



Using GitHub for Project Management

NCEAS Learning Hub
for
Working Groups

2024-2025

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).

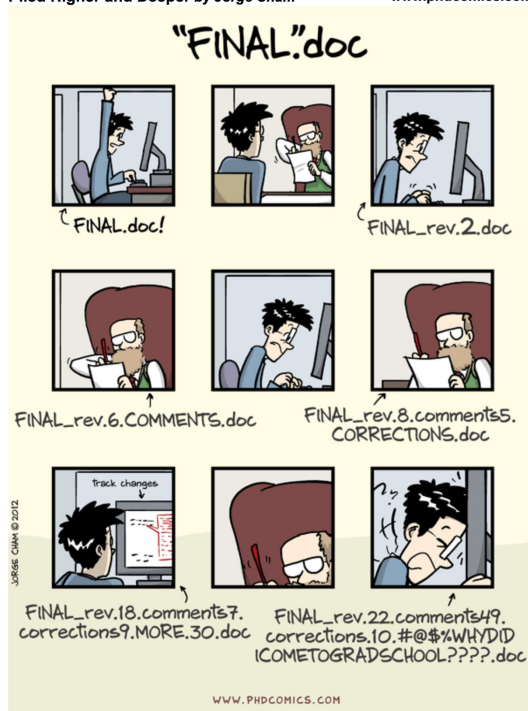


Side note: Benefits to using version control

- **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



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`logo-2.svg`



`logo-3-monica-feedback.svg`

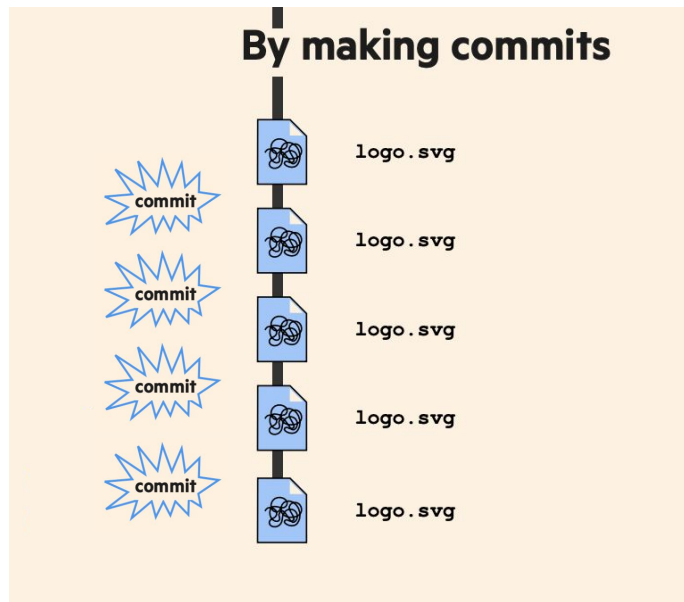
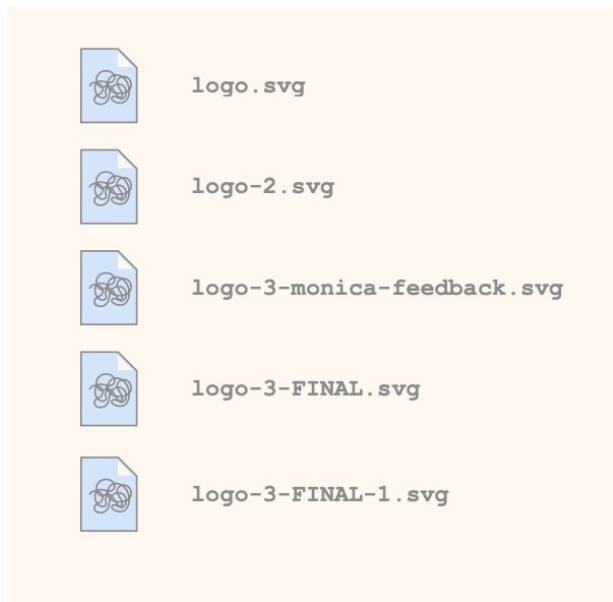


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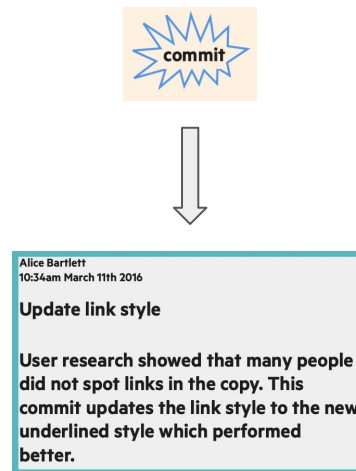
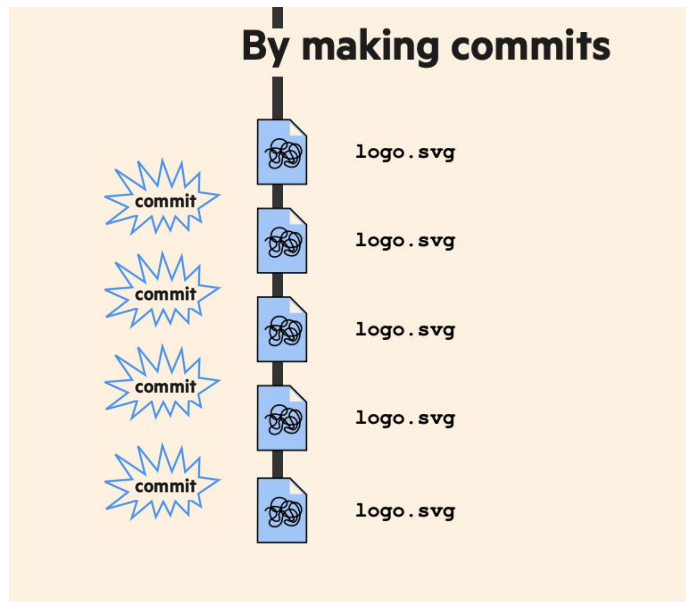
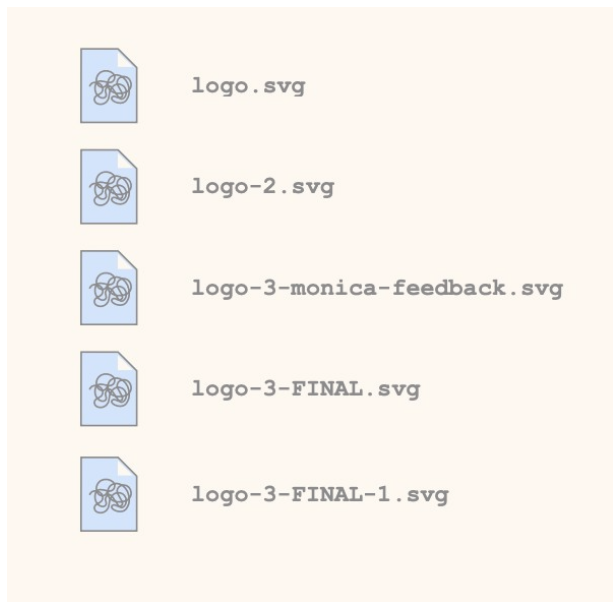


`logo-3-FINAL-1.svg`

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?

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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
“[penguins](#)
[github](#)”.

Every GitHub
repo looks the
same.

Here's the first
things to look
for:

Files and folders

The screenshot shows the GitHub repository page for 'allisonhorst/palmerpenguins'. The browser's address bar shows the URL 'https://github.com/allisonhorst/palmerpenguins'. The repository name 'allisonhorst / palmerpenguins' is displayed below the search bar. The page features a list of files and folders, a 'Recent activity' section, and a 'Readme' section. Annotations with red arrows point to the URL, the repository name, the 'Recent activity?' section, and the 'Readme' section.

URL (changes as you navigate)

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

Recent activity?

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 / globelfellows-issues'. At the top, a navigation bar includes 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 invaluable, 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. For a detailed description of the data and methods, it refers to the 'Supplemental Methods' and a 'Story Map'.

A sunburst chart titled 'The average 2020 Index score was 72 out of 100. Average Index scores have not dramatically changed over eight years,' is shown. The chart is divided into segments representing different OHI domains: Natural Products, Artisanal Fishing, Carbon Storage, Coastal Protection, Tourism & Recreation, Livelihoods, Economies, Intrinsic, Learning, Special, Species, Places, and Disease of Priorities. The central value is 72.

Below the chart, the GitHub issues page is visible. It shows a list of issues with filters for '21 Open' and '38 Closed'. The issues are listed with their titles, authors, and progress bars. Some issues have links to 'reference' documents. The issues are sorted by 'New Issue'.

Why talk about GitHub for Project Management?

(in an academic research context)

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- 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?

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- 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

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- **Streamline technical discussions** for people with different responsibilities

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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](#)

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- A “place” where you can have active discussions about any “issue” of your project(s). Code related or not.

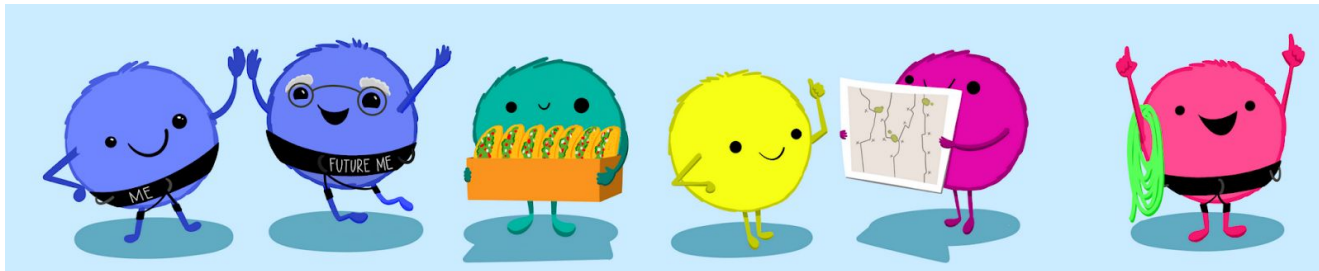
GitHub Issues

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- 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

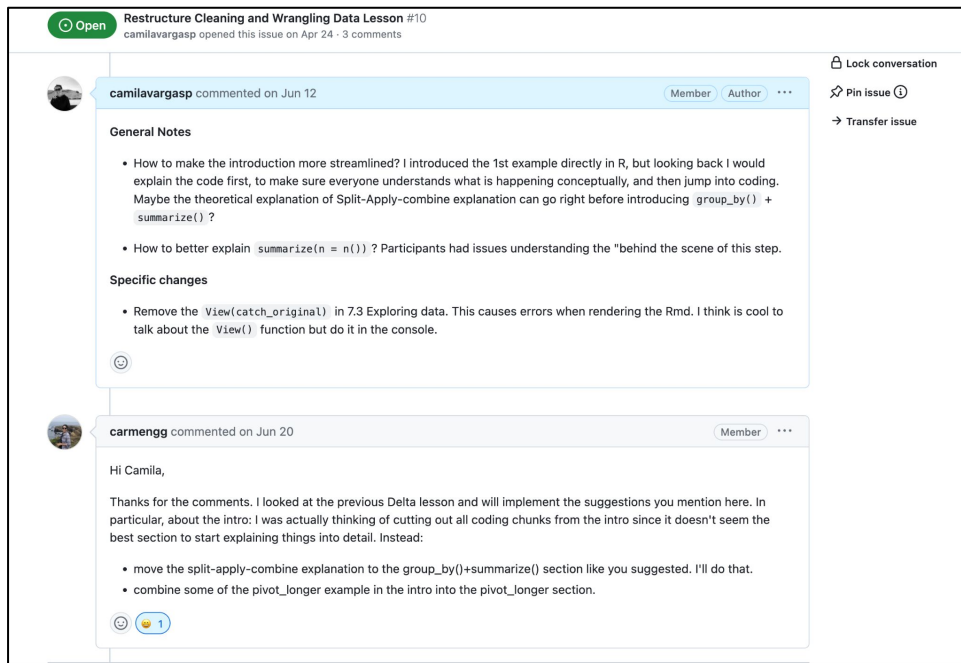


Artwork by Allison Horst

GitHub Issues

You can see and access and issue from

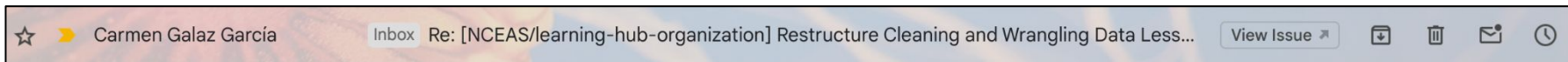
- A repository web interface on GitHub



GitHub Issues

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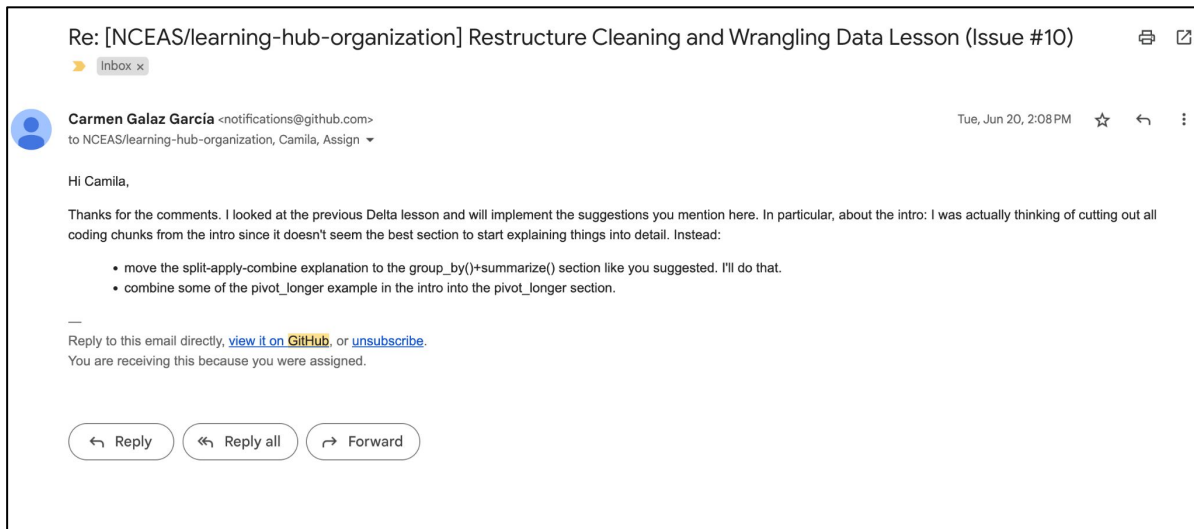
- Your email, just like regular messages (this can, of course, be configured)



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

The screenshot shows the GitHub repository page for `tidyverse/ggplot2`. The top navigation bar includes links for Code, Issues (205), Pull requests (53), Actions, Wiki, Security, and Insights. A search bar is located in the top right corner. Below the navigation bar, there is a banner encouraging contributions with the text "Want to contribute to tidyverse/ggplot2?" and a link to "contributing guidelines".

Below the banner, there is a section for filters and a search bar. The search bar contains the text "is:issue is:open". To the right of the search bar, there are buttons for "Labels 22", "Milestones 1", and a green "New issue" button.

The main content area displays a list of 205 open issues. The issues are sorted by "Sort" (default). The list includes the following issues:

- Stack imbalance warnings on CI/CD** (opened yesterday by `krmlr`) - 2 comments
- We can do better text/label keys now** (opened yesterday by `teunbrand`) - 1 comment
- Should the `trans` argument in `scale_*_continuous` etc be renamed to `transform`?** (opened 3 days ago by `davidhodge931`) - 1 comment, 5 replies
- Feature request: Add `gg` class in `ggplot2::labs()`** (opened 4 days ago by `Yunuuuu`) - 1 comment, labels: `feature`, `internals`
- Feature request: colourbar as gradients** (opened last week by `teunbrand`) - 1 comment, labels: `feature`, `guides`
- Feature request: `legend.byrow` argument added to `theme`** (opened last week by `davidhodge931`) - 1 comment, labels: `feature`, `guides`, `themes`

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', marked as 'Open' and created by ThomasThelen on August 18, 2021. The issue has one comment from ThomasThelen on August 18, 2021, and another update comment from ThomasThelen on October 4, 2021. The right sidebar shows no assignees, labels, projects, milestones, or development branches.

Navigation: <> Code Issues 28 Pull requests Actions Projects Security Insights

Set up email addresses #87

Open ThomasThelen opened this issue on Aug 18, 2021 · 1 comment New issue

ThomasThelen commented on Aug 18, 2021 Member ...

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.

ThomasThelen commented on Oct 4, 2021 Member Author ...

Update: we still need the server hardware before going through with this

Assignees
No one assigned

Labels
None yet

Projects
None yet

Milestone
No milestone

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

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

Author

...

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)

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- Projects are GitHub’s main tool for project management.

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- Projects are GitHub’s main tool for project management.
- It is an umbrella that can include many issues.

GitHub Project

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- 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 'Learning Hub Tasks' under the 'NCEAS / Projects' section. The board is organized into four columns: 'LH Focus' (8 items), 'To Do' (13 items), 'In Progress' (1 item), and 'Done' (1 item). Each column has a description and a list of tasks with their status, due dates, and labels.

Learning Hub Tasks

Filter by keyword or by field

LH Focus 8

Main projects to focus on April through September

- learning-hub-organization #105
New Learning Hub Staff Hire
New Hire Mar 11, 2024 Jun 28, 2024
- Draft
coreR Material Updates
coreR Material Apr 1, 2024 Jun 7, 2024
- Draft
Working Group Starter Package
Starter Package May 6, 2024 Jul 24, 2024
- Draft
Grant Applications
Grant Application Jun 18, 2024

To Do 13

This item hasn't been started

- learning-hub-organization #59
create coreR checklist and timeline documentation
coreR Material
- learning-hub-organization #6
Define an initial workflow on how WG data support will work
Starter Package
- learning-hub-modules #1
Modules Website
Organize Tools and Materials
- learning-hub-modules #3
Modules Website Content

In Progress 1

This is actively being worked on

- learning-hub-organization #99
UCSB Faculty Week 3 Planning
Course Planning Mar 22, 2024

Done 1

This has been completed

- learning-hub-organization #102
Reproducible Workflows to access Lesson
coreR Material

GitHub Project

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

The screenshot shows a GitHub Project page for 'Learning Hub Tasks' under the 'NCEAS / Projects' namespace. The interface includes a search bar, a 'Type' dropdown, and a 'Filter by keyword or by field' input. The project is organized into four columns: 'LH Focus' (8 items), 'To Do' (13 items), 'In Progress' (1 item), and 'Done' (1 item). Each column contains task cards with details like organization names, titles, and dates. The 'LH Focus' column lists 'New Learning Hub Staff Hire' and 'coreR Material Updates'. The 'To Do' column lists 'create coreR checklist and timeline documentation', 'Define an initial workflow on how WG data support will work', and 'Modules Website'. The 'In Progress' column lists 'UCSB Faculty Week 3 Planning'. The 'Done' column lists 'Reproducible Workflows to access Lesson'.

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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](#)