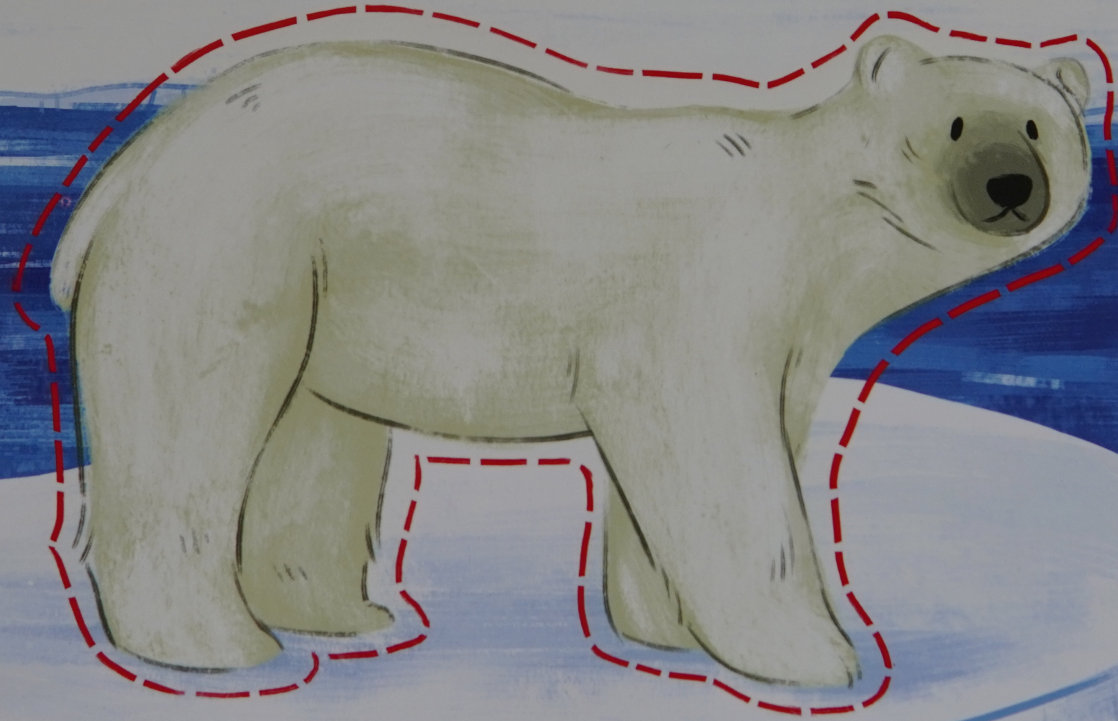




Lily Williams

IF POLAR BEARS DISAPPEARED



GLOSSARY

APEX PREDATOR: the top predator in an ecosystem.

ARCTIC: the region at the top of Earth that is centered around the North Pole and experiences long, cold winters.

ATMOSPHERE: the layers of gases surrounding a planet that are held in place by the planet's gravity.

CLIMATE CHANGE: a marked change in Earth's overall weather patterns or average atmospheric temperatures.

DEN: a cave or secluded area where wild animals live.

DENNING: to live in or inhabit a den.

DEPTH HOAR: big, cup-shaped snow crystals formed at the base of snowpack due to temperature variations.

DESCEND: to originate from a common ancestor.

ECOSYSTEM: a system of living and nonliving things interacting in an environment.

ENVIRONMENT: all the living and nonliving things in a place or region.

EXTINCTION: the deaths, or inability to reproduce, of the last individuals of a species.

GREENHOUSE GAS: a gas that absorbs infrared radiation from the sun, trapping heat and creating a "greenhouse effect" of warming temperatures on Earth. Carbon dioxide, methane, and ozone are examples. The more of these gases there are in the atmosphere, the more heat is trapped.

ICE LENS: a porous, thin layer of ice with cracks that forms as a film atop snow, dirt, or water.

POLLUTION: contamination by an unwanted or harmful substance or thing.

SEA ICE: frozen water on the surface of the ocean. Salt water freezes at 29°F (-2°C).

SUBNIVEAN: a protective zone where the snow meets the ground and where small animals live in winter.

TUNDRA: a cold, treeless landscape with permanently frozen subsoil.

THE ARCTIC IS IN TROUBLE

Our world relies on a delicate equilibrium to stay healthy, and man-made climate change is the largest contributor to a growing imbalance. According to the National Oceanic and Atmospheric Administration, fifteen of the sixteen warmest years on record have occurred since 2001. With temperatures rising consistently, the sea ice in the Arctic is melting at an alarming rate. When too much sea ice is lost, sea levels will rise. This could eventually drown some islands, greatly alter coastlines, and severely impact the fragile Arctic ecosystem. If there's inadequate sea ice, apex predators like polar bears could disappear completely, as could Arctic pinnipeds, including ringed seals.

If less—or no—snow falls, animals such as lemmings and hares that live and are protected within the subnivean ecosystem will be vulnerable to predators, and their numbers will decline. That, in turn, will affect foxes and wolves, which prey on them. Different kinds of ground vegetation could grow as the soil absorbs the warmth of the sun. This could decrease the populations of herbivores like caribou. And without sufficiently cold temperatures in the winter, the Arctic mosquito population could increase so much that they could swarm and prevent the remaining birds and mammals from feeding, starving some and driving others away. The Arctic mosquito is relentless in its pursuit of blood, often causing interruptions in the feeding patterns of caribou.

The challenge posed by climate change in the Arctic is unique because, unlike areas of the world where you can replant trees or fence off plots of land, once the temperature stays above a certain level, sea ice won't refreeze. The higher Earth's temperature rises, the worse the effects of climate change will be, and the more likely the Arctic will be changed forever.

HOW YOU CAN HELP SAVE POLAR BEARS

You can help save the Arctic by making environmentally friendly decisions to help reduce climate change:

- Burn less fossil fuels. Take public transit, bike, walk, or carpool, and be mindful of how much gasoline you use.
- Get your electricity from alternative power sources like solar and wind.
- Turn off lights and unplug other electrical devices when they aren't being used. Make sure the lightbulbs and appliances you do use are energy-efficient.
- Recycle your trash and purchase products that have less packaging. Look to see if you can participate in your community recycling and composting programs.
- Set your home's thermostat lower in the winter and higher in the summer.
- Eat locally produced, sustainable food whenever possible. Check out nearby farmers' markets and food co-ops. Buy products made closer to your home.
- Eat less meat. One pound of beef takes almost two thousand gallons of water to produce, but a pound of vegetables takes much less. Consider adopting meatless Monday.
- Tell your government representatives that you want a renewable energy-based future.
- Encourage people to talk about the environment. Speak out about climate change to spread the word!

AUTHOR'S NOTE

The information in this book is a simplified description of a complex process.

To learn more, start with the Bibliography and Additional Sources listed on the opposite page.

I believe that when art and science are combined, we can create something powerful that inspires learning. The *If . . . Disappeared* books started with sharks in *If Sharks Disappeared*, but now I am traveling the globe to learn about what happens in different ecosystems. Thank you for joining me on my journey!

While some of the information in this book is educated guesses about what might happen, those guesses are based on the best research available from scientists who have studied the Arctic and the rest of the world for many years. I also consulted with Shelby Angalik, a Nunavut, Canada, resident who kindly spent time teaching me about the Inuit people and the realities of life in the icy north. Shelby is an Inuit, the indigenous people of Alaska, northern Canada, and Greenland. In a lot of places around the world, climate change is considered a problem that will arise in the distant future. However, climate change is already a problem for the Inuit because the warmer temperatures and melting ice affect hunting and travel, disrupting their way of life and threatening their deeply held culture.

Climate change is a pressing issue right now, and we can help slow this process. Start by working together to spread facts like the ones in this book. I hope it inspires you to go on a journey yourself, whether it is in search of the truth within the pages of other books, or into the world on a daring adventure. Let's save polar bears—and the planet!

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