



# Using GitHub for Project Management

---

NCEAS Learning Hub  
*for*  
UCSB Seminar Series

March 2024

# Learning Objectives

- Understand how GitHub can serve as a Project Management tool
- Know how to create and leverage on GitHub Issues
- Be familiar with how to set and customize GitHub Projects

# Today's Agenda

- REVIEW - What exactly are Git and GitHub?
- REVIEW - GitHub Repository Orientation
- REVIEW - Benefits of Using Version Control
- Why GitHub for Project Management?
- GitHub Tools for Project Management
  - Issues & Projects
    - Overview
    - Example
    - Demo

# What *exactly* are Git and GitHub?

## **Git:**

- An open-source **version control software** used to manage the versioning and tracking of files in a folder (a repository).

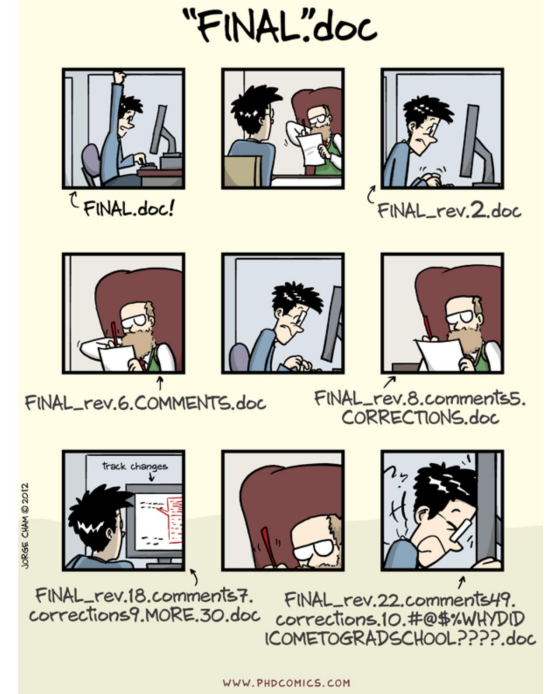


# Side note: Benefits to using version control

- **Maintain a history** of your research project's development while keeping your workspace clean
- **Facilitate collaboration** and transparency when working on teams
- **Explore bugs or new features** without disrupting your team members' work
- *and more!*

Piled Higher and Deeper by Jorge Cham

www.phdcomics.com



# Side note: Benefits to using version control



`logo.svg`



`logo-2.svg`



`logo-3-monica-feedback.svg`

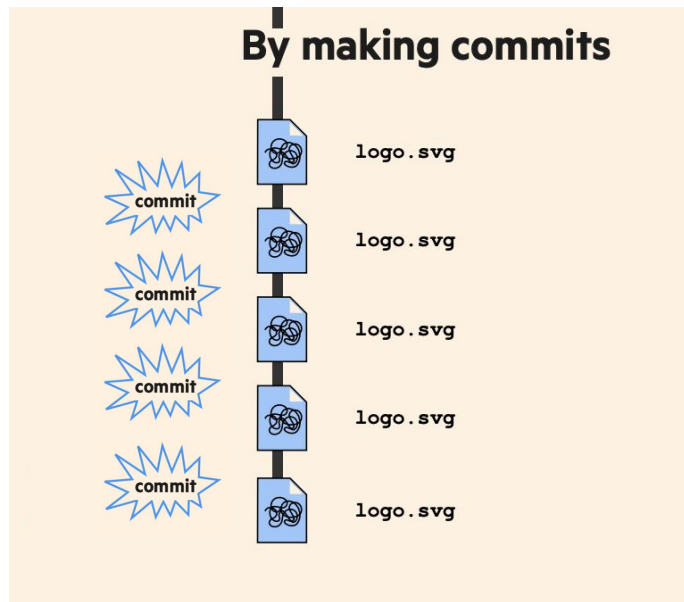
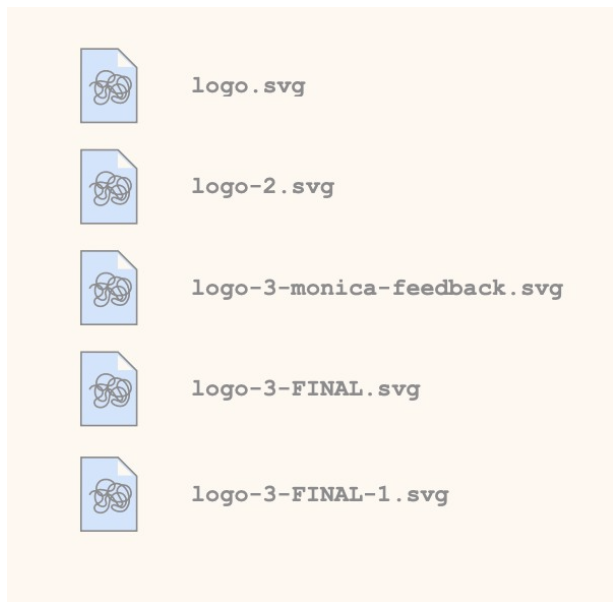


`logo-3-FINAL.svg`

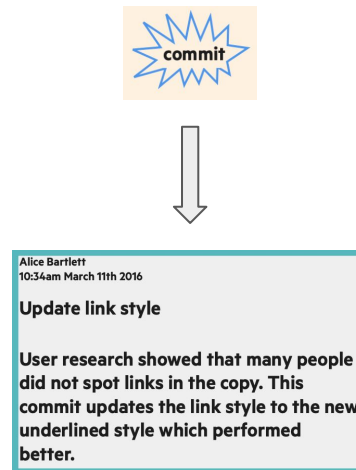
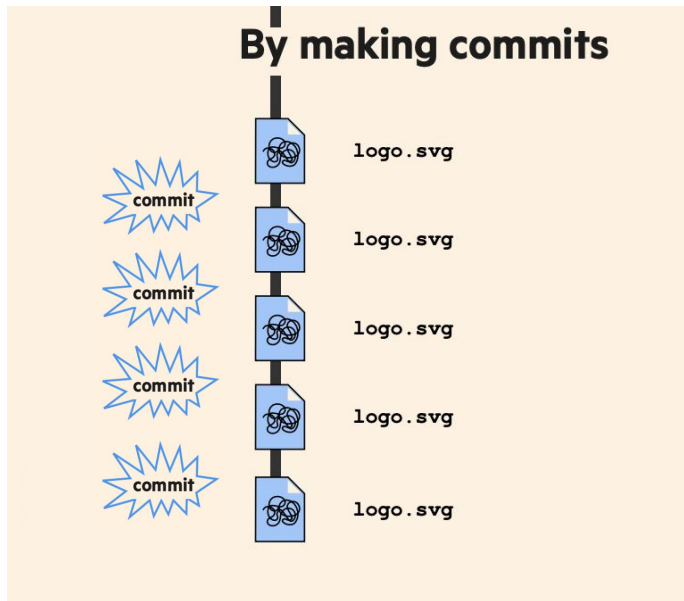
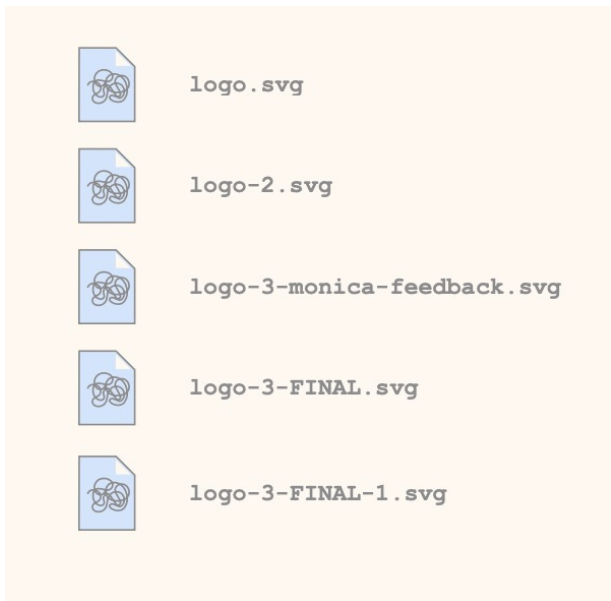


`logo-3-FINAL-1.svg`

# Side note: Benefits to using version control



# Side note: Benefits to using version control





# Side note: Benefits to using version control

## By saving copies



logo.svg



logo-2.svg



logo-3-monica-feedback.svg



logo-3-FINAL.svg



logo-3-FINAL-1.svg

## By making commits



logo.svg



logo.svg



logo.svg



logo.svg



logo.svg

# What *exactly* are Git and GitHub?

## Git:

- An open-source **version control software** used to manage the versioning and tracking of files in a folder (a repository).



## GitHub:

- **Online platform** and service that provides a centralized **place for Git repositories (repos)**



# GitHub Structure in a Nutshell

- **Repositories (“repos”)** are Git and GitHub main unit. A “contained” folder with permissions. A repository can be public or private.
- Files are stored in **repositories**.
- Repositories are “owned” (live under) by **users /organizations**.
- All repositories have the same structure. Makes is easy and familiar to navigate.

# GitHub repo Orientation

Google "pinguins github".

Every GitHub repo looks the same.

Here's the first things to look for:

The screenshot shows the GitHub repository page for 'allisonhorst/palmerpenguins'. The URL in the browser is 'https://github.com/allisonhorst/palmerpenguins'. The repository name is 'allisonhorst / palmerpenguins'. The page shows a list of files and folders, a 'Recent activity?' section, and an 'About' section. Annotations include: 'URL (changes as you navigate)' pointing to the browser address bar; '[user or org] / repo (doesn't change)' pointing to the repository name; 'Recent activity?' pointing to the activity section; 'Files and folders' pointing to the file list; 'Scroll down for README' pointing to the bottom of the file list; and 'website' pointing to the repository URL in the 'About' section.

URL (changes as you navigate)

[user or org] / repo (doesn't change)

Recent activity?

Files and folders

Scroll down for README

website

File/Folder	Commit Message	Time Ago
.github	update gh actions (#65)	9 months ago
R	Adding year to penguins (#62)	9 months ago
data-raw	Adding year to penguins (#62)	9 months ago
data	Use an internal dataset (#36)	10 months ago
inst	add DOI to citation (#73)	9 months ago
man	Adding year to penguins (#62)	9 months ago
pkgdown	Navbar border (#6)	10 months ago
vignettes	update install > CRAN (#72)	9 months ago
.Rbuildignore	update Rbuildignore (for cran sub)	9 months ago
.gitignore	Rm docs (#32)	10 months ago
DESCRIPTION	remove Palmer URL in DESCRIPTION	9 months ago
LICENSE.md	update pkg license & description	10 months ago
NAMESPACE	Extdata (#46)	9 months ago

# The power of GitHub

- **Publishing platform.** A new way for sharing & communication - your files can become websites! Share the url once, it's always the latest version.
- **Project management system.** Short- and long-term collaborative “todo” lists
  - “Issues” & “Projects”

Annual reports

Shared todo's

The screenshot displays the GitHub interface for the repository 'OHI-Science / globalfellows-issues'. At the top, there is a navigation bar with links for 'GLOBAL', 'Goals', 'Layers', 'Scores', 'Download', and 'Fellows'. The main heading is 'Annual OHI global assessments'. Below this, a paragraph explains that Ocean Health Index scores provide valuable, comprehensive, and quantitative assessments of progress towards healthy and sustainable oceans. It mentions that 2020 marks the eighth year of annual global Ocean Health Index (OHI) assessments, with scores representing ocean health for 220 coastal nations and territories. A link to 'Supplemental Methods' is provided.

A circular chart in the center shows the 'Average 2020 Index score was 72 out of 100'. The chart is divided into segments representing different OHI indicators: Carbon Storage, Natural Products, Artisanal Fishing, Livelihoods, Economies, Inland Living, Coastal Protection, Tourism & Recreation, and Resilient & Sustainable. The score '72' is prominently displayed in the center of the chart.

Below the chart, the GitHub issues page is visible. It shows a list of issues with filters for 'Open' (21) and 'Closed' (38). The issues listed include:

- Final data things for ohi 2018 assessment (4 of 7)
- Cleaning ohicore (2 of 3)
- Cleaning ohi-global (1 of 1)
- Cleaning ohiprep\_v2018 (2 of 2)
- OHI Documentation (7 of 9)
- template for region card pdfs (6)
- Ideas for 2019 OHI Fellows Improvement/Independent Projects (3)
- Parallel Processing (6)
- adding to ohi-global, expected/ok warnings (6)
- Creating country maps to display with scores timeseries (23)

# Why talk about GitHub for Project Management?

(in an academic research context)

- GitHub is mainly known for being a version control platform (extensively used by software developers).

# Why talk about GitHub for Project Management?

(in an academic research context)

- GitHub is mainly known for being a version control platform (extensively used by software developers).
- As researchers who code, we know the benefits and value of version controlling our work.

# Why talk about GitHub for Project Management?

(in an academic research context)

- GitHub is mainly known for being a version control platform (extensively used by software developers).
- As researchers who code, we know the benefits and value of version controlling our work.
- Also from the software development world comes the idea of using product management software to organize all the moving parts of a project.



# Why talk about GitHub for Project Management?

(in an academic research context)

- GitHub is mainly known for being a version control platform (extensively used by software developers).
- As researchers who code, we know the benefits and value of version controlling our work.
- Also from the software development world comes the idea of using product management software to organize all the moving parts of a project.
- As scientist, we can relate because research also has many moving pieces.

# Why talk about GitHub for Project Management?

(in an academic research context)

- To organize all the moving parts of a project (in one place), from analysis to final product to outreach.
- Use it as a communication and coordination tool with colleagues.
- Help us document our work and decisions around it.

# GitHub for Project Management

- **Organize and track projects** with single or multiple & overlapping users

# GitHub for Project Management

- **Organize and track projects** with single or multiple & overlapping users
- **Streamline technical discussions** for people with different responsibilities

# GitHub for Project Management

- **Organize and track projects** with single or multiple & overlapping users
- **Streamline technical discussions** for people with different responsibilities
- **Key for onboarding Future You and Future Us**

# GitHub for Project Management

- **Organize and track projects** with single or multiple & overlapping users
- **Streamline technical discussions** for people with different responsibilities
- **Key for onboarding Future You and Future Us**
- **Already managing code** and is linked to collaborators

# GitHub Tools for Project Management

- Issues
- Projects

# GitHub Issues

Issues “track ideas, enhancements, tasks, or bugs for work on GitHub.” - [GitHub](#)



# GitHub Issues

Issues “track ideas, enhancements, tasks, or bugs for work on GitHub.” - [GitHub](#)

- Let you discuss/organize in the same place as your code & documentation.

# GitHub Issues

Issues “track ideas, enhancements, tasks, or bugs for work on GitHub.” - [GitHub](#)

- Let you discuss/organize in the same place as your code & documentation.
- A “place” where you can have active discussions about any “issue” of your project(s). Code related or not.

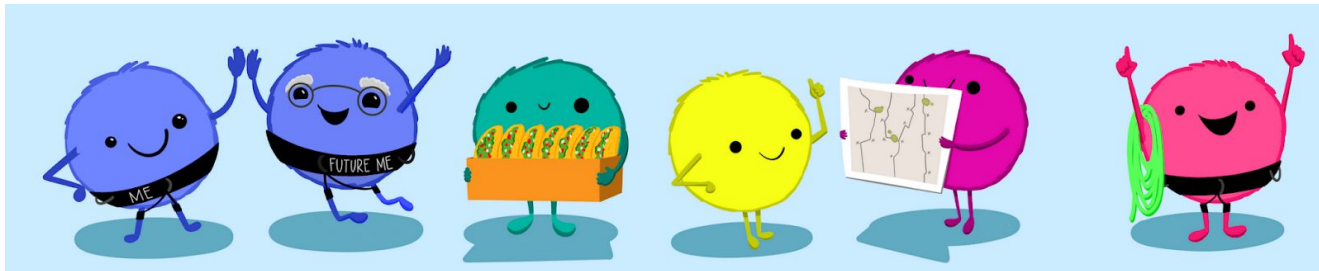
# GitHub Issues

Issues “track ideas, enhancements, tasks, or bugs for work on GitHub.” - [GitHub](#)

- Let you discuss/organize in the same place as your code & documentation.
- A “place” where you can have active discussions about any “issue” of your project(s). Code related or not.
- It streamlines technical discussions with people who are coming/joining the group.

# GitHub Issues

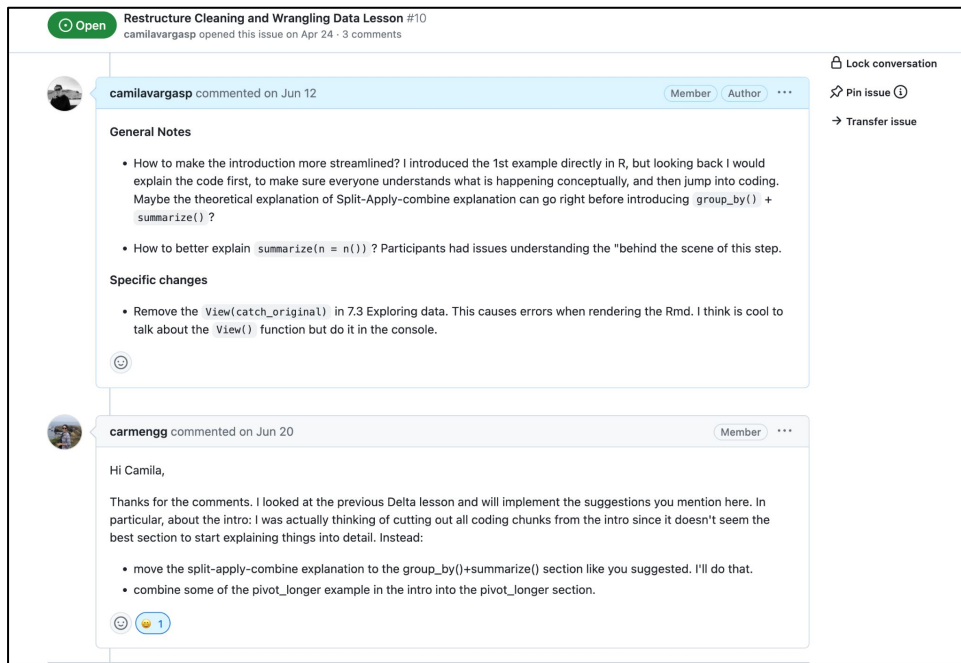
- A project bug tracker
- Digital “Lab Notebook” (ideas, brainstorming)
- Act like an external memory (notes to self, links to resources)
- Identify and delegate task
- Documentation of process over time



# GitHub Issues

You can see and access and issue from

- A repository web interface on GitHub



The screenshot shows a GitHub issue titled "Restructure Cleaning and Wrangling Data Lesson #10" opened by user camilavargasp on April 24. The issue has 3 comments. The first comment, from camilavargasp on June 12, is titled "General Notes" and contains two bullet points: one about streamlining the introduction and another about explaining the `summarize(n = n())` function. The second comment, from user carmengg on June 20, responds to the first comment, thanking the author and providing two bullet points of suggestions for restructuring the lesson's introduction.

**Restructure Cleaning and Wrangling Data Lesson #10**  
camilavargasp opened this issue on Apr 24 · 3 comments

**camilavargasp** commented on Jun 12 Member Author

**General Notes**

- How to make the introduction more streamlined? I introduced the 1st example directly in R, but looking back I would explain the code first, to make sure everyone understands what is happening conceptually, and then jump into coding. Maybe the theoretical explanation of Split-Apply-combine explanation can go right before introducing `group_by() + summarize()` ?
- How to better explain `summarize(n = n())` ? Participants had issues understanding the "behind the scene of this step."

**Specific changes**

- Remove the `View(catch_original)` in 7.3 Exploring data. This causes errors when rendering the Rmd. I think is cool to talk about the `View()` function but do it in the console.

**carmengg** commented on Jun 20 Member

Hi Camila,

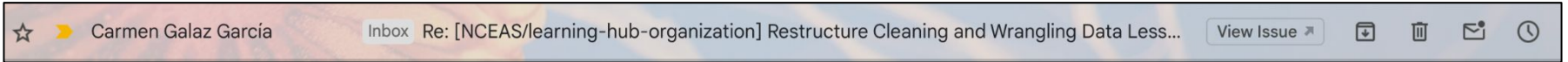
Thanks for the comments. I looked at the previous Delta lesson and will implement the suggestions you mention here. In particular, about the intro: I was actually thinking of cutting out all coding chunks from the intro since it doesn't seem the best section to start explaining things into detail. Instead:

- move the split-apply-combine explanation to the `group_by()+summarize()` section like you suggested. I'll do that.
- combine some of the `pivot_longer` example in the intro into the `pivot_longer` section.

# GitHub Issues

You can see and access and issue from

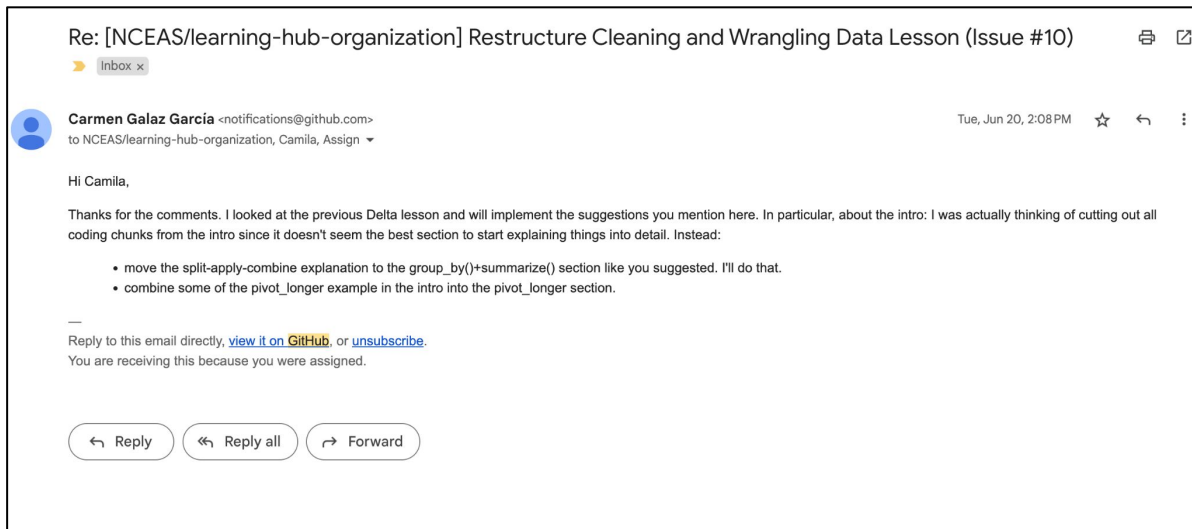
- Your email, just like regular messages (this can, of course, be configured)



# GitHub Issues

You can see and access and issue from

- Your email, just like regular messages (this can, of course, be configured)



# GitHub Issue: Example

- ggplot2 bug reports, code, feature, & help requests

tidyverse / ggplot2

Type to search

<> Code Issues 205 Pull requests 53 Actions Wiki Security Insights

Want to contribute to tidyverse/ggplot2  
If you have a bug or an idea, read the [contributing guidelines](#) before opening an issue.

Filters is:issue is:open Labels 22 Milestones 1 New issue

205 Open 3,542 Closed

Author	Label	Projects	Milestones	Assignee	Sort
#5563 opened yesterday by krlmlr					2
#5561 opened yesterday by teunbrand			1		
#5558 opened 3 days ago by davidhodge931			1		5
#5553 opened 4 days ago by Yunuuuu	feature internals				1
#5547 opened last week by teunbrand	feature guides		1		
#5541 opened last week by davidhodge931	feature guides themes		1		3



# GitHub Issue: Example

- Ocean Health Index Team

The screenshot shows a GitHub issue page for the repository 'OHI-Science / OHI-website'. The issue title is 'Set up email addresses #87', which is marked as a 'New issue'. The issue is currently 'Open' and was created by ThomasThelen on August 18, 2021, with one comment.

The first comment, from ThomasThelen (Member), is dated August 18, 2021. The text of the comment reads: 'We should associate at least one email address with the Ocean Health Index. From the August 18th call, we decided that an email address of `info@oceanhealthindex.org` that forwards to `@gclawson1` is the path that we want to go down.'

The second comment, also from ThomasThelen (Member and Author), is dated October 4, 2021. The text of the comment reads: 'Update: we still need the server hardware before going through with this.'

On the right side of the issue, there are several sections: 'Assignees' (No one assigned), 'Labels' (None yet), 'Projects' (None yet), 'Milestone' (No milestone), and 'Development' (No branches or pull requests).


# GitHub Issue: Example

- Openscapes Team


## Summary blog post [ 2023-fred-hutch ] - pub Nov 14, draft Nov 07 #187 New issue

Open 3 tasks stefaniebutland opened this issue on Aug 1 · 3 comments



---



 **stefaniebutland** commented on Aug 1 Member ...



- select one project or pathway element from each team
- draft post
- publish & tweet / toot post





---

  **stefaniebutland** added the following label on Aug 1


  **stefaniebutland** self-assigned this on Aug 1

  **stefaniebutland** added this to **CohortPlanning** on Aug 1

  **github-project-automation** (bot) moved this to **Todo** in **CohortPlanning** on Aug 1

---

**Assignees**

 **stefaniebutland**


---


**Labels**

following

---

**Projects**

 **CohortPlanning**  
Status: **Todo**

 **MainPlanning**  
Status: **In Progress This Week**

---

**Milestone**

No milestone



stefaniebutland commented on Sep 28

Member Author ...

"Tell your roommate moments" like posit::conf sharing back to Julie.  
Near end, what was different about this cohort?  
Julie's back from vacation in plenty of time to review



stefaniebutland changed the title ~~Summary blog post [ 2023-fred-hutch ]~~ Summary blog post [ 2023-fred-hutch ] - pub Nov 14, draft Nov 07 on Sep 28



stefaniebutland added this to MainPlanning on Oct 29



stefaniebutland moved this to In Progress This Week in MainPlanning on Oct 29



stefaniebutland mentioned this issue on Nov 2

Champions Cohort: 2023-fred-hutch. Aug 29 - Oct 24 [Openscapes/how\\_we\\_work#268](#)

Closed



stefaniebutland commented last month

Member Author ...

@jules32 rough draft PR for wrap up post: [Openscapes/website-new#69](#)

For now, each team/lab text is not good - just copied what I had in Call 5 digest. It would help me a lot if you took a quick look and noted anything I might highlight. I haven't yet rewatched the video to do my next round of draft.



Development

No branches or pull requests

Notifications

Customize

Subscribe

You're not receiving notifications from this thread.

2 participants



# GitHub Issue: Example

- Collaborating with myself

The screenshot shows a GitHub issue page for "Survey 123 Metadata notes #5". The issue is open and was created by user "camilavargasp" on July 7, 2022. It has 4 comments. The issue content includes a comment from "camilavargasp" on July 7, 2022, mentioning "From Vienna - slack with Tristin" and a list item about adding "NAs" in survey data. A second comment from "camilavargasp" on October 12, 2022, is titled "Phase 1" and includes a table with columns "colname" and "explanation". The table lists various data fields and their corresponding explanations. On the right side of the issue, there are sections for Assignees (No one), Labels (Notes, Survey123), Projects (None yet), Milestone (No milestone), Development (Create a branch), Notifications (Unsubscribe), and 1 participant.

## Survey 123 Metadata notes #5

Open camilavargasp opened this issue on Jul 7, 2022 · 4 comments

camilavargasp commented on Jul 7, 2022

From Vienna - slack with Tristin

- Friendly FYI that I have added "NAs" in the PHASE2\_survey123\_data\_deployment2\_summer22 data for purple and red urchin sizes as Grant was unable to collect these data due to safety issues.  
<https://tnc.box.com/s/tk65jebfp556vu7hckw5554lvhang5to>

camilavargasp added Survey123 Notes labels on Sep 19, 2022

camilavargasp commented on Oct 12, 2022 · edited

### Phase 1

- NA values explanation - Phase 1 count data. Valid for phase 2 winter and spring

colname	explanation
trap_number	"missing number". If the trap number was not recorded by Grant, this is an NA (and so is the trap type)
bait_status	No data collected
trapped_urchin_location	No data collected
other_bycatch_note	no notes on other bycatch

Assignees: No one—assign yourself

Labels: Notes, Survey123

Projects: None yet

Milestone: No milestone

Development: Create a branch for this issue or link a pull request.

Notifications: Unsubscribe

You're receiving notifications because you're watching this repository.

1 participant

Lock conversation

# GitHub Issues Demo 1

1. Create a new issue from: repository/issues
2. Tag a collaborator
3. Add comment
4. Paste and image

## GitHub Issues Demo 2

1. Create a new issue from code
2. Add label
3. Assign who is responsible
4. Add To Do list
5. Add emoji
6. Show watching and what that means

# GitHub Project

- “A project is an adaptable spreadsheet, task-board, and road map that integrates with your issues and pull requests on GitHub to **help you plan and track your work effectively.**” (GitHub)

# GitHub Project

- “A project is an adaptable spreadsheet, task-board, and road map that integrates with your issues and pull requests on GitHub to **help you plan and track your work effectively.**” (GitHub)
- Projects are GitHub’s main tool for project management.



# GitHub Project

- “A project is an adaptable spreadsheet, task-board, and road map that integrates with your issues and pull requests on GitHub to **help you plan and track your work effectively.**” (GitHub)
- Projects are GitHub’s main tool for project management.
- It is an umbrella that can include many issues.

# GitHub Project

- “A project is an adaptable spreadsheet, task-board, and road map that integrates with your issues and pull requests on GitHub to **help you plan and track your work effectively.**” (GitHub)
- Projects are GitHub’s main tool for project management.
- It is an umbrella that can include many issues.
- Helps you visualize everything that is being tracked on issues.

# GitHub Project

The screenshot shows a GitHub Project board for the organization 'Personal Organization'. The board is organized into four columns: 'To Do' (24 items), 'In Progress' (3 items), 'This Week' (4 items), and 'Done' (17 items). Each column contains task cards with titles, descriptions, and labels. The 'To Do' column includes tasks like 'Update website with 2024 speakers', 'Create survey', 'Create Flyer with all upcoming speakers for the new year', and 'Confirm all speakers for Jan-June 2024'. The 'In Progress' column includes 'GitHub for Project Management Module' and 'Practice Spatial Data Lesson (UCSB Faculty)'. The 'This Week' column includes tasks like 'Get sign holder or brochure holder for AGU', 'Create feedback survey report with out comments that can indirectly identify someone', 'Send out poll to define final presentation data', and 'Add slide content to Week 2 and 3 book'. The 'Done' column includes tasks like 'send reminder emails', 'Update course book', 'Create Report for week 3 survey', 'Data Management Essential Lesson for GEI-Biggs', and 'Intro to Git & GitHub fro GEI-Biggs'. The interface includes a search bar, view filters, and a 'Save' button.

camilavargas / Projects / Personal Organization

Personal Organization

View 1 View 2 View 3 + New view

Filter by keyword or by field

Discard Save

- To Do 24**
  - task-management #48: Update website with 2024 speakers (Roundtable)
  - task-management #47: Create survey (Roundtable)
  - task-management #46: Create Flyer with all upcoming speakers for the new year (Roundtable)
  - task-management #45: Confirm all speakers for Jan-June 2024 (Roundtable)
  - task-management #31
- In Progress 3**
  - task-management #42: GitHub for Project Management Module (modular training)
  - task-management #36: Practice Spatial Data Lesson (UCSB Faculty) (ucsb-faculty)
  - task-management #49: Create one-pager about CDC vulnerability index (Delta)
- This Week 4**
  - task-management #5: Get sign holder or brochure holder for AGU (coreR)
  - task-management #32: Create feedback survey report with out comments that can indirectly identify someone (Delta)
  - task-management #34: Send out poll to define final presentation data (Delta)
  - task-management #33: Add slide content to Week 2 and 3 book (Delta)
- Done 17**
  - task-management #38: send reminder emails (UCSB-Faculty)
  - task-management #37: Update course book (UCSB-Faculty)
  - task-management #13: Create Report for week 3 survey
  - task-management #40: Data Management Essential Lesson for GEI-Biggs
  - task-management #41: Intro to Git & GitHub fro GEI-Biggs

# GitHub Project

A project is an adaptable spreadsheet, task-board, and road map...

The screenshot displays a GitHub Project board for a user named 'camilavargas' under the organization 'Personal Organization'. The board is organized into four columns: 'To Do' (24 items), 'In Progress' (3 items), 'This Week' (4 items), and 'Done' (17 items). Each column contains task cards with titles, descriptions, and labels. The 'To Do' column includes tasks like 'Update website with 2024 speakers' and 'Create survey'. The 'In Progress' column shows 'GitHub for Project Management Module' and 'Practice Spatial Data Lesson'. The 'This Week' column lists tasks such as 'Get sign holder or brochure holder for AGU' and 'Create feedback survey report'. The 'Done' column contains completed tasks like 'send reminder emails' and 'Update course book'. The interface includes a search bar, view selection options, and a filter field.

Personal Organization

View 1 View 2 View 3 + New view

Filter by keyword or by field

Discard Save

- To Do** 24  
This item hasn't been started.
  - task-management #48  
Update website with 2024 speakers  
Roundtable
  - task-management #47  
Create survey  
Roundtable
  - task-management #46  
Create Flyer with all upcoming speakers for the new year  
Roundtable
  - task-management #45  
Confirm all speakers for Jan-June 2024  
Roundtable
  - task-management #31
- In Progress** 3  
This is actively being worked on
  - task-management #42  
GitHub for Project Management Module  
modular training
  - task-management #36  
Practice Spatial Data Lesson (UCSB Faculty)  
ucsb-faculty
  - task-management #49  
Create one-pager about CDC vulnerability index  
Delta
- This Week** 4  
Tasks that needs to be accomplished in the current week
  - task-management #5  
Get sign holder or brochure holder for AGU  
coreR
  - task-management #32  
Create feedback survey report with out comments that can indirectly identify someone  
Delta
  - task-management #34  
Send out poll to define final presentation data  
Delta
  - task-management #33  
Add slide content to Week 2 and 3 book  
Delta
- Done** 17  
This has been completed
  - task-management #38  
send reminder emails  
UCSB-Faculty
  - task-management #37  
Update course book  
UCSB-Faculty
  - task-management #13  
Create Report for week 3 survey
  - task-management #40  
Data Management Essential Lesson for GEI-Biggs
  - task-management #41  
Intro to Git & GitHub fro GEI-Biggs

# GitHub Project

- A Project can be created
  - within an Organization
  - by a User (under that user account)
- A project can be linked to a repository.
- In a project you can see and create issues in different repositories.

# GitHub Project

- A Project created **within an Organization**
  - Supports issues from any repositories
  - Editable by any users in the organization

# GitHub Project

- A Project created **from a user account**
  - Supports issues from any repository
  - Editable only by this user
    - \*Unless the user allows other users to have admin-level powers in that project.

# GitHub Project Demo 1

- Create a project within Ecodatascience organization
- Create a new Draft in the project
- Add issue created in previous Demo to project
- Add and customize columns
- Close issue and show automatization



## GitHub Project Demo 2

- Navigate to my Personal Organization project
- Different ways to open the project
- Different views
- Customize categories
- Customize labels
- Start and End dates
- Milestones

## Summary: The Workflow

- Issues are related to a repository
- Projects can be created under a user or organization
- Use Issues to track and document each task or idea of your analysis
- Use a GitHub Project to oversee all the moving pieces of your research project. Each member can track their tasks and ensure equitable effort.
- Mix and match repositories and project categories as you see fit

# Resources and References

- [Openscapes GitHub for Project Management \(Champion Series\)](#)
- [Openscapes GitHub Clinic slides](#)
- LTER SciComp Workshops
  - [GitHub Issues](#)
  - [GitHub Projects](#)
- GitHub Docs
  - [Issues](#)
  - [Projects](#)