Github Repository: https://github.com/CooperZA/NSEA-GeoMapping

Stack: MERN

MERN allows us to use one language(Javascript) to write the entirety of the application. For the front end, we are using React which is fast in order to create a better user experience when using the map in the application.

Database

The database for the NSEA map project is MongoDB. MongoDB stores data in collections that holds documents, documents are stored in the bson(binary JSON) format which allows for easier parsing when using the crud applications of the database.

Database

Geo-Mapping

Collections

Projects
Admin
FishType
ProjectType

Shema

Collection Document Schema (bson):

Projects:

```
{
    _id: objId,
    ProjectType: { type: String, required: true },
    CreekName: { type: String, required: true },
    Latitude: { type: Number, required: true, trim: true },
    Longitude: { type: Number, required: true, trim: true },
    ProjectDescription: { type: String, required: true },
    FunFact: { type: String, required: true },
    FishType: { type: String, required: true, trim: true },
    ProjectUrl: { type: String, required: true, trim: true }
}
```

Admin:

```
{
        _id: objId,
        Username: { type: String, required: true, unique: true },
        Password: { type: String, required: true, minlength: 8 }
}

FishType:
{
        _id: objId,
        FishType: { type: String, required: true, trim: true }
}

ProjectType:
{
        _id: objId,
        ProjectType: { type: String, required: true, trim: true }
}
```

Notes

- FishType and ProjectType collections are used to populate drop-down boxes on the backend (eventually the front end as well). This ensures that type input into the Projects collection is consistent and that new FishTypes and Project Types can be added at a later date.

Backend

Using the Mern stack we are creating a backend crud application so that future projects can be added to the database without having to access it directly. We are using express and mongoose to connect to the database and create routes for the crud part of the application.

Navigation

In the near term, the backend will have options to create, edit, and delete projects. In the long term the functionality should be extended to fish types, project types and admin accounts.

Frontend

On the front end, we are using React, Mapbox, Axios, and React-Map-GL. React allows for quick page updates and a separation of concerns with its component model. We are using Mapbox as the base map. Mapbox allows us to create custom styles and integrates well with

javascript to place markers and information on the map. To integrate the React framework with Mapbox we are using the Ubers React-Map-GL library. Axios is used to query the database and populate the map with project records.

The frontend of the website that will be accessible by non-admin users. It will be a single page map that displays the projects.

Design Aspects

Currently, the design of the map on Mapbox is similar to the design of the map that was sent to us at the beginning of the quarter, with a gray landscape and blue water. The map includes no roads or buildings as the focus is on the natural features and people looking at the map won't be able to gain information about any clients that NSEA has.

There are five symbols for the map that relate to the different projects that NSEA does. Here are the current designs: the symbol for fish passage barriers is a version of the NSEA logo over a blue circle background, the symbol for schools that NSEA works with is an apple over a red circle background, the symbol for the field trip locations of the schools is a magnifying glass with a macroinvertebrate under the glass over a brown circle, the symbol for worksite locations is a shovel over an orange circle and the symbol for tree plantings is an evergreen tree over a green background.

Both the symbols and the map are still in development and will have things added to them and changed to the design as per the client's request.

Likely Areas for Future Development

- Create login security for backend
- Add form validation to projects form
- Create a CSV file upload on the backend so that projects can be updated in bulk
- Sort and filter projects on the backend
- Add filter by FishType on front-end map
- Allow for icon upload when new project types are created
- Add polygons for smaller watersheds in the Nooksack watershed

End Goal and Deployment

The project should be embedded in NSEAs Squarespace page. The project should be deployed to Microsoft's Azure cloud platform.