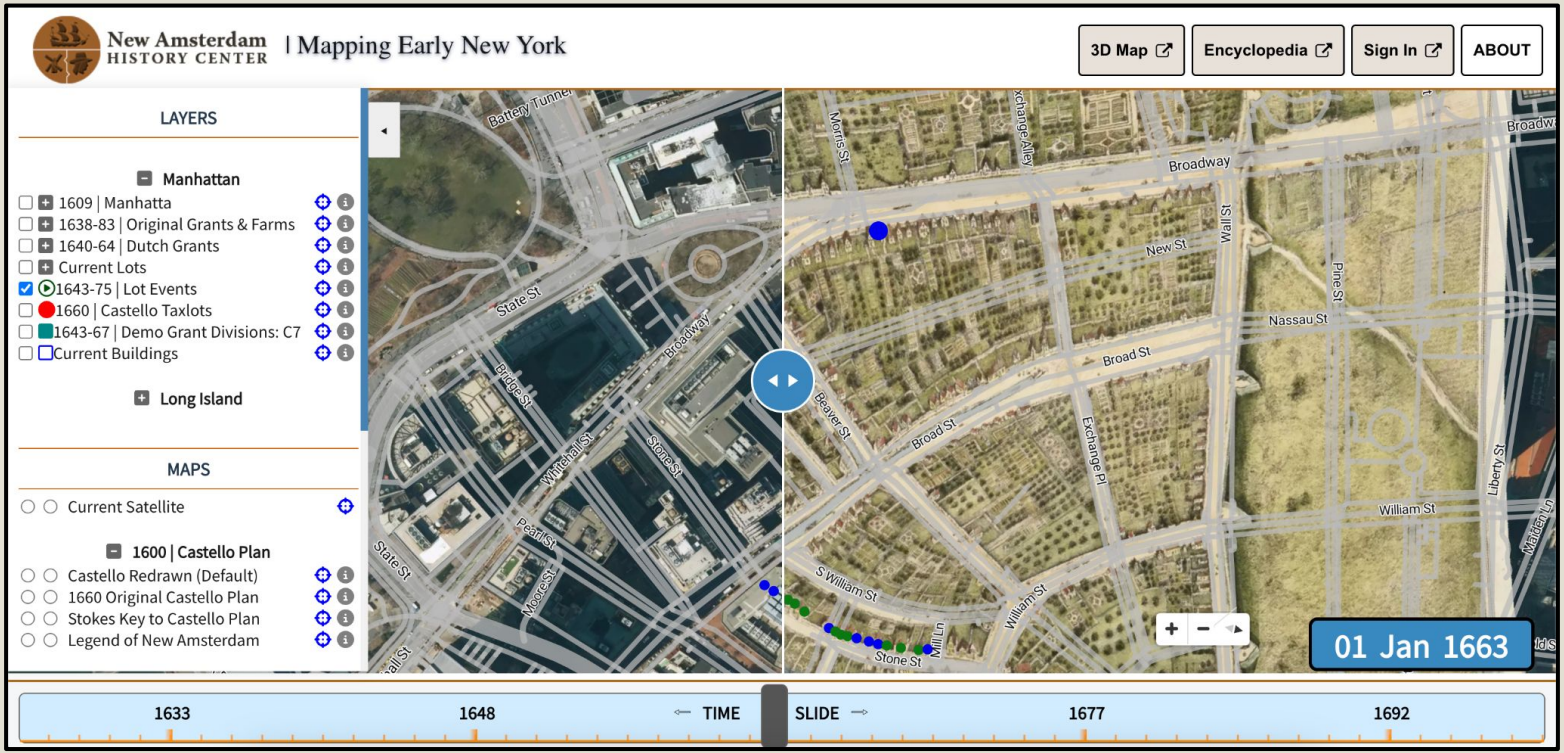
WebMap



Aren Ashlock, Subham Bhattacharya, Michael Gelineau, Braeden Hegarty, Seth Watgen

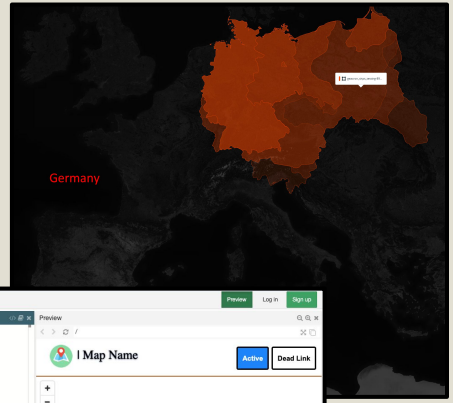
Problem Being Addressed

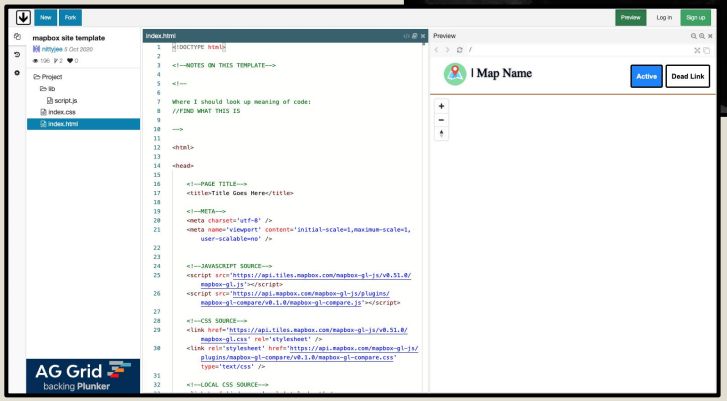
Problem

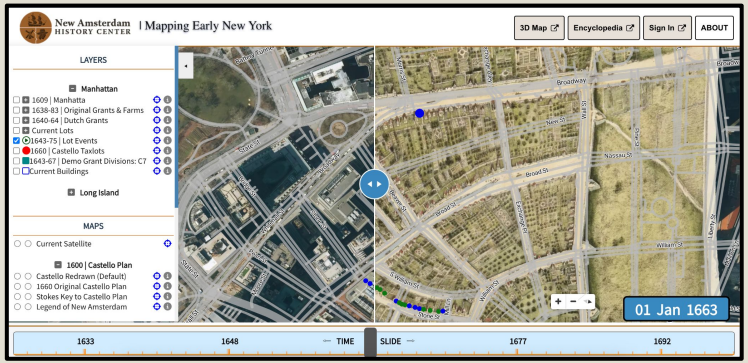
Lack of existing map creation tools

Current process:

1. Create map using multiple software
2. Start a website
3. Upload data via code
4. Make data look good





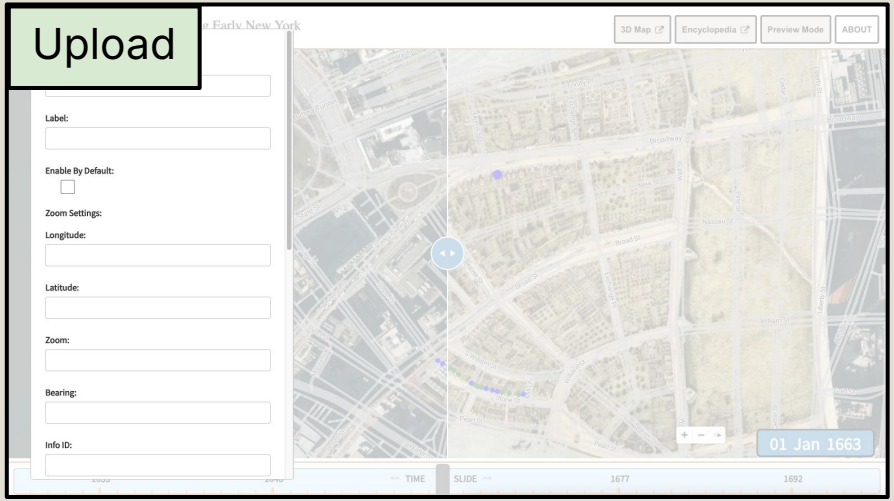


Our Solution

Streamline the Process

Goal:

1. Have our existing site
2. Users can add data
3. Users can draw directly on map
4. Share/work on maps with others



Design Challenges/Choices

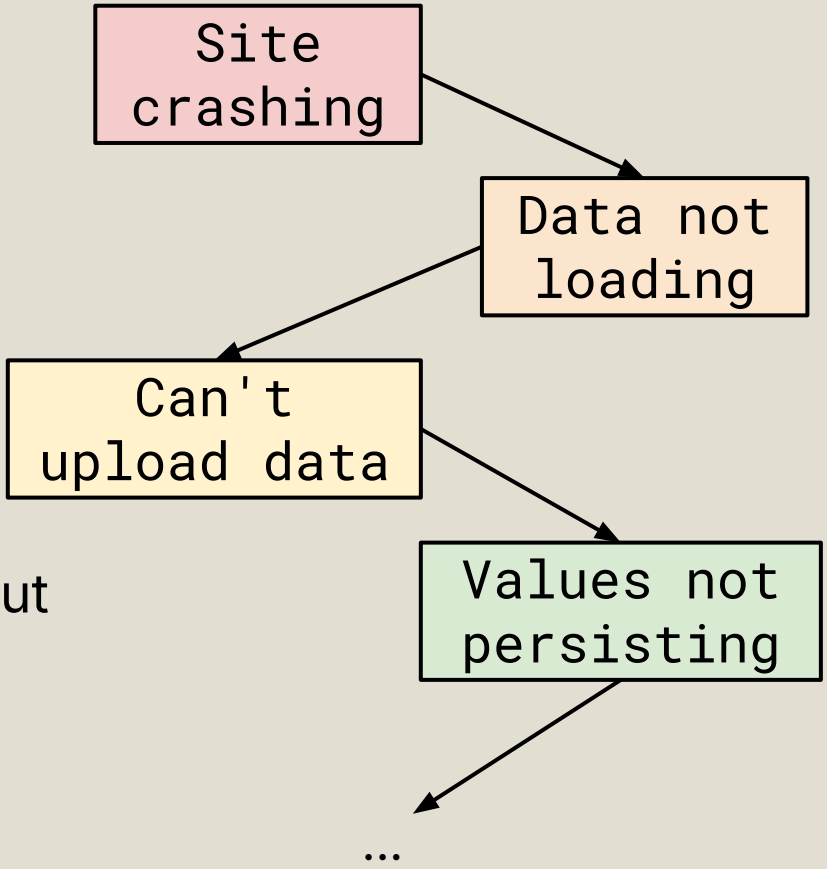
Challenge - Buggy Code

Issues:

- Existing bugs affected development
- Solving certain bugs would reveal others

Solution:

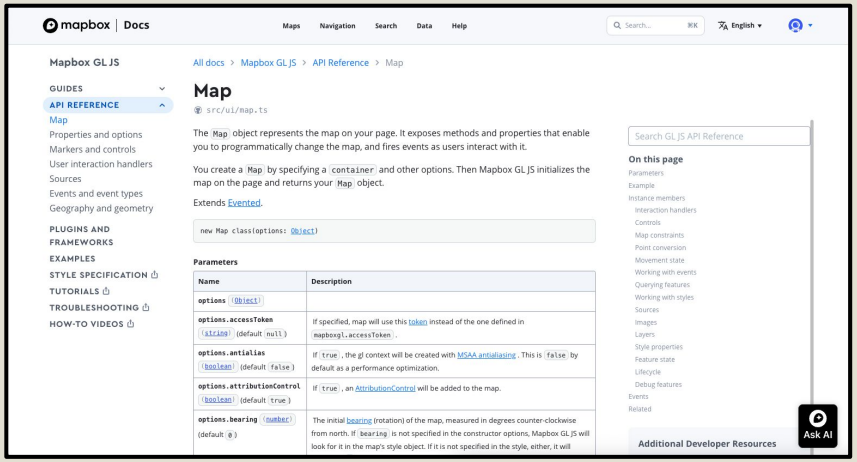
- "All hands on deck" approach
- Consistent feedback from client about functionality



Challenge - MapBox API

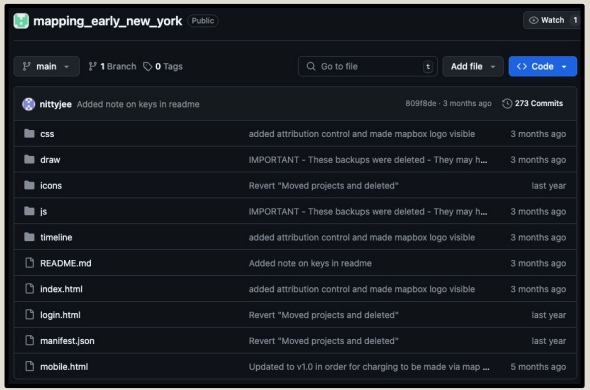
Issues:

- Unsure what properties of the API mean
- Documentation is difficult to understand



Solution:

- Refer back to old code to understand the API
- Incorporate code written by client's colleagues



Existing code

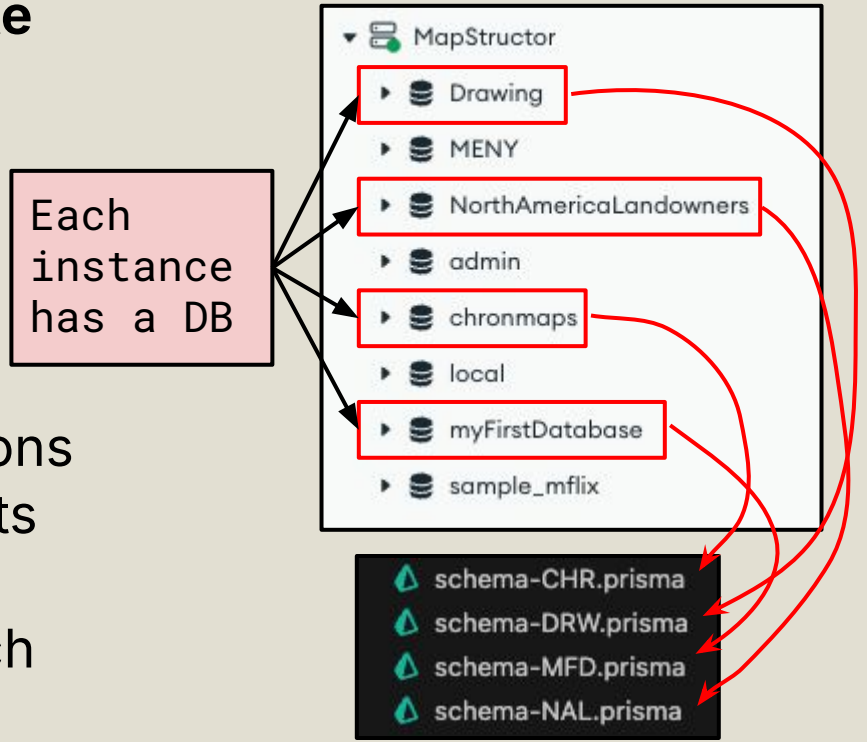
Choice - Multiple DBs

Choice: Separate instances = separate databases

- Environment variables include database connection URIs

Solution: Split the prisma schema

- Allows multiple database connections
- Flexibility to change schema objects per page
- Modify build script to generate each time



Choice - Draw Feature

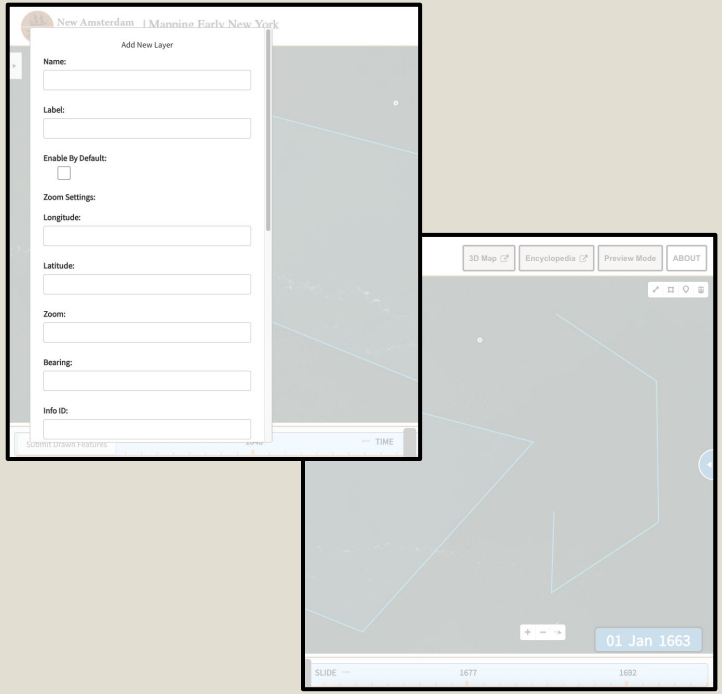

```
{     "type": "FeatureCollection",
"features": [{
"type":
"Feature",
"geometry":{
"type":
"Point",
"coordinates": [-93.6164, 41.5896]},
"properties": {"name": "Des Moines,
}
]
}
```


Choice: How to implement and get data

- Data type is GeoJSON rather than vector

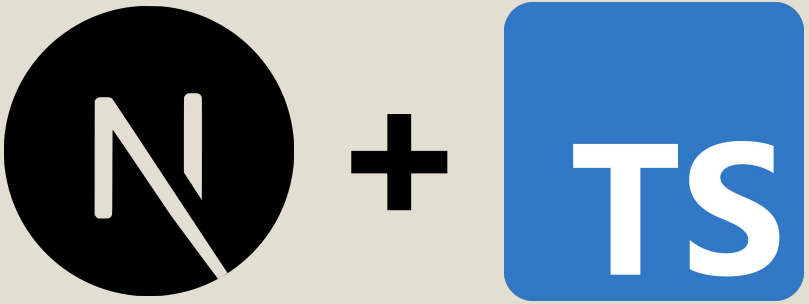
Solution: Utilize existing UI

- Minimizes the collections in database
- Keep data similar
- Info box is already functional
- Able to tie drawing info to existing properties



Software Development Practices and Tools

Programming language and framework

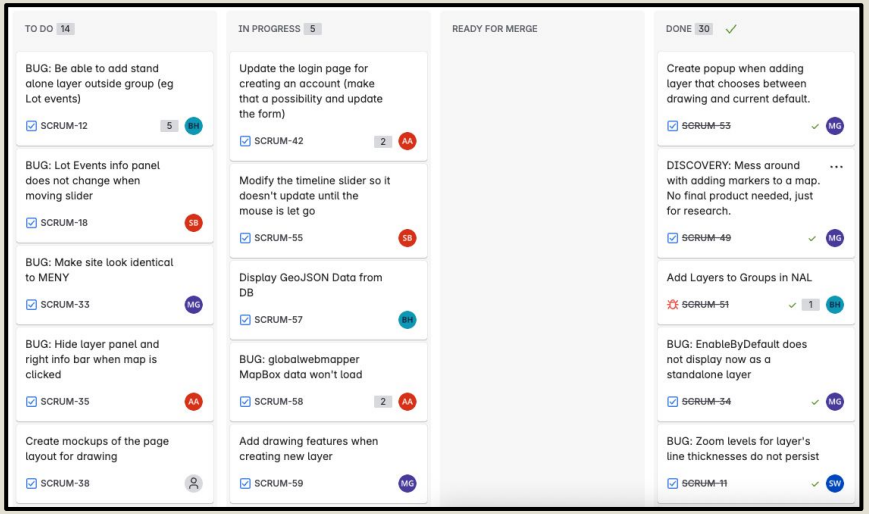


Database and APIs

Tools

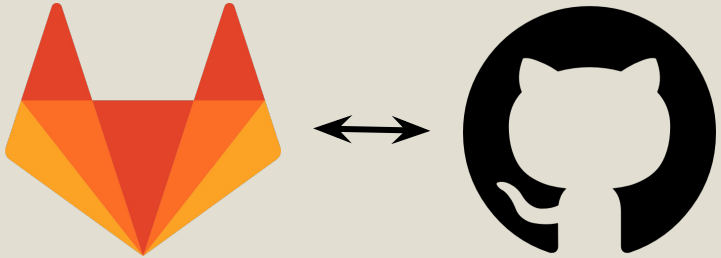
Jira:

- To-Do → In Progress → Ready to Merge → Done
- Point estimates



GitLab → GitHub:

- Mirror repositories
- Client had a public repository beforehand



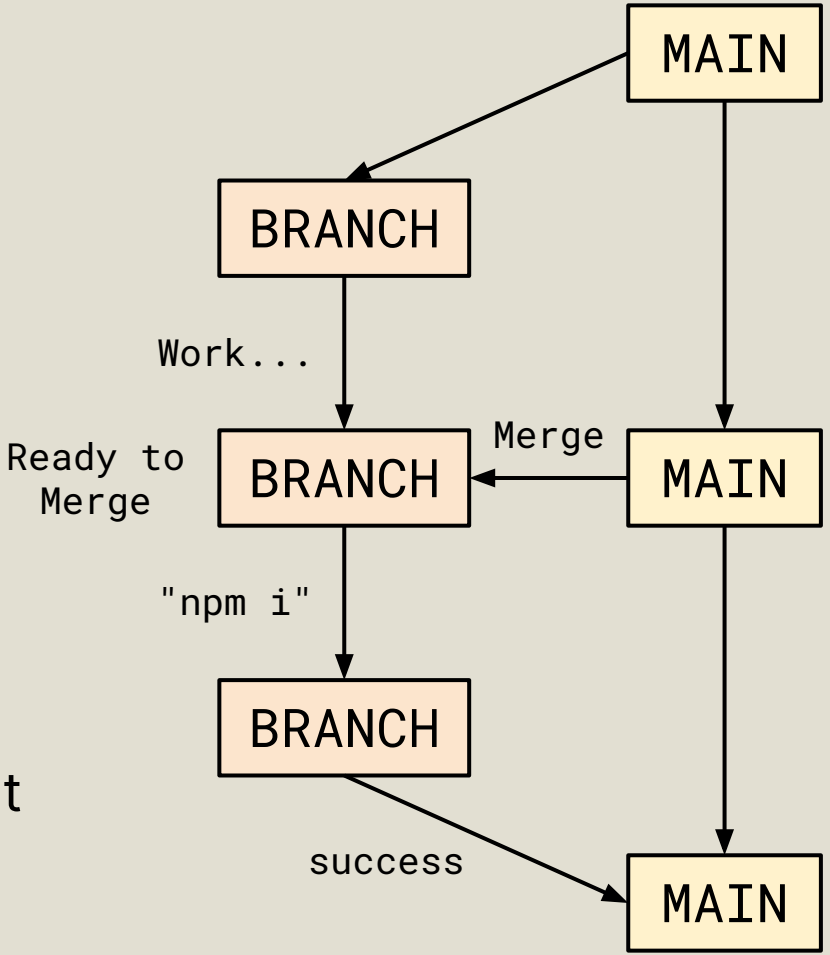
Practices

SCRUM:

- Daily standups
- Demo = sprint

Git:

- MASTER branch as archive
- Branch per feature/bug
- Merge main into branch first
- Run "npm i" to ensure deployment
- Minimum of 1 reviewer per merge



All We Did

Bugs/Work From The Last Group

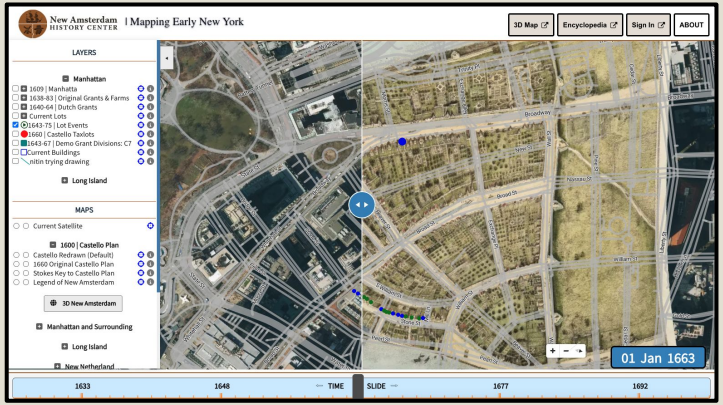
Bugs:

- Site doesn't crash
- Data loading/manipulation is functional and more reliable
- Styling and interactions are more similar

Standalone Layers:

- New feature left from last group
- Layers can exist outside of groups

Original site

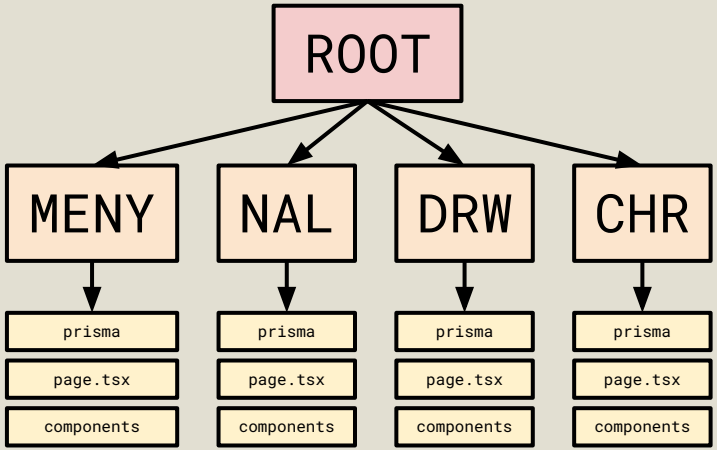


Our site

Making The Project Cloneable

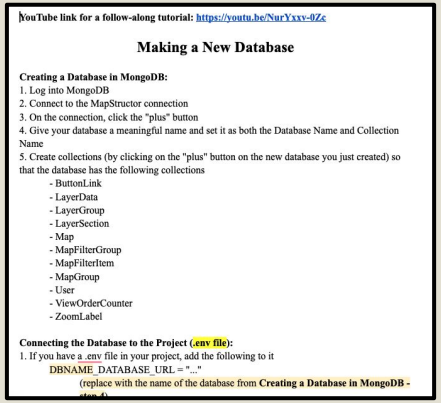
Project Restructuring:

- Determined what files/folders need separated
- Modified prisma loading and build scripts



Documentation:

- Steps to follow
- Video demonstration
- Assisting client with their attempt



YouTube link for a follow-along tutorial: https://youtu.be/NurYxxv-0Zc

Making a New Database

Creating a Database in MongoDB:

1. Log into MongoDB
2. Connect to the MapStructor connection
3. On the connection, click the "plus" button
4. Give your database a meaningful name and set it as both the Database Name and Collection Name
5. Create collections (by clicking on the "plus" button on the new database you just created) so that the database has the following collections
   - ButtonLink
   - LayerData
   - LayerGroup
   - LayerSection
   - Map
   - MapFilterGroup
   - MapFilterItem
   - MapGroup
   - User
   - ViewOrderCounter
   - ZoomLabel

Connecting the Database to the Project (.env file):

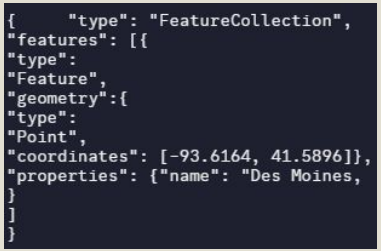
1. If you have a .env file in your project, add the following to it
   DBNAME_DATABASE_URL = "..."
   (replace with the name of the database from **Creating a Database in MongoDB -**

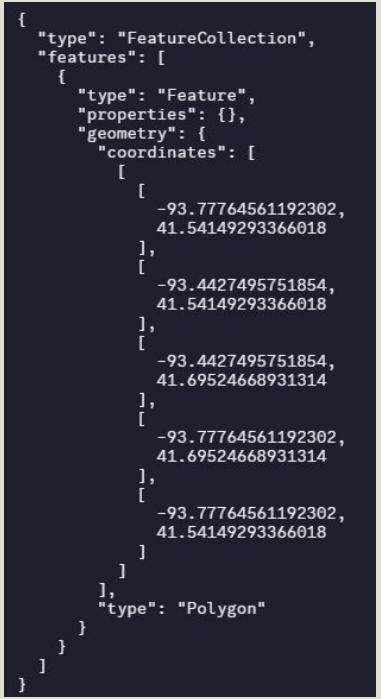
Drawing Functionality (Pt 1)

- Initial experimentation
  - Separate page dedicated to learning how to implement drawing features
- Transition to main site
  - Adjust current map instance so it can be shared across React components
    - Shared MapContext file allows us to share the Mapbox instances
    - Wrap HTML element of the page.tsx file with <MapContext.Provider> tag to allow any component nested in this tag to access the map
  - Access MapContext through layer components to allow drawings
  - Turn drawings into GeoJSON data for submission

Drawing Functionality (Pt 2)

- Experimenting with MapBox Adding GeoJSON as Source
  - Discovered existing API methods worked for JSON in correct format
- Research GeoJSON format to ensure proper data read
  - GeoJSON Files have numerous possible data types and structures
  - Built out data format files and passed them to the frontend devs once I was able to display from the database
- Integrate GeoJSON style layers into our existing edit form
  - Used existing API routes
  - Once the layer is drawn, the type and GeoJSON data are auto-set in form
  - Code parses the layer ‘link’ as a JSON object to display the layer on the frontend





What We Are Most Proud Of...

1. Fixed some VERY MAJOR issues with the website

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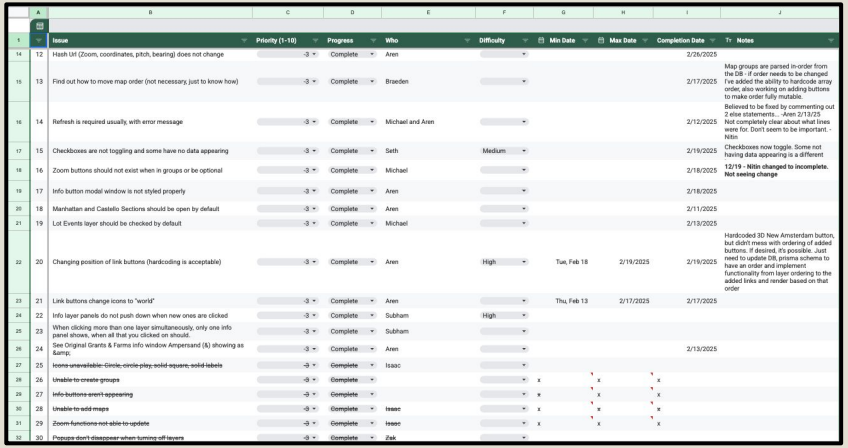
2. Added the drawing features as a starting point

Challenges Encountered

Challenges Encountered

Lack of handoff from last group:

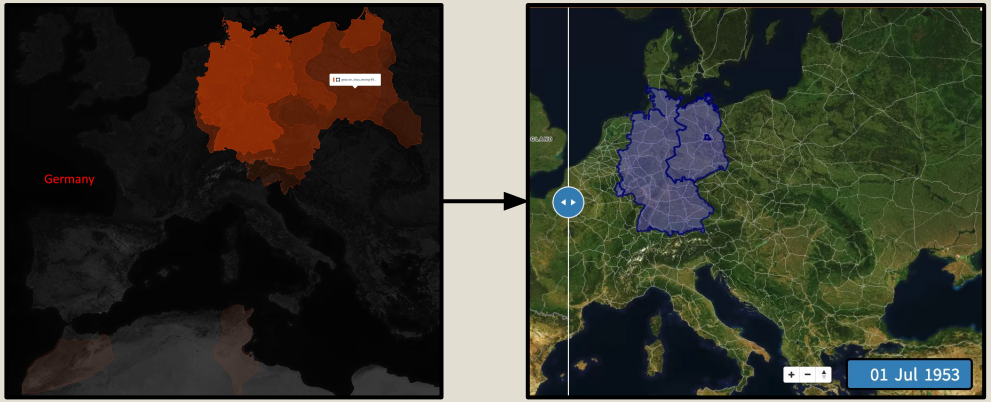
- Hard to understand what they did
- Bugs were more difficult → took longer
- Features were left unimplemented (standalone layers)



	Issue	Priority (1-10)	Progress	Who	Difficulty	Min Date	Max Date	Completion Date	Notes
14	Hash Url (Zoom, coordinates, pitch, bearing) does not change	-3	Complete	Aren				2/26/2025	
15	Find out how to move map order (not necessary, just to know how)	-3	Complete	Braeden				2/17/2025	Map groups are parsed in-order from the DB - if order needs to be changed I've added the ability to hardcode array order, also working on adding buttons to make order fully mutable.
16	Refresh is required usually, with error message	-3	Complete	Michael and Aren				2/12/2025	Believed to be fixed by commenting out 2 else statements... Aren 2/13/25 Not completely clear about what lines were for. Don't seem to be important. - Nitin
17	Checkboxes are not toggling and some have no data appearing	-3	Complete	Seth	Medium			2/19/2025	Checkboxes now toggle. Some not having data appearing is a different
18	Zoom buttons should not exist when in groups or be optional	-3	Complete	Michael				2/18/2025	**12/19 - Nitin changed to incomplete. Not seeing change**
19	Info button modal window is not styled properly	-3	Complete	Aren				2/18/2025	
20	Manhattan and Castello Sections should be open by default	-3	Complete	Aren				2/11/2025	
21	Lot Events layer should be checked by default	-3	Complete	Michael				2/13/2025	
20	Changing position of link buttons (hardcoding is acceptable)	-3	Complete	Aren	High	Tue, Feb 18	2/19/2025	2/19/2025	Hardcoded 3D New Amsterdam button, but didn't mess with ordering of added buttons. If desired, it's possible. Just need to update DB, prisma schema to have an order and implement functionality from layer ordering to the added links and render based on that order
21	Link buttons change icons to "world"	-3	Complete	Aren		Thu, Feb 13	2/17/2025	2/17/2025	
22	Info layer panels do not push down when new ones are clicked	-3	Complete	Subham	High				
23	When clicking more than one layer simultaneously, only one info panel shows, when all that you clicked on should.	-3	Complete	Subham					
24	See Original Grants & Farms info window Ampersand (&) showing as &	-3	Complete	Aren				2/13/2025	
25	~~Icons unavailable: Circle, circle-play, solid square, solid labels~~	-3	Complete	Isaac					
26	~~Unable to create groups~~	-3	Complete			x	x	x	
27	~~Info buttons aren't appearing~~	-3	Complete			x	x	x	
28	~~Unable to add maps~~	-3	Complete	Isaac		x	x	x	
29	~~Zoom functions not able to update~~	-3	Complete	Isaac		x	x	x	
30	~~Popups don't disappear when turning off layers~~	-3	Complete	Zak					

Technical unfamiliarity:

- Next.js project structure
- Mapbox (API & map creating)



Contributions

Aren: Bugs - Site crashing, Layers not loading, Hash parameters (url, initial zoom), Timeline slider lag, Page styling (buttons, modals, sections open by default); Project Restructuring - Whole thing (restructure, documentation)

Braeden: Bugs - Standalone layer implementation, CSS adjustments (page styling), Documentation, Layers not appearing; Drawing Features - Research backend adjustments, GeoJSON formatting, integrate drawn layers into existing API methods

Michael: Bugs - Enable by default function, Lot events displayed by default, Lot Event render issue, Layers not appearing, White screen crash, Zoom buttons for layers not appearing in groups, Enable by default not displaying as standalone layer

New Features - CSS changes and functionality identical to original site (nahc-mapping), Initial Drawing research New layer dialog, Drawing features on new layer front end development.

Seth: Bugs - various tasks; Drawing Features - various tasks

Subham: Bugs - Slider hold feature, info box scroll, made data load faster in the northamerica/landowner page, info box appearnce, CSS adjustments, Documentation; Drawing Features - Research, Added markers and polygons.

Demo + Q/A