

## Project Proposal

### Designated Uses for Bodies of Water Modeling

#### **Problem Statement**

Not all bodies of water, such as lakes and rivers, can be used for the same purposes. The purpose of the waterbody needs to be identified based on the technical information known.

#### **Context**

The Environmental Protection Agency (EPA) requires all federal, state, local, and tribal organizations whose jurisdiction contains waterbodies to monitor, assess, and report water quality. The EPA has final authority over what designated use a waterbody can be used for, which, for surface waterbodies, can be recreation, food, aquatic life, fishing, coastal fishing, or drinking water. This decision is based on the range of accepted values for reported physiological information of the waterbody, the most monitored values are dissolved oxygen (DO), temperature, ph, and chlorophyll.

#### **Criteria for Success**

Given the physical/chemical and biological information of a body of water, a water quality model based on these parameters should predict a designated use for the body of water (aquatic life, recreation, potability).

#### **Scope of Solution Space**

The EPA requires all organizations to upload water quality data to the [national water quality council](#). Approximately 30 variables are monitored for each body of water across 6,478 sites giving hundreds of thousands of samples.

#### **Constraints**

The EPA sets guidelines for what designated use a body of water can be used for given the technical information. But these guidelines can change depending on the geographic zone, season, physical conditions of the waterbody, and confidence of the data sampled.

#### **Stakeholders**

EPA – Authority over water quality reporting and assessment

Federal, State, Local, and Tribal Orgs – Required to report accurate information and receive guidance from the EPA over water quality

Aquatic Life – Organisms in the water are affected by the water quality

Persons using the waterbody – Anyone who uses the waterbody must comply with EPA and local regulations.

### **Key Data Sources**

1. [National Water Quality Council](#) – Comprehensive national water quality datasets
2. [EPA \(STORET\)](#) – Information on designated uses and visual aid on waterbodies
3. [USGS \(STEWARD\)](#) – The United States Geological Survey provides water quality information as well.