CEEn-2018CPST-010

Testing Different Eradication Methods for Asian Clams in Lehi Water System

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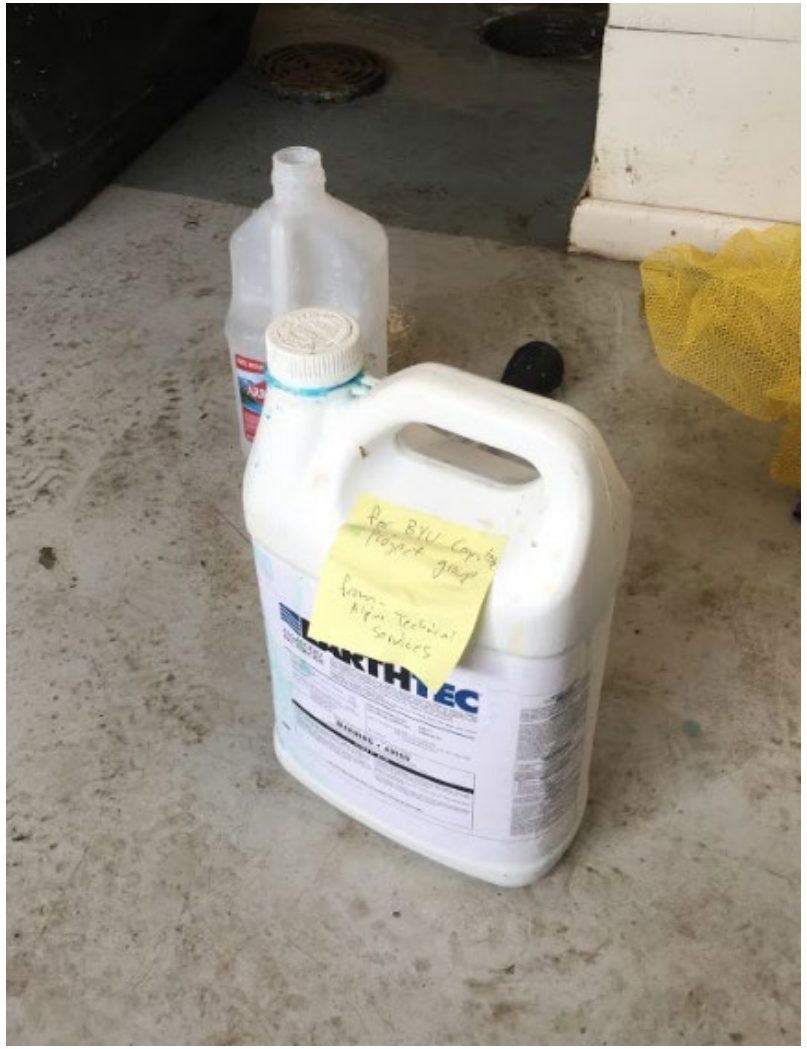
Introduction

Objective

- Finding a methodology to test EarthTech as a procedure of eradicating clams
- Finding the correlation between mortality of clams and copper concentration.
- Finding recommended amount of Earth Tec per millions gallons of water.



Introduction

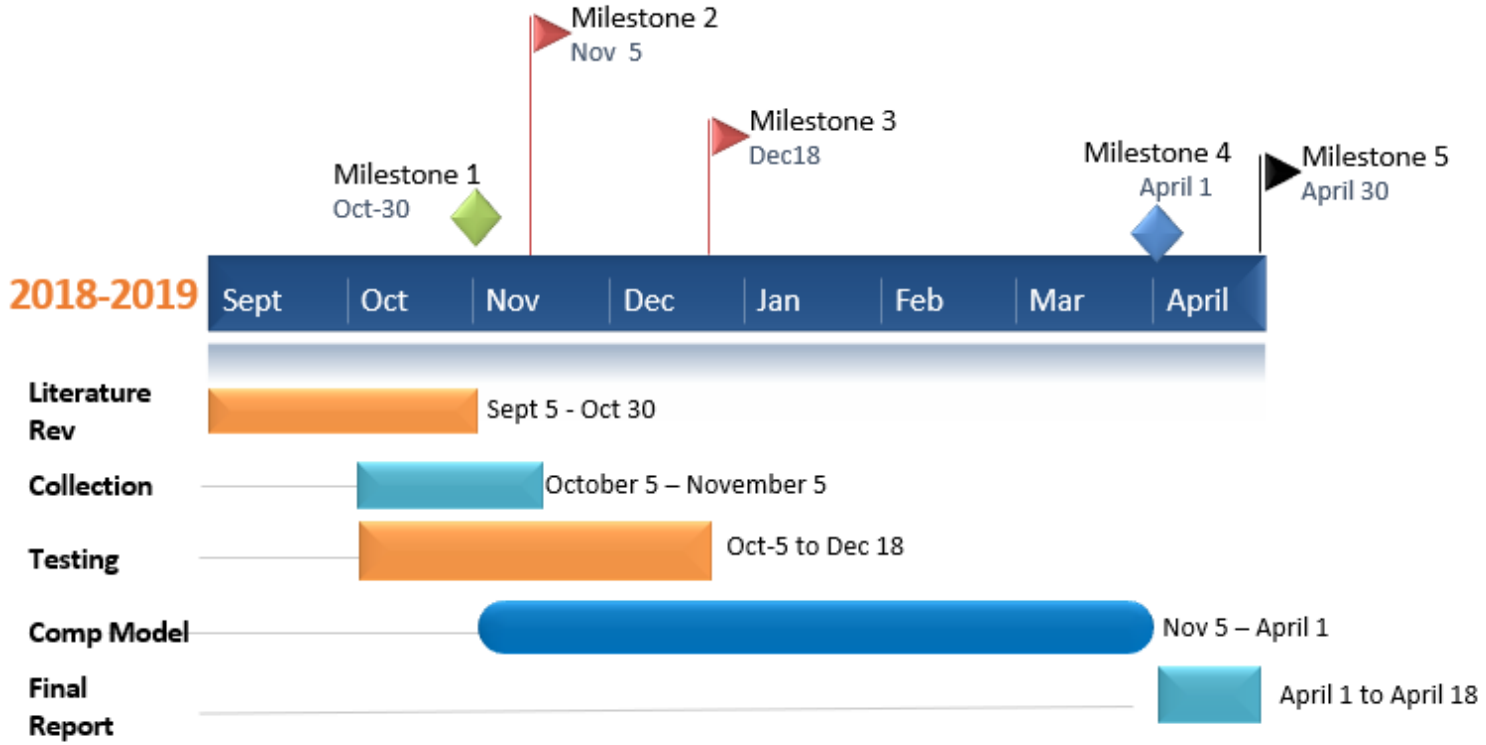
- **What was not the objective?**
  - Eradicating clams
  - Comparing different chemicals for treatment and their effectiveness.
  - Defining a schedule for controlling clams population on the system

Project Tasks and Deliverables

- **Deliverables.**
  - **What is Delivered?**
    - A Methodology to test Asian clams under different chemical treatments.
    - A Recommended concentration for water treatment against Asian Clams
  - **What was expected?**
    - Effectiveness of different amounts of Earth tech in Asian clams.
    - Deliver a better understanding of the nature of Asian clams as a invasive specie.

Project Tasks and Deliverables

Planned Schedule



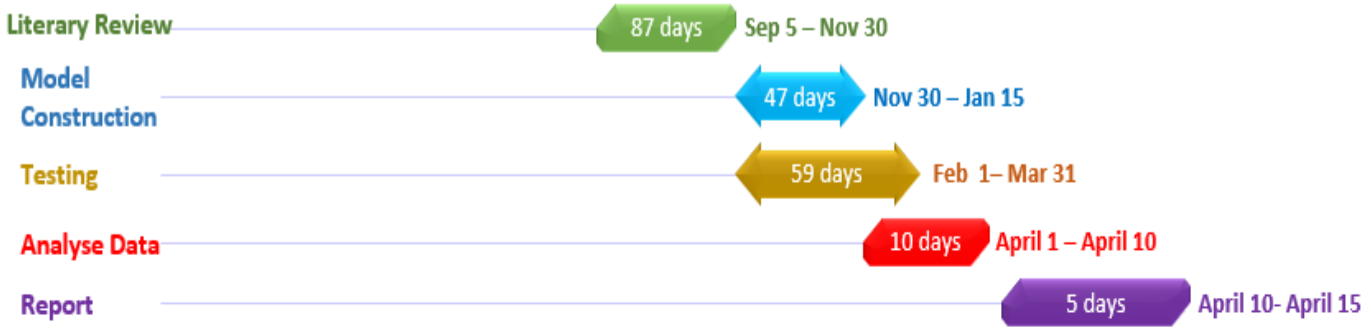
a) Testing was planned from Oct-5 to Dec -8

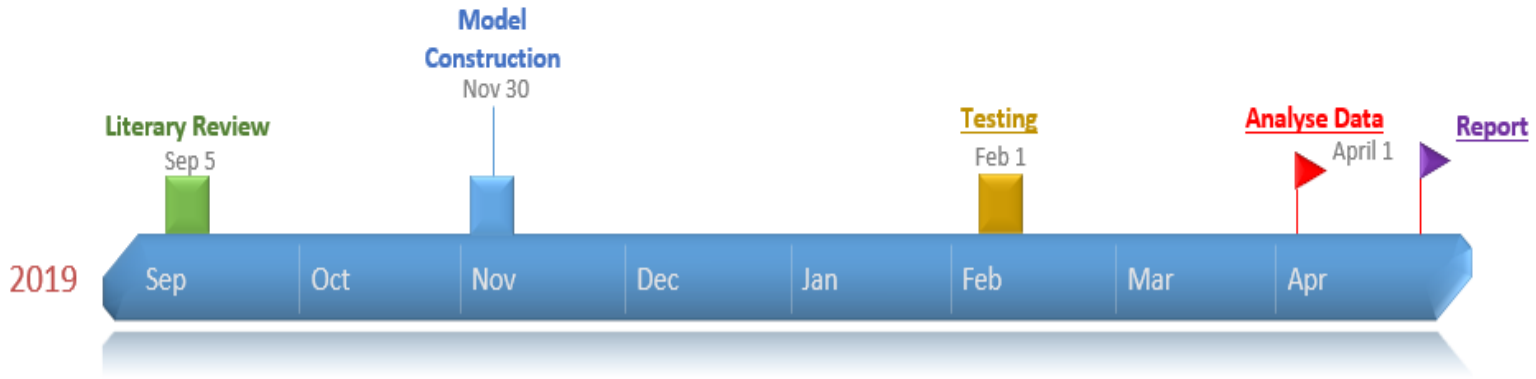
b) A computational Model was planned in order to predict the population of clams under certain amount of chemical

c) Collection/ Constructing Model was planned for a month.

Project Tasks and Deliverables

Actual Schedule





a) Testing was actually done in two months, but the first one data was not useful.

b) Model construction took one more extra month.

c) A computational method was not possible to do since the limited amount of data.

Design and Analysis

- **Methodology:**
  - Record clams live clams before treatment.
  - Treat clams with an specific concentration of EarthTech
  - Record clams after treatment
  - Analyze data

Design and Analysis

- Record clams before treatment

Design and Analysis Cont'd

- **Assumptions**
  - If clams did not move they were not alive.
  - Clams were in good condition(not weak, or half dead)

Design and Analysis Cont'd

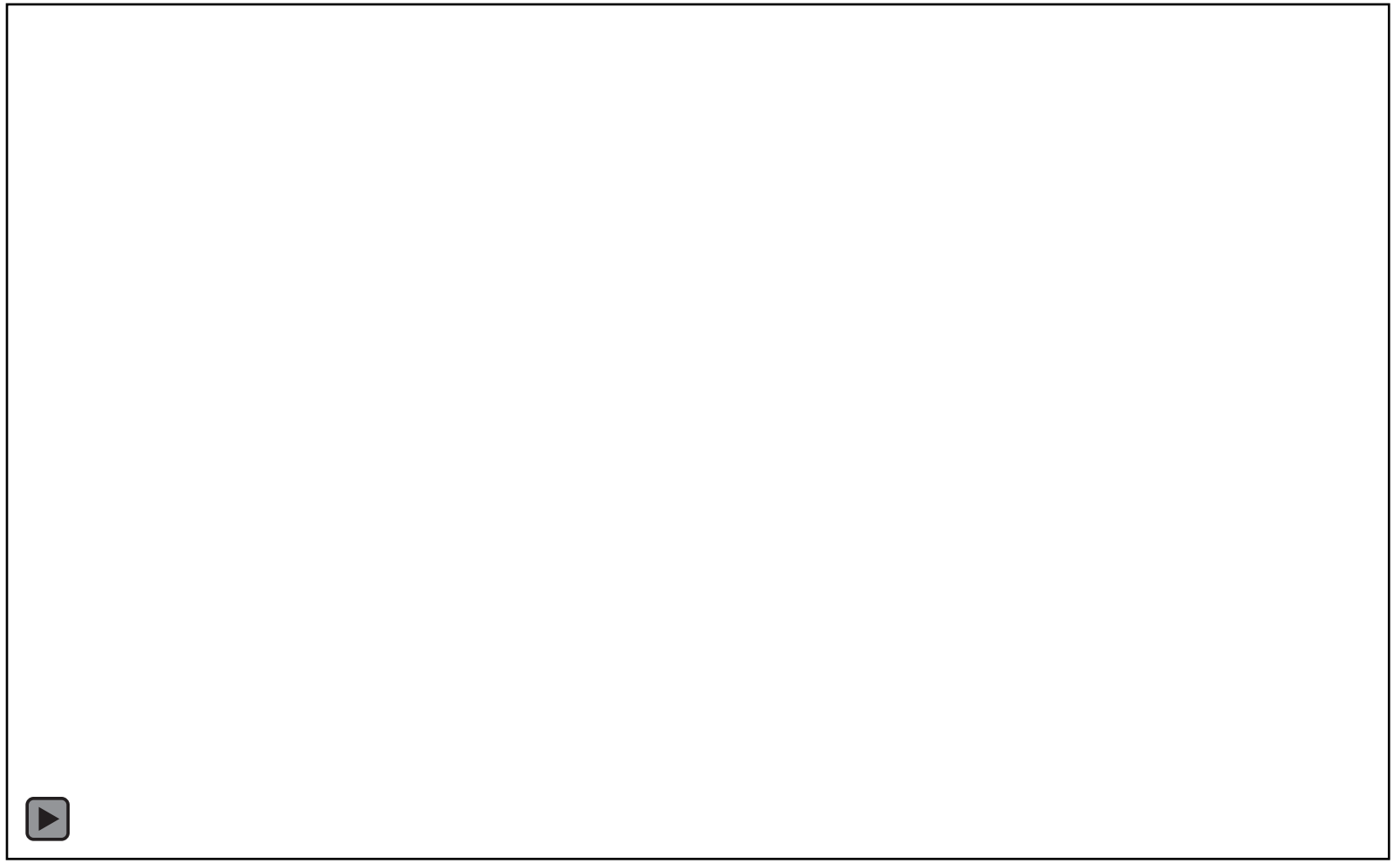
Challenges

- Clams were broken.
- Clams were really small to be recorded
- Clams did not move in water alone.
- Clams need oxygen circulating to be alive.
- Cleaning fish tanks Constantly.
- **NO MONEY** to buy cellphones to record with good quality.
- Cellphones were not able to record continually.

Design and Analysis Cont'd

- **Findings**
  - Clams like to cover themselves into fine sand.
  - Clams do not move until they feel comfortable with the new environment.
  - Clams cannot be storage in the same place for longer periods of time
  - Open Clams that lost the ability to close are dead
  - Close clams can not be classified as living or dead without recording
  - Non-Moving Clams cannot be treated as dead.

Design and Analysis



Design and Analysis

- **Methodology:**
  - ~~Record clams live clams before treatment.~~
  - Treat clams with an specific concentration of EarthTech
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Design and Analysis

- Treatment

Discussion of Results

- **Assumptions**
  - The solution was mixed evenly on the 90 and 100 Gallons tanks
  - A close system can represent Lehi water system.
- **Findings**
  - Clams tend to not move in material that is different from sediment.
  - Clams look similar before and after the treatment was done.
  - The solution was not mixed evenly through the tanks

Discussion of Results

Challenges.

- A close system was only possible for the limited material provided to construct the Model
- Not able to record clams while they were treated due to limitation time.
- Not able to test for longer periods of time.
- Not able to find a way to feed the clams in order to keep them alive

Design and Analysis

- **Methodology:**
  - ~~Record clams live clams before treatment.~~
  - ~~Treat clams with an specific concentration of EarthTech~~
  - Record clams after treatment
  - Analyze data

Design and Analysis

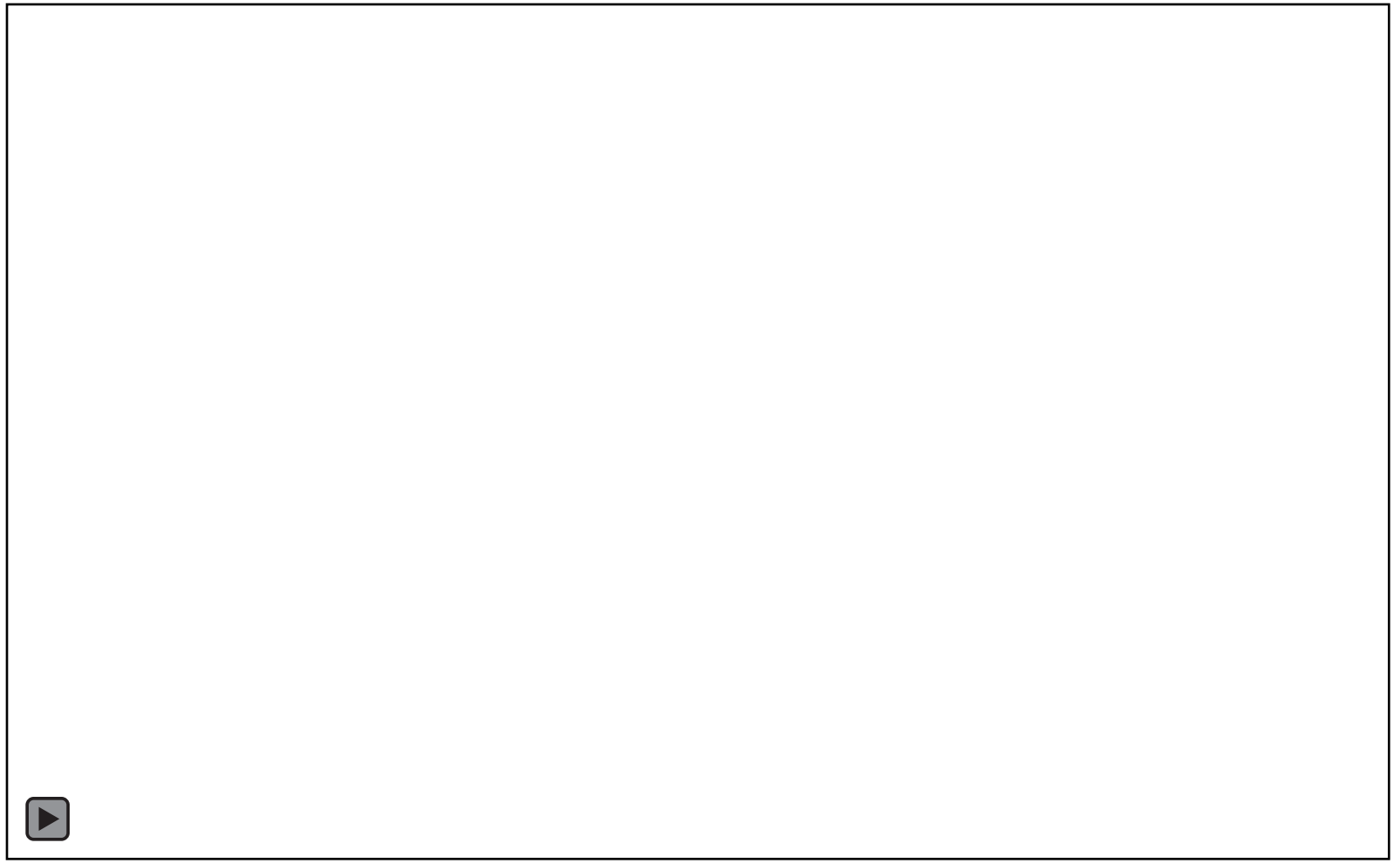
- Record clams after treatment

Discussion of Results Cont'd

- **Assumptions**
  - Non Moving clams were treated as dead.
  - Moving clams were treated as alive.

- **Challenges**
  - Not able to record clams for more than one day.
  - Not able to distinguishing if the clams stop moving due to previous damage or starvation.
  - Not oxygenation of the water on the post treatment tanks.

Discussion of Results Cont'd



Design and Analysis

- **Methodology:**
  - ~~Record clams live clams before treatment~~.
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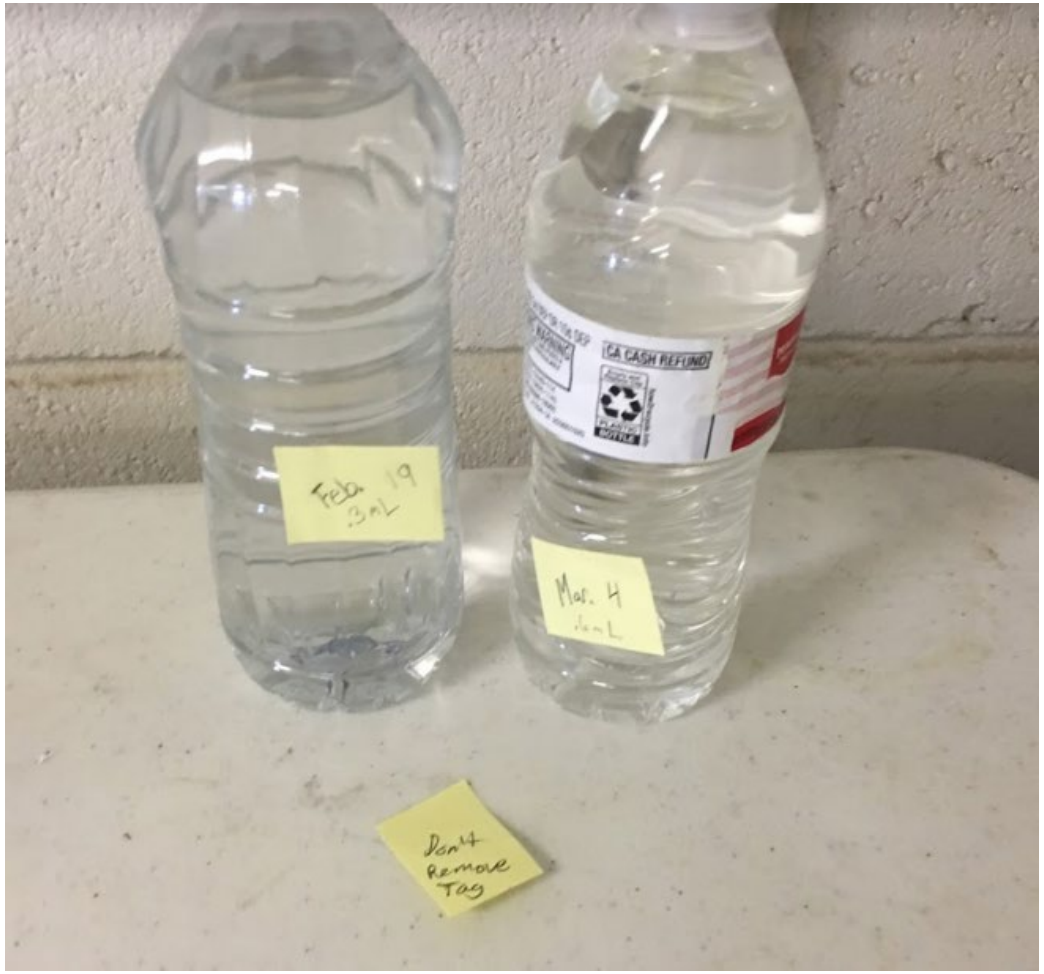
  - Analyze data

Design and Analysis

- Analyze data

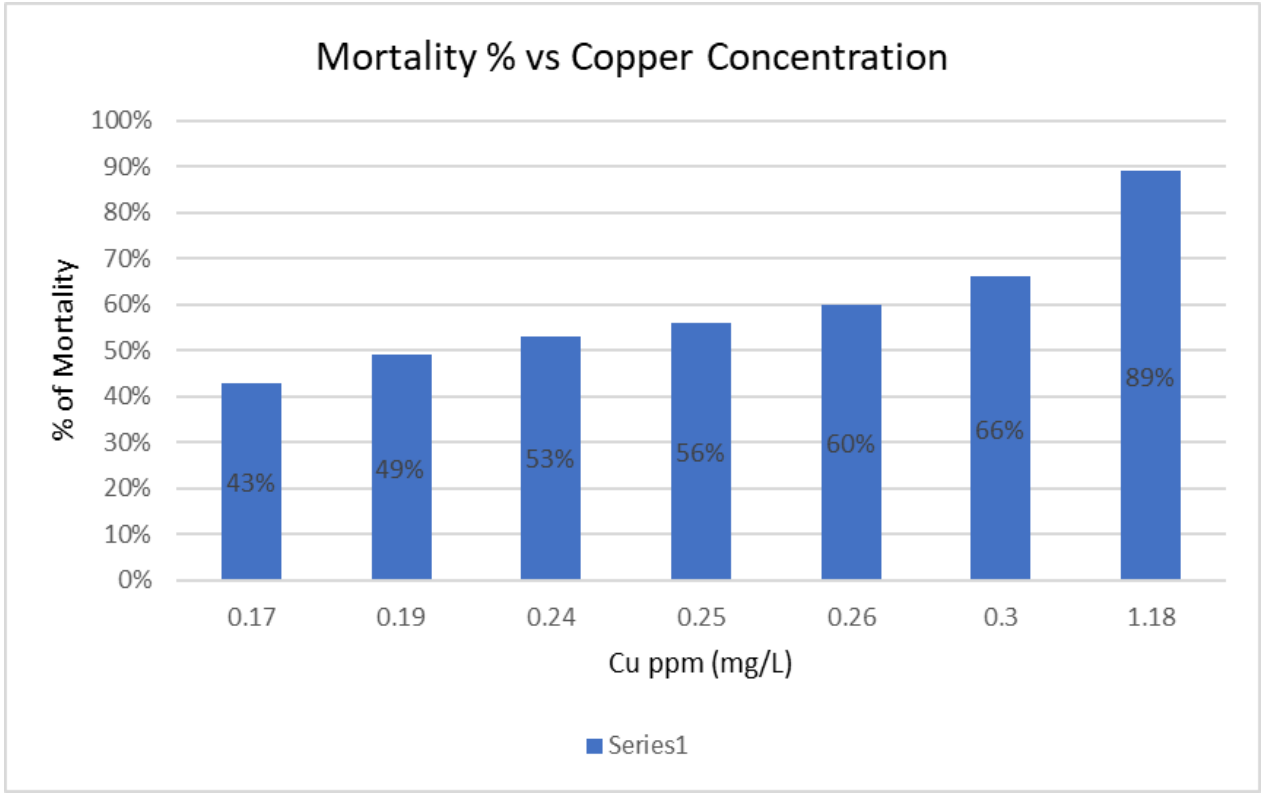
Discussion of Results Cont'd

- **Challenges**
  - There were not enough time for testing.
  - Most of the time was spend finding a methodology to analyze data.
  - Few testing data in order to do predictive modeling.

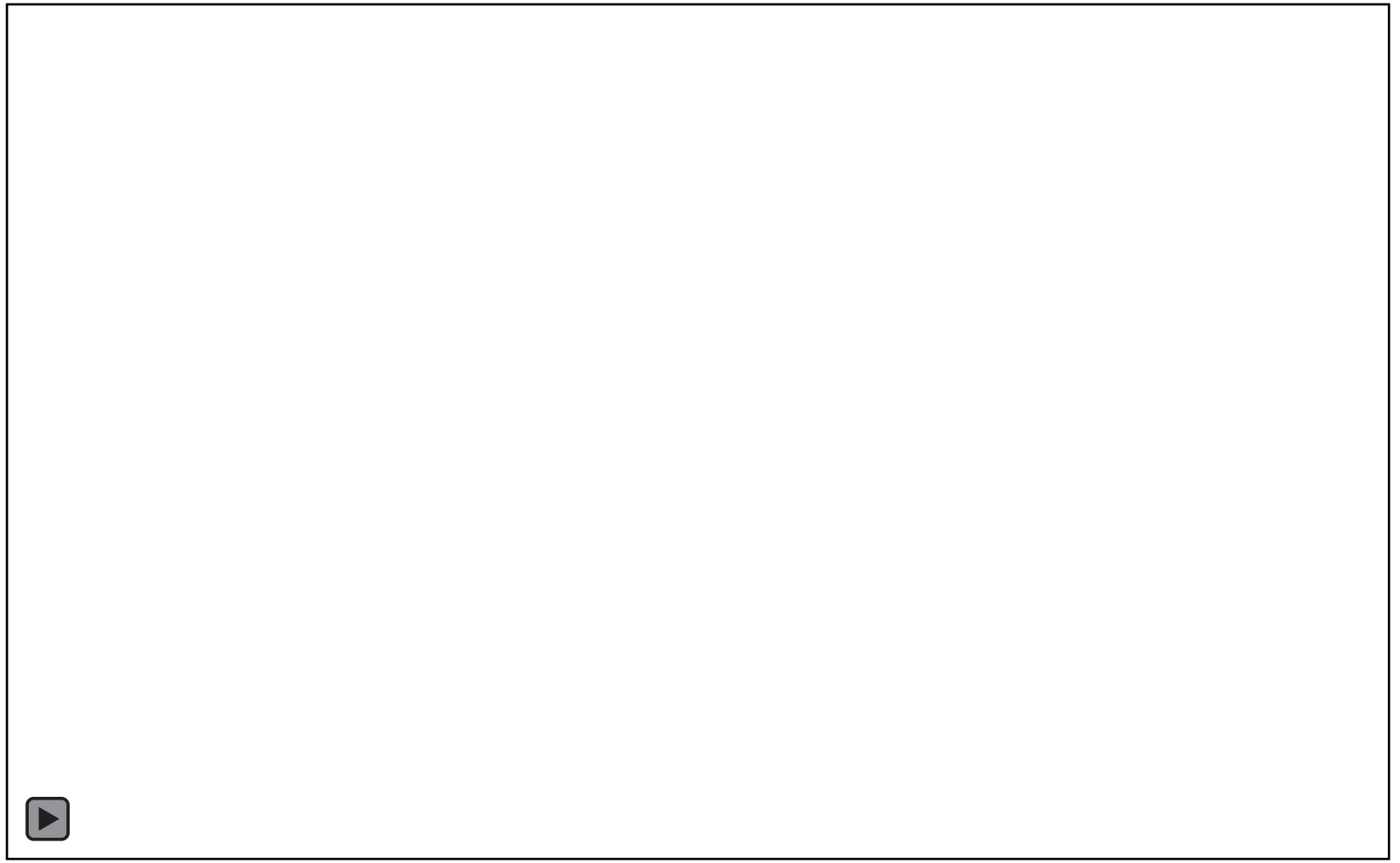


Discussion of Results Cont'd

- **Findings**
  - Higher concentration not always give a higher mortality rate.
  - Good Mortality rates are reached using more than the recommended copper concentration.
  - Longer testing time may affect the effectiveness of the treatment method.



Discussion of Results Cont'd



Design and Analysis

- **Methodology:**
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Conclusions

- Two to Four gallons of per million gallons of water.
- Test different sites on their irrigation system for concentration of copper to stay below the restriction allowed by EPA.
- Set up filters were infected water enter to the system in order to reduce clams population.
- Not possible to eradicate clams under the current situation of Lehi City water system.

The End

Any Questions?