

# GitHub in HYDR

## A practical guide



VRIJE  
UNIVERSITEIT  
BRUSSEL



WATER AND CLIMATE  
DEPARTMENT

Paul Muñoz

All-hands meeting 2025  
24/09/2025



- One place for all our code and workflows
- Most computational hydrology is not reproducible, so is it really science? (Hutton et al., 2016)
- Improves collaboration inside and outside HYDR
- Personal vs. HYDR
  - Own projects, personal website
  - HYDR: work done within the department

HYDR



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



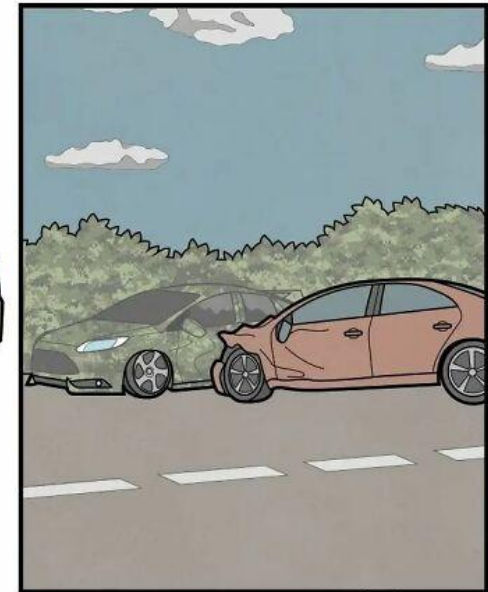
# Our numbers in GitHub

- 69 repositories
- 39 members (17 are former members)
- 0 projects (shared planning spaces)
- 1 team only (Groundwater group 🙌 )
- 0 Packages (available, but rarely used so far)

YES,



BUT

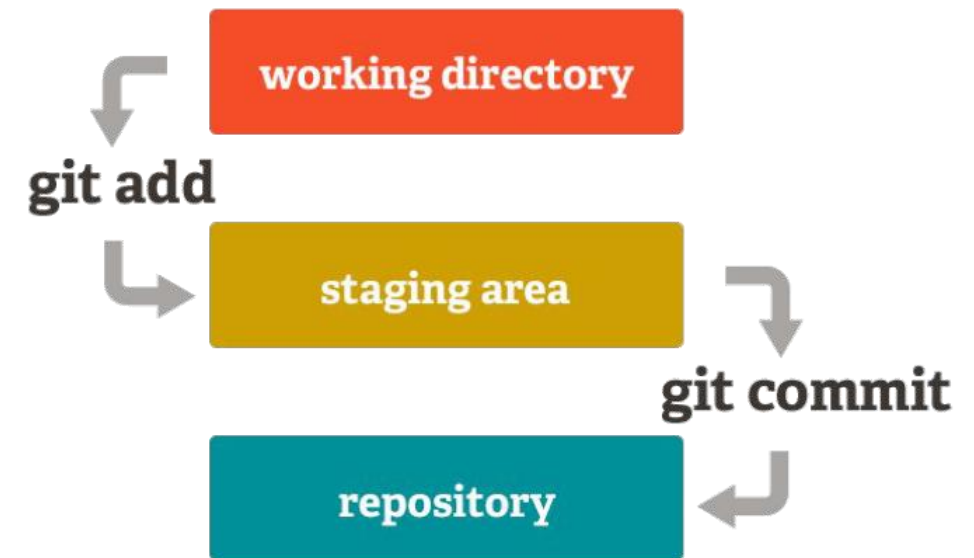


© \_yes\_but

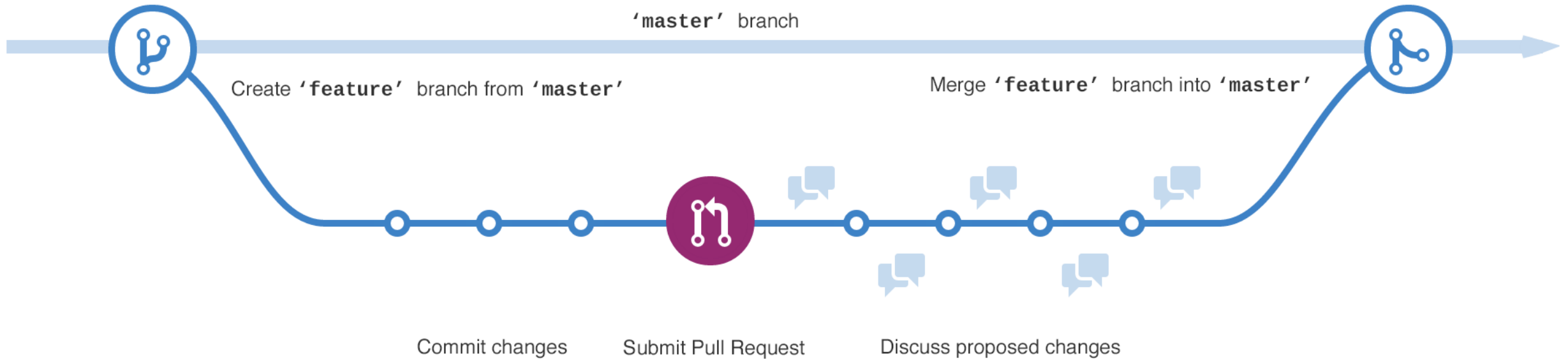


# Git & GitHub Basics

- Key terminology: repo, commit, branch, fork, pull request
- Basic commands
  - `git clone {repo url}`
  - `git add {filename}`
  - `git commit -m "comments"`
  - `git push`
  - `git pull`
  - `git status`
- Branching & merging: safe collaboration
- Undoing mistakes (reset, revert, checkout)



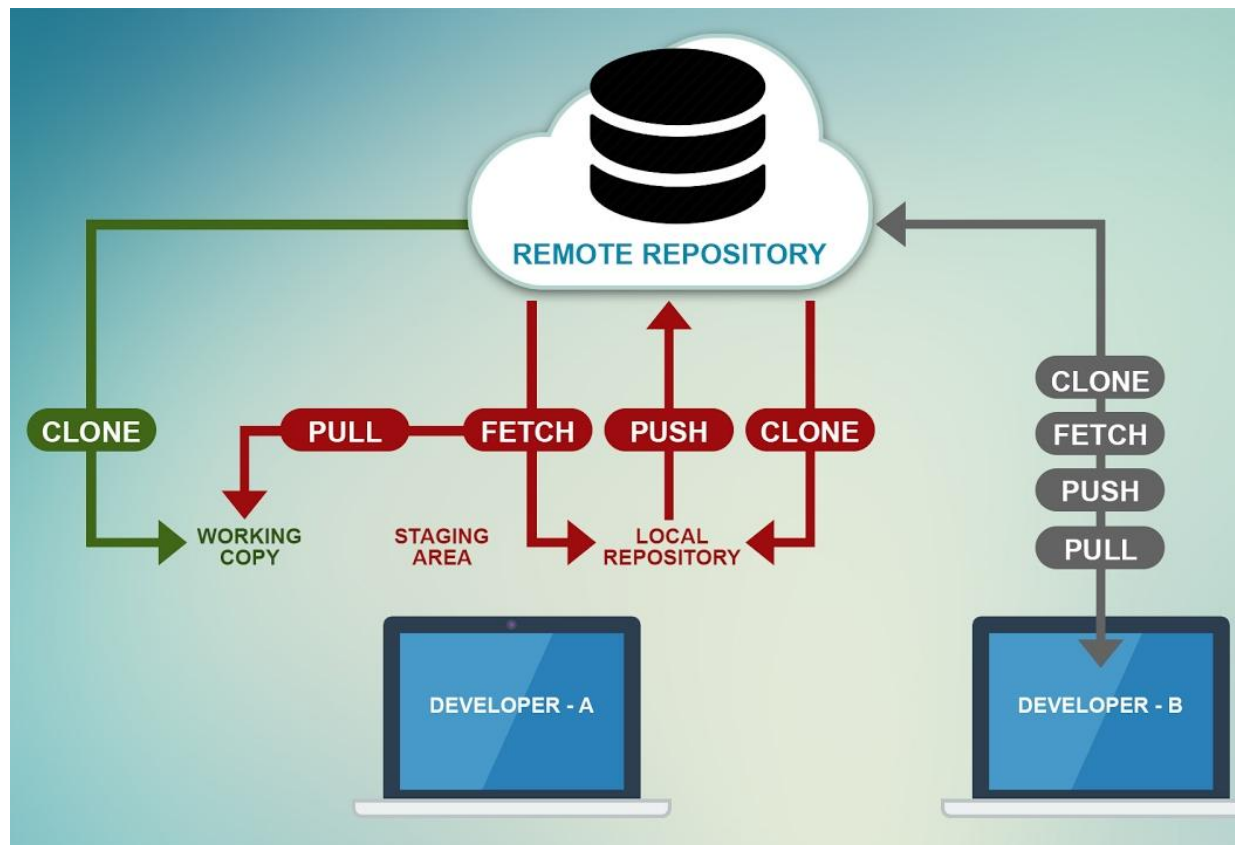
# Git & GitHub Basics



Source: GitHub

# Getting started

1. Installing Git in your machine



2. Setting up a GitHub account & 'joining' HYDR



Top languages

● Python ● Jupyter Notebook ● MATLAB  
● JavaScript ● HTML

# Getting started

Three ways to interact with GitHub:

1. Drag-and-drop files online (limited use, not recommended)
2. **GitHub Desktop**
3. Git command line (powerful, flexible, for advanced workflows)



# GitHub desktop

## GitHub Desktop documentation

With GitHub Desktop, you can interact with GitHub using a GUI instead of the command line or a web browser. You can use GitHub Desktop to complete most Git commands from your desktop, such as pushing to, pulling from, and cloning remote repositories, attributing commits, and creating pull requests, with visual confirmation of changes.






<https://desktop.github.com/download/>



# HYDR conventions

HYDR defines 5 classes of repositories (not official GitHub categories) :

1. Software → models, big codes
2. Tools → scripts, pre/post-processors
3. Publications → code used in papers
4. Vignettes → tutorials, workflows, documentation
5. Presentations → slides, seminar material

-  **SWATPlus-AW**
-  **WetSpa-Urban**
-  **myclimatefuture**
-  **2025\_Laridon\_etal\_ORE**
-  **GitHub\_PracticalGuide**

# HYDR conventions

- Naming conventions for repos

Publications: YYYY\_NAME\_JOURNAL\_SUFFIX

- Metadata requirements:  
written in the Markdown “.md” language
  - SESSIONINFO (mandatory for publications)
  - README (mandatory)
  - LICENSE (mandatory)
  - Optional:  
.gitignore, AUTHORS, CONTRIBUTING, etc.

MIT License

Copyright (c) 2019 Gert Ghysels

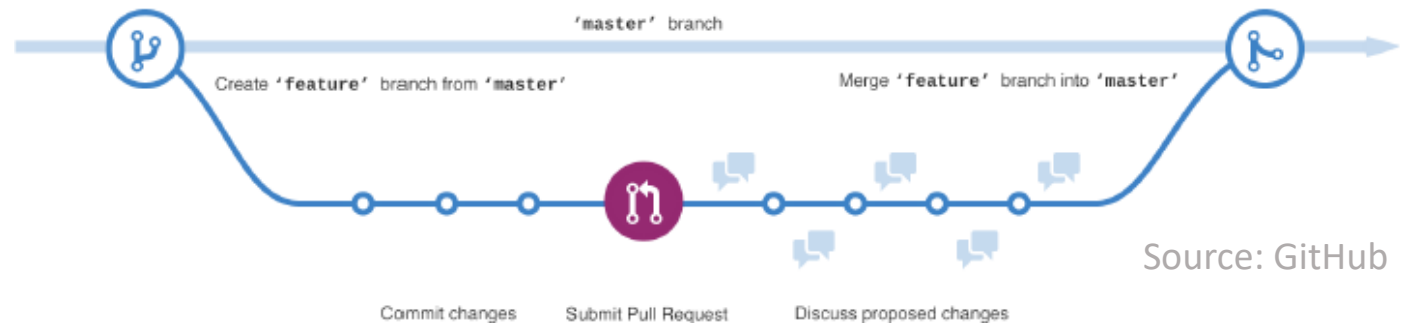
Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

# Ways to collaborate

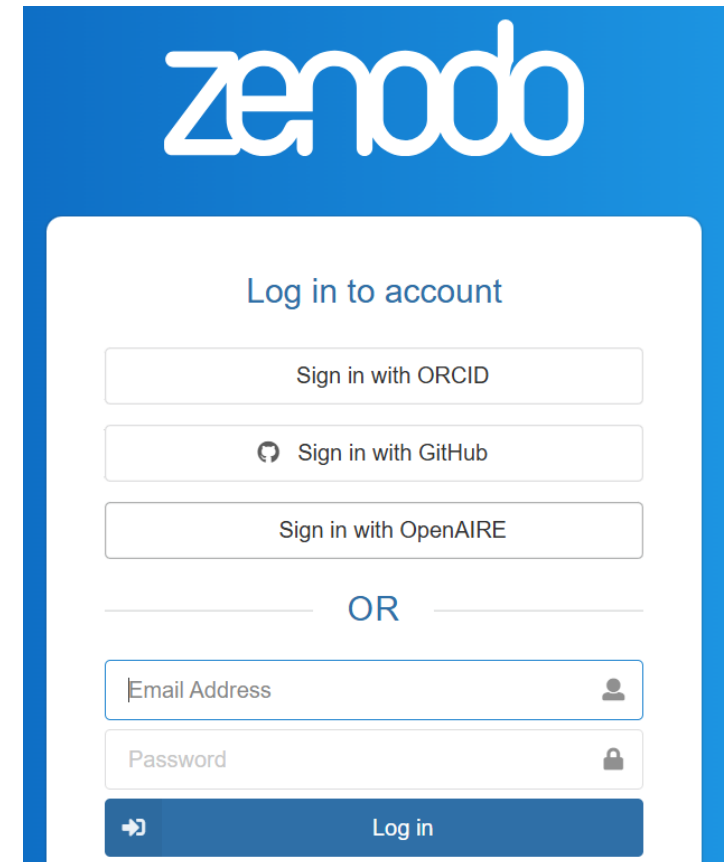
- Internal (HYDR) and external collaborators  
(managed by HYDR owners)
- Use a 'Team' when multiple people committing  
to one or more repos (managed by Team owner)  
Read-only, cloning, pushing
- Feature-branch  
vs. forking workflows




All changes are made in a separate branch. Members **never** push directly to the main branch.

# Adding a DOI to your repository

- DOI doesn't get broken
- Different code versions with different DOIs
- Adding a DOI via Zenodo (<https://zenodo.org/>)
- Steps:
  - Prepare your repo → README, LICENSE, Create a release (tag version, publish)
  - Connect GitHub → Zenodo
  - Add DOI badge in README

A screenshot of the Zenodo login page. The page has a blue header with the 'zenodo' logo in white. Below the header, the text 'Log in to account' is centered. There are three buttons for social login: 'Sign in with ORCID', 'Sign in with GitHub' (with a GitHub icon), and 'Sign in with OpenAIRE'. Below these is a horizontal line with the word 'OR' in the center. Underneath are two input fields: 'Email Address' with a user icon on the right, and 'Password' with a lock icon on the right. At the bottom is a blue button with a right arrow icon and the text 'Log in'.

# A good example

 2025\_Laridon\_et al\_ORE Public

main 1 Branch 1 Tag Go to file Add file Code

AmauryLaridon	Update README.md	1eec28a - last month	73 Commits
Publication Notes	Publication v2.0 Ready	last month	
data	finish v1 of v2.1, remains figures mod	last month	
figures	Publication v2.0 Ready	last month	
ATCM.ipynb	Publication v2.0 Ready	last month	
LICENSE	Create LICENSE	8 months ago	
Laridon et al (2025) ORE - published v1.0.pdf	update publication v1.0	6 months ago	
README.md	Update README.md	last month	
SURFER_pre3.0_ATCM.ipynb	Publication v2.0 Ready	last month	

Feb 28

AmauryLaridon v1.0 3f7633e Compare

v1.0

Latest



Release associated with the submission to Open Research Europe on 28 February 2025

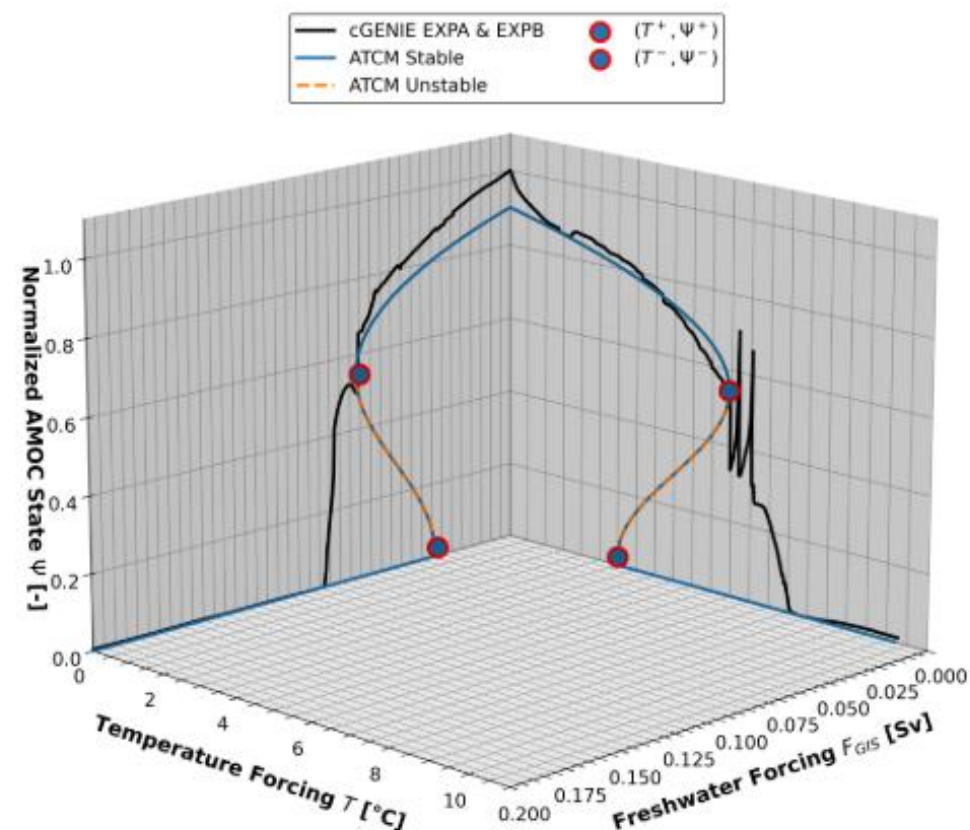
Assets 2

Source code (zip)	Feb 14
Source code (tar.gz)	Feb 14

## SURFER pre3.0 with AMOC Tipping Calibration Module (ATCM)

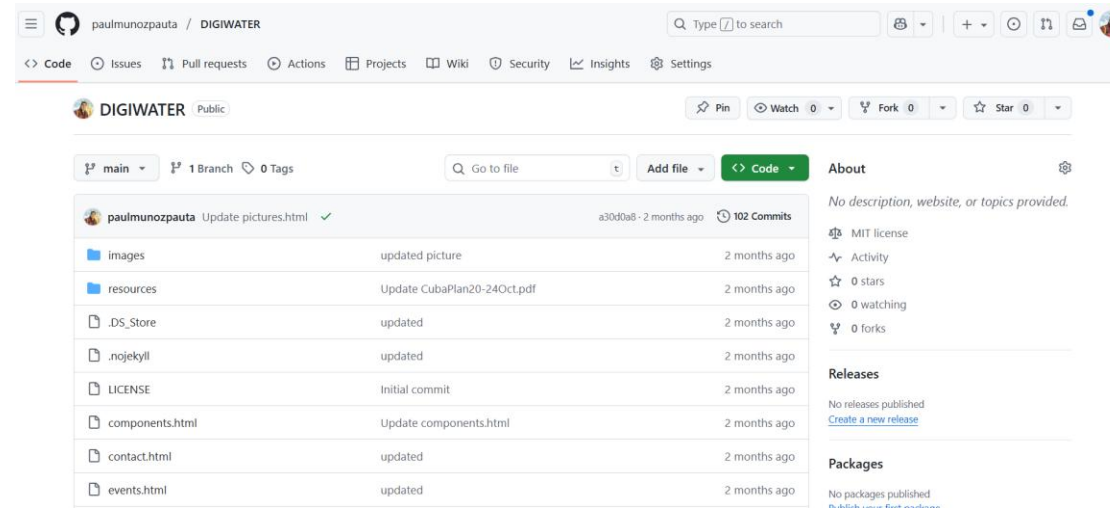
Paper : DOI [10.5281/zenodo.14979157](https://doi.org/10.5281/zenodo.14979157)

Supplementary Material : DOI [10.5281/zenodo.14979157](https://doi.org/10.5281/zenodo.14979157)



# GitHub hosts pages for free

- GitHub repository for a Project



- Page associated to that repository ([https://github.com/VUB-HYDR/2025\\_DIGIWATER\\_project](https://github.com/VUB-HYDR/2025_DIGIWATER_project))
- Optional: buy a domain only, not server (<https://digiwater.net/>)

# Other advanced features

- **GitHub Actions** → automate tasks (e.g., testing, building, or deploying)
- **Turning code into packages** (R, Python)
- **Projects & Kanban boards** → organize tasks and milestones
- **Issues & Pull Requests** → structured way to report bugs, suggest features, and review code
- **Wikis & Pages** → host documentation, guides, or even project websites
- **Packages** → share reusable software components (R, Python, Docker, etc.)
- **Protected branches & reviews** → ensure quality control in collaborative repos

# Next steps

- Talk to your group leader and admin

Special licence for repo?  
Add external collaborators

- Strongly recommended to have teams either by projects/research groups.
- Populate HYDRWiki:
  - Docjobs: General/practical info
  - All: Specifics

Docjobs 2025

Afnan
Amaury
Derrick
Ni
Paul

