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Polar bears rely heavily on sea ice for roaming, hunting, resting, mating and, in some areas, maternal dens. But due to the loss of sea ice, caused by climate change, today they're a vulnerable species

Hello!

Welcome to your latest polar bear update

Ellen Bowler, research scientist, British Antarctic Survey

Hi, I'm Ellie, a researcher at the British Antarctic Survey. I'm working on solving conservation challenges with the help of artificial intelligence (AI), such as developing automated ways of counting wildlife from satellite and drone images. As they say, a picture is worth a thousand words! The potential of counting wildlife from space is seriously cool. I'm involved in various AI-driven projects, but it's a particularly valuable tool for studying polar wildlife, due to the challenges of working in this remote, rapidly changing environment. Turn over to hear about a project I'm working on that will not only help build more resilient conservation strategies, but make a real difference for people, too. **Thank you!**

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Ice forecasts will help polar bear conservation

ICE INTELLIGENCE

We're using clever tech to help Arctic wildlife overcome ever-evolving challenges

Every year, the sea ice that defines the Arctic naturally expands and melts with the seasons. But the region is warming nearly four times faster than anywhere else on the planet, disrupting a cycle that's been in balance for millennia. Today, summer ice covers only half the area it did four decades ago. This rapid shift has devastating consequences for the people and wildlife whose lives are inextricably tied to the frozen ocean, including polar bears that depend on the ice to hunt.

The problem is that predicting the ever-changing sea ice cover is tricky due to its complex interactions with the ocean and atmosphere. Current physics-based forecasting methods are often inaccurate when predicting weeks or months ahead, and they eat up hours of supercomputer-powered processing. Much like an unreliable weather forecast might disrupt your plans, inaccurate sea ice forecasts hamper conservation efforts.

The British Antarctic Survey is working with the Alan Turing Institute, supported by WWF, on a pioneering way of accurately forecasting Arctic sea ice further into the future. Known as IceNet, this approach is based on a type of artificial intelligence known as machine learning, which underpins technologies like facial recognition and self-driving cars.

Long-term loss of summer sea ice means shipping can reach previously inaccessible areas, potentially putting polar bears at risk

An icebreaker

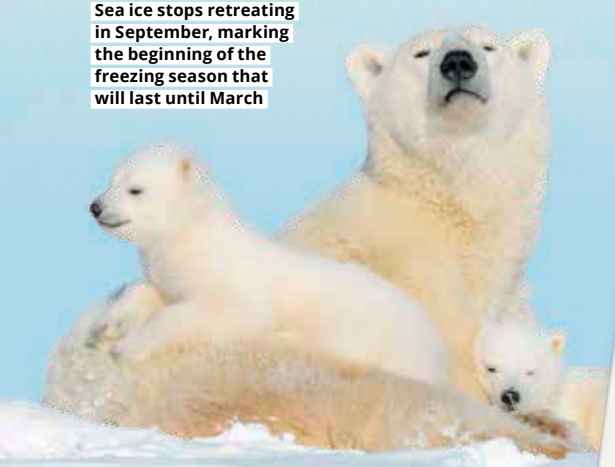
From weather observations and decades of satellite data, IceNet has learned to reliably predict sea-ice cover, months ahead. And despite its huge capability, it can be run on a laptop, so it's easily accessible to scientists.

This is where my research comes in. Thanks to your support, we're using the power of IceNet to protect Arctic wildlife. In Canada, we've been working with the government of Nunavut's Department of Environment to see whether IceNet can help predict the timing of caribou migrations across sea ice in Nunavut, laying the groundwork for an early-warning system for ships (see right). Next, we want to apply IceNet to the movements of other species, such as polar bears.

By using sea-ice forecasts to predict when bears are most likely to be stuck on land and unable to hunt on the ice, we hope to be able to give local communities a heads-up and help them make plans to minimise the risk of conflict.

This breakthrough in sea-ice forecasting has enormous value in predicting the risks to both wildlife and people, allowing us to build resilience for Arctic inhabitants. It's thanks to your support that we can embrace the power of cutting-edge technology amid the pressures of a warming world.

Ellie



Sea ice stops retreating in September, marking the beginning of the freezing season that will last until March

Every September, darkness replaces 24-hour summer daylight in the Arctic

Goodbye, sunshine!

ANIMAL CROSSING

Every autumn, the Dolphin-Union caribou herd migrates across the frozen sea ice from Victoria Island to the Canadian mainland, before returning to the island in spring. Sensibly, the caribou wait for the sea ice to get thick enough for them to cross safely.

But with warmer temperatures delaying sea ice formation each year, this endangered herd is being forced to migrate later and risk starvation, or travel over less-stable ice and risk drowning.

Using IceNet forecasts, experts can now start to predict when and where the caribou are most likely to cross, weeks in advance. This will help develop an early-warning system to alert ice-breaking vessels of the herd crossing, so they can avoid the area and give the caribou the best chance of a safe migration.