

CSHS Workshop: R for hydrologists - projects

CWRA 2022

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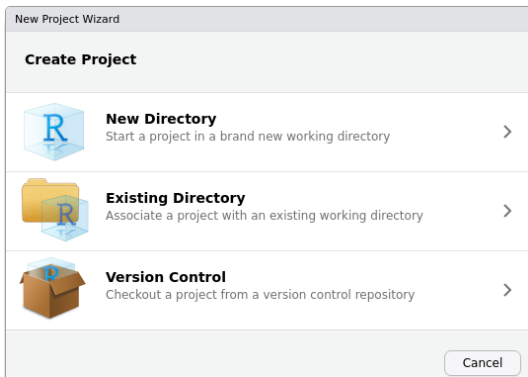


Why create a project?

- ▶ Makes your code more reproducible
- ▶ Keeps code separate from other projects
- ▶ Lets your code work with `git` and **GitHub**
- ▶ Basis for creating packages

How to create a project

- ▶ Command is **File | New Project**
- ▶ Several alternatives appear



Decisions, decisions. . . .

- ▶ New Directory
 - ▶ allows you to create any type of project, including packages
 - ▶ can use **git** (always a good idea), *but*
 - ▶ *won't* work with **GitHub**
- ▶ Existing Directory
 - ▶ only creates a simple project
 - ▶ doesn't set up **git**, but you can add it later
 - ▶ *won't* work with **GitHub**
- ▶ Version Control
 - ▶ clones a project from a repository like **GitHub** or **GitLab**
 - ▶ project has to be set up on the repository *first*

.Rproj file

- ▶ Every project contains a project file (`project_name.Rproj`)
 - ▶ a text file which contains the project settings
- ▶ Double-clicking on the file in your file manager will load **RStudio** with the project
 - ▶ default directory will be set to the project directory
- ▶ Can also load a project manually in **RStudio** using
File | Open Project or
File | Recent Projects
- ▶ You can only have one project open at a time
 - ▶ opening a project will close your current project

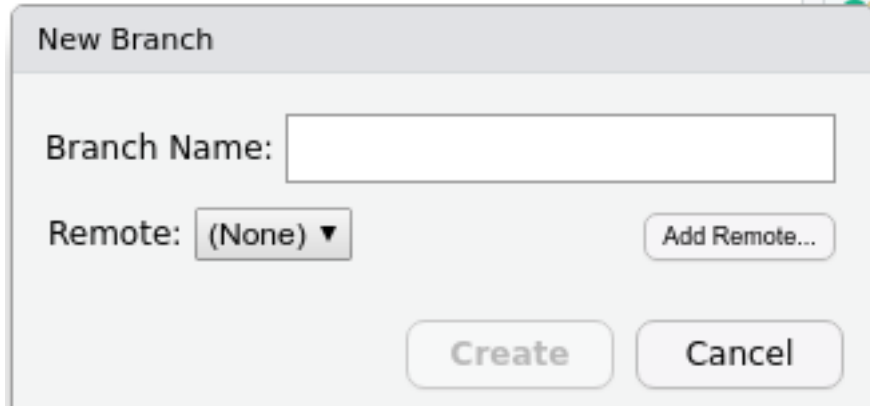
- ▶ **git** is a program for version control
- ▶ Created by Linus Torvalds (creator of Linux)
- ▶ Allows you to manage versions of your documents
- ▶ **RStudio** allows you to do most operations without typing commands
 - ▶ if you screw up, you *will* have to type **git** commands
- ▶ Can sync with **GitHub**

Working with git

- ▶ **git** is based on *branches*
 - ▶ each branch is a separate set of files
- ▶ There is always a **main** (or **master**) branch
 - ▶ best version of the files
- ▶ When a branch is ready, it can be merged into the **main** branch
- ▶ You can switch between branches at any time

git branches

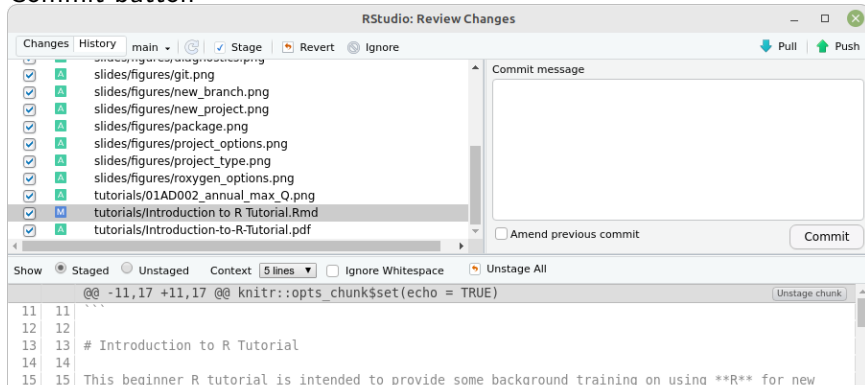
- ▶ *ALWAYS* create a new branch before working on a project
 - ▶ if you don't it will be a huge PITA
- ▶ Click on **New Branch** button in the **Git** tab



The image shows a 'New Branch' dialog box with a light gray background. At the top, the title 'New Branch' is displayed in a bold, sans-serif font. Below the title, there is a label 'Branch Name:' followed by a large, empty text input field. Underneath the input field, the label 'Remote:' is followed by a dropdown menu showing '(None)' with a downward arrow. To the right of the dropdown menu is a button labeled 'Add Remote...'. At the bottom of the dialog, there are two large, rounded buttons: 'Create' on the left and 'Cancel' on the right.

Committing

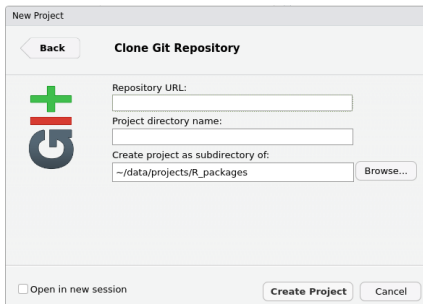
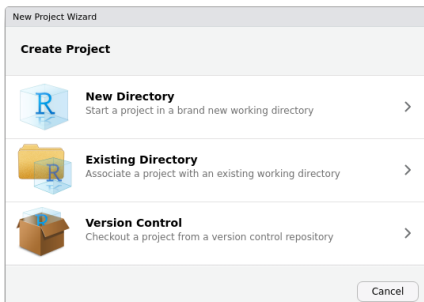
- ▶ When you have finished some work, you can commit your changes by
- ▶ selecting the files to commit and
- ▶ clicking on **Commit** in the **Git** tab
- ▶ You will then see a window which lets you review your changes
- ▶ You **must** type a Commit message describing your changes before clicking on the Commit button



Exercise

- ▶ Create a new project in a new directory
- ▶ Check “Create a git repository”
- ▶ Don’t check “Use renv with this project”
 - ▶ **renv** is a package which keeps copies of all of the packages that you use with the project
- ▶ Quit **RStudio**
- ▶ Copy the file “f2c.R” to the project directory
- ▶ Copy the file “Introduction_to_R_Tutorial.Rmd” to the project directory
- ▶ Go to your file manager and double-click on the “.Rproj” file in the new directory
 - ▶ you should now see “f2c.R” in the Files tab
- ▶ Create a new branch in the Git tab
 - ▶ load “f2c.R”
 - ▶ make an edit to the file “f2c.R”
 - ▶ commit the change
- ▶ In **RStudio** click on **File | Recent Projects** to re-load *this* project

- ▶ You can sync your project with an online repository at GitHub or GitLab
- ▶ Have to set up the online repo *first*
 - ▶ need an account
 - ▶ have to have ssh set up on your computer
- ▶ When you create a project, you select Version Control



R Packages

- ▶ **R** packages are special types of projects
- ▶ Only hold functions - do *not* use them for Notebooks
- ▶ Have