1.1 Problem Statement

What problem is your project trying to solve? Use non-technical jargon as much as possible.

Our client has been working on a machine learning model that attempts to predict watershed discharge at the end of river basins given inputs like precipitation, land cover, etc. Our goal is to help visualize this numerical data with an interactive map and customizable overlays.

1.2 Requirements & Constraints

List all requirements for your project . This includes functional requirements (specification), resource requirements, qualitative aesthetics requirements, economic/market requirements, environmental requirements, UI requirements, and any others relevant to your project. When a requirement is also a quantitative constraint, either separate it into a list of constraints, or annotate at the end of requirement as "(**constraint**)". Other requirements can be a single list or can be broken out into multiple lists based on the category.

Functional Requirements:
- Selectable Watersheds
- Interactive Map
        - Mouse-over coordinates, drag and click map, real-time Google Maps data
- Visual graphing of data
        - Precipitation, temperature, land cover, soil properties, etc…
- Display of water discharge over time
- Color coordinated weather data and timeline

Non-Functional Requirements:
- Scalable
- Handle advanced datasets and new data
- Good performance
- Manageable response time and refresh rate
- Easy to maintain/update
- Reliable
- Implementation of other map data like weather

Constraints:
- Using format of existing datasets
- Access to datasets
- Licenses for external software to use as a project framework

1.3 Engineering Standards

What Engineering standards are likely to apply to your project? Some standards might be built into your requirements (Use 802.11 ac wifi standard) and many others might fall out of design. For each standard listed, also provide a brief justification.

- Any restrictions introduced by Google Maps API. Right now we don't really see anything big in Google's TOS but that could change as we get further into the project. A few examples might be:

- ○ Our app must not be used for monetary gain as the Google Maps API is free
- ○ Users must be notified if we collect location data from them
- ○ Our implementation must be easily identifiable by Google (we aren't hiding it from them)

- Any standards that may be present on flood hazard reporting (FEMA, etc). Most flood reporting requirements come from insurance agencies, so there may not be a lot of overlap on these requirements. Here are a couple examples:
  - ○ Being sure data is well monitored and reliable
  - ○ Making sure data is presented clearly and is not confusing
  - ○ Data should be as "open" or as available as possible

1.4 INTENDED USERS AND USES

Who benefits from the results of your project? Who cares that it exists? How will they use it? Enumerating as many "use cases" as possible also helps you make sure that your requirements are complete (each use case may give rise to its own set of requirements).

The intended user for this project is our clients, a third year PHD student and Dr. Ali Jannesari. This project will be used to create an interactive UI for flood forecasting specifically for the data that the clients have gathered. The user should be able to have real-time Google Maps data with grids and watersheds overlaid. They should get mouse-over coordinates and be able to drag around and navigate the map. The user can also view graph data gathered by a machine learning algorithm that is visualized within our UI.