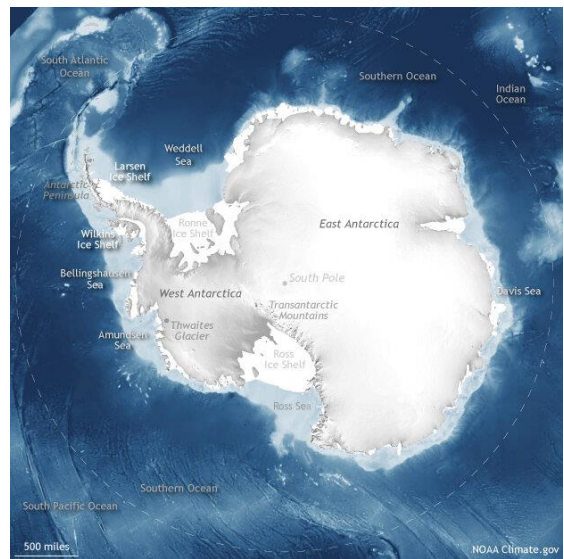


All about the Ice

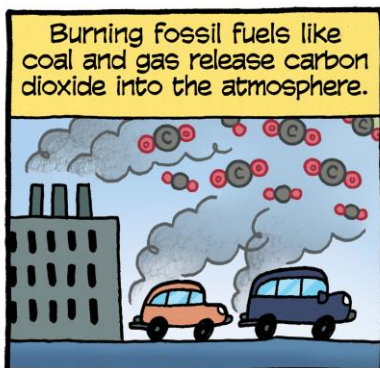
Introduction:

Ice is an important feature of the Antarctic. The creatures that live there have special adaptations to living in a cold environment. Many of the marine mammals that The Marine Mammal Center works with have similar adaptations, and similar problems to overcome. Studying how and where ice melts can provide insights into how the ocean is changing all over the world. Through our work with Northern elephant seals along the California coast, the Center can find ways to better protect these precious creatures in our backyard and the Antarctic, like the Southern Elephant Seals! To learn more about Antarctic and polar species, [click here](#).



Background Information:

We see ice at the poles and around the world melting. This excessive melting, and warming water temperatures is caused by burning fossil fuels like coal, oil and natural gas. This releases excess carbon dioxide gas into the atmosphere where it acts like a heat trapping blanket around the earth and warming the land, air, and sea. When the sea and land warms, water expands and ice melts causing sea levels to rise. Sea level rise makes the beaches smaller and it becomes easier for storms to wash a pup away from mom, resulting in many malnourished and underweight pups.



Impacts on Northern Elephant Seals like Madeleine

Madeleine: We see the effects of sea level rise all over the world, especially in coastal communities such as in Northern California where The Marine Mammal Center is located. Sea level rise can reduce the available space on breeding beaches leading to more crowded beaches. In turn, young pups become more likely to get washed out to sea or separated from their moms. We think this might be what happened with Madeleine, a malnourished and underweight northern elephant seal pup who needed help! Northern elephant seals like Madeleine are the second most common patient at the Center.



Madeleine
Northern elephant seal
Female pup

Rescue Location:
Hearst Memorial State Beach - San
Simeon, San Luis Obispo

Age: Less than a month

Admit weight = 29.50 kgs (65 lbs)

In Treatment For:

- Malnutrition
- Maternal separation

Release: Luckily for Madeleine, she came into our care at The Marine Mammal Center. After about four months of food and learning to hunt on her own she was able to be released back into her ocean home with other northern elephant seals this past June! While we are so happy Madeleine got the help she needed, we want to make sure every elephant seal pup is ok. We need to tackle this problem at the source! And for that, We need to take a closer look at the melting ice that is causing the sea level to rise!

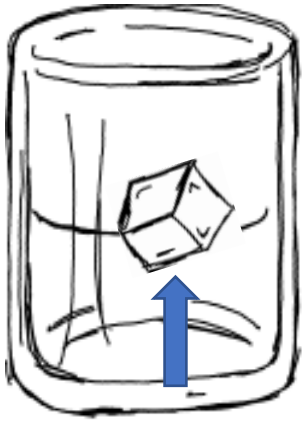


All about the Ice: Activity Setup and Process

There are two places we see ice in our world, either on land like the Antarctic or in the ocean as icebergs. And with our activity today, we are going to look at how where ice melts from makes a difference when it comes to sea level rise.

Materials Needed:

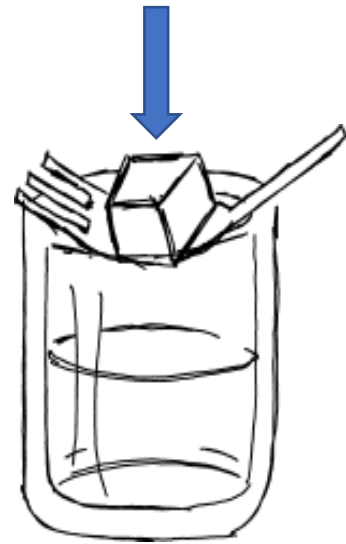
- **Water**
- **2 Cups**
- **2 Ice cubes (about the same size)**
- **1 small sieve or filter or fork***
- **Dry erase marker/tape**
- **Hairdryer**



Sea Ice (ice IN water)



Land Ice (ice IN sieve)



Land Ice (ice ON fork)

Instructions:

1. Fill both cups with water to a similar level. The water in these cups represents the ocean.
2. Prepare 1 cup for land ice. Place a small sieve or fork* over the top of the cup so that the ice melts into the water. (see setup above)
3. Add the ice! For the land ice, place the ice cube on the sieve or fork so that as it melts it will drip into the water below. For the sea ice, place the ice cube directly in the water.
4. Now that we have represented the ice we see in the world, mark with a dry erase marker or piece of tape where the water line is.
5. Grab the hairdryer! Do your best to heat both cups evenly with warm or hot air from the hairdryer. This represents the warmer climate conditions the ice is under.
6. After a little while (you don't have to melt the ice completely, but you can!) mark where the new waterline is now.

* Note: Most forks will need to be held as not to tip out of your cup



All about the Ice Activity: Conclusion

Activity Questions:

1. What did you notice?

2. Based on the change in water level, where do you think we should look for ice melt? Where does that ice exist on our Earth? Click [here](#) for a nifty map of land ice!

3. Can ice that melts into the ocean so far away make a difference for me or the coastal places I like to visit?

4. How can you help make sure there is plenty of ice on our Earth so that there can be room for elephant seal pups like Madeleine on the beaches? (*Hint, click [here](#) to learn more!*)

Further Learning:

All ice melting makes a difference. Because sea ice is directly in warming water, it will melt faster than the land ice and can be a good indicator of changes we need to make. Explore how sea level change might affect you or your favorite coastal places to visit using this [tool](#). Then, become an Ocean Hero and explore ways you can take action to reduce your use of fossil fuels and lessen the impacts of climate change, like sea level rise, on marine mammals! Learn more on our [website](#) on the "How You Can Help" section.