



Applied Geodata Science 1

Session 7 - git

Prof. Dr. Benjamin Stocker & Dr. Fabian Bernhard
Spring semester 2025



Why git?

Git allows version control from small individual projects to large shared code bases

"git commits" make up the git history.

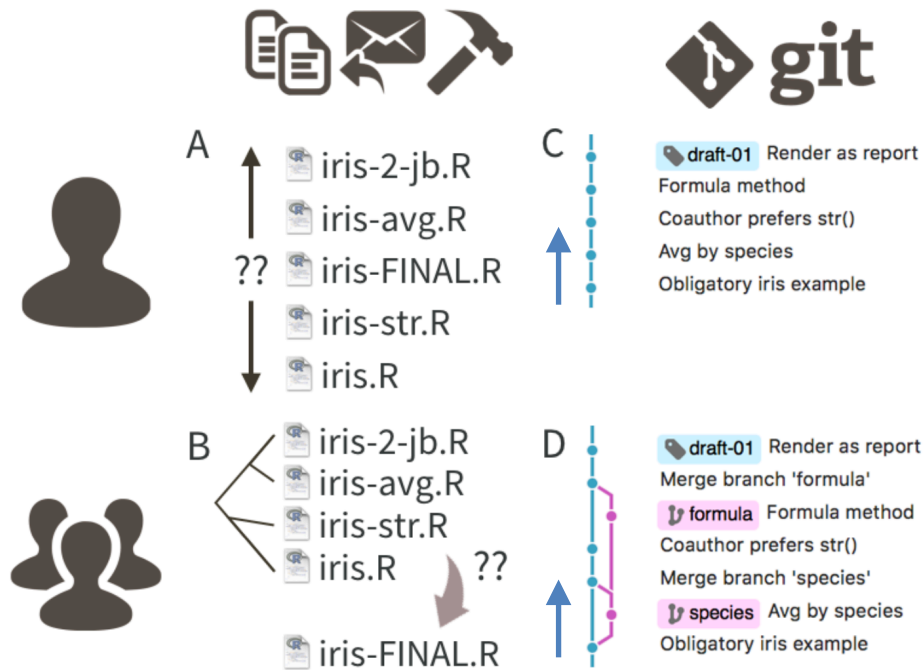


Figure 1: A: Solo work with DIY version control via filename. B: Collaborative work with DIY version control. C: Solo work with Git. D: Collaborative work with Git.

Taken from: <https://happygitwithr.com>

git commits

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git history. A single commit:

- tracks changes in
multiple files
- records when and what
changed, by whom, and
why ("commit message")
- is line-based

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The screenshot shows the RStudio 'Review Changes' interface. At the top, a commit history table lists several commits, with the commit 'Fix vignettes in phydro' selected. Below the table, the commit details are shown, including the author (Fabian Bernhard), date (2025-03-04 16:29), subject ('Fix vignettes in phydro'), and parent hash. A list of files changed in the commit is displayed, including 'vignettes/files/morrisOut.rda', 'vignettes/files/par_calib.rda', 'vignettes/files/pmodel_runs.rda', 'vignettes/files/sensitivity_analysis.Rmd_morrisOut.rds', 'vignettes/files/sensitivity_analysis.Rmd_par_calib.rds', 'vignettes/files/sensitivity_analysis.Rmd_pmodel_runs.rds', and 'vignettes/sensitivity_analysis.Rmd'. The diff view for 'vignettes/sensitivity_analysis.Rmd' is shown at the bottom, with line 163 highlighted in red, indicating a change.

Commit Hash	Author	Date	Subject
7d9d21f8	FrancescoGrossi-unimi <115780963+Francesco.2025-03-24>	2025-03-24	Introduce a new input parameter gw_calib (#287)
fbcca7d6	Fabian Bernhard <10245680+fabern@users.noreply.github.com>	2025-03-05	Merge branch 'phydro-test-pass-II' into phydro
d88e0cf1	Fabian Bernhard <10245680+fabern@users.noreply.github.com>	2025-03-04	Fix vignettes in phydro and remove cowplot
997eca95	Fabian Bernhard <10245680+fabern@users.noreply.github.com>	2025-03-04	Fix vignettes in phydro by updating dataset name
3997611d	Fabian Bernhard <10245680+fabern@users.noreply.github.com>	2025-03-04	Fix vignettes in phydro
9f5c788b	Fabian Bernhard <10245680+fabern@users.noreply.github.com>	2025-03-04	Use single Makevars as in branches 'main' and 'luluc'
4e07f028	Fabian Bernhard <10245680+fabern@users.noreply.github.com>	2025-03-04	Activate R-CMD-check on phydro
6429d138	Fabian Bernhard <10245680+fabern@users.noreply.github.com>	2025-03-03	Activate tests for push to phydro

Author: Fabian Bernhard <10245680+fabern@users.noreply.github.com>
Date (UTC): 2025-03-04 16:29
Subject: Fix vignettes in phydro
Parent: 9f5c788bef89190cdece33aaec2f010c1b381f8f

Files changed:

- vignettes/files/morrisOut.rda
- vignettes/files/par_calib.rda
- vignettes/files/pmodel_runs.rda
- vignettes/files/sensitivity_analysis.Rmd_morrisOut.rds
- vignettes/files/sensitivity_analysis.Rmd_par_calib.rds
- vignettes/files/sensitivity_analysis.Rmd_pmodel_runs.rds
- vignettes/sensitivity_analysis.Rmd

Diff for vignettes/sensitivity_analysis.Rmd:

```
@@ -160,12 +160,13 @@ morrisOut <- sensitivity::morris(  
160 160  
161 161 ```{r eval = FALSE, echo = FALSE}  
162 162 # Save Morris sensitivity output because it takes very long to compute  
163 163 save(morrisOut, file = "files/morrisOut.rda")  
163 163 saveRDS(morrisOut, "files/sensitivity_analysis.Rmd_morrisOut.rds")
```

RStudio

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To make a commit:

- make a code change
- `add` the changes (staging)
- `commit` the changes including a commit message

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To make a commit:

- (**pull` from GitHub**)
- make a code change
- **`add`** the changes (staging)
- **`commit`** the changes including a commit message
- (**push` to GitHub**)

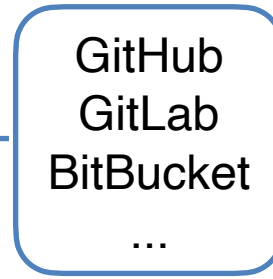
git and GitHub

Local:

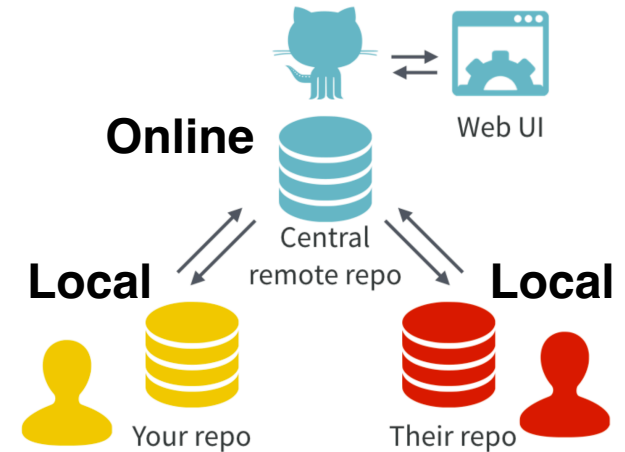


- Command Line: `git`
- **RStudio**
- GitKraken
- ...

Online:

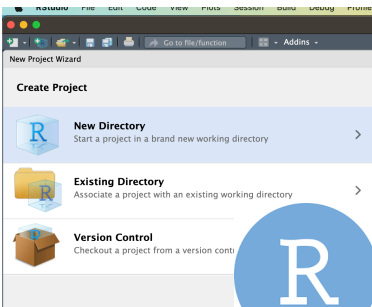
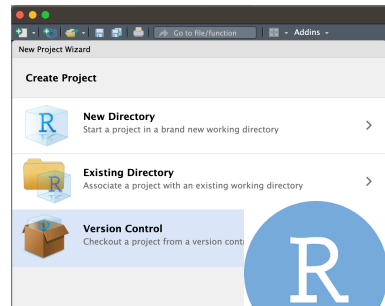
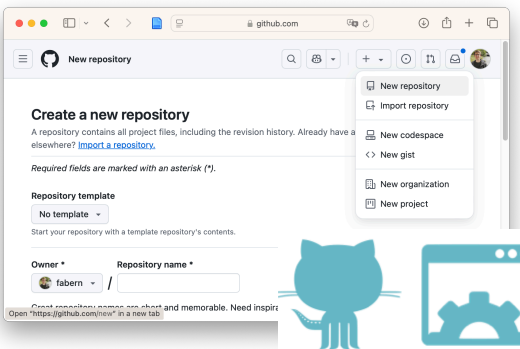
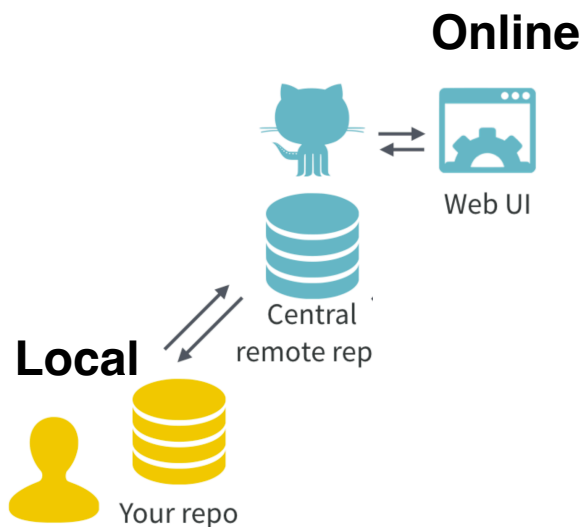


- **Web UI: github.com**
- Command Line: `gh`
- GitKraken
- ...



How to start a project with git and GitHub?

Different ways to get started:

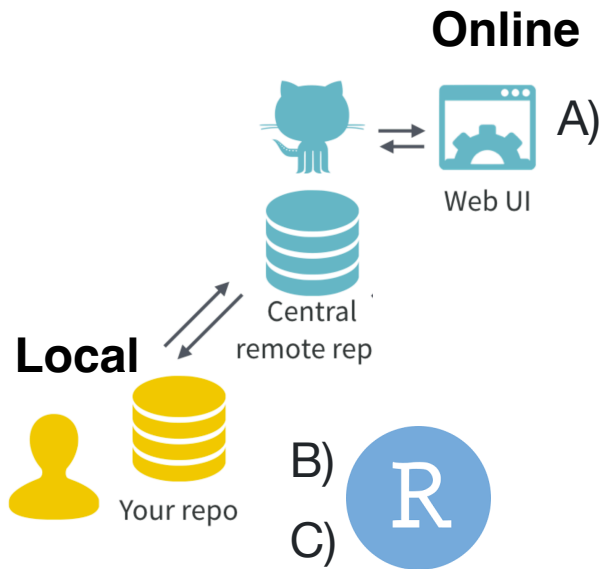


```
> usethis::use_github()
```


How to start a project with git and GitHub?

Different ways to get started:

- A) **New project, GitHub first** is the easiest way to get a working project.
- B) **Existing project, GitHub first** is a pragmatic way to get pre-existing work onto GitHub.
- C) **Existing project, GitHub last** is the more proper way to connect existing local work to a remote on GitHub.



Detailed instructions:

<https://happygitwithr.com/usage-intro>

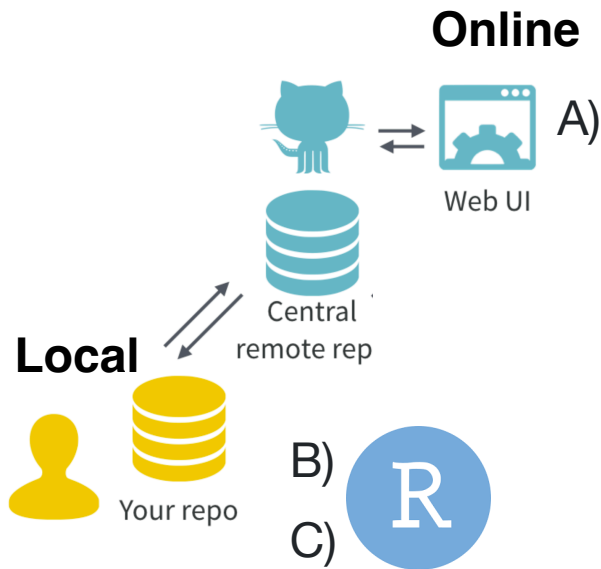
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How does this look in practice?

Live tutorial:

- start a new GitHub repo
- create a connected RStudio project
- write the code for our data analysis
- commit frequently with informative commit messages
 - only add what is needed to git history