ECE 143 Team 11 Group Project Proposal

Analysis of Water Quality in California Based on Cities in California

Evan Green(A12230491) Bing Liang(A98006351)
Jinbum Park(A99420922) Xiaotian Wang(A53238781)

Project Description:

The objective of this project is to provide a comprehensive analysis on the water quality in California using datasets provided by CEDEN (California Environmental Data Exchange Network). Our work will be split into three stages. During the first stage, we will extract the data we need with at various times (month cycle, yearly cycle). At the second stage, we will analyze each parameter (Dissolved Oxygen, Temperature, pH, Turbidity) that can determine water quality. At the last stage, we will find if the water quality relates to any factor of a city based on geographic location in the dataset. Based on our analysis, we will make some reasonable predictions about the water quality in California. The results of this project are important to every California citizens because clean water not only protects public health, but it also protects marine ecosystems.

Approach:

The CEDEN website provides water quality data, as well as 4 important parameters which can determine the water quality, geographic locations, and exact date, etc. This data will help us delve into the relation between water quality and some other factors related to cities in California. Particularly, we will use several python modules, like numpy, matplotlib and tensorflow, to process our statistical files and make scientific computations as well as visualization.

Procedure:

1) **What is topic?**

Find the datasets of water quality in multiple location of California and find out the relation between those parameters from water quality and multiple factors from the nearest cities of California.

2) **Why is this interesting/important/relevant?**

Analyzing water quality data collected in different time/space will help us verify or discover some relations between water quality and cities. E.g. Is water quality worse around cities of heavy industry? Does the change of water quality happen at the same

time when city population booms? Around a city, how does water quality change along with the economic growth of this city in different era? All these possible discoveries are interesting and can give an innovative perspective on the impact of human activities to our living environment (or the other way around).

3) What is currently known about this topic

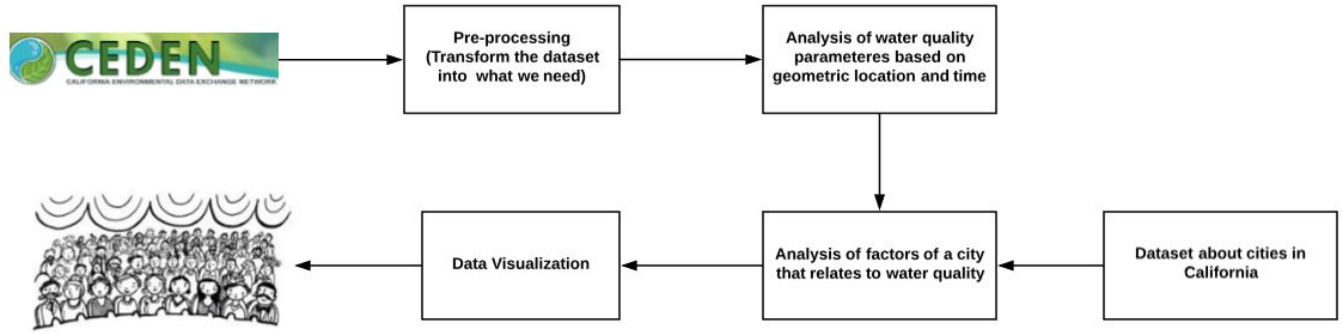
We already know:

1) Data:
    a) Four parameters (dissolved oxygen, temperature, pH, turbidity) of water samples collected all around California, from 2000 to 2018.
    b) Geographic data of cities in California.
    c) City data (collecting).
2) Domain Knowledge:
    a) How water quality affect human health.
    b) How water quality influence development of a city.
    c) How industrial activity influence water quality.

4) What is the anticipated impact of this work

Our project will give an informative visualization of water quality all around California in recent decades. Hopefully this visualization will give audiences an impression of how the development of cities impacts our environment, and how people's actions can lead to polluted water.

Flow chart:



Project Timeline:

Weekly Tasks	Expected Deadline	Assigned Members
Find datasets about “Water Quality”	05/10/2018	Bing Liang **&** Jinbum Park
Find datasets about “Cities in CA”	05/10/2018	Evan Green **&** Xiaotian Wang
Analysis of water quality parameters Based on geometric location and time	05/24/2018	Bing Liang **&** Jinbum Park
Analysis of the factors of cities that relate to water quality	05/24/2018	Evan Green **&** Xiaotian Wang
Data visualization	06/01/2018	ALL
Prepare for PPT, presentation and paper document	06/06/2018	ALL

References:

“Datasets related to Water Quality”

Surface Water – Toxicity – CEDEN
https://data.ca.gov/dataset/surface-water-%E2%80%93-toxicity-%E2%80%93-ceden
Dataset Size: ~500MB

Water quality data for California
https://waterdata.usgs.gov/ca/nwis/qw/

http://ceden.waterboards.ca.gov/AdvancedQueryTool

5 vital signs for Water Quality - parameter
http://home.iitk.ac.in/~anubha/Water2.pdf

“Datasets related to Cities located in California”

Cities of California and population
https://en.wikipedia.org/wiki/List_of_California_locations_by_income