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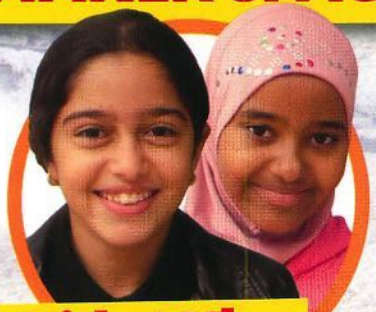
OWL

POLAR DINOS

Are Dinosaurs Even Cooler Than We Thought? NEW CLUES SAY YES!

MAKER SPACE



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Contents

IN THIS ISSUE

Regulars

COVER: Dinosaur illustration courtesy of Joe Tucciarone (Science Photo Library); Cover collage: Kathy Boake. OWL mascot by Meghan Lands.

From the Editor

Dino-*soar* into the New Year

We are kicking off this issue and the new year with a staff favourite topic—dinosaurs! We were just as curious as you about how dinosaurs braved the cold. Thanks to one of our readers, Alex, for his awesome question. We'll find out exactly what kind of dinosaurs survived in chilly conditions.

This edition of Incredible will be a really moving experience for you... literally! OWL investigates why some trees are heading north.

Last year, OWL's Design-a-Snowboard contest was a hit! We received so many amazing entries that we decided to bring it back. So send us your most creative snowboard masterpiece for a chance to win.

Good luck!

Kim

Editor, OWL
editor@owlkids.com

Illustration: Claude Bordeleau (Kim) Photos: ©USA Today Sports/Reuters (Dwyane Wade); all other photos Dreamstime, Shutterstock

From the Readers

MOVIE MAGIC

"The coolest technology in November's feature is the digital costumes. I would want to be turned into a superhero!"

D'Artagnan Passaillaigue, 8

"If I had the chance to be turned into a computer-generated character, I would want to be a bird—calm, free, soaring, and colourful. In other words, carefree and majestic!"

Alicia Campbell, 13

"The coolest technology is the air drones because they allow for cool film shots from the sky. I might want to work in the special effects industry. I'd like to make cool computer-generated images."

James Yu, 10

SUPER SLOTHS

"I didn't really think about sloths before I read the November article, but now sloths have won a small part of my heart, and they are also part of the circle of life."

Kirsten Hannah, 10

"I had heard of sloths before and always regarded them as cuddly creatures. Now I know not to cuddle them."

Julia Carrigan, 12

"I like sloths even more now because I know more about how they work and how cool they are!"

Yoon Hong, 12

Insider

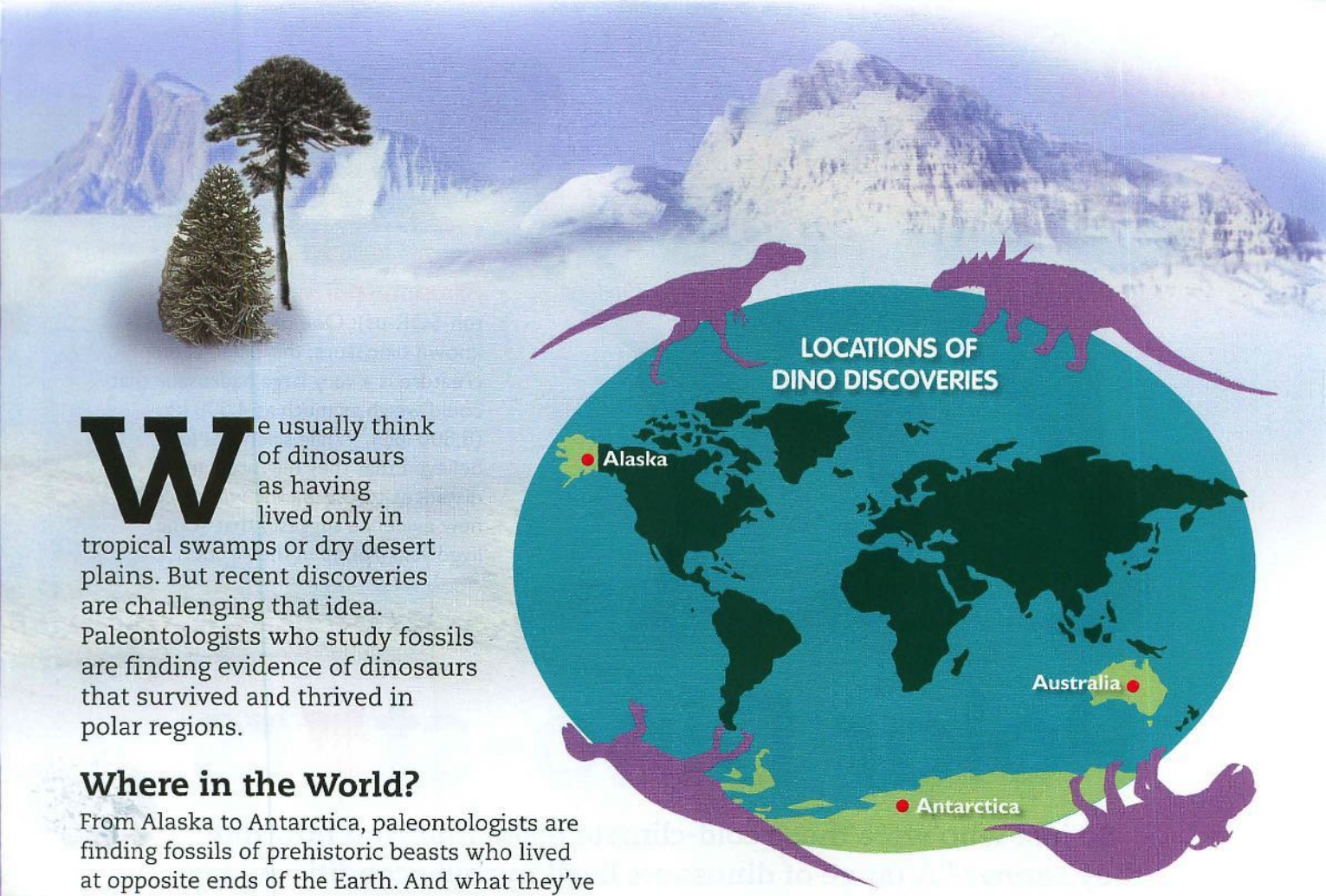
DINOS THAT BRAVED THE COLD

Heard the theory that dinosaurs became extinct because they couldn't survive the cold? Hot new research has scientists rethinking the idea.

BY DOMINIC ALI

Dinosaurs Are A BIG DEAL!

You might even say that dinosaurs are experts in surviving climate change. Inhabiting our planet for more than 200 million years and occupying every continent, they have a lot to teach us about adapting to change!



We usually think of dinosaurs as having lived only in tropical swamps or dry desert plains. But recent discoveries are challenging that idea. Paleontologists who study fossils are finding evidence of dinosaurs that survived and thrived in polar regions.

Where in the World?

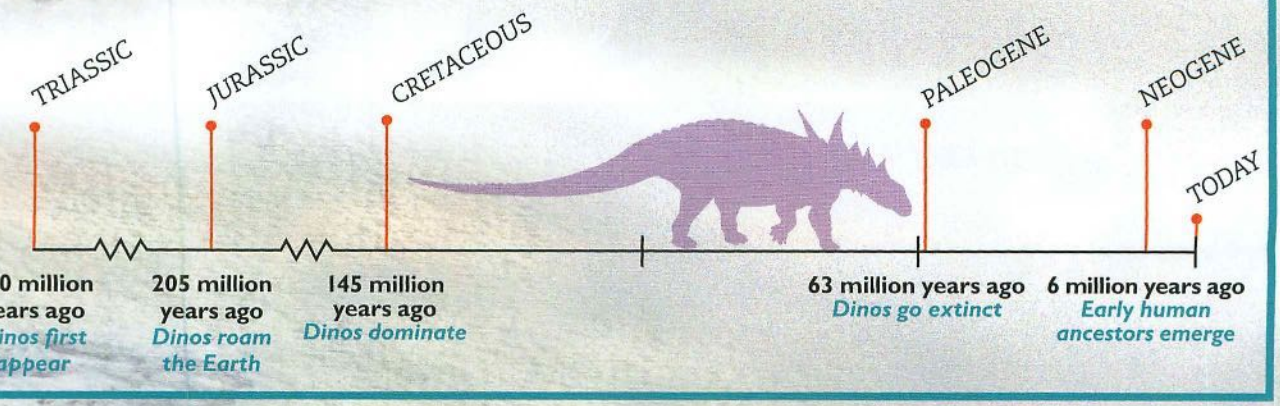
From Alaska to Antarctica, paleontologists are finding fossils of prehistoric beasts who lived at opposite ends of the Earth. And what they've learned is surprising enough to topple a T. Rex!

Recently, a team of researchers working near Alaska's Denali National Park and Preserve discovered a stadium-sized field full of tracks made by a herd of huge duck-billed dinosaurs called hadrosaurs. The largest are estimated to have weighed as much as five cars! (Check out our interview with team leader Anthony Fiorillo on page 16.)

Near the southern tip of Australia, in an area called Dinosaur Cove, scientists have also found fossils of ancient cold-climate dinos. Researchers believe that during the Earth's Cretaceous period (65 to 145 million years ago), this area was still within the Antarctic Circle.

Although the Earth's climate was warmer during the Cretaceous period than it is today, temperatures could still get cool at the poles. This means polar dinosaurs dealt with frozen ground, icy weather, three or more months of darkness, and limited food and plant sources.

HOW LONG AGO? **Polar dinosaurs lived during the Earth's late Cretaceous period.**



Illustrations: Kathy Boake

Insider

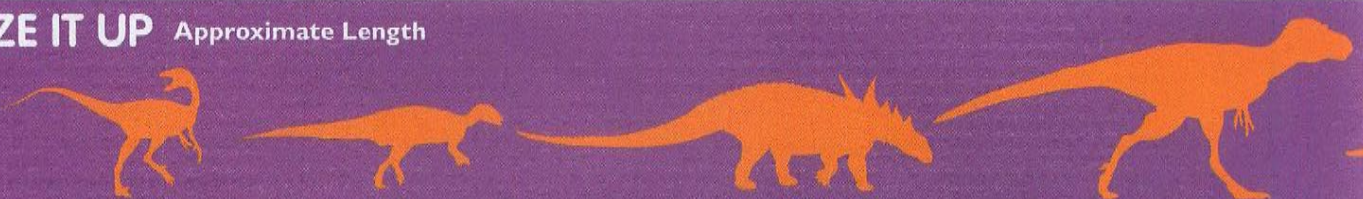
Edmontosaurus (say: ed-MON-tuh-SOR-us): One of Canada's best-known dinosaurs, this plant-eating creature is a very large hadrosaur that could weigh as much as 4,000 kg (8,800 lbs.). While scientists long believed that they migrated great distances to escape the winter cold, new evidence suggests that some lived year-round in the Arctic.

Polar Dino-stars

So just who were these cold-climate residents? And how did they survive? A range of dinosaurs lived in chilly conditions, say paleontologists. Here are some of the ones whose remains have been found.

Pachyrhinosaurus (say: PAK-ee-rye-no-SOR-us): Resembling a rhinoceros, this dinosaur had horns, bony ornaments called a frill, and a thick nose. Like the Edmontosaurus, this dinosaur lived in Alaska and Alberta. Fossils of both species are often found near each other!

SIZE IT UP Approximate Length

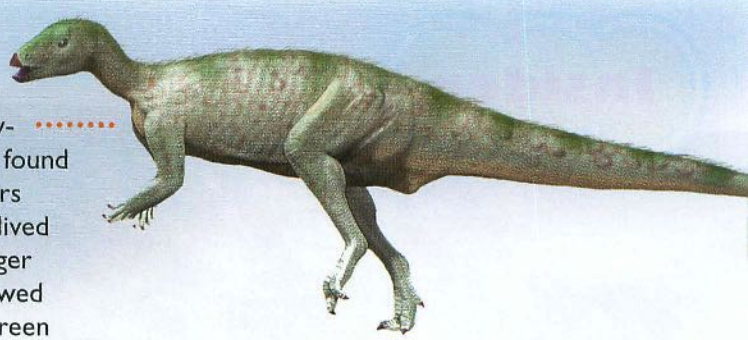


TROODON
Up to 2 m (6.5 ft.)

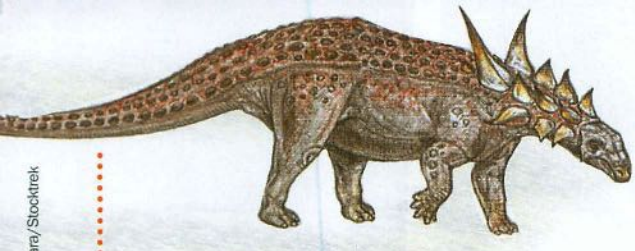
HYPSILOPHODON
Up to 2 m (6.5 ft.)

ANTARCTOPELTA
Up to 4 m (13 ft.)

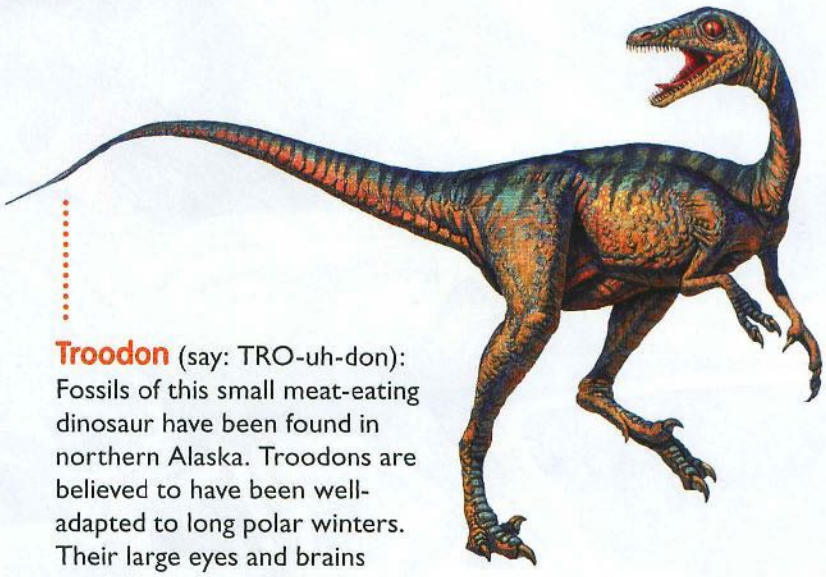
NANUQSAURUS
Up to 7 m (23 ft.)



Hypsilophodon (say: hip-sih-LOH-foh-don): These turkey-sized creatures make up almost half of the dinosaur remains found in polar Australia. Scientists think these plant-eating dinosaurs were too small to migrate thousands of kilometres, so they lived there year-round. Australian Hypsilophodons have much larger eyes than other species, and paleontologists believe this allowed them to see better in the dark so they could snack on evergreen trees and plants during the winter.

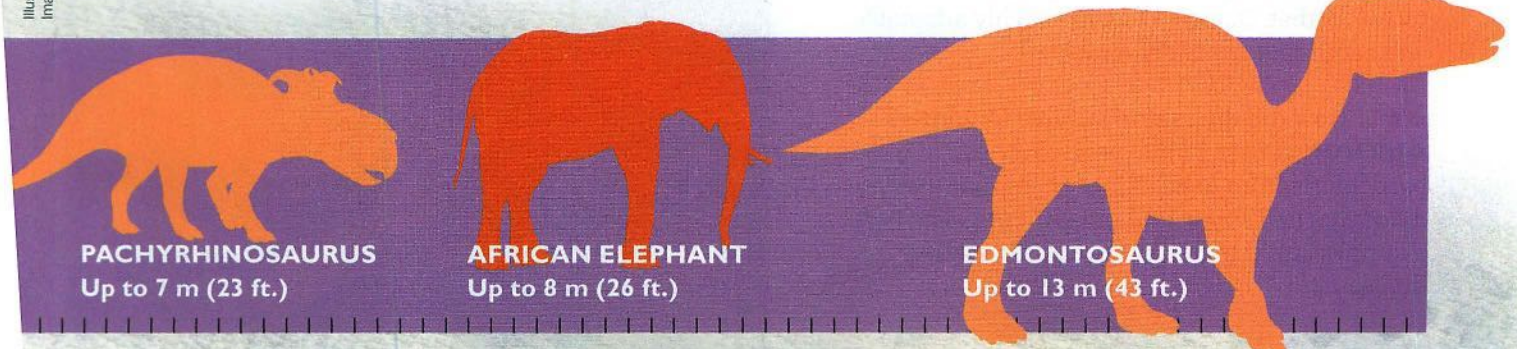


Antarctopelta (say: ant-ARK-toe-PELL-tuh): These small-brained herbivores were a type of Ankylosaurus (say: ANK-ill-oh-SOR-us) that were covered in bony plates and spikes. They travelled low to the ground on four feet and had horns that they could have used to defend themselves. These dinosaurs were first discovered in (you guessed it!) Antarctica.



Troodon (say: TRO-uh-don): Fossils of this small meat-eating dinosaur have been found in northern Alaska. Troodons are believed to have been well-adapted to long polar winters. Their large eyes and brains would have been useful for hunting.

Nanuqsaurus (say: na-nook-SOR-us): If Tyrannosaurus rex had a Mini-Me, it would've been this carnivorous dinosaur! Unearthed in Alaska's North Slope region in 2006, these relatives of the T. Rex were about half the length of their more famous cousins. Paleontologists believe their small size was an adaptation from the pressure of hunting for food in a cold, barren landscape.



Meet a Dino Detective

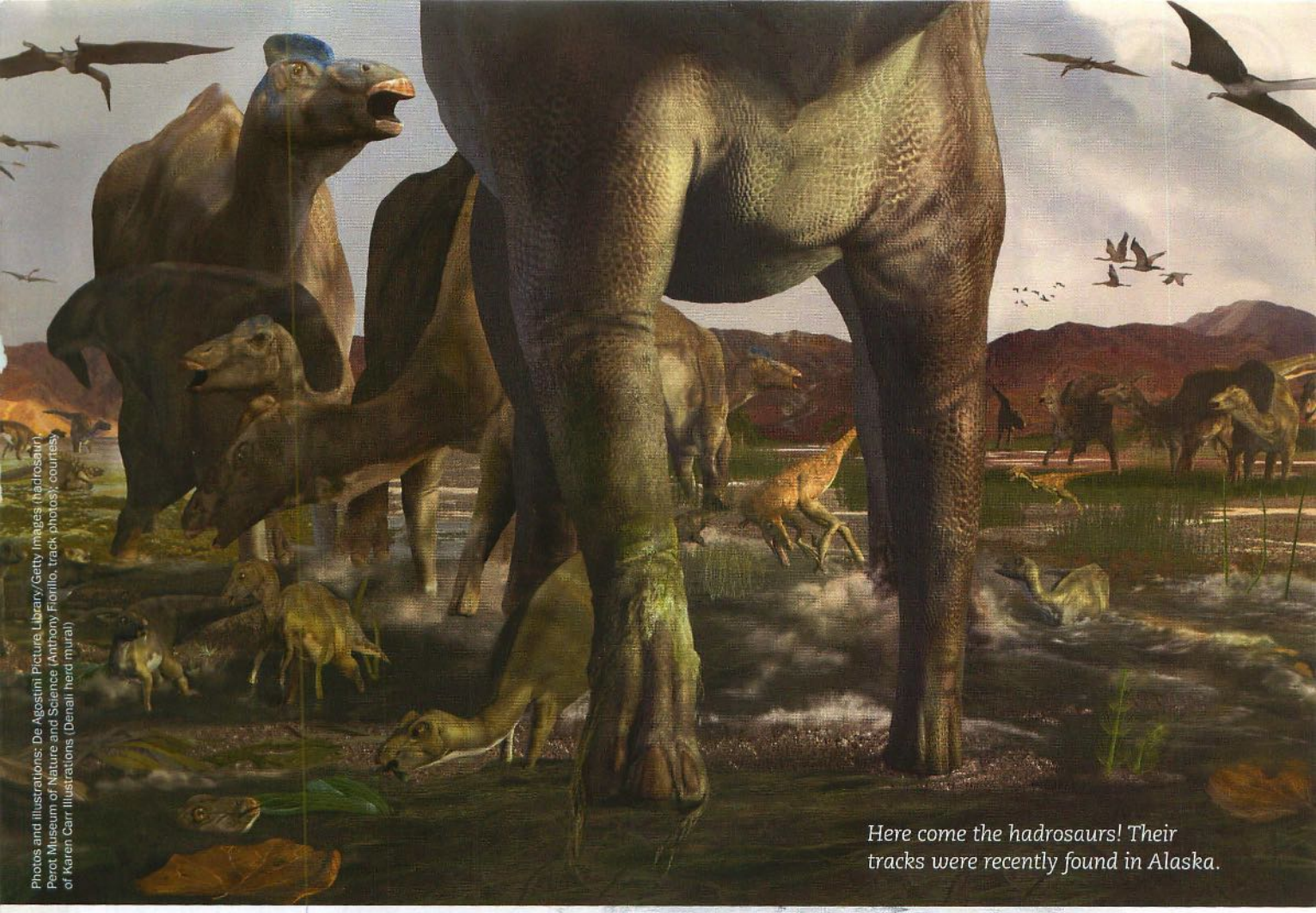
Anthony Fiorillo is vice president of research and collections and chief curator at the Perot Museum of Nature and Science in Dallas, Texas. He and his team members recently discovered a field of hadrosaur tracks in Alaska. The team believes that the dinosaurs lived there year-round in herds.

A hadrosaur track found at Denali National Park and Preserve in Alaska

Tony and his team making a mould of the dinosaur track

OWL: Why is this research important?
ANTHONY: I think that the study of polar dinosaurs challenges everything we think we know about dinosaurs. The stereotype still exists that dinosaurs lived in warm subtropical to tropical swamps, and clearly polar dinosaurs didn't do that. Dinosaurs were a highly adaptable and successful group of animals.

OWL: How did dinosaurs survive in winter?
ANTHONY: Based on new discoveries, particularly from Asia, it does seem that many dinosaurs had some kind of feathering. The best examples are the theropods, or meat-eating dinosaurs.



Photos and illustrations: De Agostini Picture Library/Getty Images (hadrosaur); Perot Museum of Nature and Science (Anthony Fiorillo, track photos); courtesy of Karen Carr Illustrations (Denali herd mural)

Here come the hadrosaurs! Their tracks were recently found in Alaska.

What's Next?

Paleontologists studying polar dinosaurs face many challenges. Researchers can work only in the short summer season, when it's light and some of the snow has melted, and getting all the equipment to the sites can be very complex. Not surprisingly, field trips can be expensive. However, the digs must go on! By learning how dinosaurs survived in different climates, scientists hope to better understand today's climate changes and how humans can adapt in the future.

DINO BITES

OWL readers weigh in on the new polar dinosaur research.

"It's important that scientists study dinosaurs and learn as much as they can about them. Dinosaurs are an important part of Earth's history and may explain a lot about the evolution of this planet."
—Molly, 13

"I didn't know that dinosaurs could live in cold climates. This type of news interests me and makes me want to find out more!"
—Jocelyn, 14

"It's very important to study dinosaurs because some things alive today evolved from the dinosaur era."
—Michael, 10

"You had me at *feathers*."
—Hoot the owl