Git-ting It Together: Learn to Use Git and GitHub for Your Projects

Eli Holmes and Em Markowitz

NOAA FISHERIES

Women in Statistics and Data Science conference October 6-8, 2022

Using GitHub to Help a Team Tackle a Project Together

Artwork by @allison_horst

Elizabeth "Eli" Holmes

Emily Markowitz

Scientists at NOAA Fisheries and mentors in the NOAA Fisheries Openscapes program. We help scientists adopt Open Science workflows

https://nmfs-openscapes.github.io/

https://github.com/EmilyMarkowitz-NOAA
https://github.com/eeholmes

GitHub Project Boards

Kanban task board

Editing markdown files

Branches

Pull Requests

Artwork by @allison_horst

Schedule

8:15-10:45am

- 15-30 minute lectures and demos followed by 20-30 minute team work time

10:45-11am Break with snacks provided

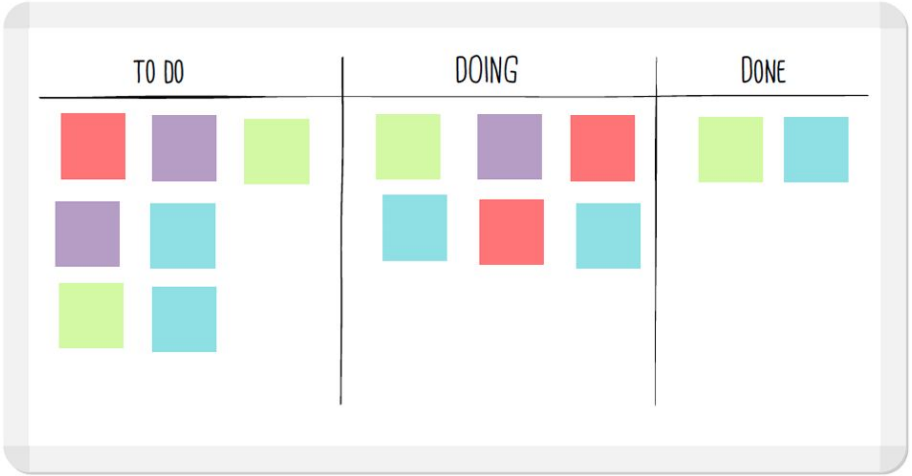
11-12pm Lectures and team work time

Learning warm up! A game!

Team Activity: Draw a zoo or zoo exhibit

Use only post-it notes, blue tape, and sharpies for zoo elements

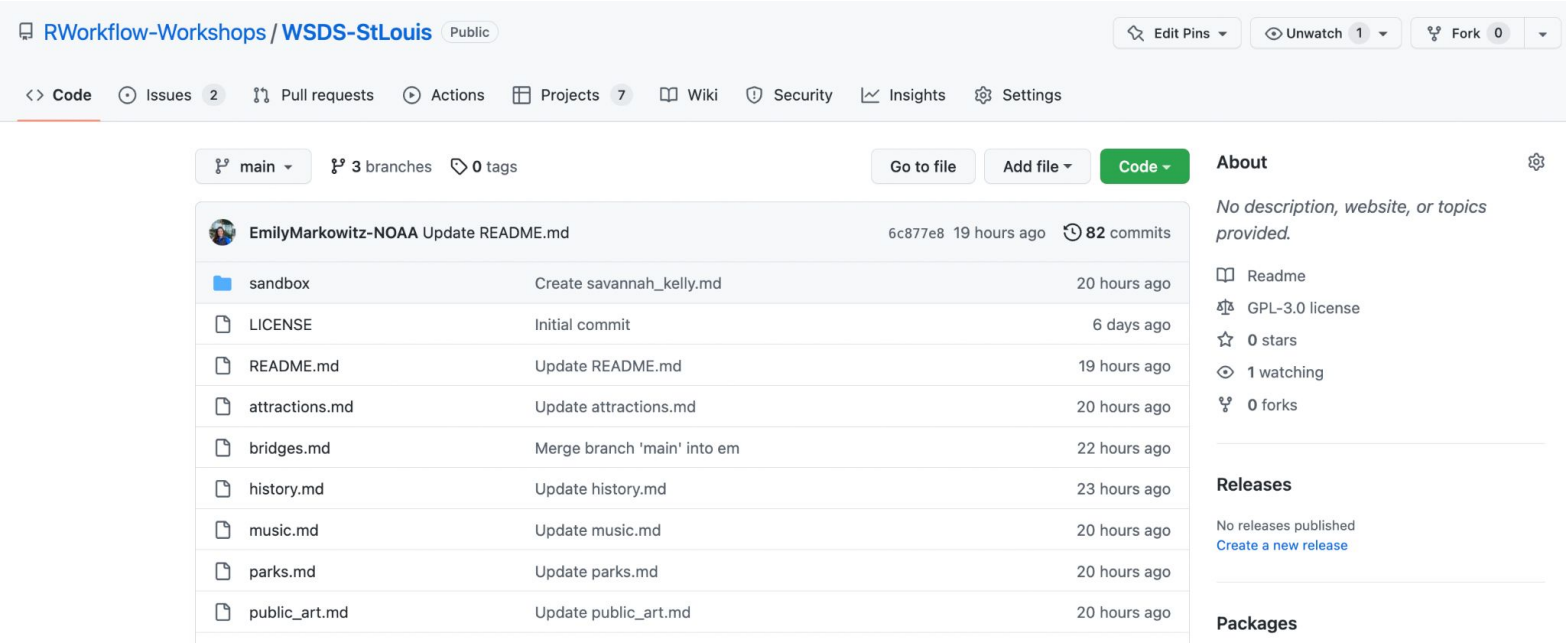
Rules



- You can talk to each other
- Only do tasks in the “to do” column
- Only do tasks written by someone else
- Everyone writes tasks
- One task at a time
- Move your task through the board

Intro to GitHub in the browser

https://github.com/RWorkflow-Workshops/WSDS-StLouis



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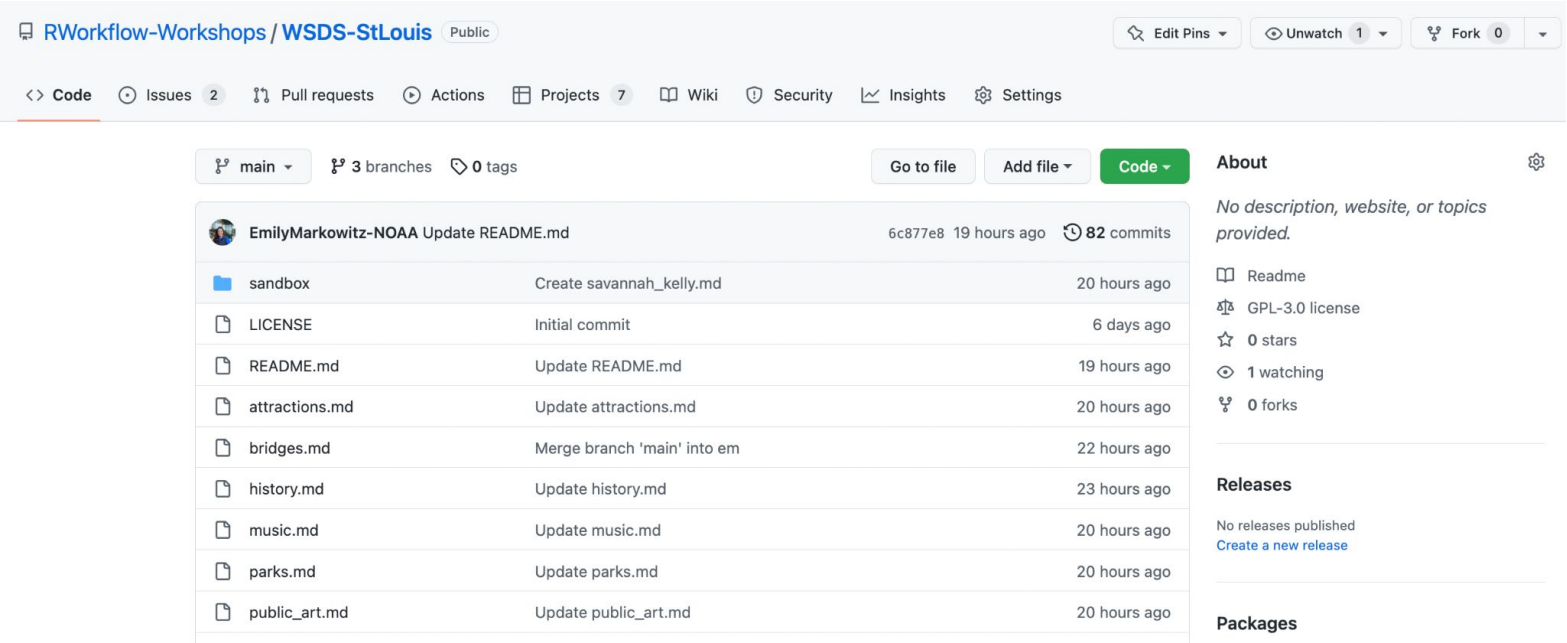
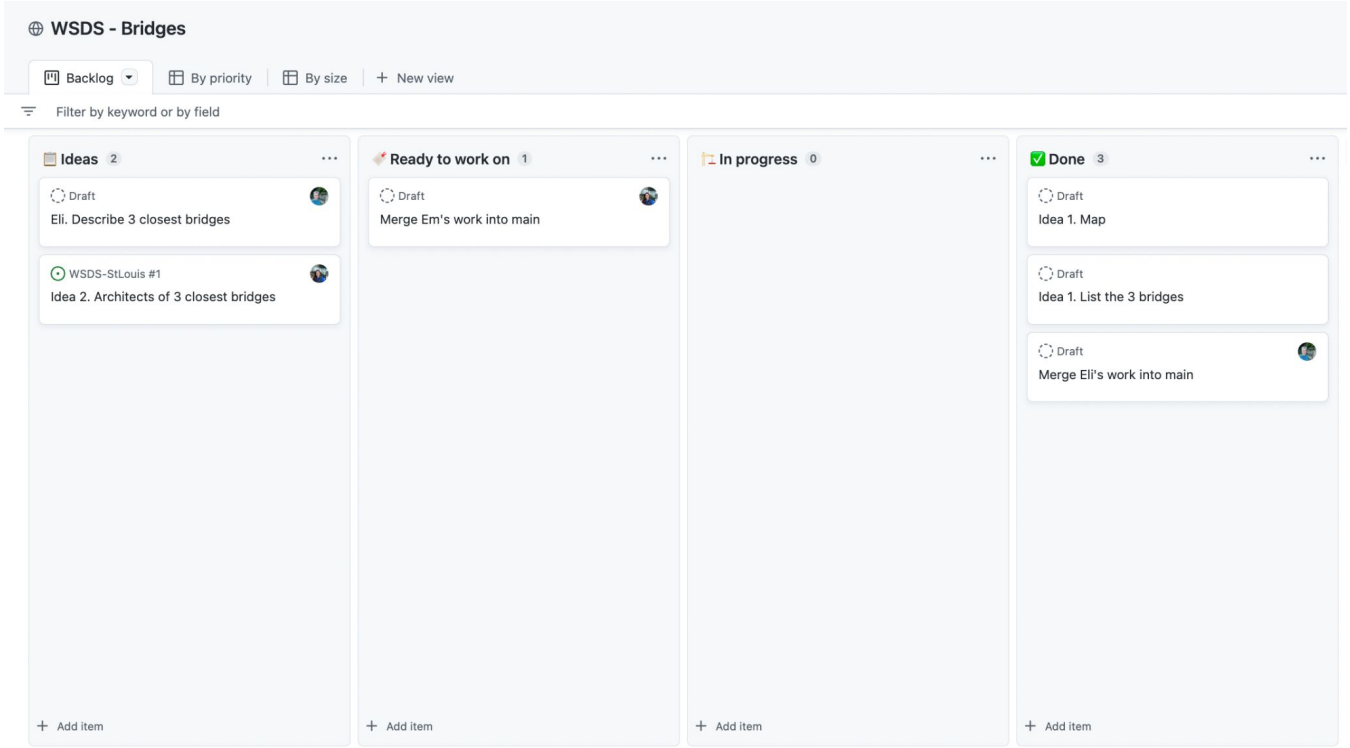
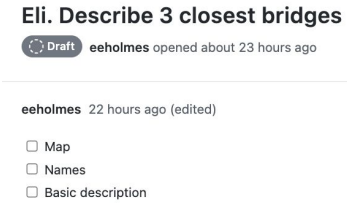


Intro to GitHub Project Boards

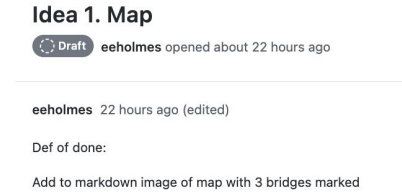
https://github.com/orgs/RWorkflow-Workshops/projects/6/views/1



IDEA CARD



TASK CARD



Eli and Em demo

1. Open their team project board
2. Add some notes/ideas to the idea column
3. Make 2-3 task cards in the task column
4. Task cards need ‘Definition of done’

Teams

Team work 30 min: Project boards

Add some idea cards (3-4) to your GitHub Project Board

- Idea card is free form; helps you focus your tasks
- https://youtu.be/8D72GBVBVe4

Add some (2-3) task cards for each idea

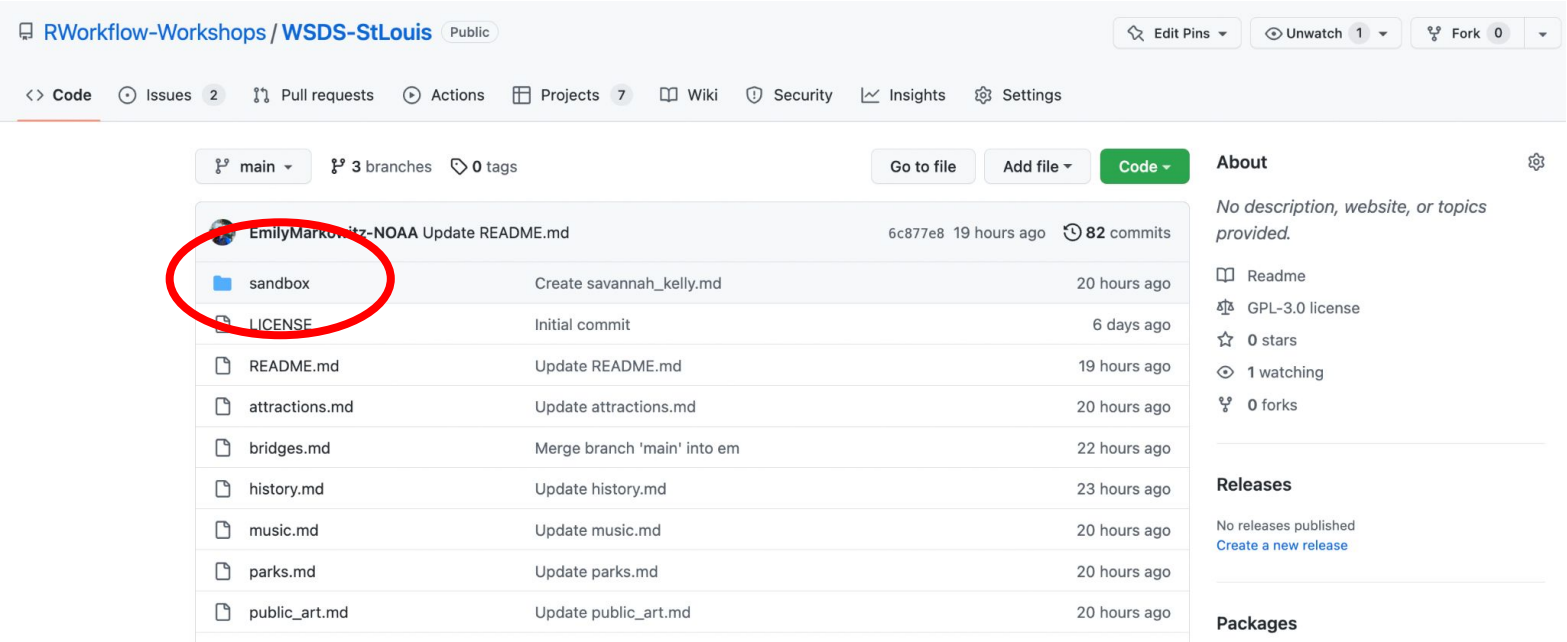
- Task card must have a “definition of done”
- https://youtu.be/frJoBaQqWmI

Tips

- Don’t try to micro-manage with “Definition of Done”
- Let whoever grabs a task card, decide how to get to “done”

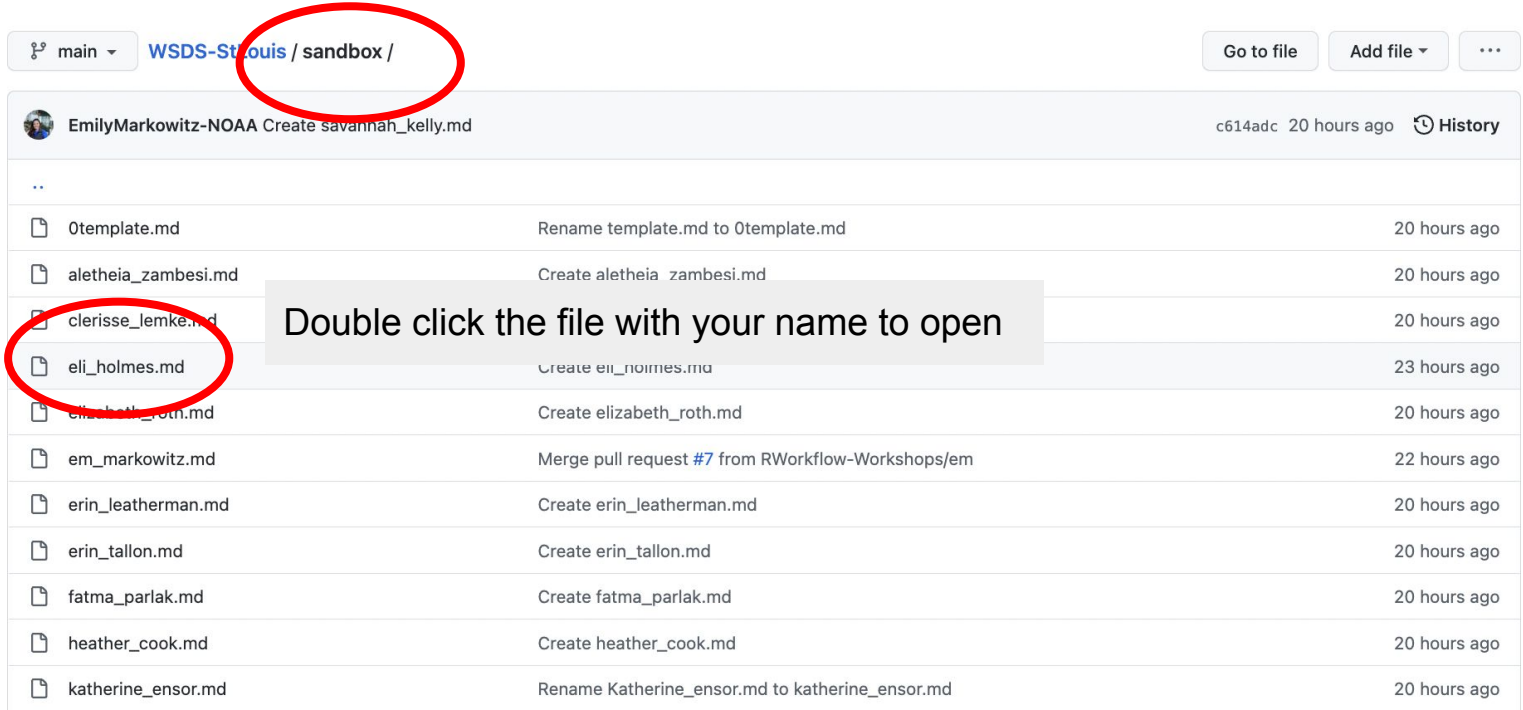
Editing files in the browser

https://github.com/RWorkflow-Workshops/WSDS-StLouis

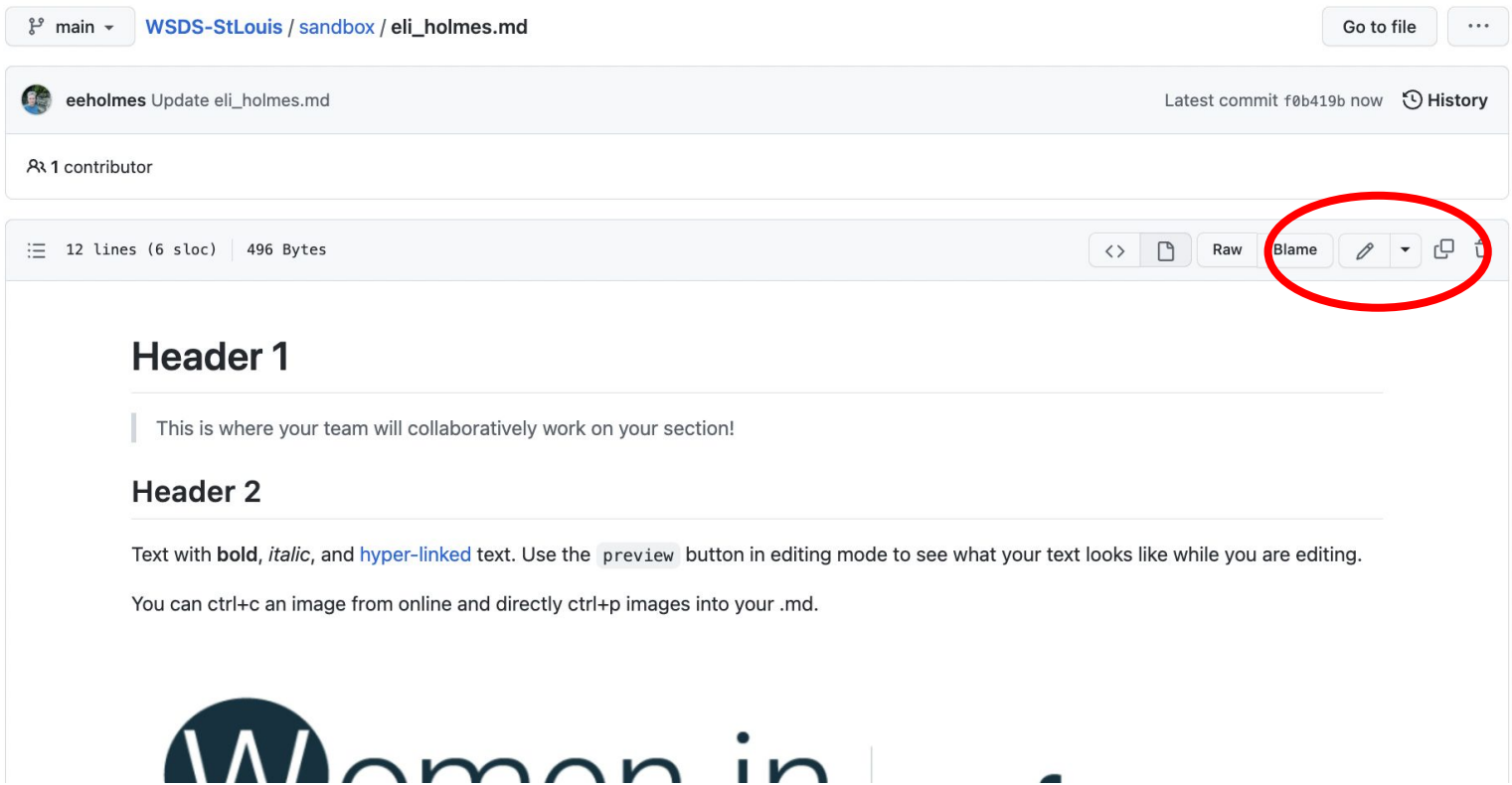


Opening files in the browser

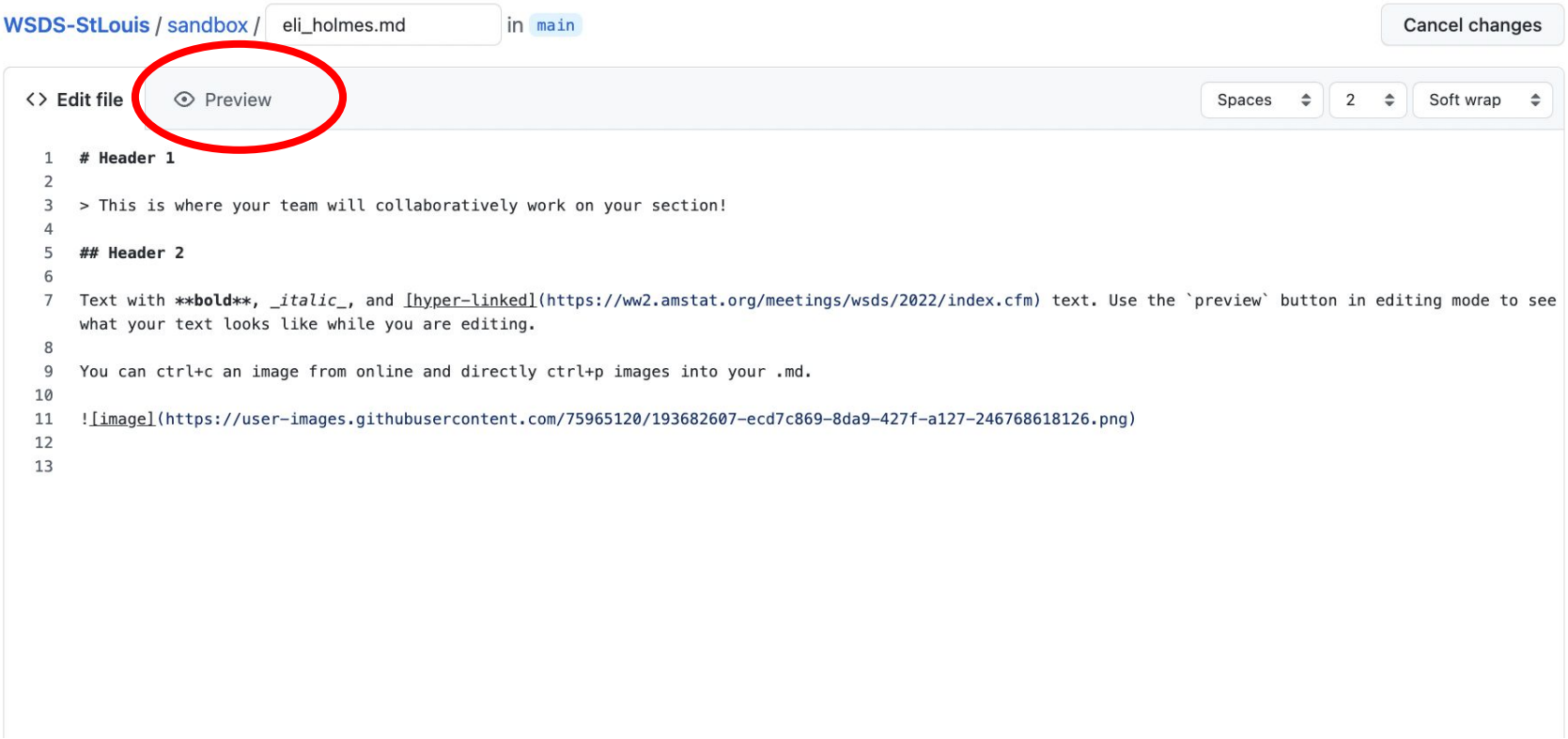
https://github.com/RWorkflow-Workshops/WSDS-StLouis/tree/main/sandbox



Edit a file


main
WSDS-StLouis / sandbox / eli_holmes.md
Go to file
eeholmes Update eli_holmes.md
Latest commit f0b419b now
History
1 contributor
12 lines (6 sloc)
496 Bytes
Raw
Blame
Header 1
This is where your team will collaboratively work on your section!
Header 2
Text with bold, italic, and hyper-linked text. Use the preview button in editing mode to see what your text looks like while you are editing.
You can ctrl+c an image from online and directly ctrl+p images into your .md.

Edit a file: you can preview



Commit your changes

Commit changes

Describe the change. Brief is fine

Update eli_holmes.md

Add an optional extended description...

eli.holmes@noaa.gov

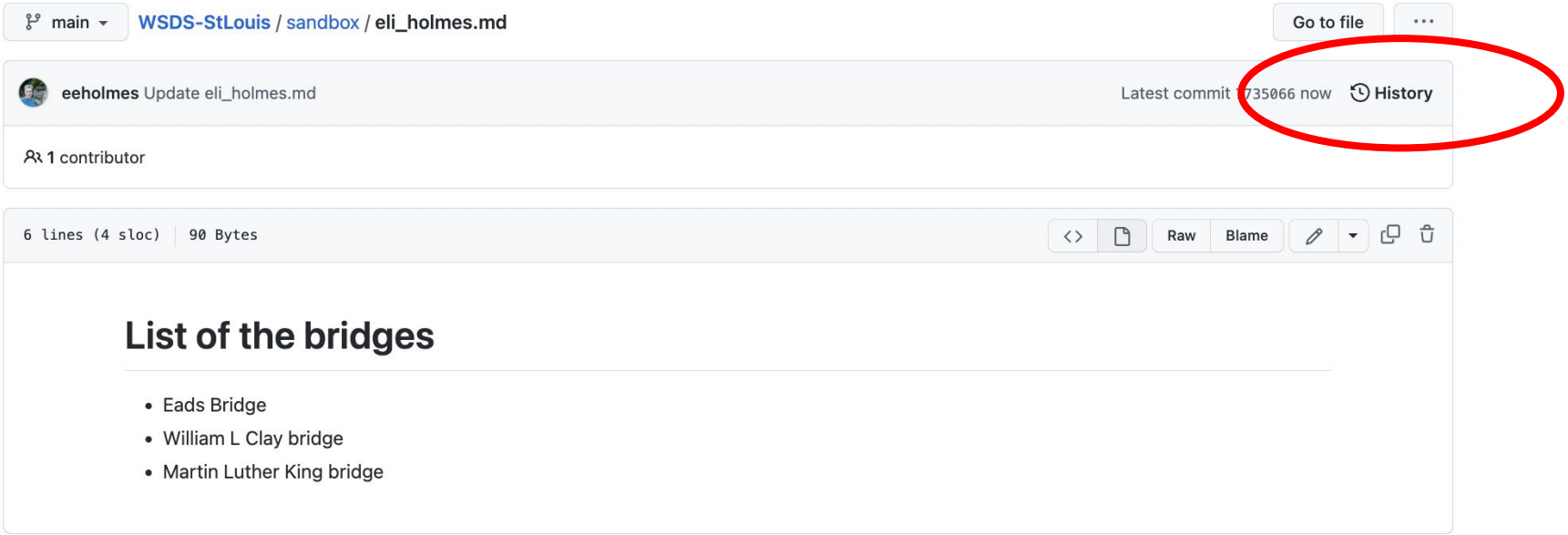
Choose which email address to associate with this commit

Commit directly to the `main` branch.

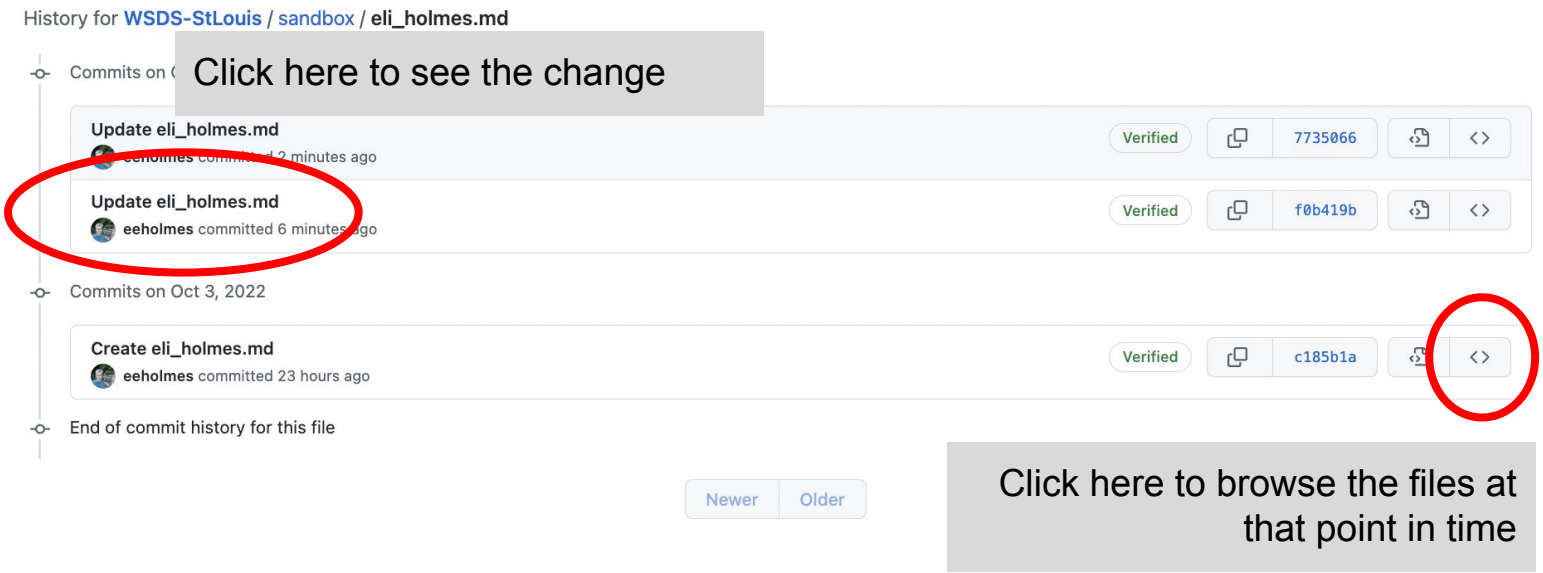
Create a **new branch** for this commit and start a pull request. Learn more about pull requests.

Commit changes Cancel

Click on history to see all the changes



Click on history to see all the changes



Em demos

1. Navigate to the sandbox directory
2. Open her markdown file
3. Make some changes
    a. Header
    b. Text with a link
    c. Add an image

Individual work 20 min: Edit your file in the sandbox

Try

- Adding a header
- Adding a list
- Adding an image

Make multiple commits

- Click the history and look at the history

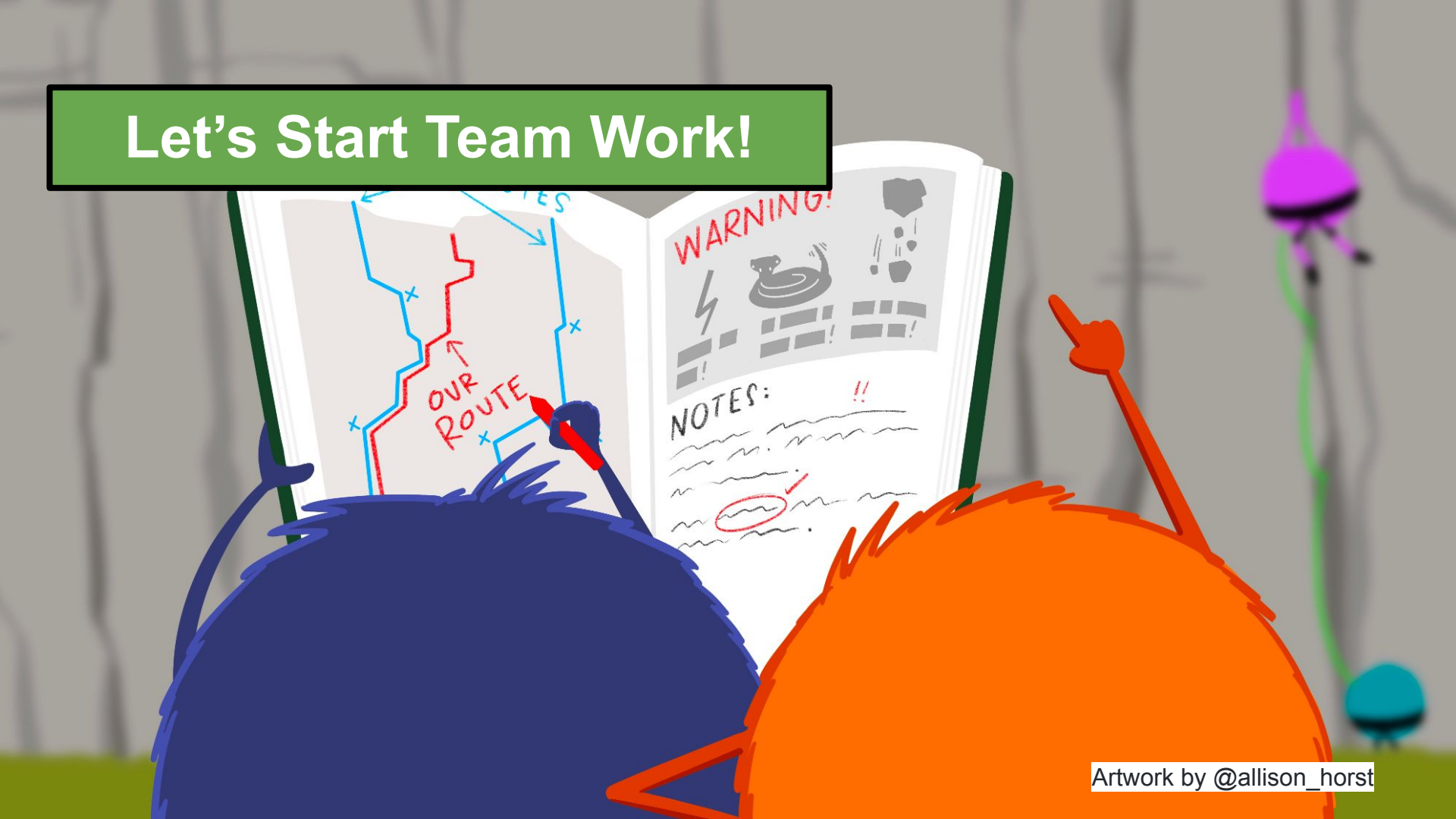
https://youtu.be/Ly4hdNSBKkA

https://www.markdownguide.org/cheat-sheet/

Images

- You can right-click, copy image, and then paste
- On a Mac, Cmd-Shift-4 gets you a snip tool for copying screen snips

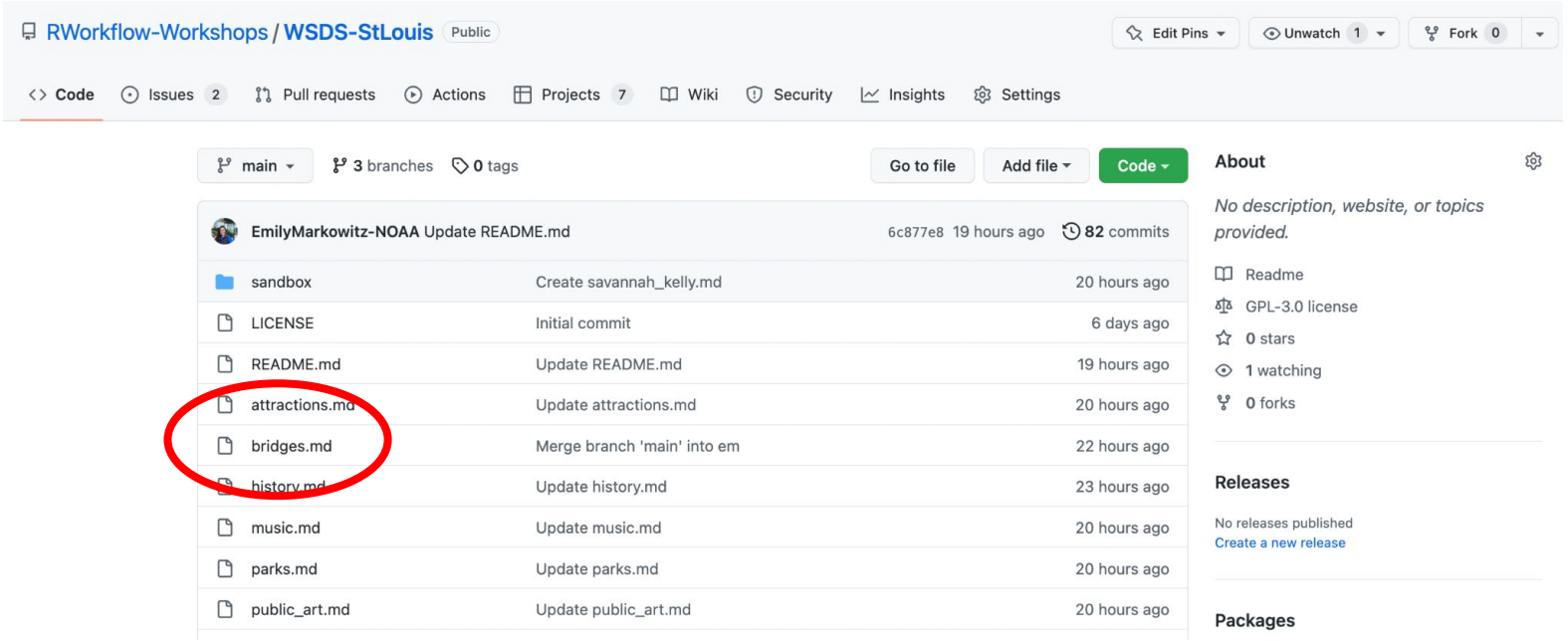
Let’s Start Team Work!



Artwork by @allison_horst

Goal is for the team to edit the one team markdown file

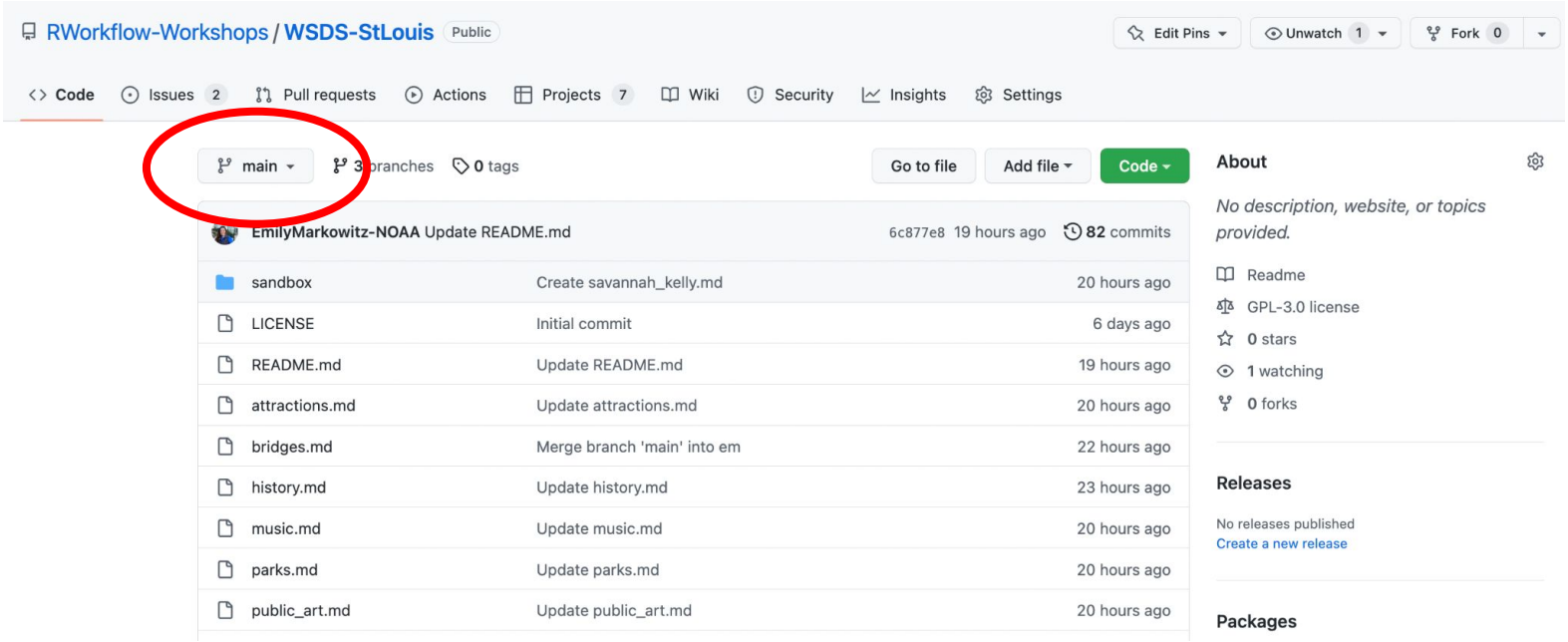
https://github.com/RWorkflow-Workshops/WSDS-StLouis



Eli and Em demo bad things happening if we both edit our team file

What is a branch?

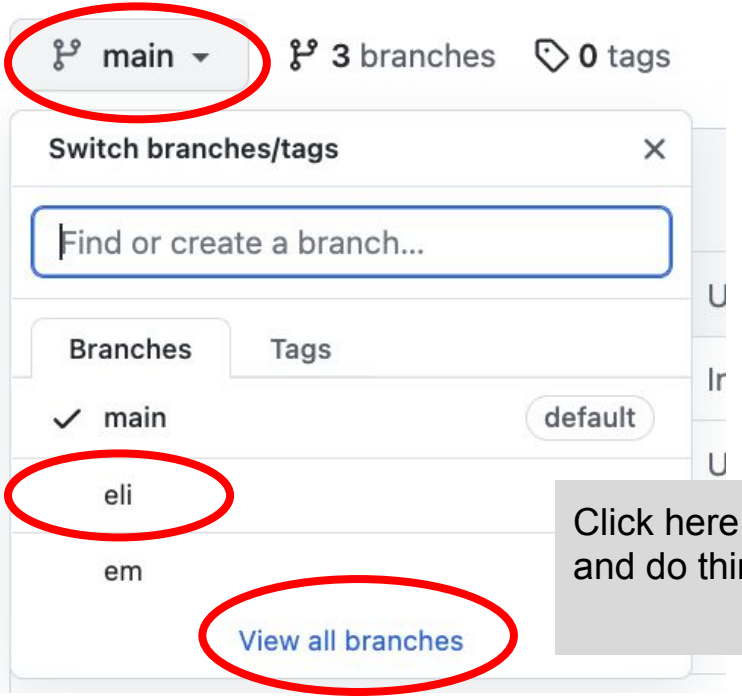
https://github.com/RWorkflow-Workshops/WSDS-StLouis



Create a branch in the browser

https://github.com/RWorkflow-Workshops/WSDS-StLouis

Click on “main” to get to branch controls



Click on an existing branch to see the status of the repo on that branch

Click here to see all the branches and do things (like delete).

ALWAYS be aware of what branch you are on

main WSDS-StLouis / bridges.md

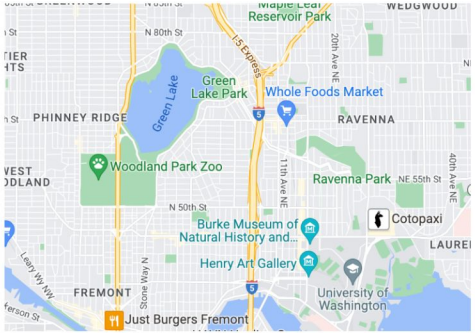
Go to file ···

Latest commit debd77b 23 hours ago History

2 contributors

18 lines (10 sloc) 546 Bytes Raw Blame

Nearby Bridges



Fads Bridge, 1867

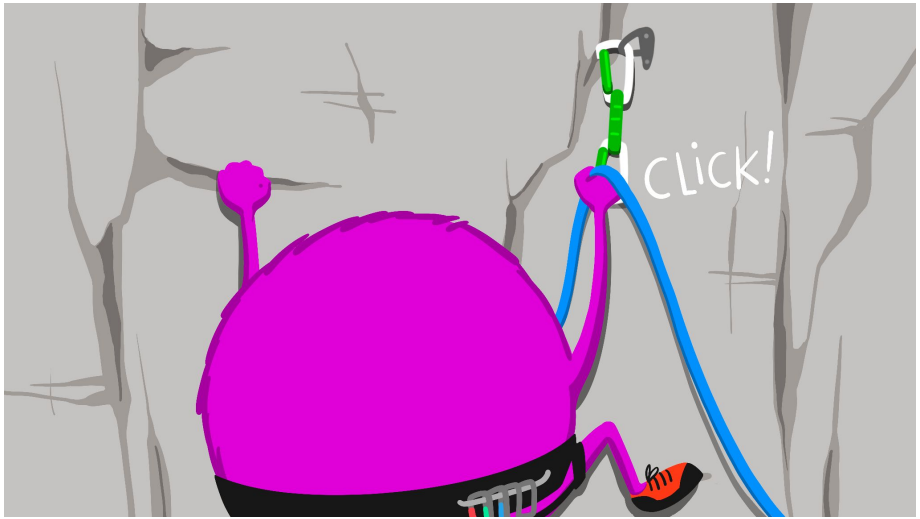
Em demos

1. Make a branch FROM MAIN
2. Open the team markdown file
3. Double-check that you are on your branch
4. Edit the file and commit changes

Team work 30 min: Work on tasks on your project board

Steps

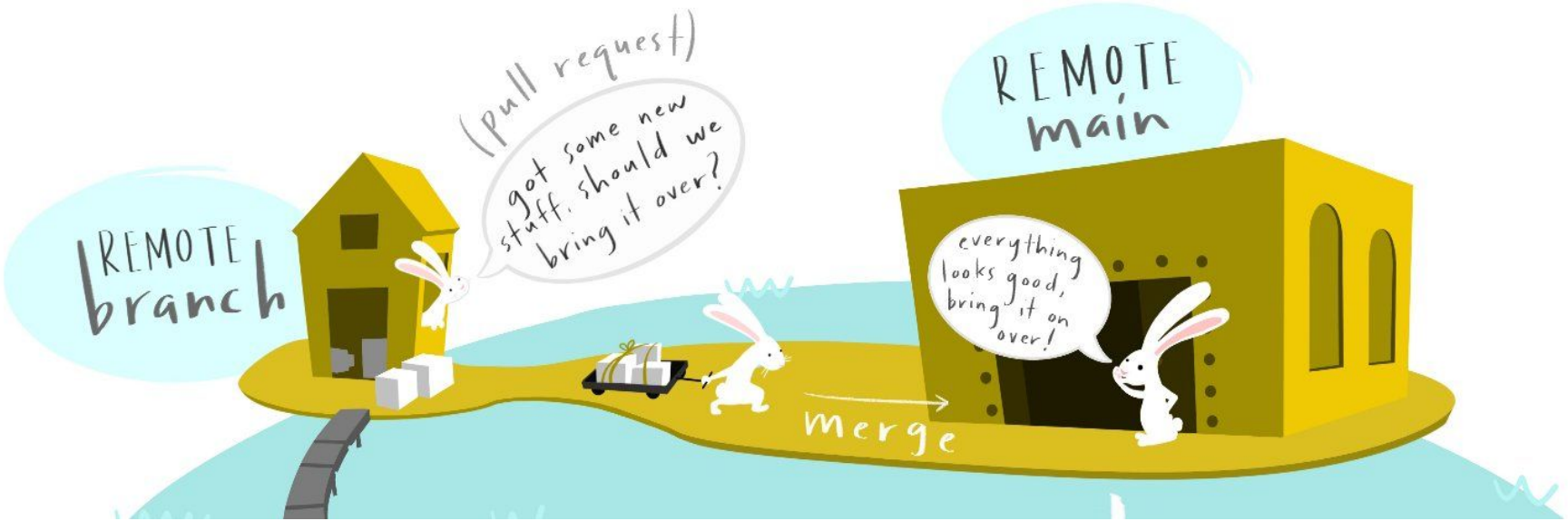
- Make a branch FROM MAIN
- Switch to that branch
- Open your team's md file
- Work on 2-3 tasks from your team task board
- Double-check that you are in your own branch



Artwork by @allison_horst

https://youtu.be/Wt59IDTnpHU

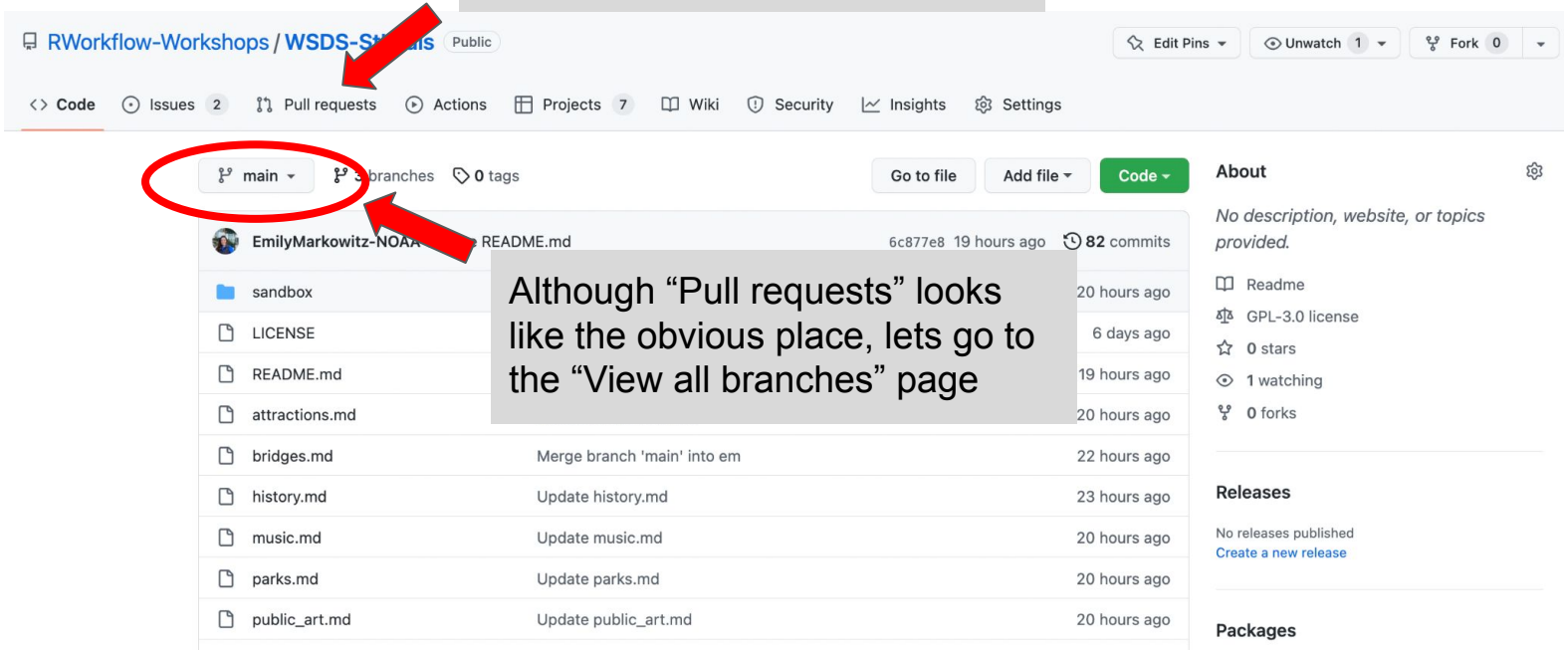
Pull requests: merging your changes back into main



Artwork by @allison_horst

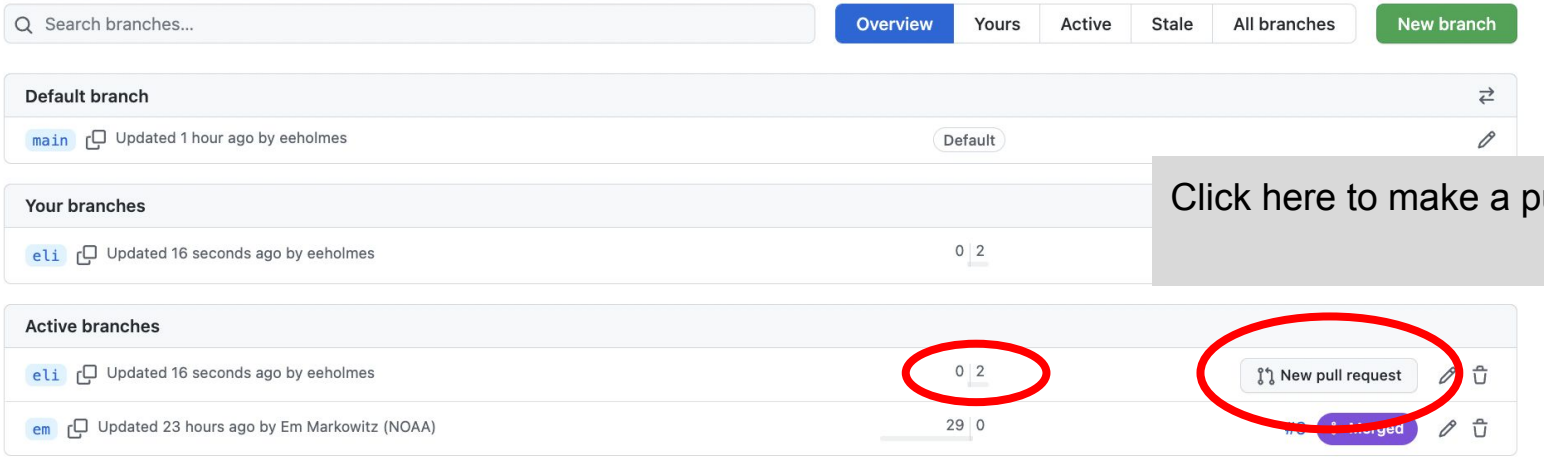
Pull requests: merging your changes back into main

Not here. We'll look at this later.



Although "Pull requests" looks like the obvious place, lets go to the "View all branches" page

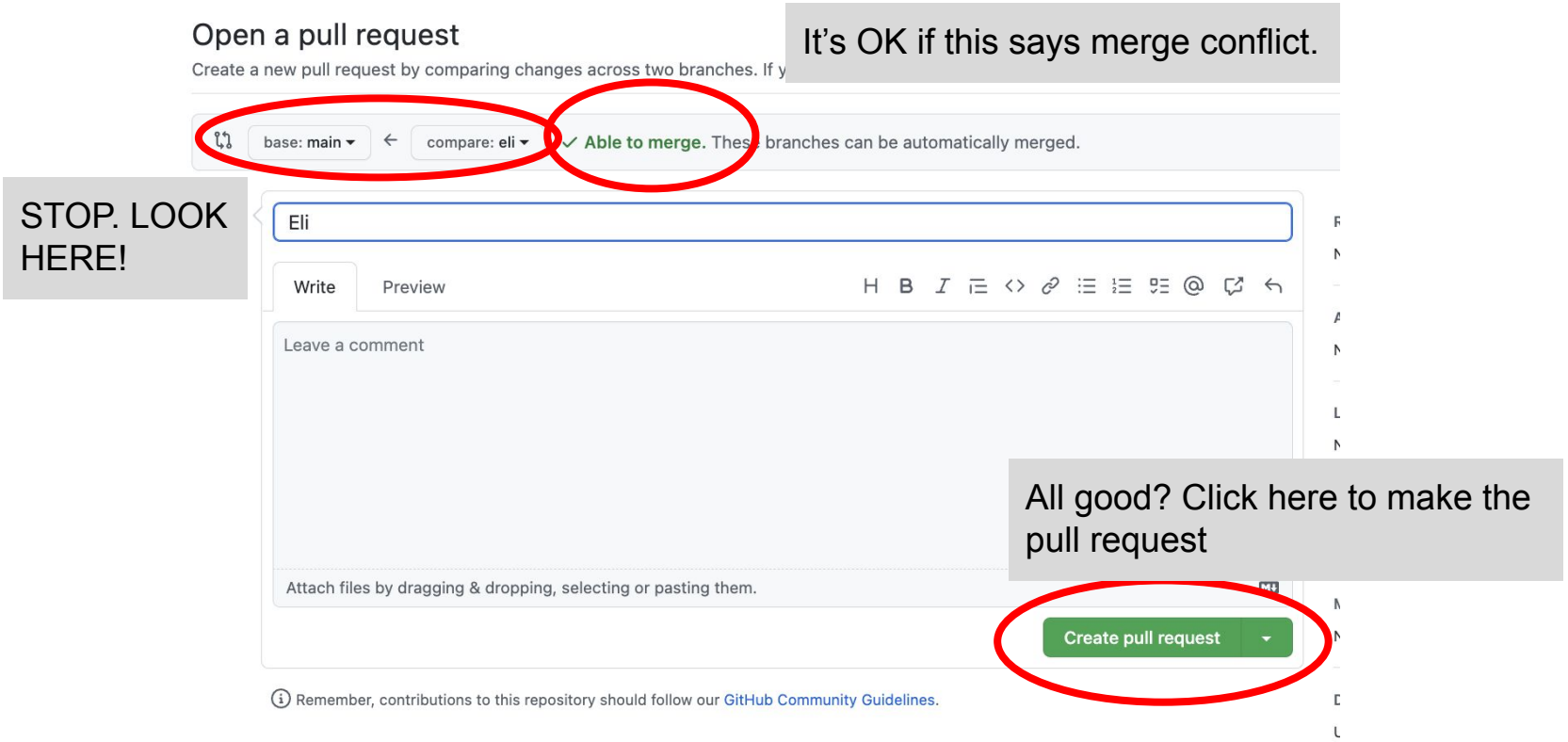
From ‘view all branches`



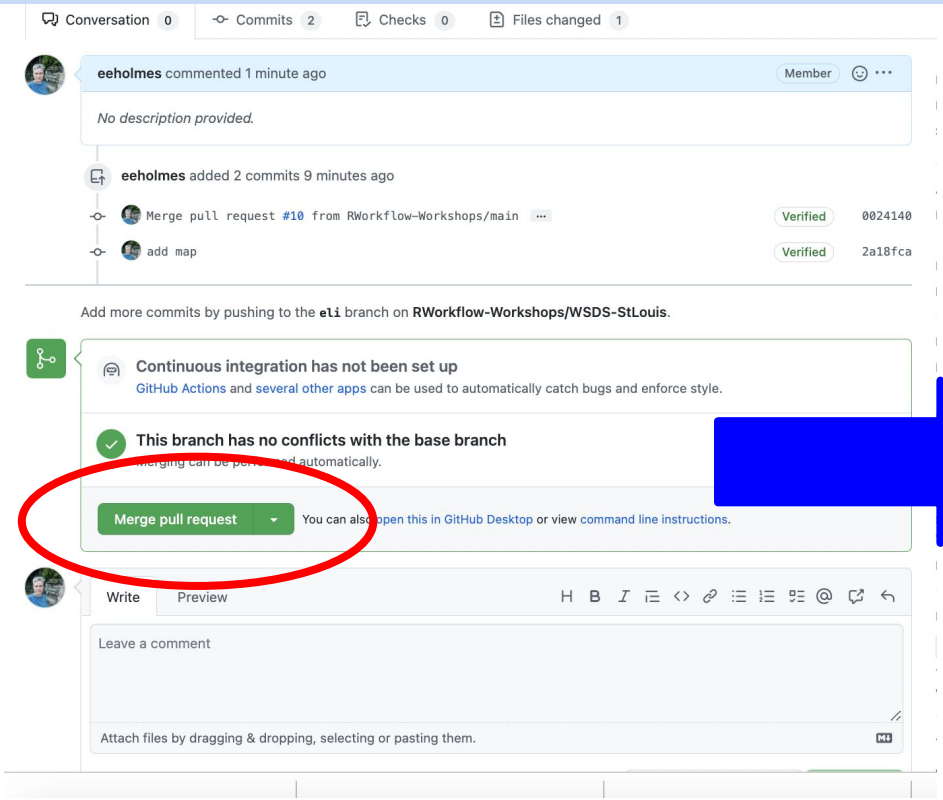
Click here to make a pull request

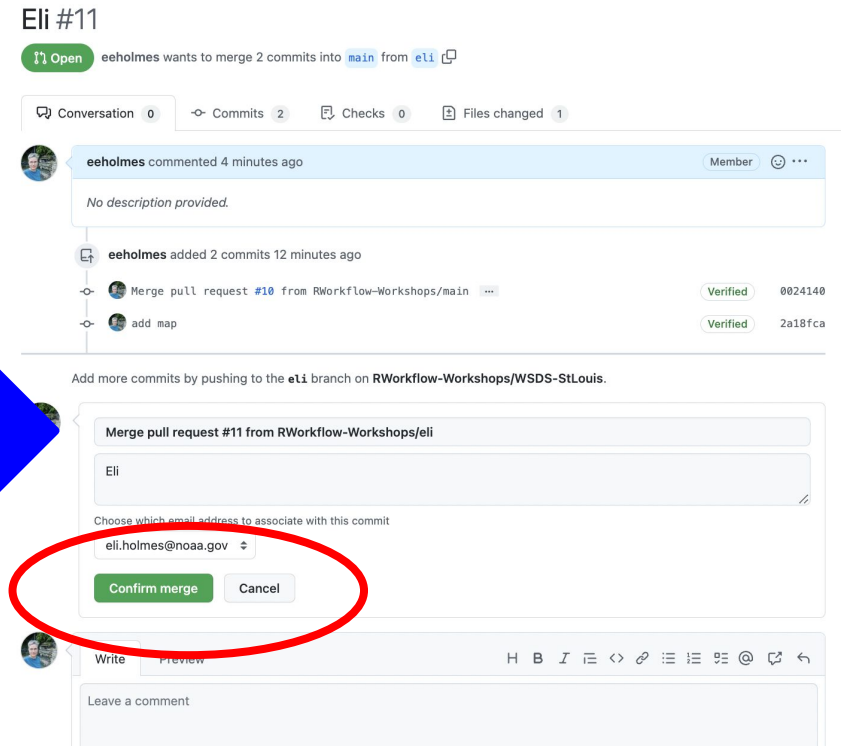
This shows that I am ahead of main

Make the pull request



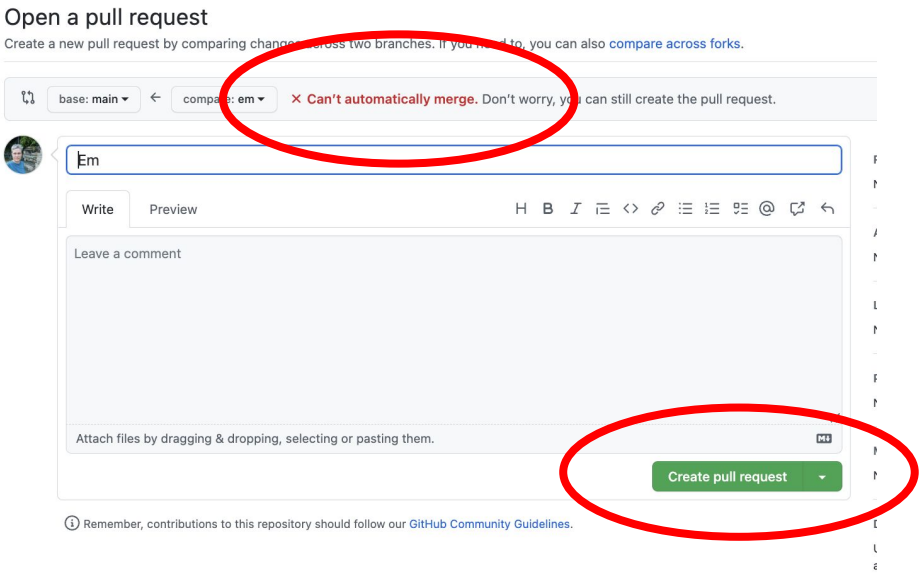
So many green buttons to click…





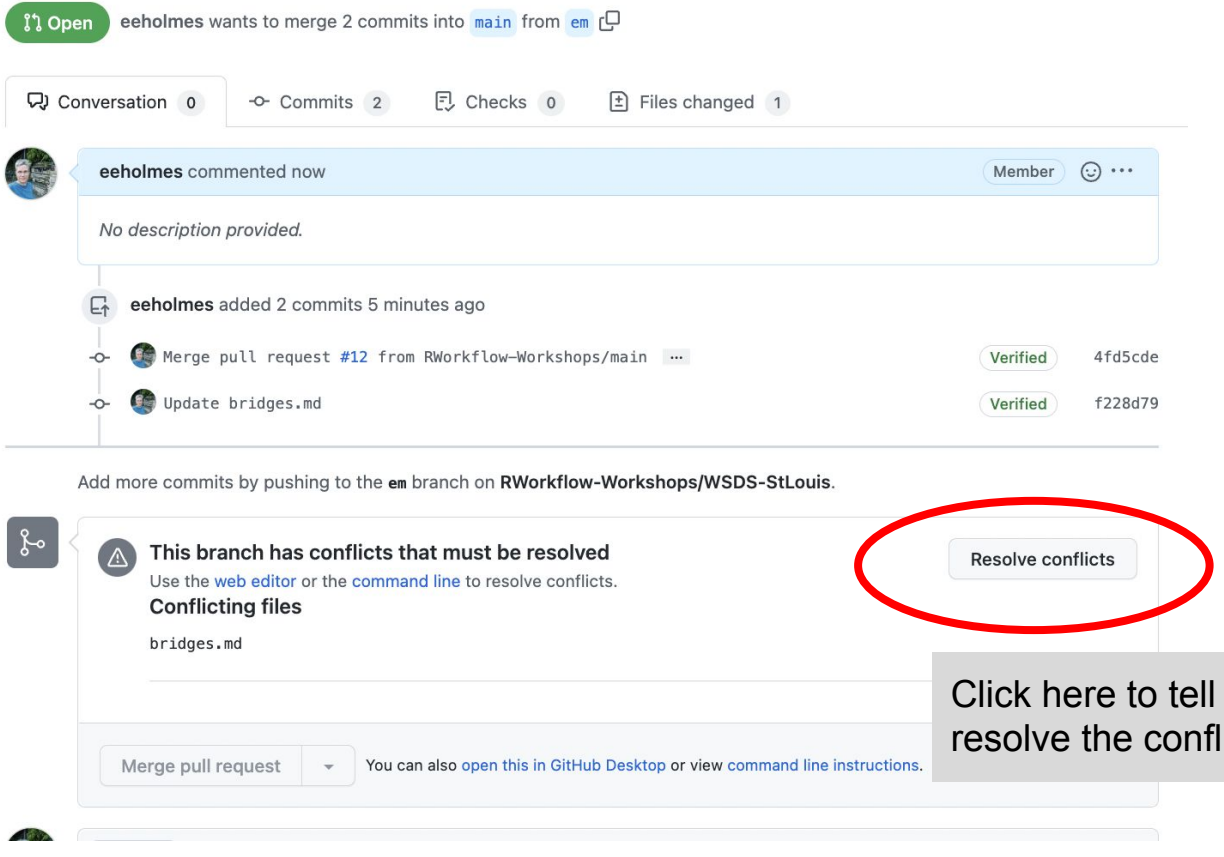
Merge conflicts

Git needs your help to resolve the conflict



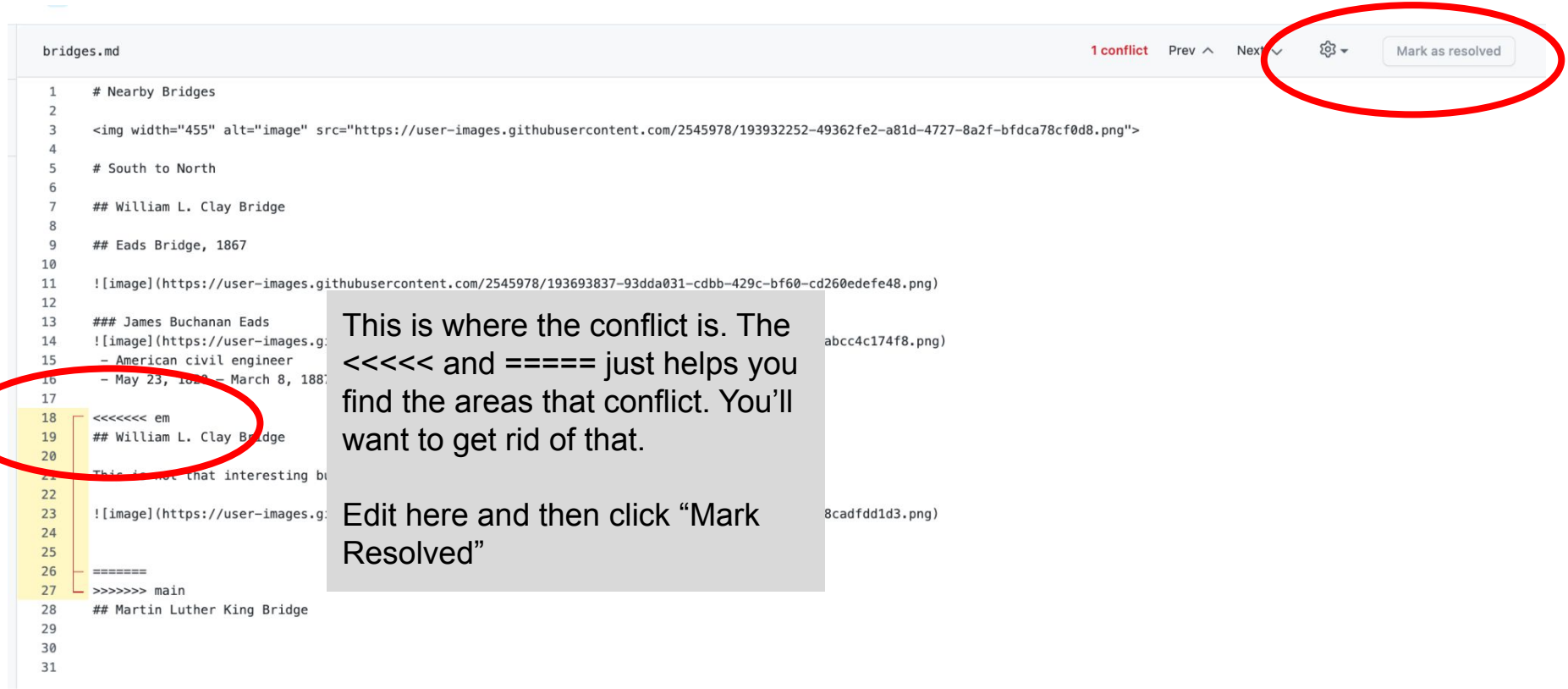
Go ahead and create the pull request

Merge conflicts



Click here to tell Git how to resolve the conflicts

Merge conflicts



Merge conflicts

bridges.md

1 conflict Prev Next Mark as resolved

```
# Nearby Bridges

<img width="455" alt="image" src="https://user-images.githubusercontent.com/2545978/193932252-49362fe2-a81d-4727-8a2f-bfdca78cf0d8.png">

# South to North

## William L. Clay Bridge

This is not that interesting but has a nice view of the Great Arch.

![image](https://user-images.githubusercontent.com/2545978/193943425-d03caf8a-9f9c-43a5-b991-7b8cadfdd1d3.png)


## Eads Bridge, 1867

![image](https://user-images.githubusercontent.com/2545978/193693837-93dda031-cdbb-429c-bf60-cd260edefe48.png)

### James Buchanan Eads
![image](https://user-images.githubusercontent.com/75965120/193693631-9f544f75-6d8d-4082-b24f-3abcc4c174f8.png)
 - American civil engineer
 - May 23, 1820 – March 8, 1887

## Martin Luther King Bridge


```

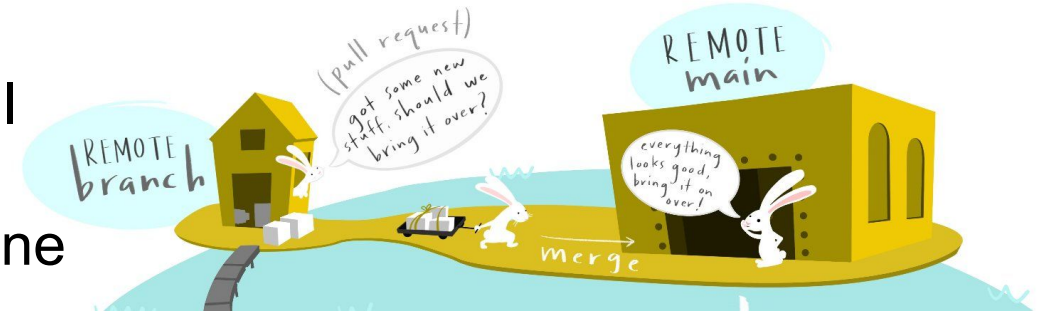
Eli and Em demo

1. Eli makes a pull request and merges
2. Em makes a pull request, gets merge conflict
3. Em resolves the merge conflict and merges

Team work 30 min: Pull requests

Steps

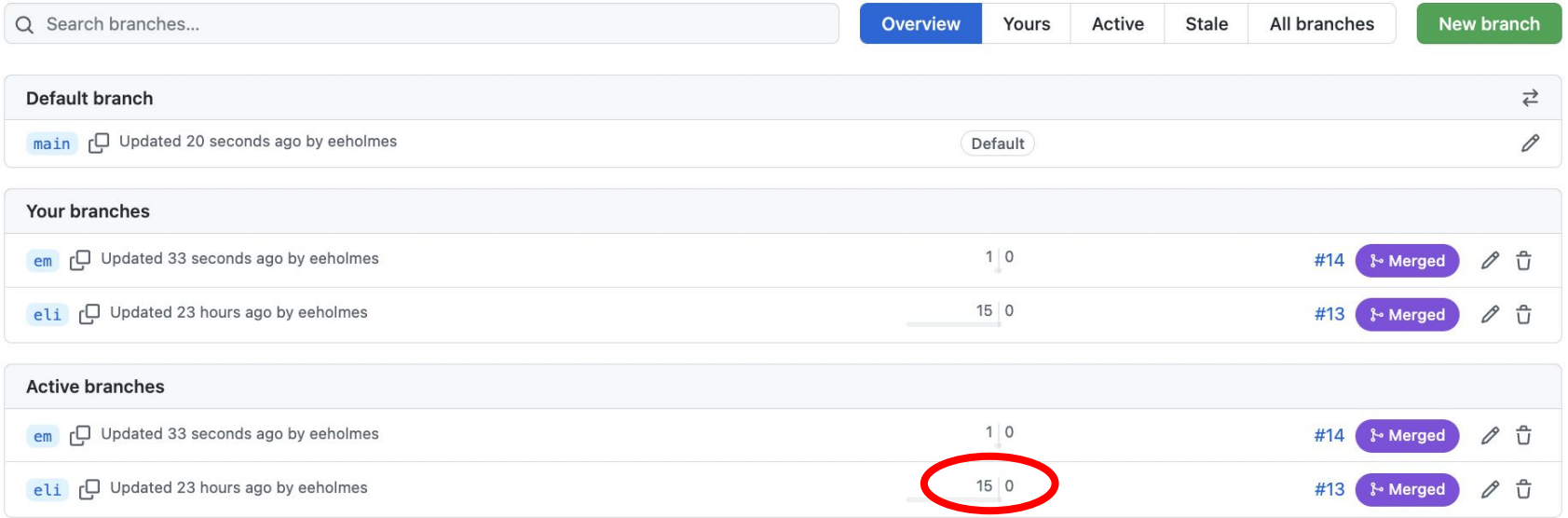
- Add each pull request to the task board
- One at a time, do your pull requests.
- Move the task cards to done as you do each one
- Work together to help each other



Artwork by @allison_horst

https://youtu.be/wmzjzuWhzq0

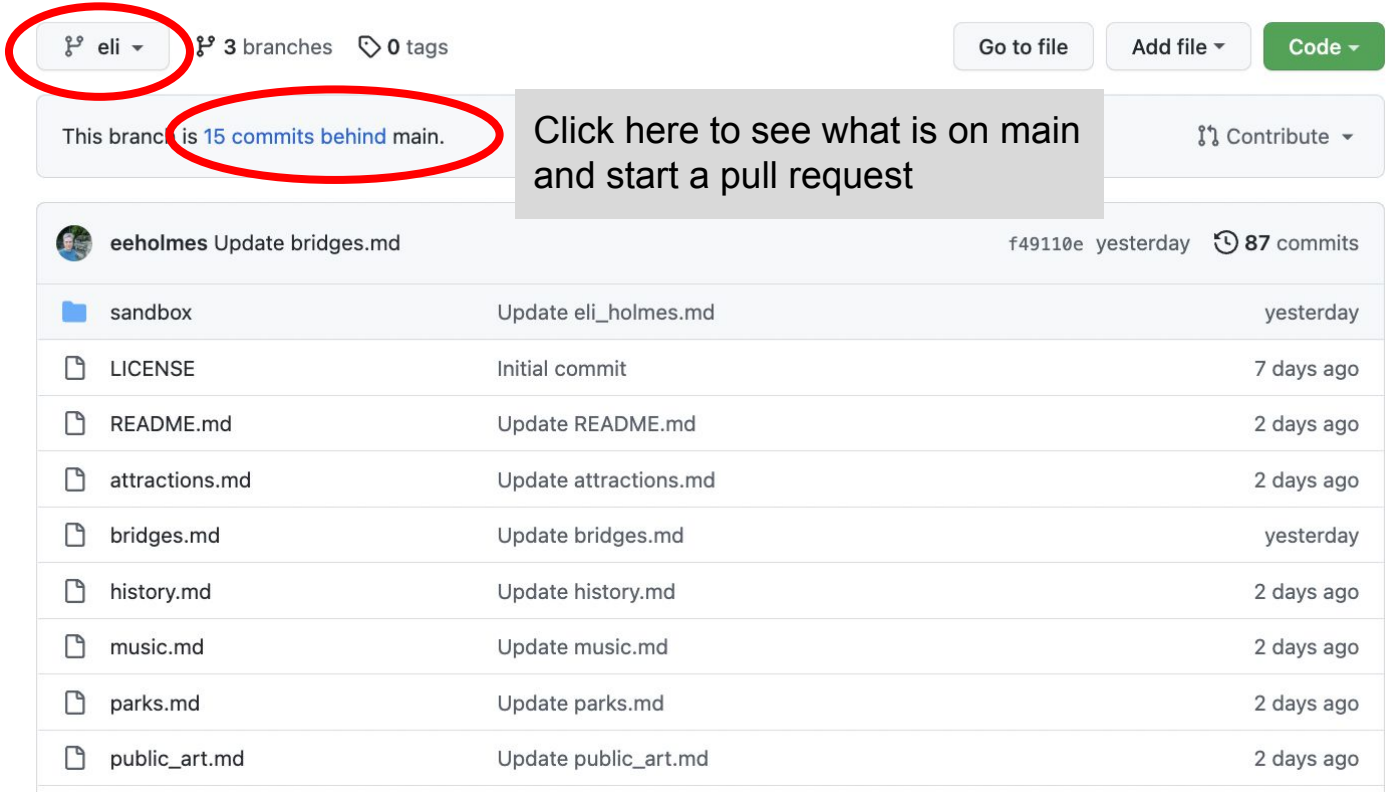
After Em merges her branch, Eli's branch is behind main



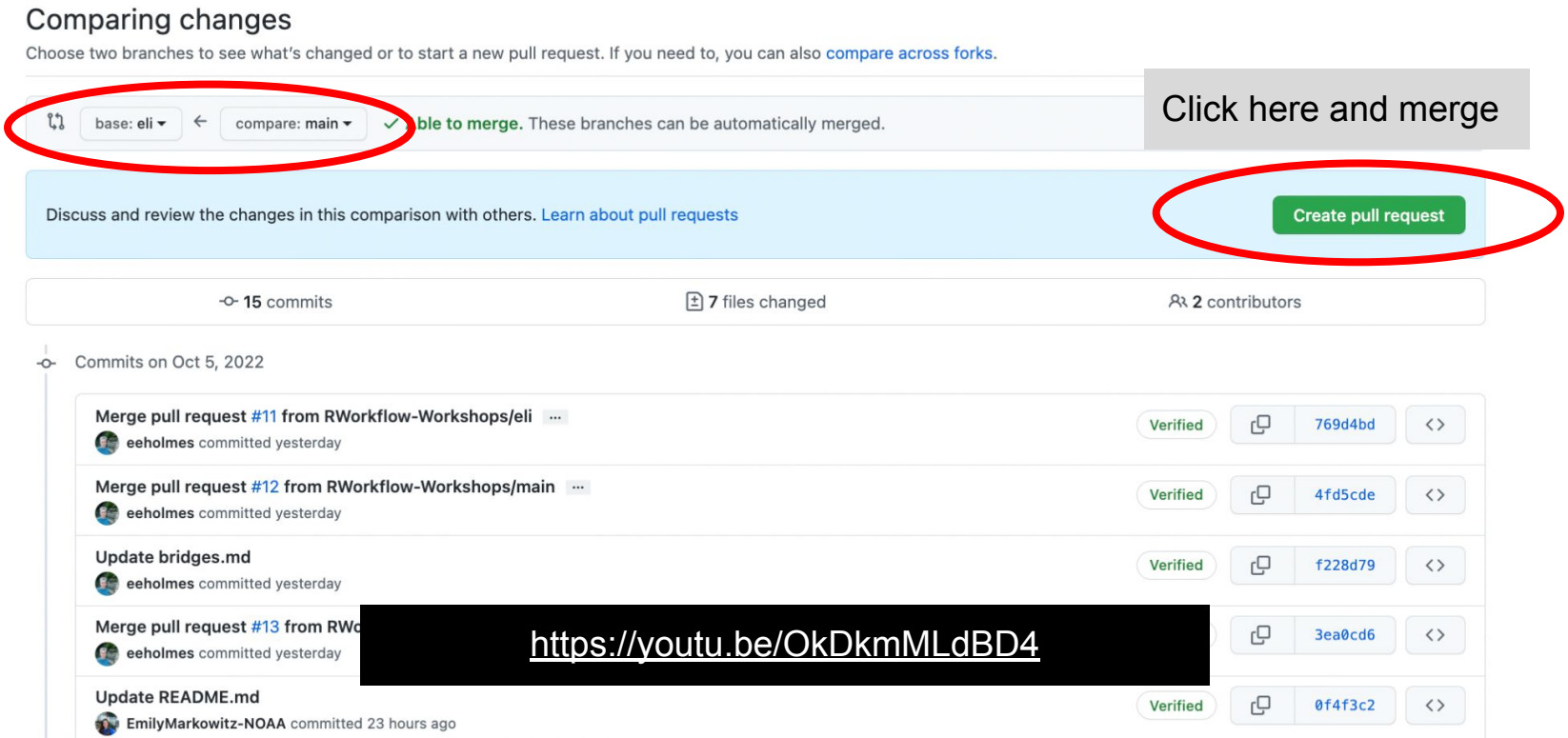
This shows that there are commits on main that I don't have

I need to do something about this before I start working again.

We can also see this if I am on my branch



Do a pull request to merge main into your branch



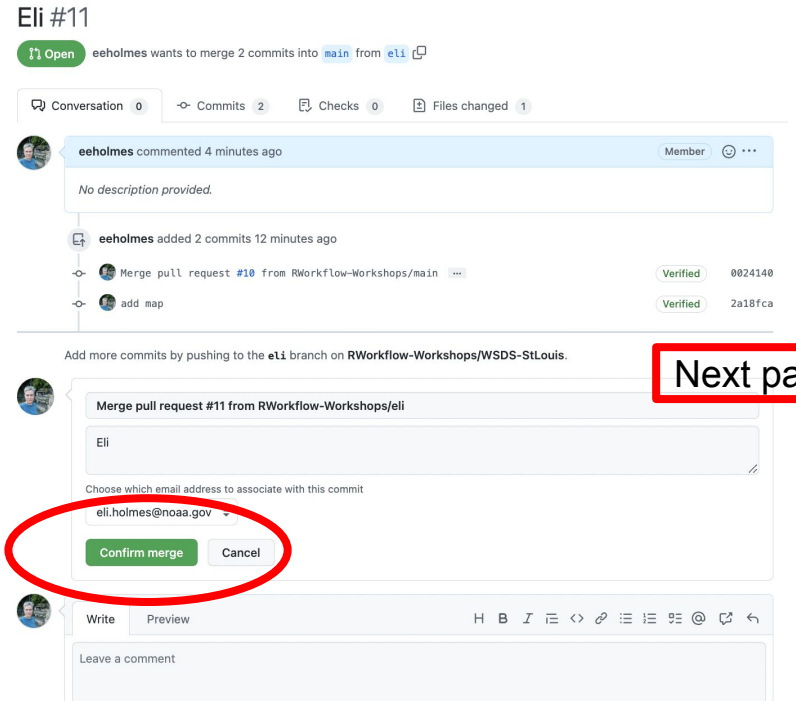
But the normal workflow is to delete your branch!

Delete my precious branch??

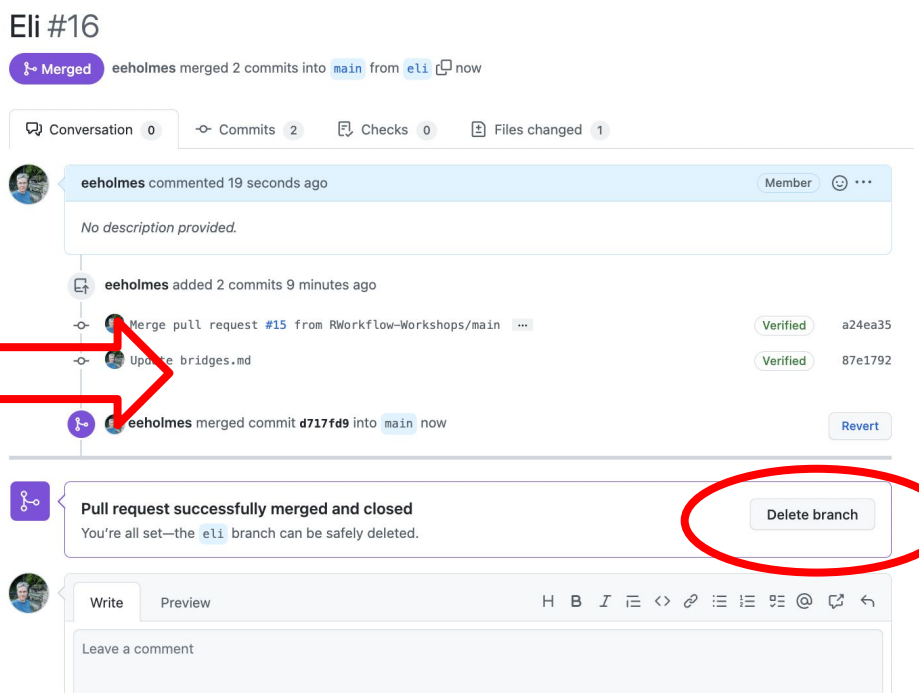
Yes!

1. Start task (grab a task card)
2. Make branch
3. Complete the task
4. Merge work into main with pull request
5. Delete branch
6. Move task card to done column

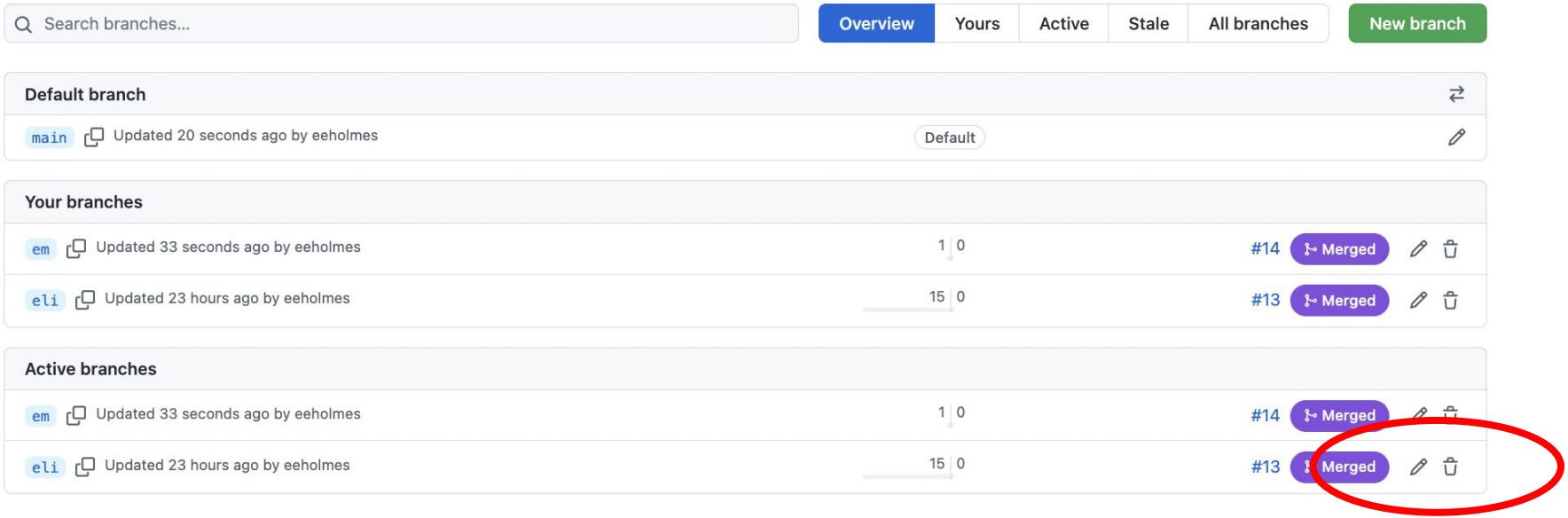
But the normal workflow is to delete your branch!



Next page

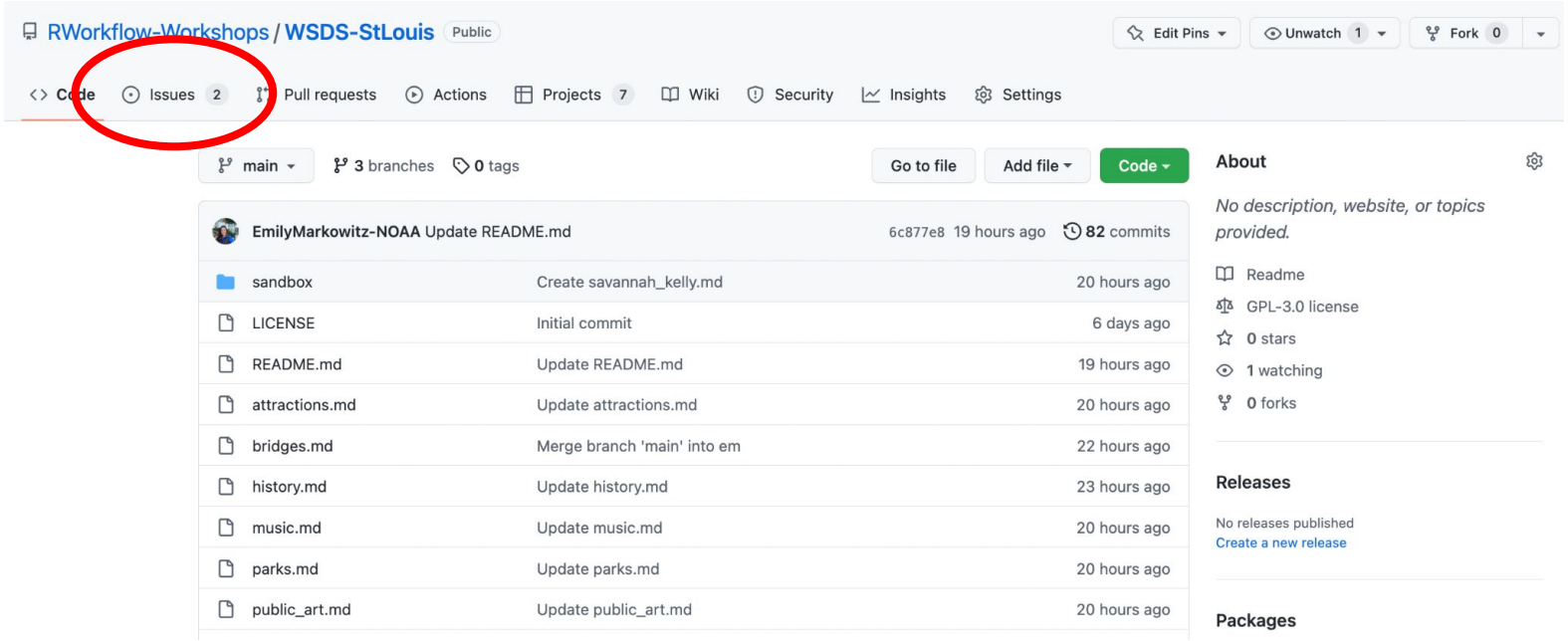


Or delete from “View all branches” page



DISCUSSION and Q&A

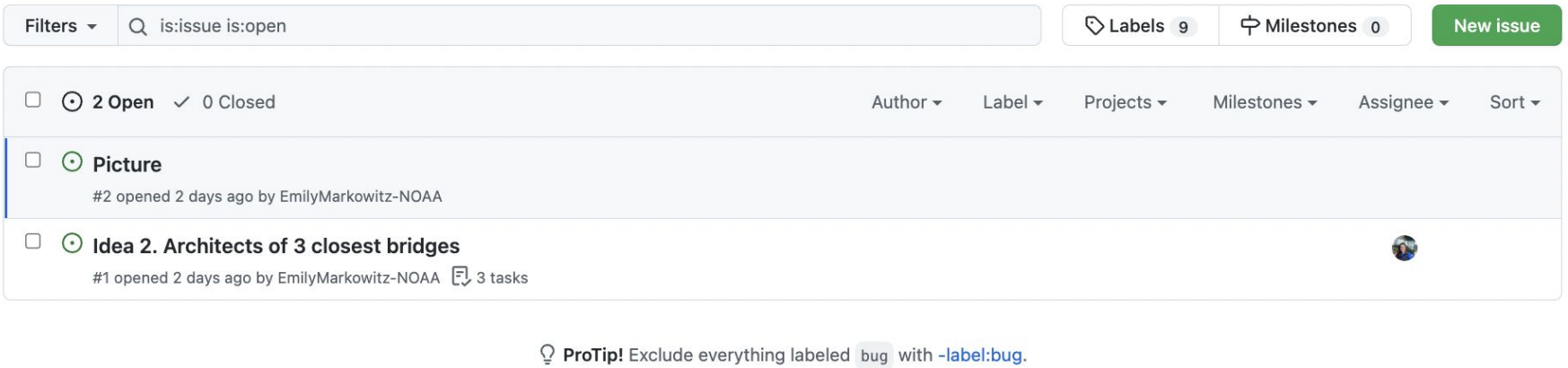
Next learning steps: GitHub Issues



Next learning steps: GitHub Issues

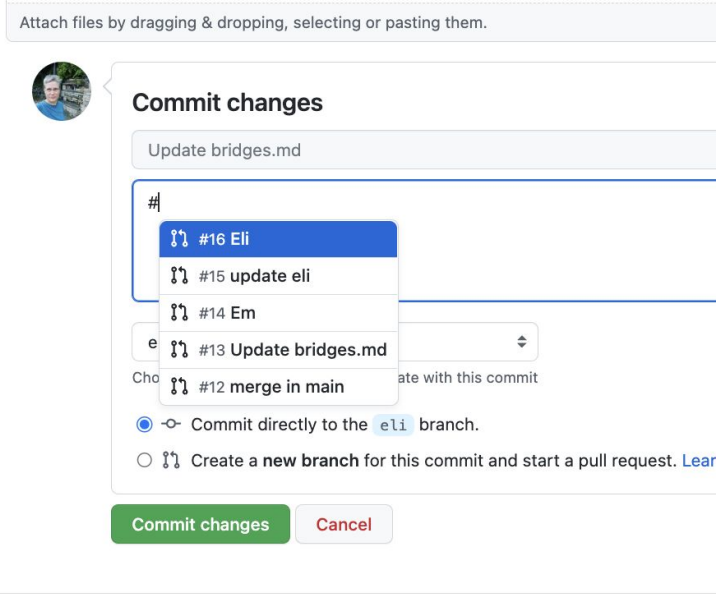
Every team uses issues.

- allow a discussion
- a record of any info needed to resolve that issue
- documents how and when issue resolved

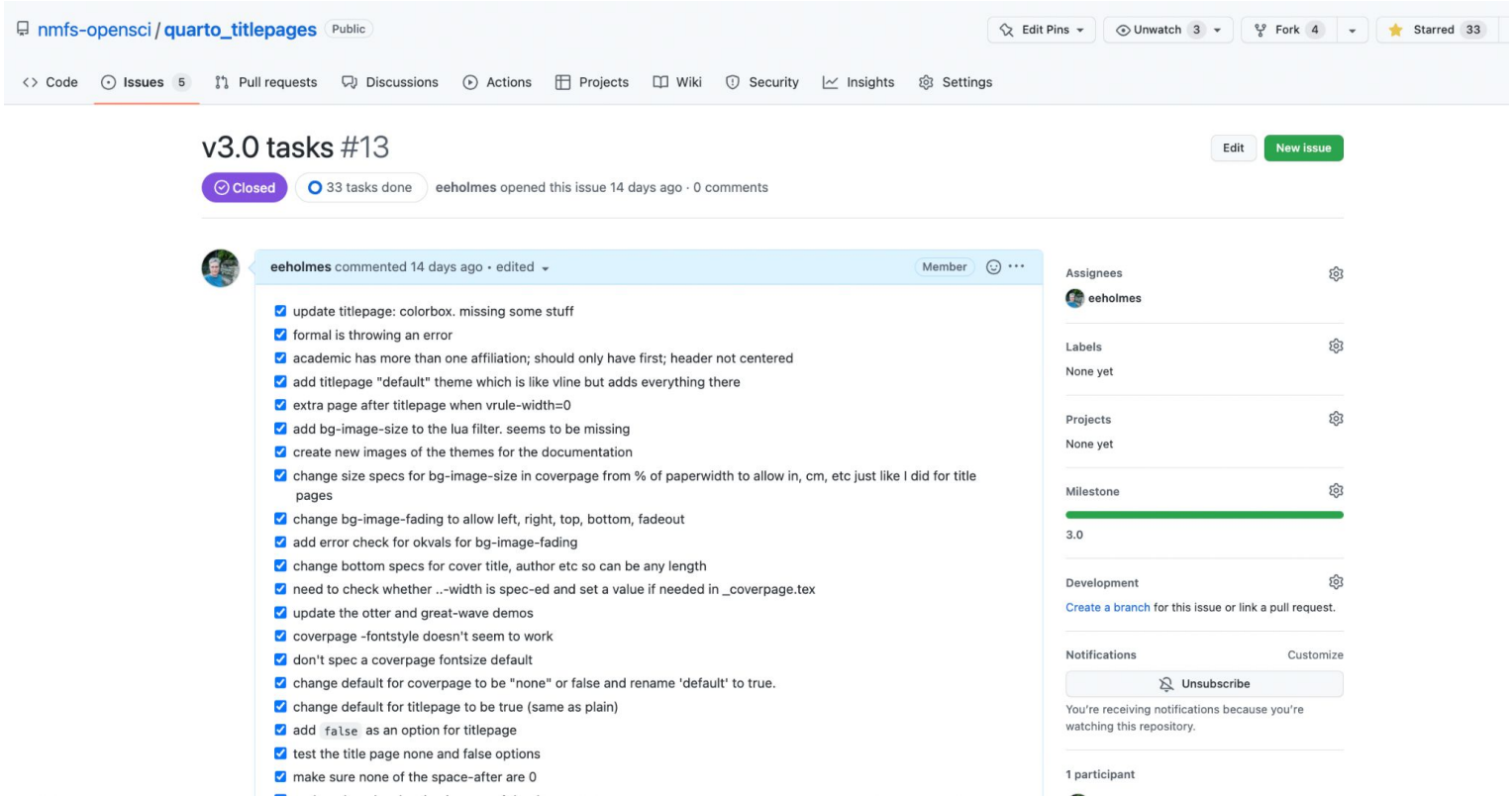


Next learning steps: GitHub Issues

When you commit a change, type # in the description area to select an issue that the commit addresses.



Next learning steps: GitHub Issues with check boxes



Next learning steps for GitHub Project Boards

- Create GitHub issues
- Add them to your project board
- Watch them automatically move to done column on your board when you close them

Some more material on these topics

- RWorkflow 2022 Workshops (1 hr lectures)

- Openscapes GitHub Clinics
  Part 1 Contributing from the browser:
  Part 2 GitHub Projects

topic
May 20 Git/GitHub, part 1 lecture – video
May 27 Git/GitHub, part 2 lecture – video
June 3 Agile part 1, Kanban lecture – video
June 10 Agile part 2, Scrum lecture – video