The Effects of Ocean Temperature on *Ecklonia Cava* Growth and Its Implications

Thousand Oaks High School
AP Research STEM

Introduction

Ecklonia Cava

- Edible brown algae
- Found around the coasts of Japan and Korea

Figure 1. *Ecklonia cava* (*E. cava*)

Health Benefits

- Decrease blood pressure
- Lower glucose levels
- Lipase inhibitory activity
- Increase hair growth

Figure 3. Bottle of *Ecklonia cava* extract

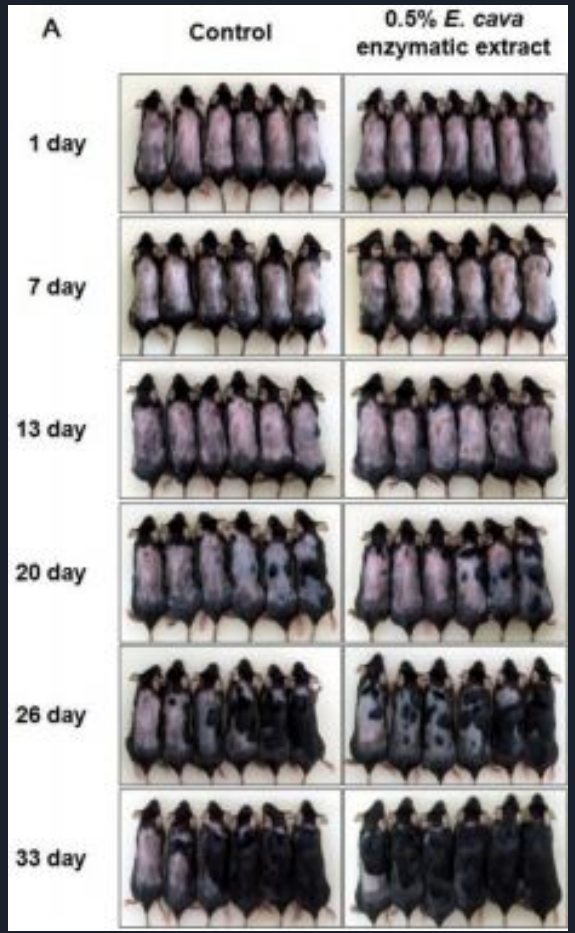


Figure 4. Experiments done on mice to determine effects of *E. cava* on hair growth

Harmful Environmental Factors

- Increasing ocean temperatures
- Grazing herbivorous fish
- Kuroshio Current

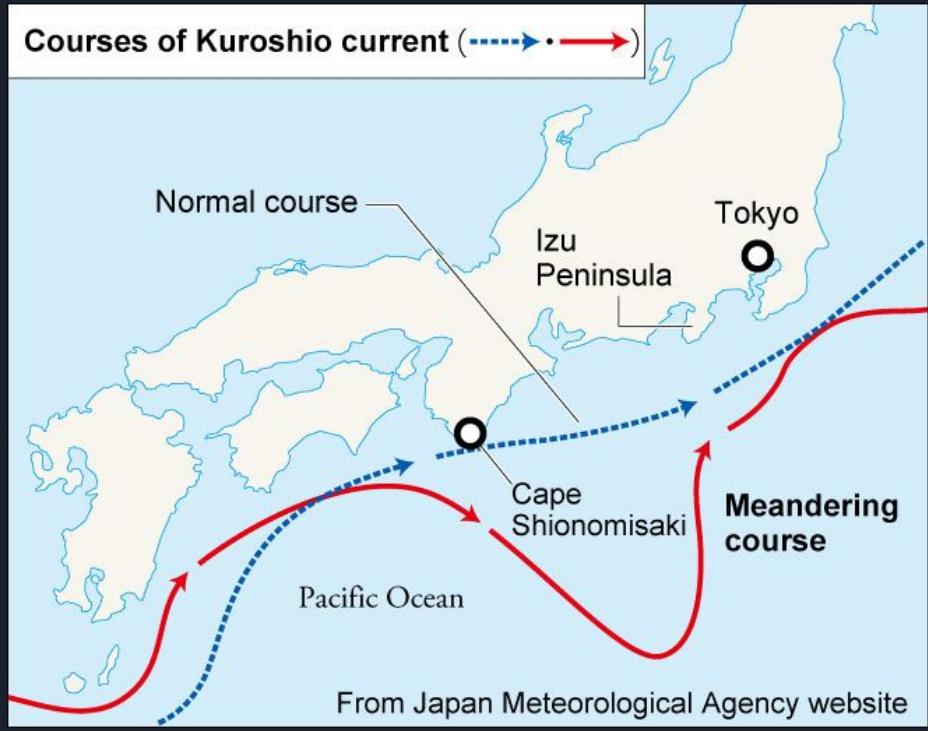


Figure 2. Course of Kuroshio current

Problem

- Coastal ecosystem will unbalance
- Abalone farmers lose income
- Potential health benefits disappear

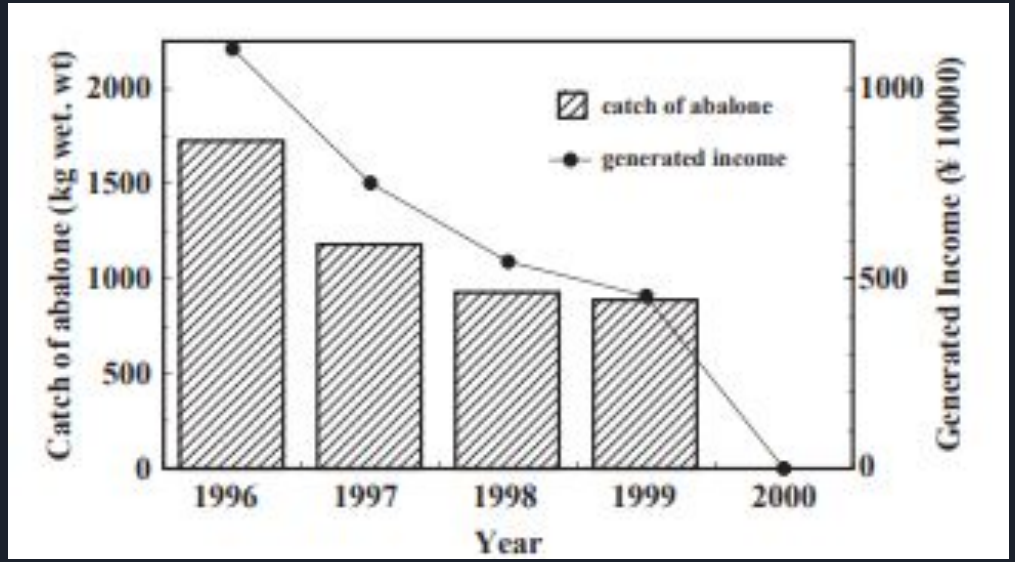


Figure 5. Abalone catches and generated income at Tei from 1996 to 2000

Current solutions

Figure 6. Signs of grazing on the edges

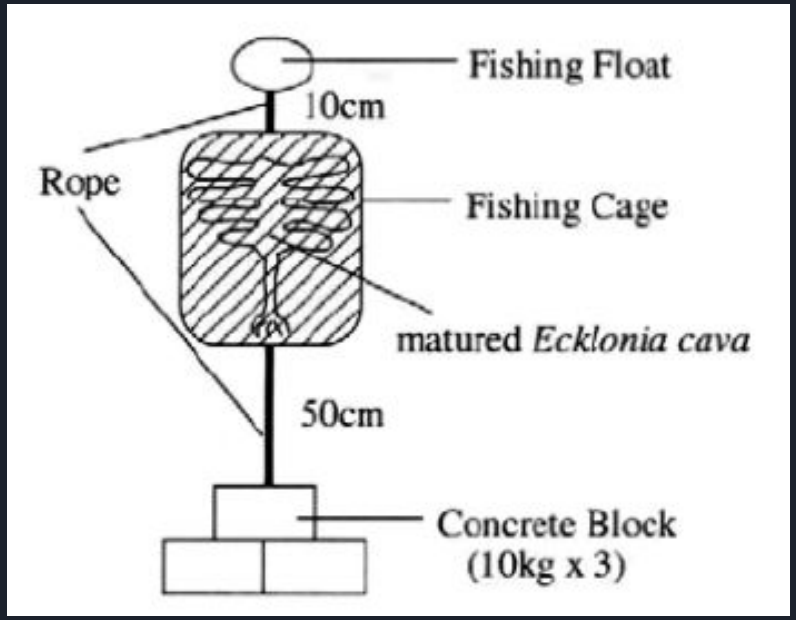


Figure 7. Diagram of the spore bag method

Current Solutions

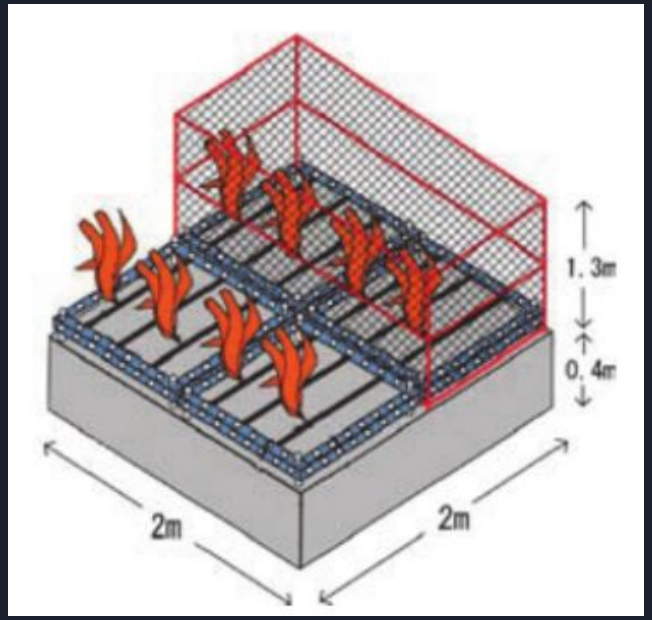


Figure 8. Diagram of the net cage methods

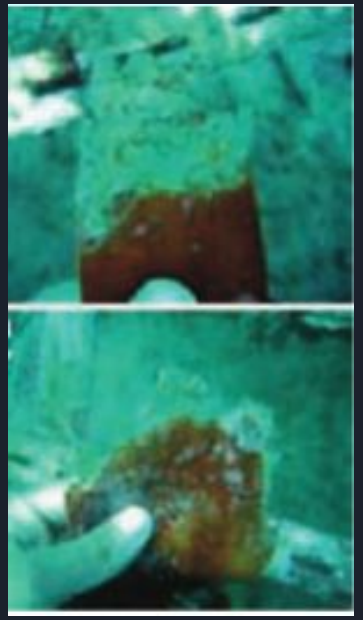


Figure 9. Bleaching and dissolving of the leaning edge of the blade

Current Solutions

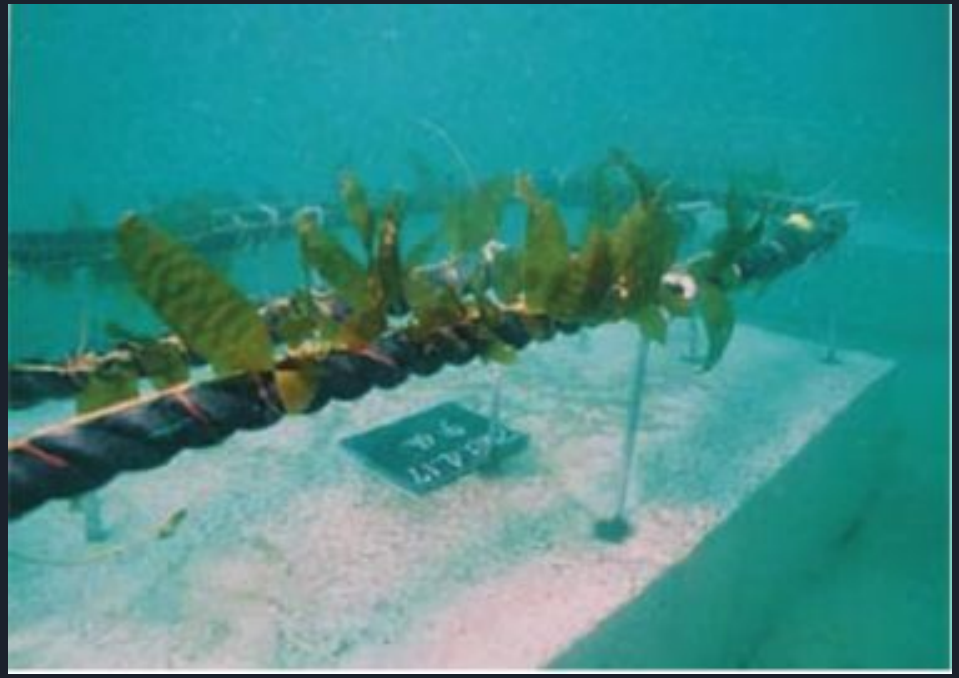


Figure 10. Seedlings on an artificial reef

Purpose

- To determine the effects of rising ocean temperatures on *E. cava*

Research Question

Do rising ocean temperatures affect *E. cava*?

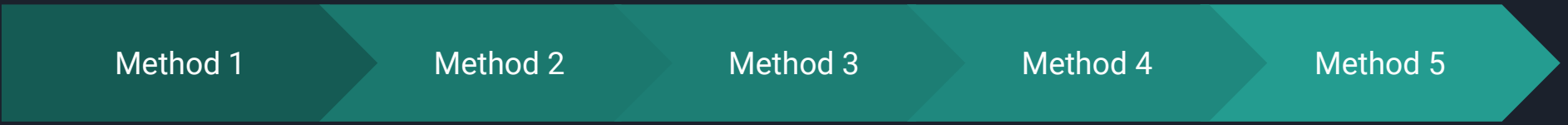
Hypothesis

Alternative: Increasing ocean temperatures decrease the growth rate of *E. cava*.

Null: Temperature does not affect the growth rate of *E. cava*.

Methods

Methods



Systematic Literature Review

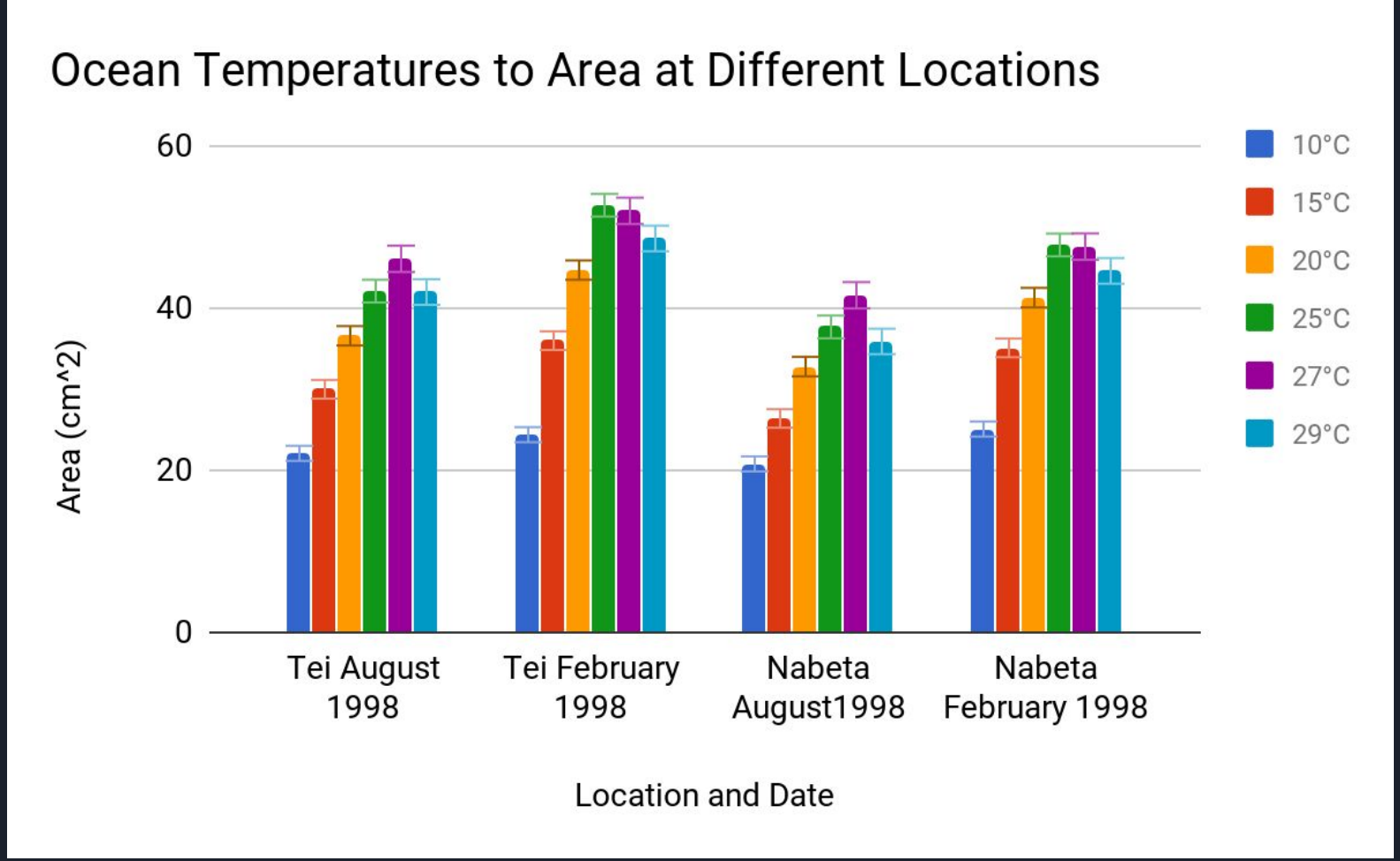
Article Collection

Data Collection

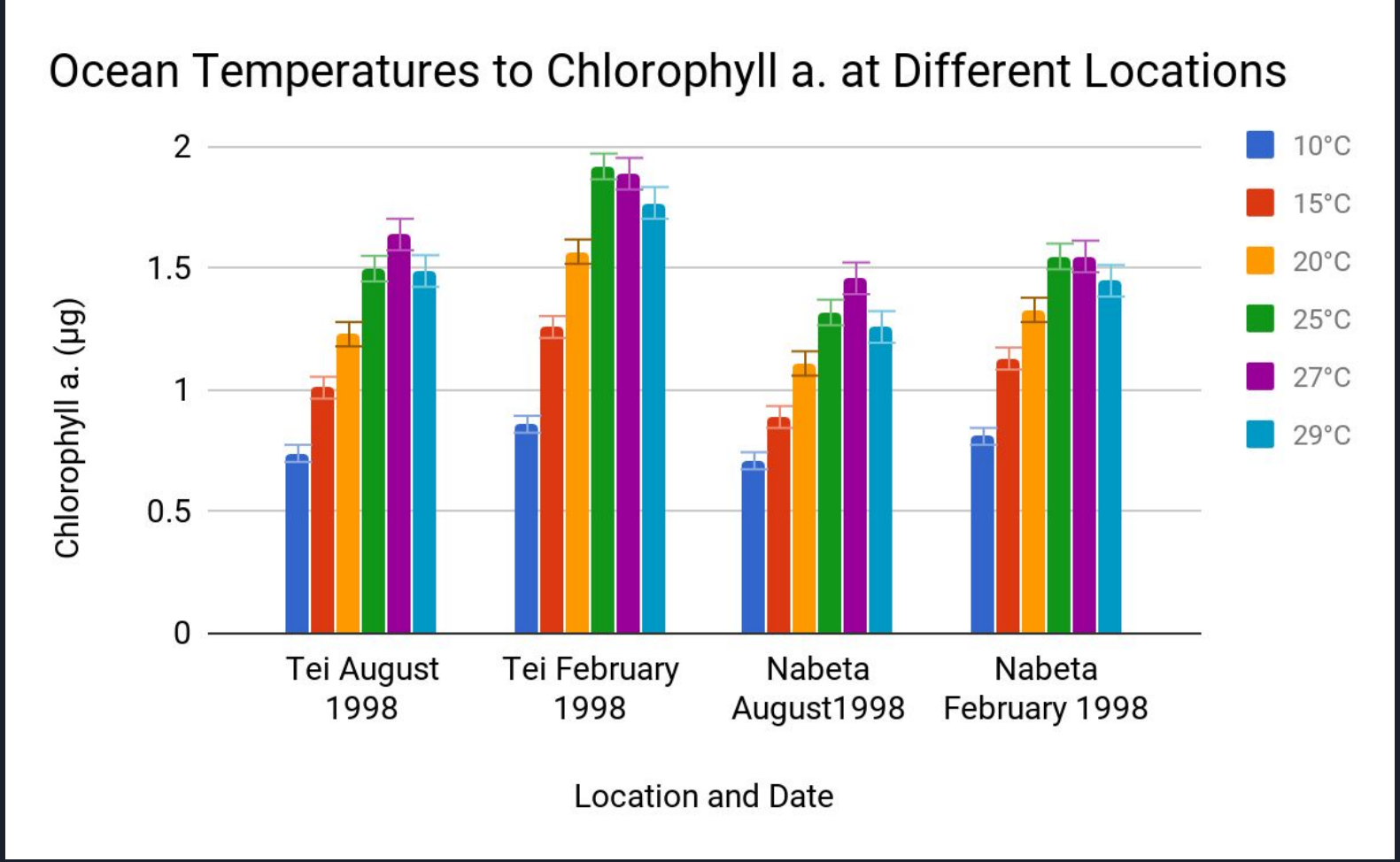
Analyze Potential Applications

Publicize Findings

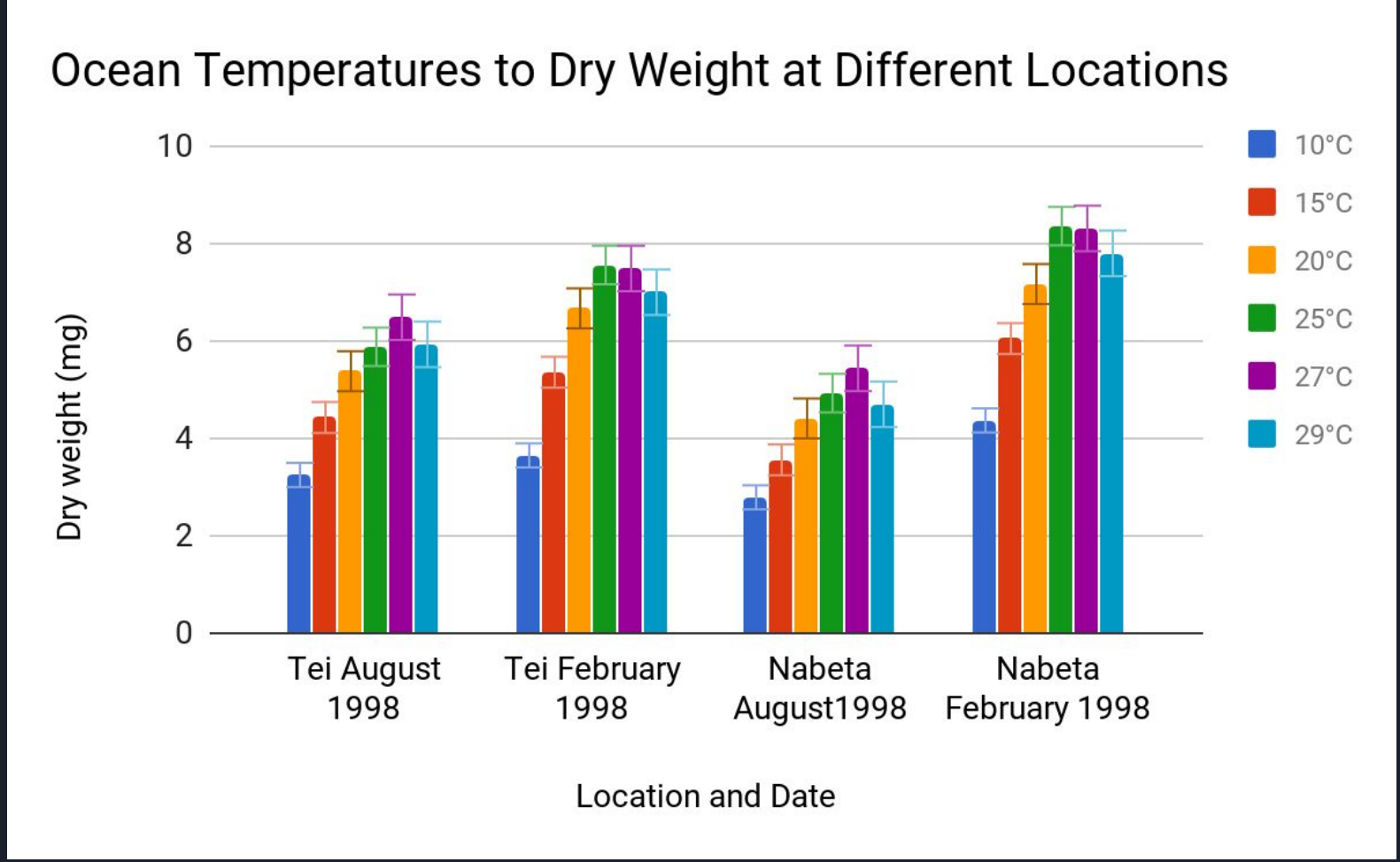
Results



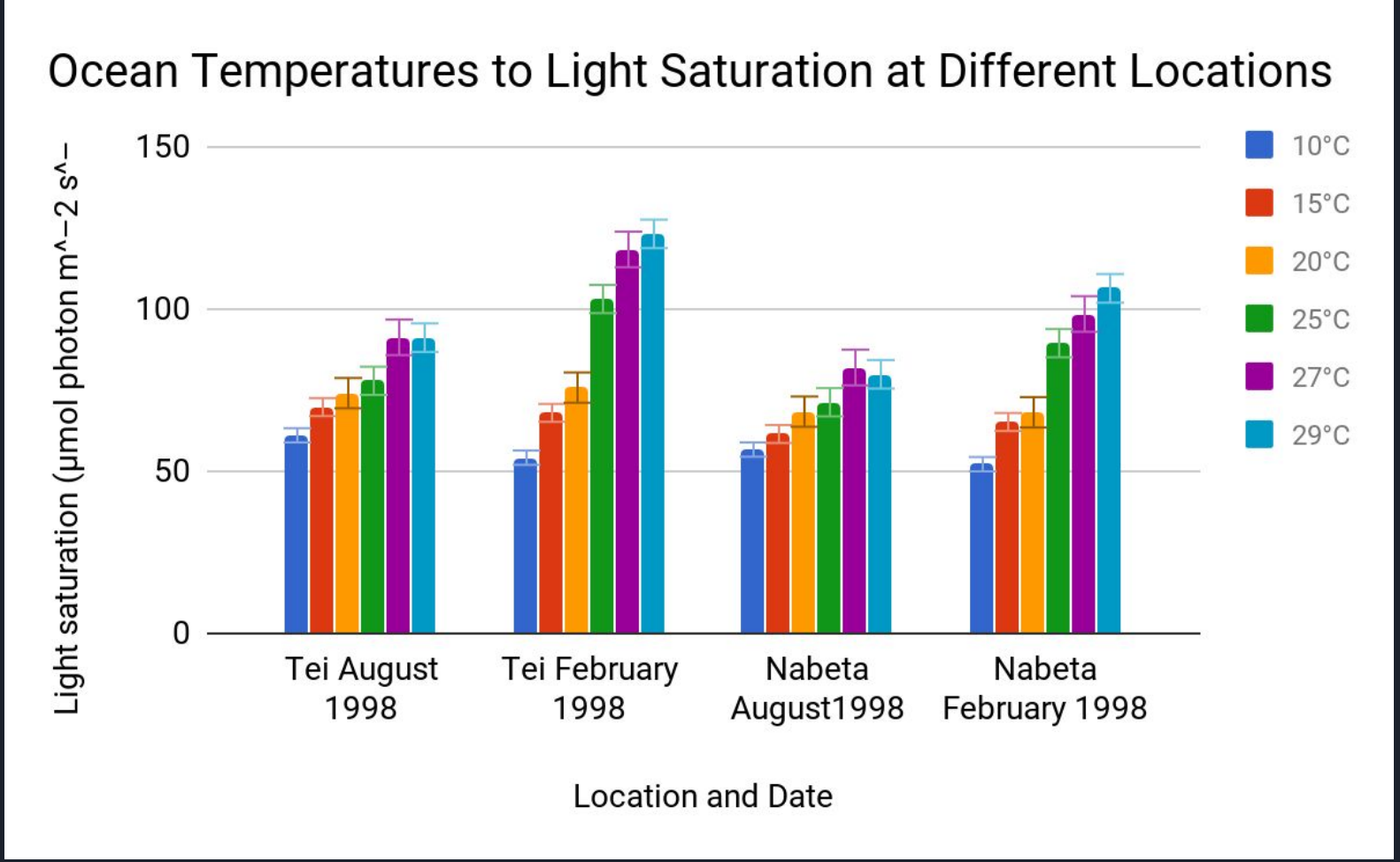
Graph 1. The bladelet area measured at different temperatures and locations



Graph 2. The bladelet chlorophyll a. measured at different temperatures and locations



Graph 3. The bladelet dry weight measured at different temperatures and locations



Graph 4. The bladelet light saturation measured at different temperatures and locations

Discussion

Discussion

- Brings in herbivorous fish
- Seaweed growth affected by these factors
- Best solution is habitat change

Limitations

- Declined around 1980s
- Located around coasts of Japan and Korea
- Declined quantity of seaweed beds

Conclusion

- Rising temperatures can decline the population of *Ecklonia Cava*
- Potential solutions would be moving the habitat
- More research on potential solutions
- Potential health benefits

Application to the real world

- Permanent solutions could help many species
- Health benefits apply to many people

Acknowledgements

- Dr. Malhotra
- Dr. Henckels
- Dr. Htway
- Michelle Magnusson
- Emily Htway

References

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