Stage IV - Design

Team Members: Hunter Dubel, Jeremy Leon, Richard Levenson, Evan Melquist and Zachary Nelson
Team Name: Pollution Prognosticators
Project Name: Pollution Prediction
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Detailed Design Class Diagram:

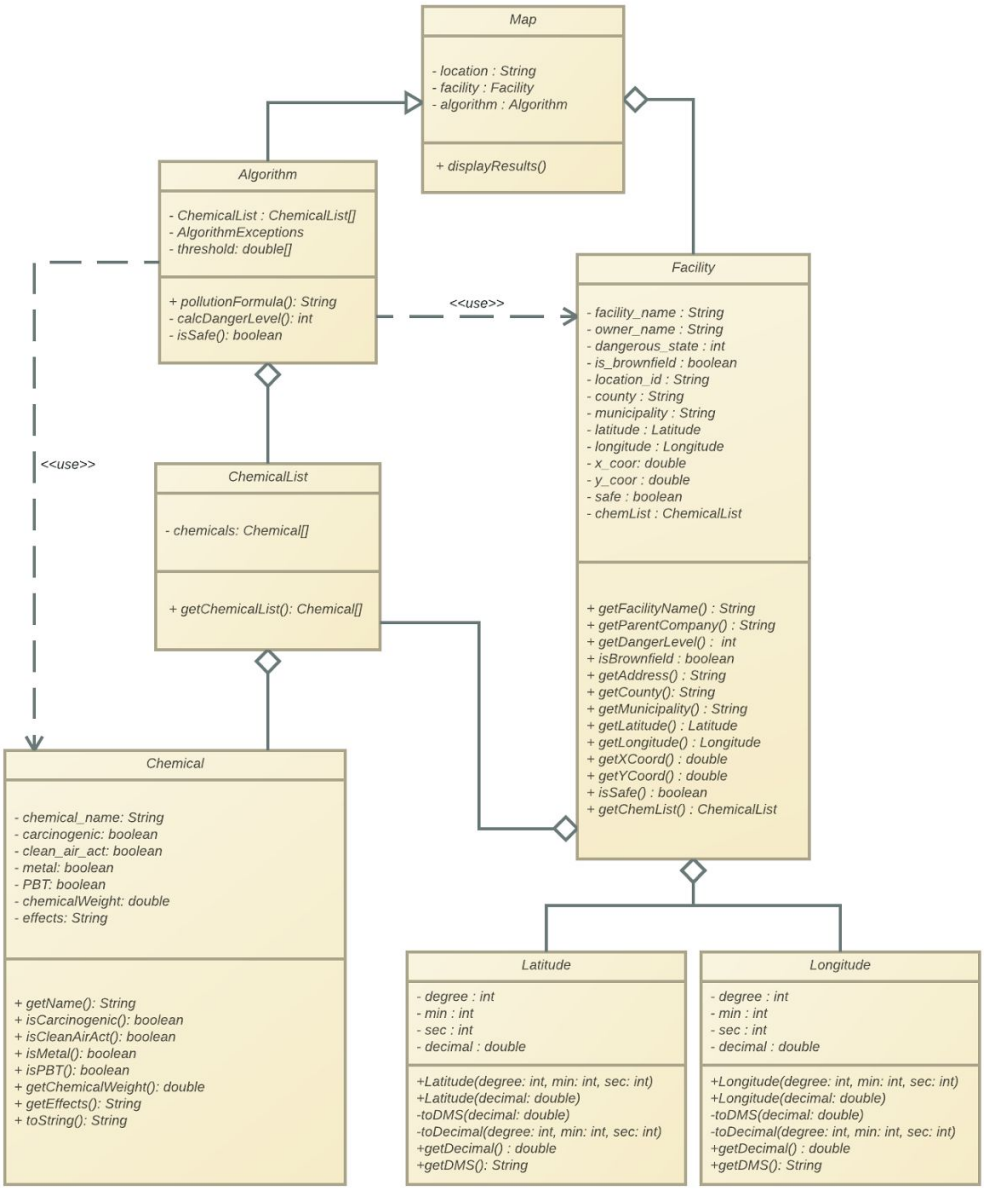

Figure 1. Detailed design class diagram for pollution prediction.

System Sequence Diagram:

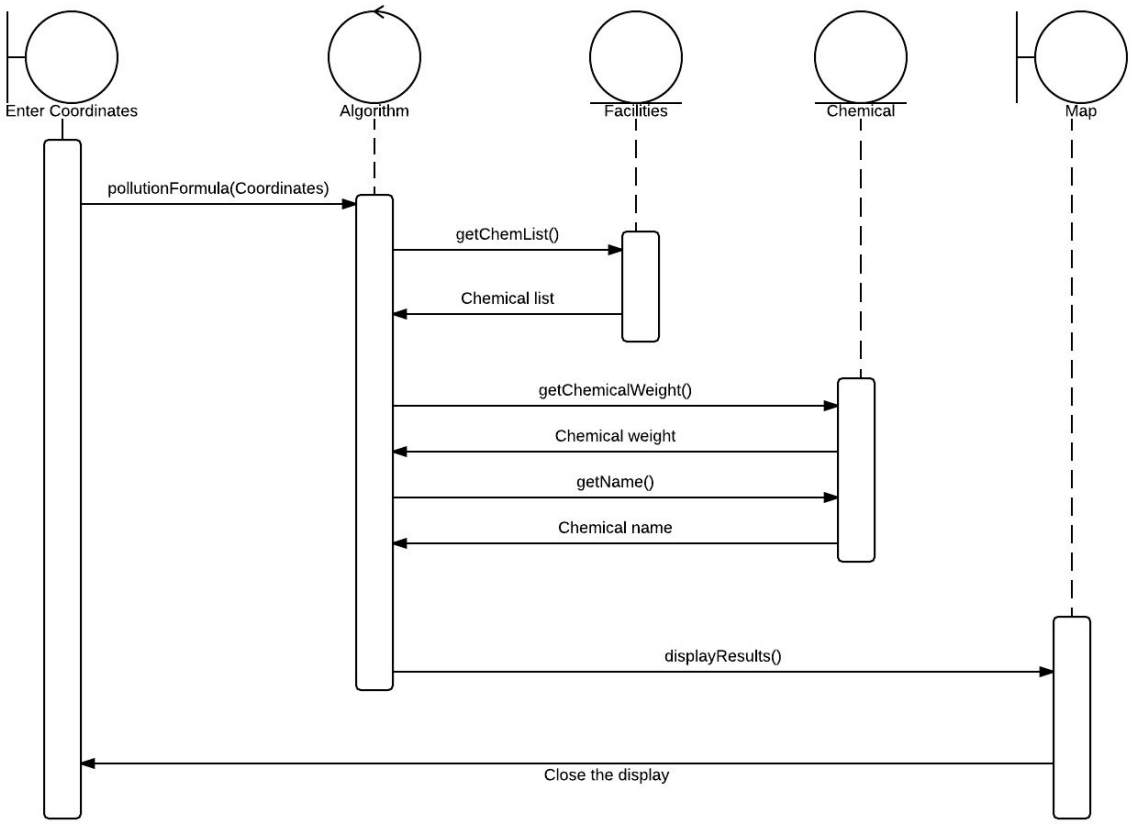

Figure 2. System sequence diagram for pollution prediction.

Detailed Statechart:

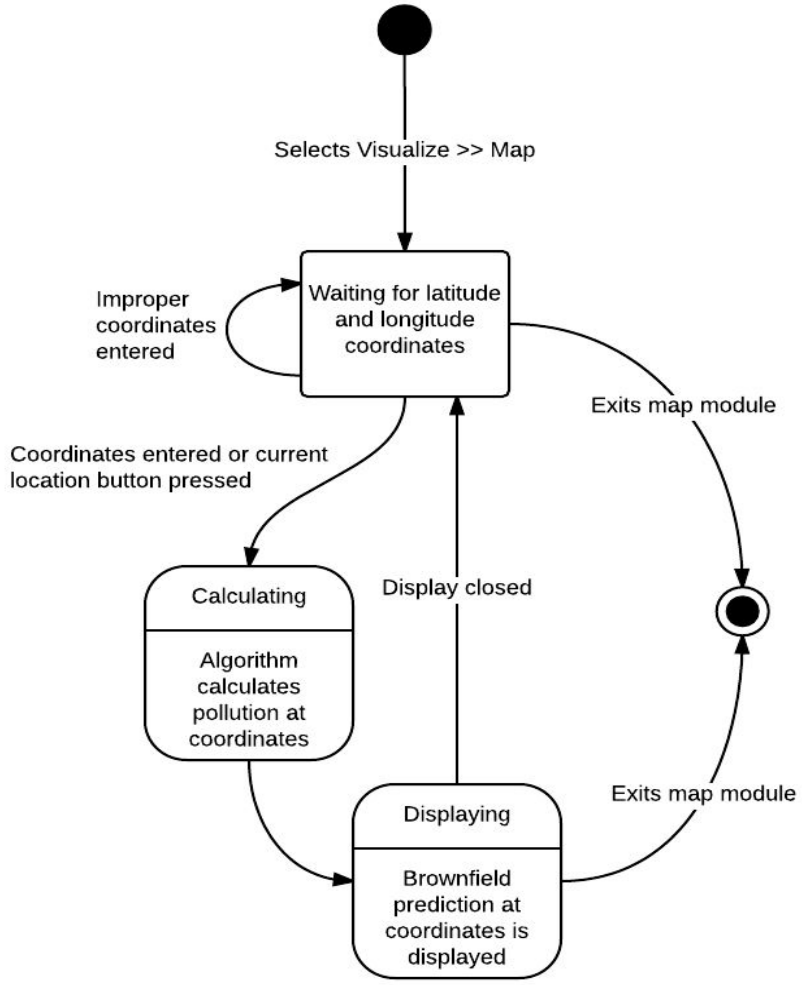

Figure 3. Detailed statechart for predicting pollution at a location.

User Interface Design:

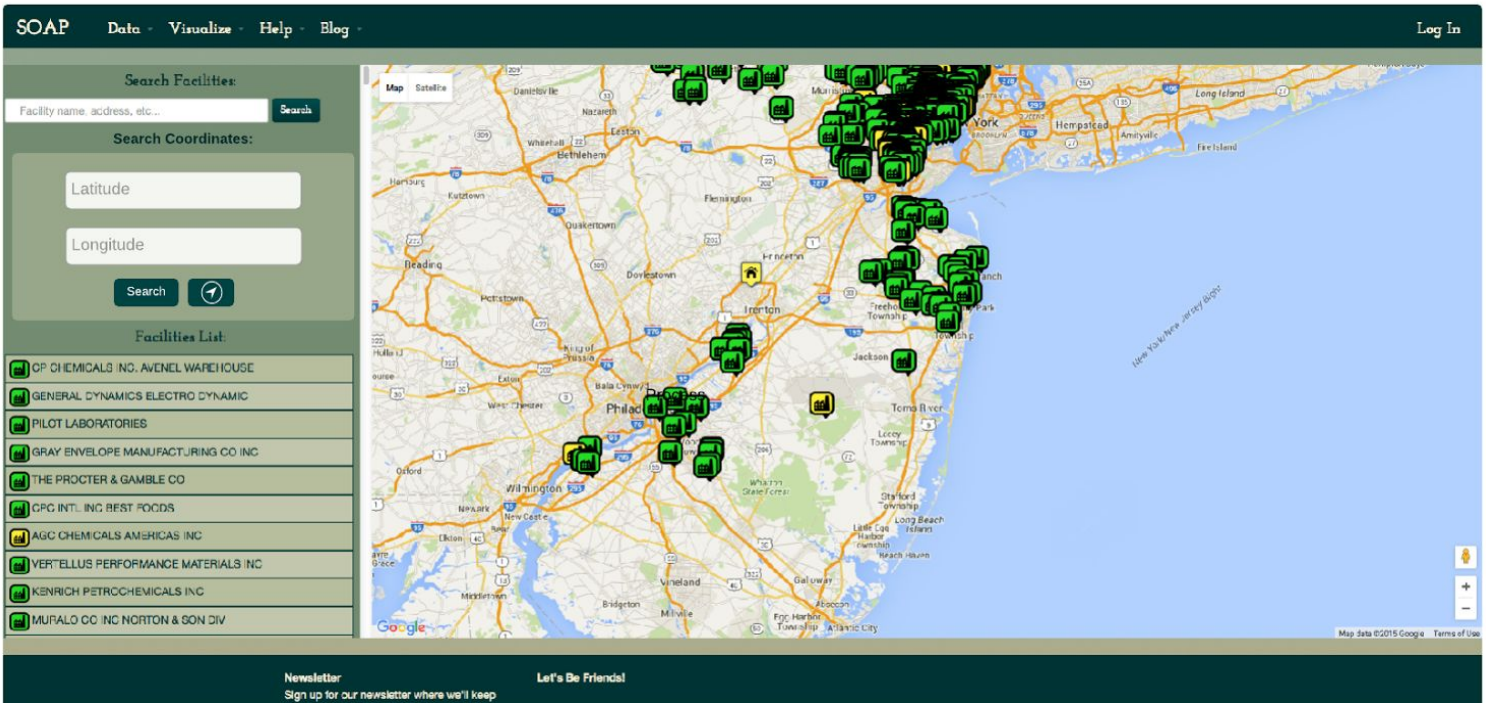

Figure 4. Map module with the ability to search by coordinate.

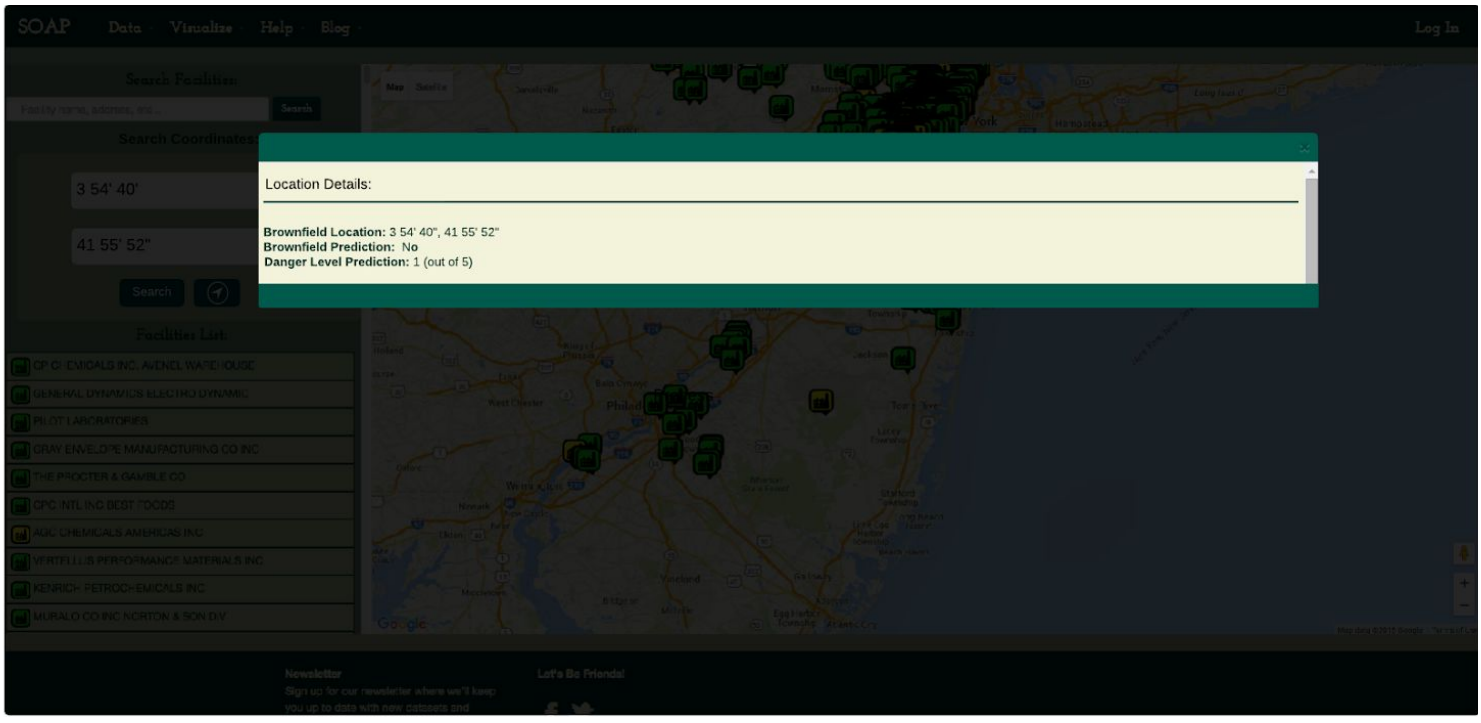

Figure 5. Pollution prediction pop-up window that opens when location is entered.

- **Strive for Consistency:** The first way the user interface strives for consistency is that it maintains a similar color scheme to the current SOAP website. The latitude and longitude text fields used to search for a coordinate also have the same look as the text field used to search for a facility. The new search button and "current location" button also look the same as the other search button on the page.
- **Enable Frequent Users to Use Shortcuts:** Using the current location feature allows the user to quickly determine pollution at their location. This is helpful for a user who needs to estimate the pollution at their location and doesn't want to keep entering in latitude and longitude values.
- **Offer Informative Feedback:** All entered and processed information will be displayed to the user in real-time when either the search or current location button is pressed. When the pollution prediction window opens it includes the potential brownfield's location again as informative feedback to the user.
- **Design Dialogs to Yield Closure:** The search functionality will alert the user that the calculation is taking place and present the results once they have been calculated. Therefore, opening the pollution prediction pop-up window lets the user know the calculation is done and serves as dialog to yield closure.
- **Offer Simple Error Handling:** Incorrect coordinates will prompt for another set of correct coordinates. Also, the user will be alerted if the pollution level cannot be predicted at the coordinates specified.
- **Permit Easy Reversal of Actions:** Nothing is being permanently changed when the prediction functionality is used. The lot or coordinates searched will be the only action capable of reversal which will be done by simply entering new coordinates or using the browser's undo feature to remove the coordinates. The user can also easily close out of the pop-up window that displays the prediction information.
- **Support Internal Locus of Control:** The user feels like they are in control because they are the ones controlling the prediction feature since they have to enter the coordinates or allow the user to use their current location.

- **Reduce Short-Term Memory Load:** This is supported because there is minimal page traversal to be able to use new features. The user only needs to get to the map page to use the functionality. Once the user gets to the map they have two simple choices, enter specific coordinates or use their current location to find the estimated pollution level at that location.