# Final Report

**Team Number: 9**

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**Area of Science:** Environmental Science

**Executive Summary**

Ice algae are groups of microalgae organisms that live on ice in the arctic regions. Ice algae photosynthesize under very low lights. However, if they are exposed to too much light, they will not be able to thrive and do their job in the arctic food web. Ice algae are pretty much the bottom of the food web. It is eaten by zooplankton, zooplankton are eaten by sea birds, arctic cod, and more animals. That leads up to seals, which are Polar Bears main food source. 90.2% of ringed seals are eaten by polar bears. If the ice melts and the ice algae dies that will completely throw off the current ecosystem that inhabits the Arctic circle.Ice algae are pretty much the bottom of the food web. It is eaten by zooplankton, zooplankton are eaten by sea birds, arctic cod, and more animals. That leads up to seals, which are Polar Bears main food source. 90.2% of ringed seals are eaten by polar bears. If the ice melts and the ice algae dies that will completely throw off the

current ecosystem that inhabits the Arctic circle.

## Problem Statement

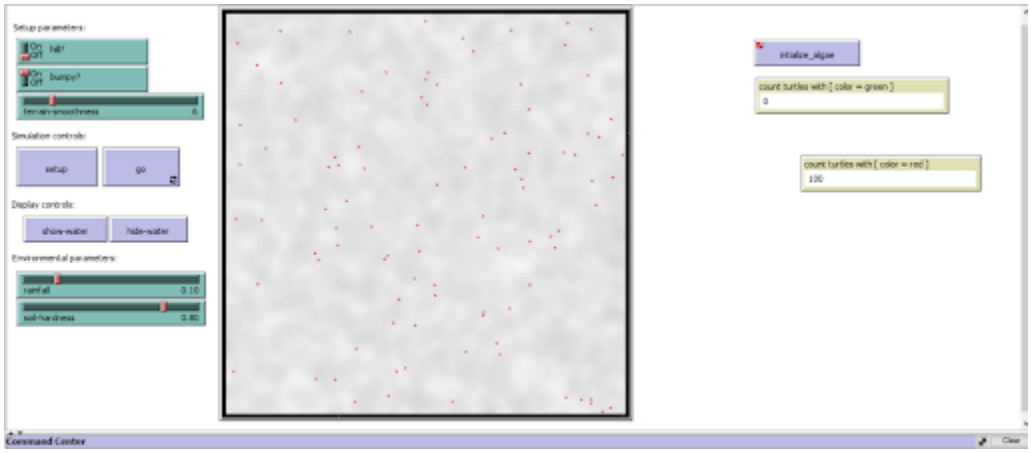
The ice that is in the Arctic circle is melting because of the rising temperature of the earth. With that in mind you can already guess so many ways as to why that affects our earth. Especially our Arctic ice and life within it. Seals live in the water along the ice around the arctic circle so they have easy access to their food source, different types of fish and penguins. Polar bears hunt seals, so it would make sense that just as the seals do, the *polar bears would follow their food source.* However, the ice is melting. The arctic is actually shrinking approximately 13% per decade. So, as the ice melts, the access Polar bears have to their food source is melting along with it.

## Method

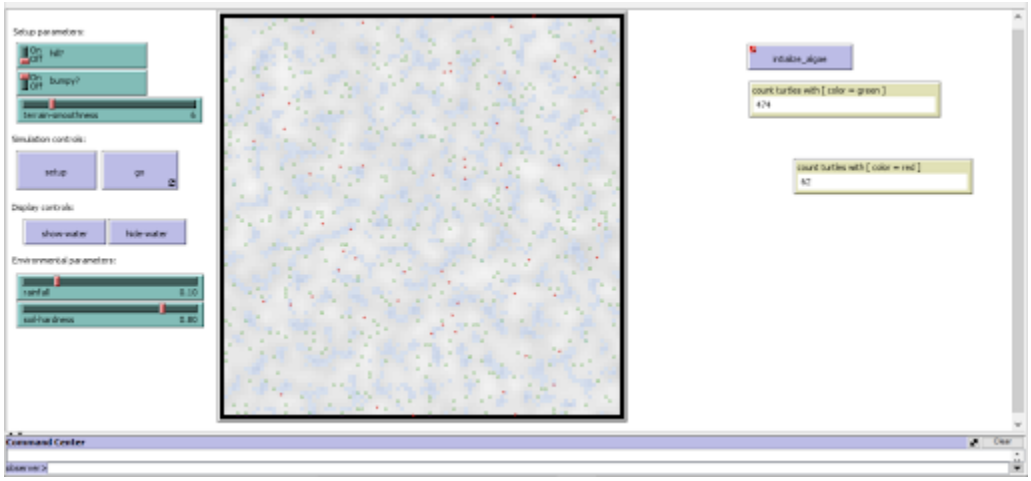
Our plan to help the polar bears is to move a food web to somewhere that is a lot more suitable for living. How exactly we plan to do that is by breeding ice algae in a new place that has thicker ice so the Algae does not have too much exposure. The ice algae will die if it does have too much sun exposure. As the old ice algae is dying we are breeding more in a safer location so the food web can continue to live.

**Code**

Unfortunately due to a learning curve I didn't have the chance to do exactly what I wanted in our model. However, our model shows a very important step to our project, how the ice melting affects the food web.

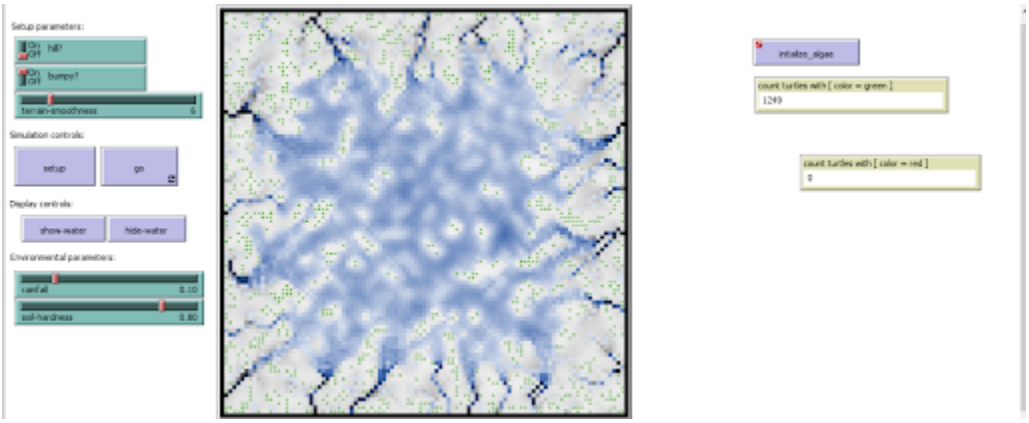


This screenshot of our model shows the crustaceans (red) before the algae grows.



This SC shows how the crustaceans and algae interact with each other. In our

model the crustaceans live on the algae.




This SC demonstrates the process of the ice melting causing the algae to start dying, as a result the crustaceans die.

**Conclusions**

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We plan to use our current model and grow onto it and add much more data. As well as polish our model so it can show great results. What we plan to add to our current model is a demonstration of the effects the algae dying and our plan to grow more in a different place has on the food web. We hope over the summer and next year we can become much more adept to the world of coding.

This year has truly allowed us to take and hone our skills at researching, working together and so much more. In conclusion we now are made aware of the issues happening in the arctic circle. So as our project grows, we will with it and learn as

much as we can to help the polar bears.

Our results this years are only a little part of what we need to go through with our project. As a result of our research we know the climate conditions of the Arctic circle that originally attracted us to this issue. However there is so much more happening than just the ice melting, the effects that it has on the food web. This project has made us want to learn as much as we can and allowed us to put ourselves to thinking and put the issue to rest as much as we can with those findings.

**Acknowledgments**

Throughout this project we have had so many chances to learn about our subject through the internet and the opportunities granted to us through the supercomputing challenge, so now we would like to give a special thanks to the ones that helped and gave us the good fortune that brought us to this point throughout our challenge. Thank you so much to Ms. Patty and Ms. Glennon for giving the start to our adventure into supercomputing and helping us along the way. I also want to thank The ABQ Zoo for allowing us to learn and ask questions with people who actively take care of polar bears.