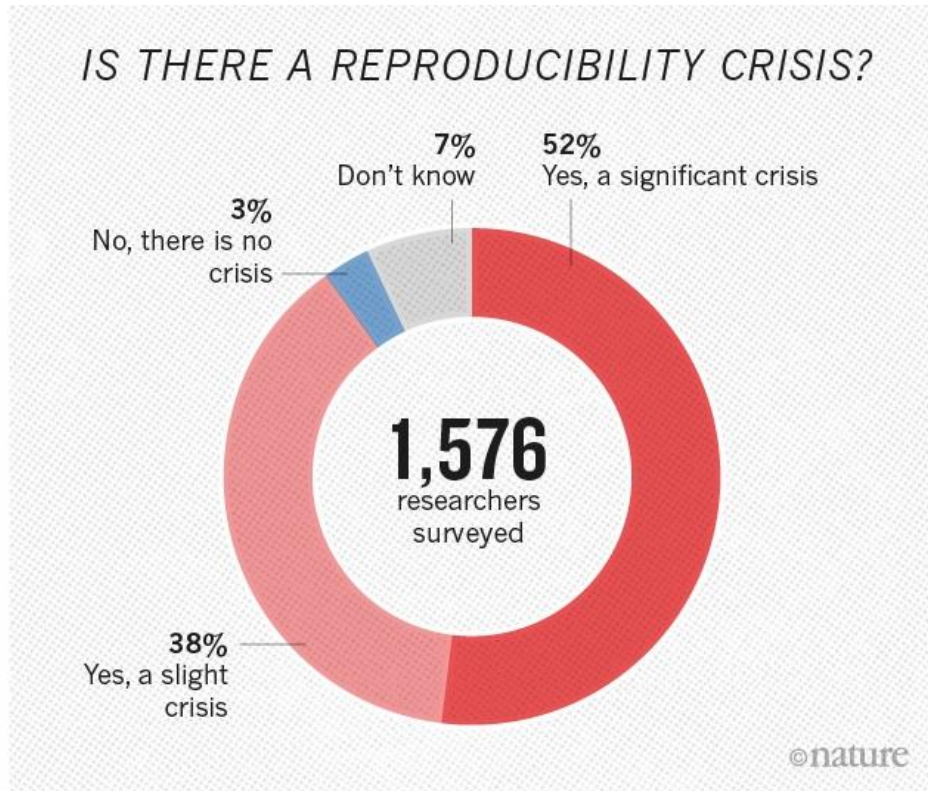
Cas Neyens

23 October 2019

Mini Open Science Fair

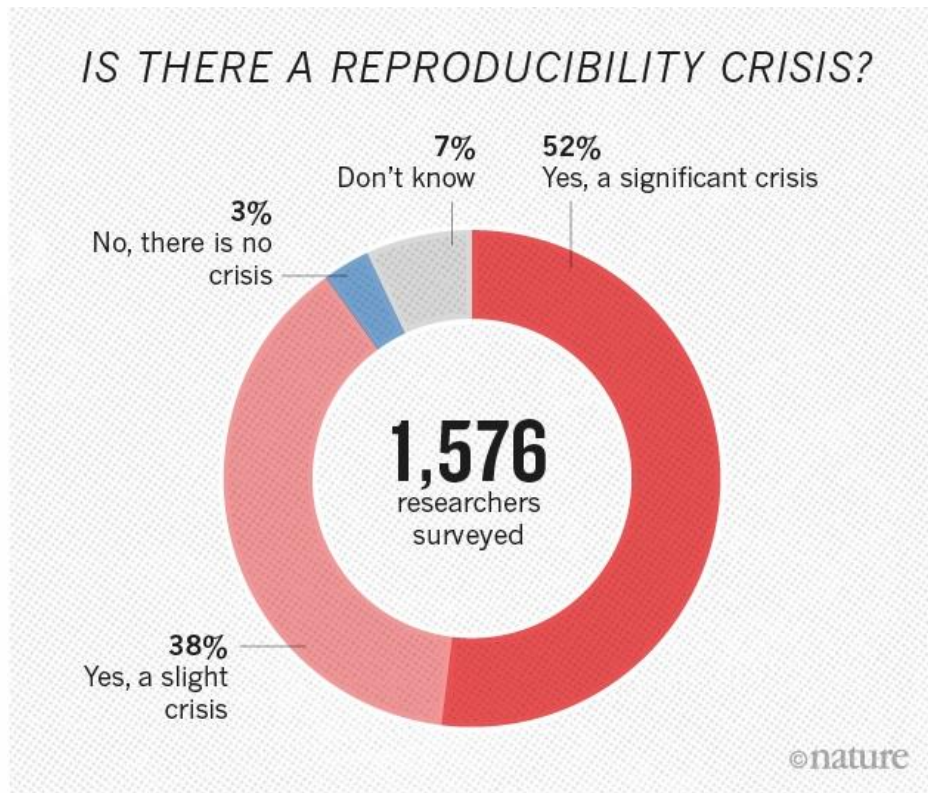


Reproducible research

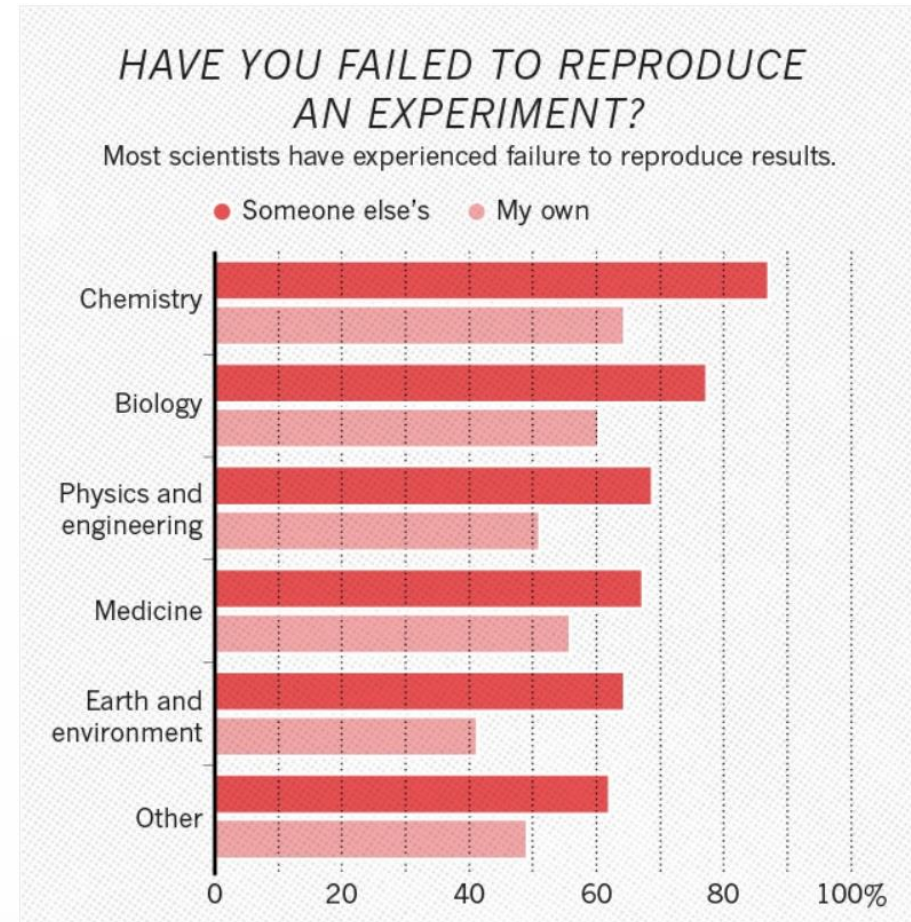


Source: Nature, 2016

Reproducible research



Source: Nature, 2016



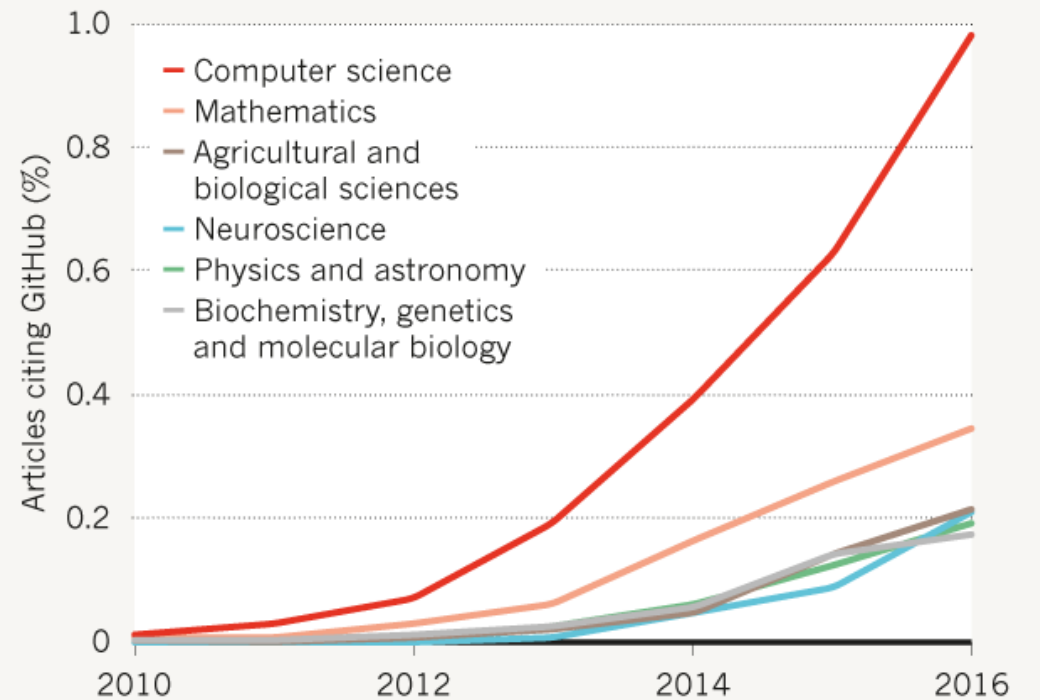
Sharing code

- Make analysis scripted & public
 - Distribute
 - Further development
 - Reproducibility

GROWING INFLUENCE OF GITHUB

©nature

An increasing proportion of research articles cite GitHub in their references.



Source: Nature, 2016

Reproducible research

"Most computational hydrology is not reproducible, so is it really science?"

Hutton et al., 2016

Reproducible research

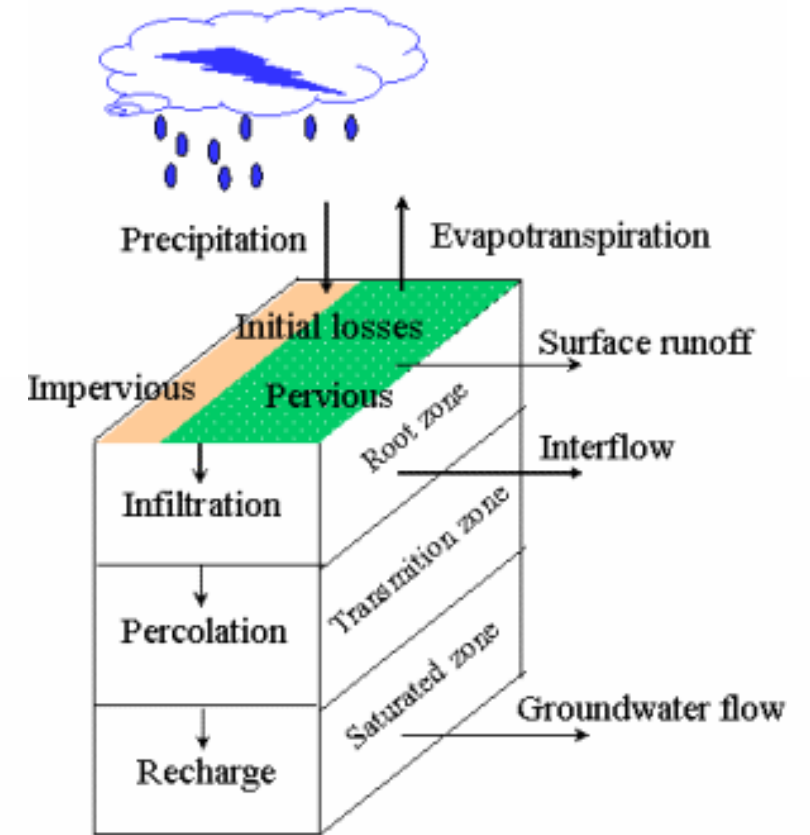
"Most computational hydrology is not reproducible, so is it really science?"

Hutton et al., 2016

- Can be improved by scripted analysis & open source sharing

HYDR code

- HYDR has developed:
 - Software
 - Tools
 - Publications



Source: VUB

GitHub

- Online code hosting
- Open source
- Used for sharing & collaborating on code

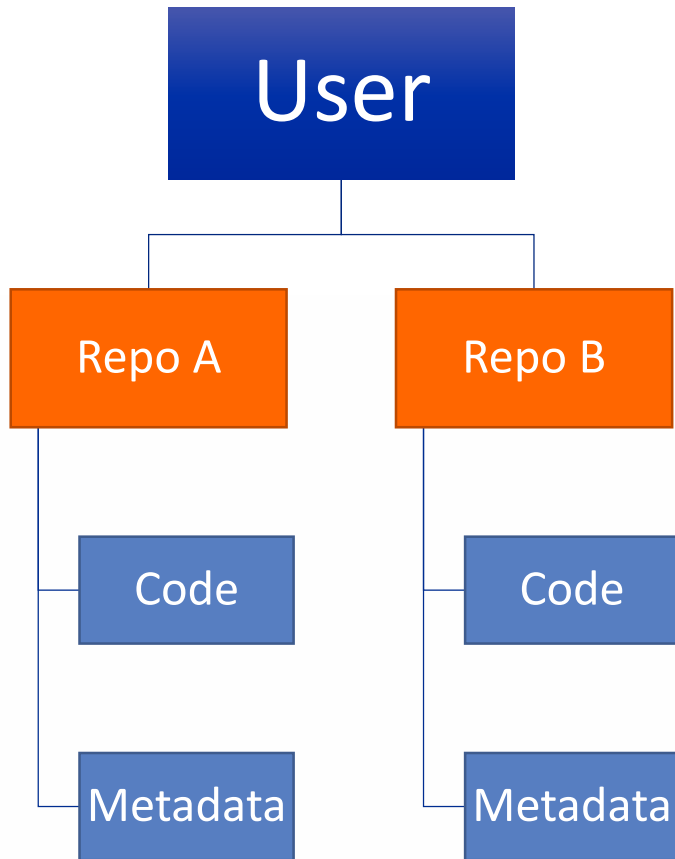


GitHub

- Uses Git software at its core
- Version control
- “Keeping track of who changed what where”



GitHub structure



Set status

Cas Neyens
cneyens

Edit profile

Hydrogeologist - PhD researcher at VUB, Department of Hydrology and Hydraulic Engineering. Working on reactive transport models.

VUB
Brussels, Belgium

Organizations

Overview Repositories 4 Projects 0 Packages 0 Stars 176 Followers 8 Following 5

Popular repositories

Customize your pins

prms

R functions for facilitating the reading and writing of input and output files for the USGS Precipitation Runoff Modeling System.

R ★ 1

RMODFLOW

Forked from rogiersbart/RMODFLOW

Pre- and post-processing of MODFLOW files in R

R

RMT3DMS

Forked from rogiersbart/RMT3DMS

provides a set of tools for solute transport modelling with MT3DMS

R

MODFLOW-MAXDRN

Maximum-flux constraint for the MODFLOW DRAIN package to simulate dewatering wells

Fortran

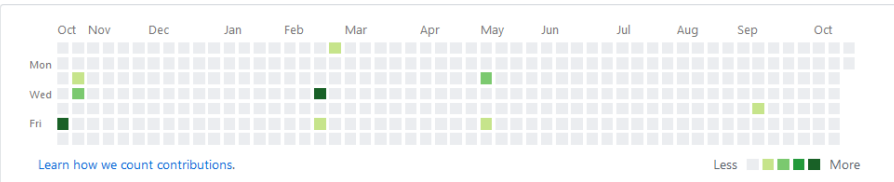
32 contributions in the last year

Contribution settings

2019

2018

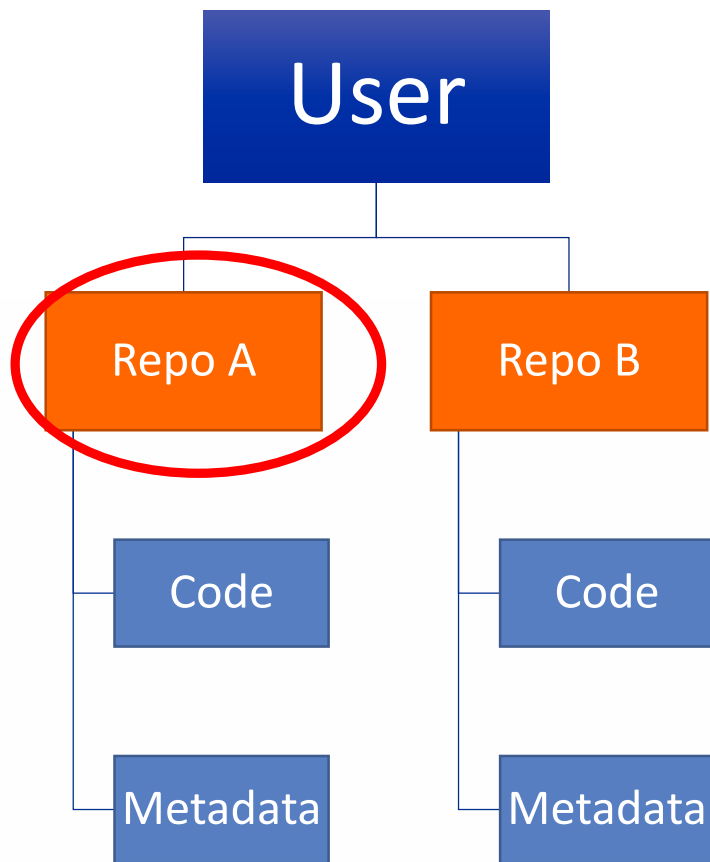
2017



Learn how we count contributions.

Less More

GitHub structure



cneyens / prms Watch 1 Star 1 Fork 0

Code Issues 0 Pull requests 0 Projects 0 Wiki Insights Settings

R functions for facilitating the reading and writing of input and output files for the USGS Precipitation Runoff Modeling System. Edit

precipitation-runoff-modeling hydrology hydrological-modelling Manage topics

9 commits 1 branch 0 releases 1 contributor

Branch: master New pull request Create new file Upload files Find file Clone or download

cneyens Syntax update Latest commit 4d6d1ba on Sep 8, 2017

R	Version 0.1.0; added functions and documentation	8 months ago
inst	Version 0.1.0; added functions and documentation	8 months ago
man	Version 0.1.0; added functions and documentation	8 months ago
DESCRIPTION	Version 0.1.0; added functions and documentation	8 months ago
NAMESPACE	Version 0.1.0; added functions and documentation	8 months ago
README.md	Syntax update	8 months ago

README.md

prms

HYDR GitHub

<https://github.com/VUB-HYDR>

- GitHub organization
 - Members
 - Centralized repo's
 - Easy to collaborate and discuss

HYDR
Department of Hydrology and Hydraulic Engineering at VUB
Brussels, Belgium <http://www.hydr.vub.ac.be/>

Repositories 18 Packages People 15 Teams 1 Projects Settings

Find a repository... Type: All Language: All Customize pins New

QSWAT_Automated_Workflow
The automated workflow for setting up SWAT Models presented in Chawanda et al., 2019 EMS
workflow tool hydrology swat
Python MIT 2 10 0 0 Updated 12 days ago

REVUB
Renewable Electricity Variability, Upscaling and Balancing
solar wind balancing electricity flexibility hydro renewable
MATLAB MIT 0 1 0 0 Updated 13 days ago

TREX
Tool for Raster data EXploration
tool remote-sensing probav

Top languages
Python MATLAB Ruby Jupyter Notebook

Most used topics
publication tool climate
spqb thiery

People 15 >

HYDR GitHub

- Software
 - Stand-alone software

VUB-HYDR / REVUB

Unwatch 1 Unstar 1 Fork 0

Code Issues 0 Pull requests 0 Projects 0 Wiki Security Insights Settings

Renewable Electricity Variability, Upscaling and Balancing

standalone-software renewable electricity solar wind hydro balancing flexibility Manage topics

16 commits 1 branch 0 releases 1 contributor MIT

Branch: master New pull request Create new file Upload files Find file Clone or download

sebastiansterl Updated code Latest commit 9c31e72 13 days ago

code	Updated code	13 days ago
data	First commit of readme, license and data files	28 days ago
graphs	Updated logo	28 days ago
LICENSE.md	Updated license file	26 days ago
README.md	Updated readme file	28 days ago

README.md

REVUB (Renewable Electricity Variability, Upscaling and Balancing)

REVUB

Authors: Sebastian Sterl
Contact author: sebastian.sterl@vub.be

1. Introduction

HYDR GitHub

- Tools
 - Simple scripts

VUB-HYDR / slugtest

Watch 0 Star 0 Fork 1

Code Issues 0 Pull requests 0 Projects 0 Wiki Security Insights Settings

Python scripts for analyzing slug test data

tool slugtest hydrogeology conductivity Manage topics

5 commits 1 branch 0 releases 1 contributor MIT

Branch: master New pull request Create new file Upload files Find file Clone or download

File	Commit Message	Time
gghysels Update README	Latest commit 95a514e on Apr 16, 2018	
LICENSE	Add README and LICENSE file	2 years ago
README.md	Update README	2 years ago
SlugTestAnalysis.py	Initial commit	2 years ago
plotCurve.py	Initial commit	2 years ago

README.md

Slug Test Analysis

Python scripts for the plotting and analysis of rising-head slugtests.

For users

This repository includes python scripts for the plotting and analysis of rising head slugtests. K values are calculated with the Bouwer & Rice (1976) method modified for anisotropy by Zlotnik (1994) and the Hvorslev (1951) method. The guidelines of Butler (1997) are used for the selection of normalized heads: normalized heads in the range of 0.20-0.30 for Bouwer and Rice (1976) and 0.15-0.25 for Hvorslev (1951).

Bug reports

For any bug reports, please open a new [issue](#).

Versions

Version 0.1.0 - April 2018

License

This project is licensed under the MIT License. See also the [LICENSE](#) file.

HYDR GitHub

- Publications
 - Data analysis, not data

The screenshot shows a GitHub repository page for 'VUB-HYDR / 2018_Vanderkelen_et_al_HESS_ab'. The repository has 9 commits, 1 branch, 2 releases, 1 contributor, and is licensed under MIT. The README file is selected, showing the following content:

2018_Vanderkelen_et_al_ab

Data analysis and modelling used in Vanderkelen et al., 2018 a and b.

[DOI10.5281/zenodo.1464820](https://doi.org/10.5281/zenodo.1464820)

For users

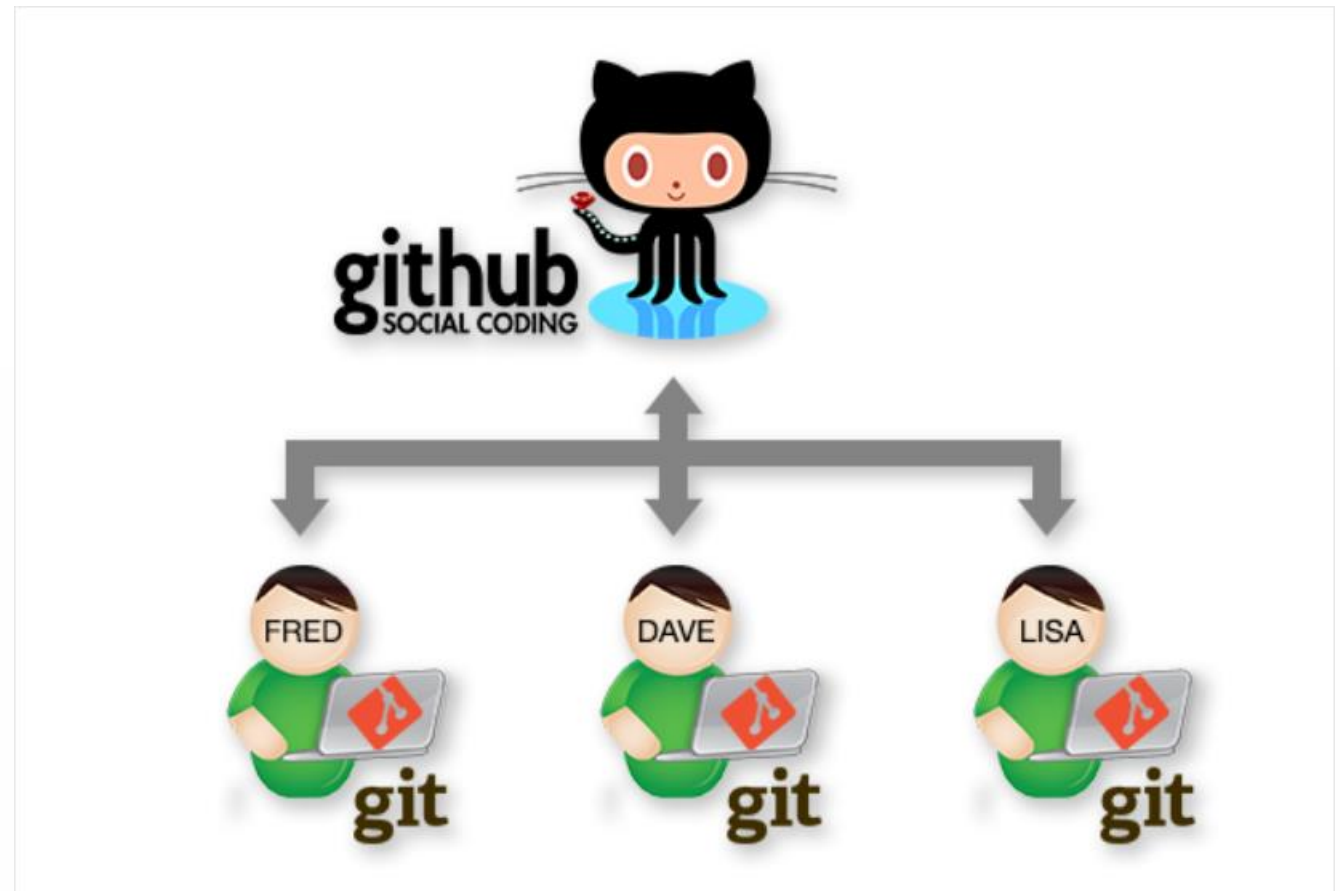
This repository includes the processing scripts of the Water Balance Model (WBM) for Lake Victoria. The main analysis is performed in *Matlab 2017b*. The four different components of the repository are described below.

1. WBmodel

This folder contains all the necessary scripts to run the WBM forced by observations as done in Vanderkelen et al. (2018a)

HYDR GitHub

- Collaboration
 - Git = version control



Source: McWilliams, 2013

Pros & cons

Pro:

- Reproducible research
- Code/tool sharing
- Collaboration → improvement
- Analysis should be scripted

Pros & cons

Pro:

- Reproducible research
- Code/tool sharing
- Collaboration → improvement
- Analysis should be scripted

Con:

- Git has a steep learning curve
- Maintenance
- Analysis should be scripted
- Needs quality control

Questions ?

cas.neyens@vub.be



VRIJE
UNIVERSITEIT
BRUSSEL