Shoreline Water Quality Lab

**Group Names:** Kristina Cotta, Eliana Bentley, Edgar Millan, Melannie Urquidez

**a.) Independent Variable**

The independent variable is the water from the beaches.

* Piare #1 - San Diego NTC bay bridge
  + Close to school
* Piare #2 - Ocean Beach Pier
  + Along the san diego county. Also there's a dog beach next to it
* Piare #3 - Pacific beach pier
  + We choose this beach because it's in an expensive area and is very well kept.

**b.) Dependent Variable**

Dependent variable are different indicators of water quality that will be measured: salinity (g/kg), Ph, dissolved oxygen (mg/L) levels, and nitrogen (mg/L) levels on site in a stable environment. These show if there are any abnormalities in the water.

* Minimum DO levels in the ocean is 1 mg/L
* Maximum DO levels are 14 mg/L
* Minimum Salinity levels is 34 parts per thousand
* Maximum Salinity levels is 37 parts per thousand
* Minimum Ph levels is 0.
* Maximum Ph levels is 14.
* Maximum Nitrogen levels 10 mg/L
* Minimum Nitrogen levels 1 mg/L

**c.) Control Variable(s)**

* Control is the amount of sample collected and also following the directions to each tester thoroughly.
* Rinsing the dissolved oxygen device each time after use. Avoiding contamination as well.
* When collecting data, the water must be obtained from high/deep locations on different days to avoid scientific errors.

**d.) Confounding Variable**

Confounding variables are the weather and the amount of people at the beach that day. Also the amount of trash that is at each beach, recent storms, and where the water is connected.

**e.) Testing outline**

1. Go toPacific Beach and collect three water samples
2. Test water for an average in salinity, Ph, oxygen levels, and Nitrogen levels on site in a stable environment
3. Go to mission beach and collect another three samples and conduct the same tests conducted with the estuary water
4. Go to NTC bay and repeat the test
5. Go to La Jolla shores and repeat the test
6. Repeat all previous tests twice with two day intervals
7. Collect all data and interpret if there is any distinct change in water quality

**f.) Sample Size**

The experiment will test three beaches across San Diego county. In total we are doing eight tests, two for each beach. Reference the dependent variable section for details.

* Piare #2 - San Diego bay bridge
  + Close to school
* Piare #3 - Ocean Beach Pier
  + Along the san diego county. Also there's a dog beach next to it
* Piare #4 - Pacific beach pier
  + We choose this beach because it's in an expensive area and is very well kept.

**g.) Materials**

* Gloves
* Refactormeater
* Ph water testing kit - Super Scientific Advanced Ph Meter
* Solicit water testing kit - Portable refractometer
* Dissolved oxygen levels water testing kit - YSI Environmental
* Negotiation levels water testing kit
* Data Sheet/Journal
* Bucket
* Pencils
* Camera
* Car/Transportation
* Permission Slips
* Measuring Tape
* Collection Container

**h.) How to test**

**Salinity**

We are aiming for this

* Minimum Salinity levels is 34 parts per thousand
* Maximum salinity levels is 37 parts per thousand

We need just the surface level amount of water for testing.we are doing one test at each piare. Will use the Refactomers to see the salinity levels. First we turn the dile to 0, Then add 3 drops of water from the sea to the eye piace. Peak though eyepeace and adjust focus with knob accordenley. Then look for an upper blue area and a lower white area. Find the number that meets up with the debive between the blue and white, The number on the right is you salinity level.

**Ph Testing:**

We are aiming for

* Minimum Ph levels is 0.
* Maximum Ph levels is 14

Will only need the surface water to test and will be using a Ph meter to measure. Will be taking two sample at four different beaches.

**Dissolved Oxygen levels testing:**

We are aiming for this

* Minimum DO levels in the ocean is 1 mg/L
* Maximum DO levels are 14 mg/L

We only need surface level of water. We are using a dissolved oxygen sensor to measure the dissolved oxygen in the water. The will test dissolved oxygen at the location.

**Nitrogen Levels Testing;**

Aiming for this

* Maximum Nitrogen levels 10 mg/L
* Minimum Nitrogen levels 1 mg/L

We only need surface level of water. We are using a dissolved oxygen sensor to measure the dissolved oxygen in the water. We will be taking two samples and it’ll be taking them at four different locations.

1. Go toPacific Beach and collect three water samples
2. Test water for an average in salinity, Ph, oxygen levels, and Nitrogen levels on site in a stable environment
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4. Go to NTC bay and repeat the test
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Group Names:

**Research Schedule:** Complete the schedule and include it as the last page of your methods. You may not have something

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Day** | **Task** | **Times** | **Tools/Equipment** | **Goals Completed?** |
| Thursday Nov. 2 | Finalize Methods |  |  |  |
| Friday Nov. 3 | nothing |  |  |  |
| Saturday Nov. 4 | nothing |  |  |  |
| Sunday Nov. 5 | nothing |  |  |  |
| Monday Nov. 6 | nothing |  |  |  |
| Tuesday Nov. 7 | Go get water from ocean beach and pacific beach |  |  |  |
| Wednesday Nov. 8 | Collect water from IB. and the bay. |  |  | \*NOTE\* Preliminary data analysis & discussion due today |
| Thursday Nov. 9 |  |  |  |  |
| Friday Nov. 10 |  |  |  |  |
| Saturday Nov. 11 |  |  |  |  |
| Sunday Nov. 12 |  |  |  |  |
| Monday Nov. 13 |  |  |  |  |
| Tuesday Nov. 14 |  |  |  | RESEARCH WRAPS TODAY & Draft of Data analysis due- CANNOT BE EXTENDED |

Data Collection Sheet

**Roles**

* Data collector
  + Kristina
* Data interpreters
  + Melannie
* Presenter
  + Edgar
  + Eliana
  + Kristina

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date & Time: | | | |  |
| Location: | Imperial beach pier  (cancelled) | San Diego NTC Park Bay | Pacific Beach pier | Ocean Beach pier |
| Ph |  | 6.69  6.8  6.86  7.04  7.08 | 8.81  8.80  8.01  8.13  7.97 | 8.79  8.8  8.8  8.81  8.8 |
| Salinity |  | 30  1.025 | 30  1.025  Temp: 18.3 celsius | 30  1.025  Temp: 18.5 celsius |
| Nitrogen  (no proper materials to test) |  |  |  |  |
| Dissolved Oxygen |  | 117  116.8  116.7  16.5  116.6  116.8 | 128.3  130.1  129.7  126.9  125.6  123.7 | 124.6  123.3  124.5  121.7  123.4  123.3 |