Indigenous Lens: Greenland | Polar Bear Basics | Separating Fact from Fiction

POLAR BEARS INTERNATIONAL

Tundra Times

The Annual Newsmagazine of Polar Bears International

FALL 2017

Tracking Polar Bear Dens in Svalbard

photo © Daniel J. Cox/NaturalExposures.com

THE COMPASS POINTS NORTH

Last February, I joined a Polar Bears International research team on an expedition to study polar bear den sites in Svalbard. Along with partners from the Norwegian Polar Institute and San Diego Zoo Global, we skied to the remote snow dens of polar bear moms and cubs, transporting our gear by traditional sleds called *qamutiiks*.

photo © Simon Gee

Visiting the region that has served as a polar bear nursery for hundreds, if not thousands, of years, was an exhilarating experience—but also disconcerting. Normally, the fjords surrounding the island are frozen at that time of year, providing hungry polar bear moms with quick access to their seal-hunting grounds when they emerge with their cubs in spring. Without a platform of ice, the families seemed likely to face a rough spring instead of a time of plenty.

Helping the public understand the polar bear's dependence on sea ice—and the need to take action on climate change—is a core focus of our work at Polar Bears International, whether we're conducting field research or taking part in conservation outreach.

In this year's Tundra Times, scientist Andrew Derocher takes us through the basics of what it means to be a polar bear, with sea ice playing a central role. The theme appears again as scientists Nicholas Pilfold and Kristen Laidre transport us to Canada, Svalbard, and Greenland.

We're also lucky to have Katharine Hayhoe—one of Time magazine's 100 Most Influential People—contribute a primer on climate change and Steven Amstrup share insights on separating fact from fiction.

Rounding out the issue are pieces on beluga whales, our work with youth, and our annual World Ranger Day Award. And, finally, our tear outs include talking points and postcards that will help you become an engaged citizen, and a fun Flat Nanuk for the younger set.

We hope you enjoy this year's Tundra Times and feel inspired to continue to work with us on polar bear conservation—no matter where in the world you live.

Sincerely,

Krista Wright

Krista Wright
Executive Director

Polar Bears International's mission is to conserve polar bears and the sea ice they depend on. We also work to inspire people to care about the Arctic and its connection to our global climate.

Inside

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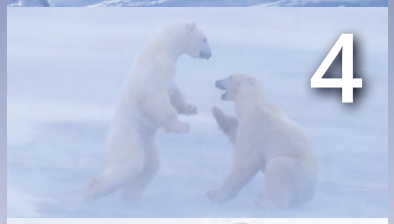
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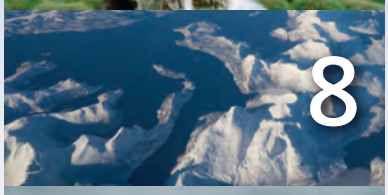
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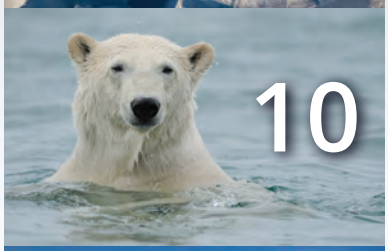
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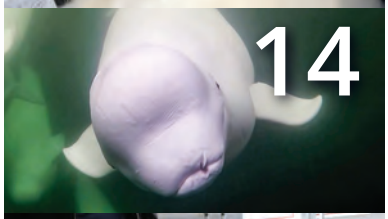
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Cover photo:
Daniel J. Cox | NaturalExposures.com
Dan generously allows PBI use of his award-winning images free of charge.

SPEAK UP *for* Polar Bears *and* Climate ACTION

Phone calls, letters, and in-person meetings have proven to be remarkably effective in gaining the attention of elected officials and making our voices heard. No matter where in the world you live, it's important to let your representatives know you support action on climate change—helping polar bears and people too. **Become an engaged citizen:**

- Call your representatives (see talking points next page). Be sure to let them know you won't vote for someone who doesn't support action on climate.
- **Use these postcards to send a message urging climate action.**
- Express your concerns to your representative in person, at a public meeting, or by making an appointment.
- Also talk about this issue with your friends, family members, and colleagues; urge them to join you in speaking up.

IF your representatives state that they do not believe climate change is human-caused, ask them this: With near consensus from climate scientists that human activity is causing the warming, and with the serious threats predicted if we don't take action, ***what if you are wrong?***

photo ©Simon Gee/polarbearsinternational.org

photo © Daniel J. Cox/NaturalExposures.com

Talking points on the need for climate action:

- There is no uncertainty about climate change.
- Climate change is not just a problem for the future. We are already experiencing climate impacts here, including [*provide local examples*].
- Climate change threatens our national security. The U.S. military is worried about instability and conflicts due to droughts, famines, and water shortages.
- Climate change is increasing droughts, floods, and severe storms. Scientists have predicted these extreme weather events for decades, and they're happening all over the world.
- Climate change threatens our health. Officials warn of increased asthma and other respiratory diseases, longer allergy seasons, more cases of heat stroke and other heat-related illnesses, and increased risks of insect- and waterborne diseases.
- Climate change threatens our economy. The financial sector warns of costly impacts, such as lower crop yields and massive property losses from rising sea levels.
- The solutions are here. Clean energy like wind and solar are improving the climate, while creating good jobs and boosting the economy.
- We owe it to our children and grandchildren to be good stewards of our environment. We should leave a legacy of protecting our natural resources.
- Polls show the majority of people want action!

place stamp here

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HONORING FRONT LINE HEROES

By Geoff York

For people who live and work in polar bear country, coexisting with a powerful predator is part of northern life. While polar bear attacks are rare, communities across the Arctic strive to keep polar bears and people safe, relying on rangers, patrols, or conservation officers to watch for bears and prevent harmful incidents. This is especially important as sea ice continues to retreat, causing more bears to spend more time onshore in more places, increasing the likelihood of encounters.

© Manitoba Sustainable Development

The Polar Bear Alert Team works hard to keep polar bears and people safe.

In recognition of the dedication and courage of the men and women who work on the front lines of polar bear conservation, Polar Bears International established a World Ranger Day Award in 2016. The first recipient was the late Vladelin Kavry, who co-founded the Umky Patrol in Chukotka, Russia.

This year we're proud to recognize the men and women who help the town of Churchill, Canada live safely with its bears through the Polar Bear Alert Program. Run by Manitoba Sustainable Development, the current team includes Brett Wlock, Jeff Chuchmuch, Jack Batstone, Donald Spence, Sheila McGillivary, Crystal Collins, and April Lundie.

The Polar Bear Alert Program has a long history of protecting people while also conserving polar bears. Recent surveys of western Hudson Bay polar bears (which include Churchill's polar bears) show that their numbers have decreased, with longer ice-free periods stressing the population. This makes the program's three-pronged approach of public safety education, detection, and non-lethal deterrence more critical than ever.

Geoff York is Polar Bears International's senior director of conservation. The World Ranger Day Award comes with a cash prize and Canada Goose gear.

photo © Daniel J. Cox/NaturalExposures.com

POLAR BEAR BASICS

By Dr. Andrew E. Derocher

Ask anyone what Arctic species they'd like to see and polar bears top the list. Why? Perhaps because polar bears are the world's "largest terrestrial carnivore"? Except they aren't.

All three words are wrong. First, polar bears rely almost exclusively on marine ecosystems, so they aren't terrestrial. Second, in the marine environment, polar bears lose out to killer whales for size. Lastly, there's the carnivore issue. Polar bears make their living from seal blubber and not so much from meat. The seal's thick fat layer makes the polar bear possible. Perhaps the term *lipivore* (fat eater) is more appropriate because the *carni* in *carnivore* refers to meat.

Polar bears evolved from a brown bear ancestor and rapidly adapted to their sea ice environment. When the separation occurred is uncertain due to hybridization events in Ireland and Alaska. Regardless, the differences between the two species are profound. Beyond the obvious difference in color, the polar bear's fur, claws, skull, teeth, physiology, and behavior have all evolved to deal with an intensely seasonal marine Arctic environment.

For polar bears, life is a feast and famine existence. Spring is their time of plenty because naïve seal pups are abundant. Further, mother seals trying to nurse their young also fall prey to polar bears. Adding to the spring bounty, male seals have their attention diverted by mating. This all adds up to a window of feeding dictated by the ecology of the seals and the dynamics of sea ice.

How many seals does a polar bear eat in a year? It's a question scientists can't easily answer. Consider that a newborn ringed seal weighs about the same as a human baby at birth, but an adult bearded seal weighs 3-4 times that of an adult human, and the peril of estimating the number becomes clear. A few adult bearded seals

Far left and top left photos © Daniel J. Cox/NaturalExposures.com; top right © Simon Gee/polarbearsinternational.org

per year would suffice for most polar bears—given that they can eat about 20% of their weight in a single meal and deposit over 90% of that into their own fat stores—but most bears make their living from ringed seals of various ages.

Fat stores are the key to the polar bear's survival. In the past, the summer sea ice endured long enough for polar bears to store enough fat to see them through the lean months until the ice returned. (When the sea ice melts, seals aren't constrained to breathing holes and come up anywhere they like for a breath, making it very difficult for polar bears to hunt them.)

The ice-free season is increasing across the Arctic, although at different rates across the 19 polar bear populations. How quickly the ice is disappearing in each area is directly related to the threat each population faces.

Despite claims that terrestrial foods may augment a polar bear's diet, the energy in such foods pales in comparison to seal blubber. Although any polar bear will happily supplement its diet with berries, grass, goose eggs, or any carrion it may find, it can't make a living from such resources. Terrestrial foods are exploited by grizzly bears in many parts of the Arctic, but they are a fraction of the size of polar bears and their whole life history is the opposite. Grizzly bears hide from winter and hibernate while polar bears embrace the cold as a time of plenty. Polar bears lounge away the summer waiting for the Arctic Ocean to freeze so they can move about its surface to hunt.

The Arctic is a tough environment but an incredibly rich one from a polar bear's perspective. Polar bears have evolved to live on the sea ice. In fact, some bears are born on the ice and never step onto land! However, such a life trajectory is quickly changing and more and more polar bears are spending more time on land.

The fate of polar bears is intimately tied to the fate of sea ice. During past cold periods when sea ice expanded, polar bears shifted south. For example, we know they made it to Ireland, Sweden, and the Alaska Panhandle during the last ice age. How polar bears deal with diminishing ice is also well understood from scientific studies.

Humanity has choices to make and they include a future with or without polar bears. It's our call.

Dr. Andrew E. Derocher is professor of biological sciences at the University of Alberta and a long-time scientific advisor to Polar Bears International.

INDIGENOUS LENS

GREENLAND

By Barbara Nielsen

Dr. Kristin Laidre, a marine biologist at the University of Washington's Polar Science Center and the School of Aquatic and Fishery Sciences, was recently awarded a Pew marine fellowship to study the effects of climate change and subsistence hunting on polar bears.

Her three-year project will include a public exhibit that combines photography, storytelling, and science, including interviews with local Inuit communities in Greenland.

In this Q & A, Kristin talks about the project and its potential impact.

Q: You've studied marine mammals and polar bears in Greenland for 17 years. What led you to propose this project?

A: I've spent many years working on marine mammal projects out of small settlements in Greenland, which has given me an appreciation for how important polar bears are to local communities. It has impressed upon me how conservation is intertwined with working with the people who value and use these species as resources. These factors led me to propose a two-part project. One part focuses on using a long-time series to analyze scientific data on generation length for polar bear subpopulations, and the other is focused on an art-science exhibit for the public about polar bear conservation and related issues.

Q: Let's start with the artistic component. Can you describe it?

A: Throughout much of the Arctic, polar bears are an important nutritional, cultural, and sometimes economic resource for Inuit. People have hunted these animals for thousands of years, a practice that in many areas is alive and well today. But currently there is a lot of social and environmental change in the Arctic. So, we're planning an exhibit that addresses important issues on polar bear management and conservation, within the context of polar bears as a natural and renewable resource. I'll be working with an artist and a writer to create an exhibit that combines art, photography, science, and storytelling focused on polar bears, climate change, and local communities. Finnish photographer Tiina Itkonen, who is well known for her compelling portraits of northern indigenous people in remote communities in Greenland, and award-winning science writer Susan McGrath will collaborate with me on this.

photos © Tiina Itkonen

Q: What insights do you hope to gain from subsistence communities in Greenland? Why is it important to tell their stories and share their knowledge and observations?

A: Hunters live in their environment year-round, and depend on it for their livelihoods. Many hunters have decades of personal experience as well as knowledge that is transmitted through communities and across generations. I've been involved in Traditional Ecological Knowledge (TEK) surveys of subsistence hunters in Greenland, on polar bears and walrus, for many years. In TEK surveys, hunters are asked about climate, harvest, and traditional life through organized systematic interviews. The results provide information and perspectives that scientists would not otherwise get. The results also help us understand how best to design conservation actions that work for both people and animals.

Q: The three-year project will conclude with an exhibit in Seattle that will also travel to Finland and Greenland. What is the focus of the exhibit? What do you hope viewers will gain?

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SVALBARD:

Tracking Maternal Dens in a Time of Rapid Change

By Dr. Nicholas Pilfold

I had never set foot on Svalbard, Norway before. Yet for a polar bear biologist, going to Svalbard is a little like going to Churchill, Canada: it's a renowned place that must be experienced. Both places have a long history with polar bears, expanding tourism industries, and steadily increasing scientific research capacities. Both are also undergoing rapid environmental change.

Environmental change is generally understood as something that takes place over long periods of time. But sometimes, you can stand in a place, at a given moment, and understand you're experiencing a shift, and that what is happening around you is not normal. For me, this experience occurred both in Churchill and Svalbard over the past year.

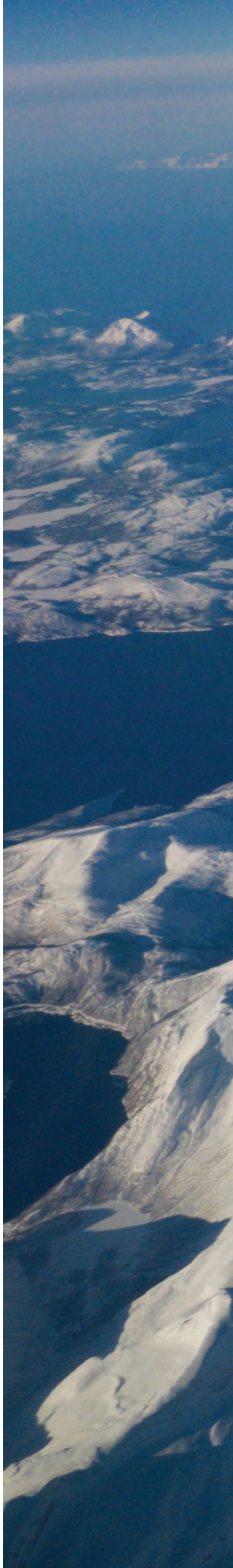
When I arrived for fieldwork in Churchill in November 2016, it had rained only days before. There was barely a trace of snow on the ground when we landed at the Churchill airport, and the winter-scape that I'm used to as a Canadian was absent, replaced by warm and mild conditions. Sea ice last year in Hudson Bay formed late. The delayed freeze-up forced the area's polar bears to spend more time on land, away from their seal-hunting grounds.

Svalbard was equally unsettling. When I arrived for fieldwork in February 2017, I was met with open fjords. Areas that historically were guaranteed to freeze over by late winter, providing bountiful hunting grounds for polar bears, remained bare and blue. I had been watching the satellite imagery of sea ice around Svalbard for years and had read about the changes: The area is losing an astonishing 41 days of ice cover per decade.

But it's one thing to read about the ice loss and see it on your computer screen—and entirely another to stand and look at an open fjord and learn that orcas were recently sighted swimming there. Orcas hunting at the height of winter, in the places where polar bears once did, is an undeniable shift.

One other aspect shared by Svalbard and Churchill is that both areas are home to some of the best polar bear denning habitat in the world. Because of this, Polar Bears International, San Diego Zoo Global, and the Norwegian Polar Institute began collaborating in 2016 to start a long-term monitoring project of polar bear maternal dens on Svalbard. This is what brought me to Norway, along with a dedicated team: Megan Owen (SDZG); BJ Kirschhoffer (PBI), Krista Wright (PBI), and Rupert Krapp (NPI). The project just completed its second year.

The maternal denning project uses remote camera systems to record the behavior of adult female polar bears



and their young, from the very moment they push through the den opening and the cubs experience the outside world for the first time. The research is vital to understanding how a rapidly changing Arctic is impacting vulnerable, newly born cubs. From the video footage, we can examine the dates when the families emerge from the den, the length of time they spend near the den before migrating to the sea ice, and the associated maternal behavior of the mother bear. This information will provide us with a better understanding of how critical polar bear denning habitat will function as the climate continues to warm.

Although the project on Svalbard is in its infancy, observations of polar bear maternal dens on the archipelago have a long history. Early research was conducted by Norwegian scientists Rasmus Hansson and Jorn Thomassen in the late 1970s. They skied into polar bear denning areas around Svalbard and spent weeks recording observations of emerging mothers and cubs. This long history is a boon to our project, providing us with a reference point in the face of rapidly changing conditions.

In our own way, we paid homage to Hansson and Thomassen this year. We skied our camera into place on the slope, minimizing our presence around the den site. Moving the camera system into place was no easy task. BJ, Krista, and I all pulled the sled uphill and across the slopes. Once there, the kit snapped together easily, and within 30 minutes was up and running.

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photo © Daniel J. Cox/NaturalExposures.com

THE WEATHER IS GETTING WEIRD

By Dr. Katharine Hayhoe

It's real.

Climate is changing—in the Arctic, through North America, and across the planet as a whole. Temperatures are increasing, ice and snow are melting, rainfall patterns are shifting, sea level is rising, and extreme precipitation and heat wave events are more frequent.

We can see the evidence of a changing climate in our own backyards. Trees and plants are flowering earlier. Many animals, birds, and insects are heading north. And the weather is just getting plain weird. If we add up all the different lines of evidence around the world, over 26,500 "natural thermometers" tell us that, yes, climate's changing.

It's us.

How do we know today's conditions are so unusual? To look back through thousands and even millions of years of Earth's history, scientists use records preserved in tree rings, caves, ice sheets, even ocean sediments. These records show ice ages, and warm periods in between like we're in right now. Further back, they show even larger changes, changes that occurred naturally—due to cycles in the earth's orbit, ups and downs in energy from the sun, even periods of continuous volcanic eruptions.

photo©DanielJ.Cox/NaturalExposures.com

But today, these same natural factors should be causing the earth to cool. That's right: according to natural cycles, we should be gradually heading into the next ice age. Instead, we're warming; and at a faster pace than any time preserved in these records.

Since the Industrial Era began, we've been burning more and more coal, gas, and oil for energy. But burning fossil fuels releases carbon dioxide, a powerful heat-trapping gas. Other activities, like deforestation and agriculture, also contribute.

These heat-trapping gases from human activities have been building up in the atmosphere, wrapping an extra blanket around the planet. And just like an extra blanket can trap too much of our body heat, this extra blanket is trapping too much of the earth's heat that would otherwise escape to space.

For the first time in the history of this planet, it's not natural cycles—it's us.

It's serious.

Climate change isn't just a problem for polar bears or for future generations. We care about a changing climate because there's 7.5 billion of us on this planet, and we depend on it for our very lives.

Two-thirds of the world's biggest cities lie within a few feet or a meter of sea level. What happens when our oceans rise by two, four, even six feet—as they very well may, this century?

Poor people in developing countries already struggle to provide food for their families. What happens when longer, stronger droughts wipe out their harvest, as we've already seen in Syria this past decade?

Nearly a billion people rely on fish as their primary source of protein, and most of those people live close to the poverty line. What happens as rising ocean temperatures—and acidification, from all the carbon dioxide the ocean's absorbing—cause the marine food web to fall apart?

And 40 percent of the world's population lives within 60 miles, or 100 kilometers, of a coastline, putting many in direct range of coastal storms that already bring catastrophic winds, waves, and flooding. What happens as warmer oceans power even stronger hurricanes and cyclones, like Superstorm Sandy or Super Typhoon Meranti?

We care about climate change because it exacerbates the risks we already face today: food shortages, economic damages, even poverty, hunger, and disease. A certain amount of harm is inevitable, built into the system by decades and even centuries of fossil fuel use.

But the good news is we can make a difference.

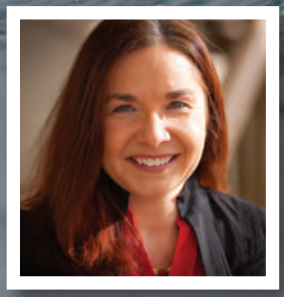
There are solutions, but we need to act now.

What's the fix? To wean ourselves off our addiction to old, dirty ways of getting energy—and fast. The faster we're able to transition to new, clean ways of getting energy, the better off we'll be.

The good news is that we don't have to convince a lot of other countries of this. China currently leads the world in wind and solar energy installations, and plans to spend an additional $360 billion to create 13 million new jobs in the clean energy industry by 2020. India is breaking records for the cheapest solar energy anywhere on the planet, and sub-Saharan Africa, where over 600 million people live in energy poverty, is being revolutionized by pay-as-you-go solar that provides affordable electricity and grows the local economy, too.

But we do have to convince ourselves. And that's why, when someone asks me, "what can I do?" my number one recommendation isn't changing light bulbs, recycling, eating less meat, biking to work, or even signing up for Elon Musk's new solar shingles—although all of these are valuable ways to reduce our personal carbon footprint.

No, the single most important thing we can do about climate change is talk about it. Because, in the U.S. at least, nearly three-quarters of us only hear someone talk about climate change no more than two or three times a year. And if we never talk about it, how will we convince ourselves—and others—of what's at stake?



Artie Limmer, Texas Tech University

Dr. Katharine Hayhoe is an atmospheric scientist and director of the Climate Science Center at Texas Tech University. She is one of Time magazine's 100 Most Influential People.

TRUTH *or* LIES?

Separating fact from fiction in the digital age

By Dr. Steven C. Amstrup

I've studied polar bears almost my entire career, producing research that has added greatly to our understanding of the bears and the threats they face.

The data I collected, along with that of other scientists, proves polar bears are in jeopardy. The **evidence** confirms the earth is warming due to a rise in greenhouse gas emissions—causing sea ice to melt. The **evidence** also shows that polar bears rely on sea ice to catch their seal prey. Therefore, to save polar bears, we must reduce emissions. In 2007 my team and I presented our findings to the U.S. Secretary of the Interior; the **evidence** convinced him to designate polar bears as a threatened species.

Yet numerous websites claim, **without any evidence**, that polar bears are outstanding survivors of climate change, that their numbers are growing, and that sea ice is recovering. Although human-caused global warming is as well understood as gravity, some government leaders have falsely stated, "There's too much uncertainty to take action—and global warming may not even be real!"

Denying global warming and the threats it poses for polar bears, is, as science writer Michael Specter describes, "rejecting obvious truths for more comfortable lies." Discerning the truth goes way beyond polar bears to the core of how we understand, respond to, and indeed manage our world. But with so much misinformation out there, how do we get to the truth?

Separating Fact from Fiction

In their insightful essay, *The World at Our Fingertips,* Stuart Pimm and Jeff Harvey offer a set of basic guidelines to assess things we hear and read:

- **Follow the data.** Is the statement supported by evidence or does the data trail go quickly cold?
- **Follow the credentials.** Have the authors/speakers done any research to support their claims? Do they cite peer-reviewed sources?
- **Follow the language.** Do the authors/speakers substitute personal attacks and sweeping statements for data and analysis?
- **Follow the money.** Who is paying for that statement and what may they have to gain by doing so?

When evaluating statements on a website or in a speech by one of our political leaders, we must ask these questions and verify that the statements are evidence-based—not unsubstantiated opinions or intentional efforts to mislead.

Question and Verify

We live in an amazing era, where we can dive into any subject with a few clicks. But we must remember:

- *More words do not necessarily mean more information.*
- Despite the ease of digital searching, sound decisions still require evidence.
- Internet-based material often lacks citations; it can be hard to determine whether it is based on evidence.
- The "stovepiping" of information makes it easy to capture an audience, keep it on a particular path, and mislead. *When you see messages like, "People who looked at that information also liked this," you probably need to break out of that stovepipe and broaden your search.*

Follow the Evidence

As a science-based organization, Polar Bears International believes education is critical to polar

Dr. Steven C. Amstrup, right, collects data from a tranquilized polar bear. Decades of research on polar bears, with findings published in peer-reviewed papers, provide the evidence that the bears are in trouble.

bear conservation. All of our materials are based on the best available scientific evidence. Our readers can follow the data, credentials, language, and money to verify that our information is factual.

To help share accurate information and dispel myths and falsehoods, we maintain a website visited by millions of people from around the world and team up with educational partners like Discovery Education and Apple iTunes U.

We write peer-reviewed papers, give public talks, provide media interviews, connect with classrooms through our Tundra Connections® program, and maintain an active presence on social media.

Reality Check

Blaise Pascal concluded in the 17th century that "People almost invariably arrive at their beliefs not on the basis of proof, but on the basis of what they find attractive." It would be attractive if human activities weren't warming the planet and polar bears weren't threatened with extinction. Unfortunately, there is no evidence to support either claim.

If we really care about the world we're leaving our children and grandchildren, we must be wary of letting ourselves be swayed by misinformation that appeals to our wishes for the world rather than how the world really is.

We know what we need to do to ensure a future for polar bears. All **evidence** indicates that unless we stop the rise in emissions our planet will continue to warm, the sea ice will continue to melt, and polar bears ultimately will disappear.

If we follow the evidence and curb emissions, however, there is still time to save polar bears over much of their current range. And if we act in time to save polar bears, we'll benefit the rest of life on Earth, including ourselves.

Dr. Steven C. Amstrup is the chief scientist at Polar Bears International.

Belugas, Boats, and Bits

By Alysa McCall

I gasped as the cold water seeped into my wet suit, soaking the material. I adjusted my snorkel, lowered my face into the water, and clutched the rope that would tow me slowly through the river. As my ears sank below the surface and my breathing steadied, a wonderful, eerie song filled my head. Its source soon came into view: beluga whales. Thousands of them.

The annual beluga migration to Churchill, Manitoba, brings approximately 57,000 white whales to the region each summer. Like polar bears, belugas depend on sea ice for survival; their futures are linked. By highlighting their story, we can inspire even further conservation efforts aimed at protecting sea ice, good for future generations of all species. Though the whales have been migrating to the Churchill River for ages, many questions about them remain unanswered. Through explore.org and Polar Bears International, the underwater camera technology is helping to change that, letting us learn more about belugas than we thought possible. But only with your help.

From July to September, anyone in Churchill can watch hundreds of belugas at a time from the river's banks, but what happens underwater really gives insight into the whale's world. These canaries of the sea, named for their incessant chattering, arrive at their shallow summer grounds to nurse their young, molt their skin, and feed on fish. Not everyone can make the journey to see this in person, so our Beluga Cams bring the whales to them.

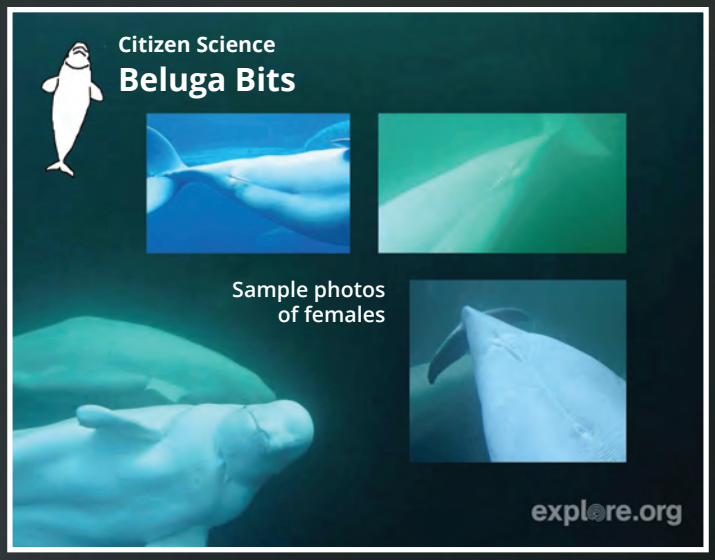
The Beluga Boat hosts two cameras: one above deck and one underwater. It streams live beluga whales and their vocalizations into computers across the world, thanks to the boat captain(s) and local student assistants. The captains expertly guide the boat through the river while interpreting natural events, and the students practice their communication skills by talking about themselves and their town. Thanks to this team, the footage collected has given us an extraordinary view into the natural lives of belugas. Researchers soon realized that the footage could be used for more than pleasure: It could also help answer important scientific questions.

For several years, explore.org viewers have captured beluga snapshots on their computer screens to share with their online community. Researchers at the Assiniboine Park Zoo in Winnipeg, Canada, recognized the value of these snapshots and how they could work in the beluga's favor. They developed an online platform via Zooniverse, called Beluga Bits—a Citizen Science project that relies on the public to examine and sort underwater photos of wild belugas, providing insights into the population.

The photos organized through this crowd-sourced project tell an incredible story. The Beluga Bits platform makes it possible to approximate group structures, determine if an animal is male or female, estimate age by size and color (e.g., calves are small/grey, adults are large/white), and identify individuals by marks (scars or pigments). Only with the public's support can we collect and sort the thousands of snapshots collected over many years. Gathering baseline information is especially important before the Arctic changes further.

photo ©Madison Stevens/polarbearsinternational.org

A Citizen Science project called Beluga Bits is helping scientists obtain baseline information on beluga whales. Like polar bears, belugas rely on sea ice for their survival. By sharing their story, we hope to raise awareness of the need to save their icy habitat—benefiting bears and all of us.



With the help of easy-to-understand graphics, volunteers sort underwater photos of belugas into age and sex categories. The Beluga Bits platform also allows them to identify individual whales through scars and pigments.

Sea ice is important to belugas because it protects them from their main predator: orcas. The smooth-backed belugas can maneuver around sea ice floes easily, but the orca's dorsal fin limits it from entering icy regions. As sea ice declines due to climate change, orcas are expanding their range, lessening the number of refuge areas available to belugas. Declining sea ice also means more human activity, so belugas face increased noise, pollution, shipping traffic, and oil spill risk.

Learning as much as we can now will help us protect the whales in the future. No matter where people live, they can get involved by watching the Beluga Cam and taking snapshots, by signing up for Beluga Bits to support beluga researchers, and by reducing greenhouse gas emissions in their communities—which is good for Arctic sea ice, belugas, polar bears, and everyone who shares the planet. Thanks to explore.org, we can help people across the globe experience the incredible world of the wonderful white whales, minus the freezing cold wet suit.

Alysa McCall is PBI's director of conservation outreach and staff scientist. Explore.org and PBI have partnered together, with support from Parks Canada, Frontiers North Adventures, and SeaNorth Tours, to bring belugas to the world through remote cameras.

PROJECT POLAR BEAR: The POWER of YOUTH

By Marissa Krouse

When I was a child, we separated our garbage into recycling bins, checked it off the list, and called it a day.

What a world of difference from young people today.

Concerns about a warming climate have inspired the next generation to get involved on a much larger scale. Sure, they're still recycling. But they're also setting up no idle zones, organizing bike to school programs, planting community gardens, and campaigning for a swift transition to renewable energy.

Polar Bears International's annual Project Polar Bear Contest taps into the power of these young leaders. Year after year, the competing teams think big, work hard, laugh long—and melt the hearts of everyone around them.

CLIMATE CHAMPS

It's hard to resist a group of elementary students who ask their community to take part in bike commutes. Or a group of teens who start a school composting program and succeed in removing disposable dishes and utensils from their cafeteria. Or still others who stage a climate change art show and inspire the crowds to join them in taking action.

In each case, the overall impact is so much more. It makes the adults around them think: *If it means so much to them, I should care too.*

Teams of students around the world take part in the annual contest. Their challenge? To design and carry out long-lasting community projects that reduce CO_2. While the goal is to inspire people to care about the Arctic and to effect change, the

contest is also designed to nurture leadership skills. That's why each team includes an adult mentor, one whose role is to guide, not lead.

Because current and past participants of Project Polar Bear have grown up with climate change as part of their reality, they bring a different perspective to climate leadership. For them, learning about climate change and wanting to contribute to the solution are the norm.

A WIDER NETWORK

Students stay engaged throughout the contest with the help of their adult mentor, who also helps them learn which actions have the most impact. Adult mentors stay connected with other mentors (and team members) through private social media pages, text apps, and other tools.

PBI relies on key partners to make the program as effective as possible. By aligning ourselves with leaders in climate education and youth engagement, we help ensure our adult mentors have the resources they need. Organizations like the Alliance for Climate Education provide access to their award-winning multimedia climate education curriculum.

Partners with experience in youth engagement help the students evaluate and hone their skills. Others help by providing the necessary framework for productive conversations on polar bears in a warming Arctic.

Since the contest began, PBI has engaged with over 2,000 youth leaders. This year, teams of students and their mentors spanned the globe, representing nine countries on four continents.

THE PATH FORWARD

Many of the students who take part in Project Polar Bear find that it influences their path in college and the direction they take as young professionals. And the educational opportunities and professional development they gain from Project Polar Bear help with college applications and job interviews.

Adult mentors earn recognition for their mentorship too. Last year, one advisor was honored by President Obama as a Climate Education and Literacy Champion of Change. Another received the Carnegie Science Center's Honoring Innovation in Science and Technology Award.

But in the end, the contest is focused on empowering youth. As one young leader said: "We need to take this issue into our hands. The future will be ours, so we have to take ownership over it, tackle it, and make sure it's something we'll be proud of."

Marissa Krouse is Polar Bears International's program manager. Photos (at right) © 2016–2017 Project Polar Bear Teams.

A: We hope to raise public awareness of how climate change is impacting humans in the most remote parts of the globe, how the conservation of an iconic species is intertwined with the lives of humans, and how addressing the growing conservation challenges in the Arctic requires working together with local communities and respecting their social values and cultural practices.

Q: The second part of the project is a comprehensive analysis of the polar bear's status in those subpopulations with data. Can you tell us about the approach you will be using?

A: I will be working with stakeholders from four Arctic nations, uniting state and federal governments and universities, who together have data from the past several decades of polar bear fieldwork. We will look at the average age of reproducing adult females—which is called *generation length* and can influence population dynamics—to estimate how fast a population can grow. We will evaluate generation length in different subpopulations, and investigate how it has changed over time with different levels of harvest or sea ice loss.

Q: How might the analysis help polar bear researchers and managers elsewhere?

A: A circumpolar analysis of generation length, using one of the most comprehensive datasets available for a large carnivore, should improve our understanding of the resilience and plasticity of polar bears in relation to climate change. Having definitive estimates of generation length will provide a consistent time frame for future conservation assessments, for example under the U.S. Endangered Species Act or the Red List assessment for the International Union for the Conservation of Nature. And importantly—this analysis will help us figure out how to use generation length as a monitoring tool in the future.

Q: You just returned from studying polar bears in remote Greenland. Any parting thoughts from your fieldwork this year?

A: We've been working in Southeast Greenland for the past three years. It's a vast and interesting area where polar bears have not been studied before. This year (2017) was quite difficult due to poor ice in most of our study area, which reflected the record-low ice conditions throughout the Arctic. We saw a lot of bears that we couldn't capture because the ice was too rough or there was open water nearby, which is a hazard when you're trying to immobilize bears. It's a fascinating place to work but the ice conditions this year made me pretty concerned about the future.

Barbara Nielsen is the director of communications at Polar Bears International. You can follow Kristin's project on Twitter via @KristinLaidre.

PBI Calendar of Events

Canada's 150th
All year long

Project Polar Bear Registration
October–November

Polar Bear Cam
Late October–late November

Polar Bear Week: Energy Challenge
First full week of November

Northern Lights Cam
November–March

International Polar Bear Day: Thermostat Challenge
February 27

Earth Day: Transportation Challenge
Project Polar Bear winners announced
April 22

Arctic Sea Ice Day: Clean Energy Challenge
July 15

Beluga Cam
Mid July–mid September

Visit **polarbearsinternational.org** *for details on these events and how you can get involved.*

photo © Daniel J. Cox/NaturalExposures.com

www.polarbearsinternational.org

Meet Flat Nanuk!

Flat Nanuk is a polar bear who loves to travel and meet kids. Color him in and cut him out, and add a message to his sign: like "Save polar bears!" or "I bike for polar bears!" or whatever you decide. Then, take a photo of yourself with Flat Nanuk—in your backyard, at school, or in a favorite place. Ask your parents for permission to share it with Polar Bears International. You can email it to us at info@pbears.org or post it on our Facebook wall. We'll share the photos on International Polar Bear Day, February 27th and/or at other times of the year! Please include your first name and city/country or the name of your school in your email or post.

Learn More About Polar Bears Like Nanuk

POLAR BEARS ARE BUILT FOR COLD. THE SEA ICE IS THEIR HOME.

- Two layers of fur and thick fat help keep them warm. Small ears and a small tail stop heat loss.
- Tiny pads on the bottom of their paws, called *papillae*, grip the ice and keep them from slipping—like winter tires!
- Curved claws are perfect for catching seals and pulling them from their breathing holes.

POLAR BEARS NEED SEA ICE TO MORE EASILY HUNT SEALS.

- Polar bears catch seals at their breathing holes when seals come up for air.
- Without sea ice, polar bears would have trouble surviving in many parts of the Arctic.

SEA ICE ACTS LIKE EARTH'S AIR CONDITIONER. IT HELPS KEEP PEOPLE AND WILDLIFE COOL AROUND THE GLOBE.

But the sea ice is melting from a warming climate.

- Why? Gases in the air act like a blanket that traps heat around Earth. This is what makes our planet comfortable to live on.
- But when we burn fossil fuels like coal and oil, we pump extra gases into the atmosphere. This is like piling on a VERY thick blanket, making the planet too warm!
- Just as a hot summer day melts ice in a glass of water, a warming planet melts Arctic sea ice.
- The good news is that we can save sea ice and help polar bears by switching to clean energy like wind and solar. By burning less coal and oil, we'll help polar bears and people, too!

POLAR BEARS INTERNATIONAL

www.polarbearsinternational.org

SVALBARD | *continued from page 9*

The technology this project is developing is pushing our ability to collect quality observations of Arctic animals with minimal disturbance. It is not an easy task to ask for electronics to function in the Arctic, but the challenge leads to innovation. BJ developed a camera system that can withstand the harsh Arctic winter (and polar bears). He also struck a delicate balance between battery capacity and available solar power as the winter sun makes its long trek back north.

Back in Longyearbyen, the signs of change were omnipresent. Old cable systems to move coal mined from within the slopes of Svalbard dotted the landscape. A barge, docked and filled with coal, sat in an open fjord without ice. In the center of Svalbard, businesses were starting to see their first rush of seasonal tourists, and the university campus hummed with students and researchers.

photo © Daniel J. Cox/NaturalExposures.com

Change is underway on Svalbard. What it means for the future of polar bears remains to be seen.

Dr. Nicholas Pilfold is a postdoctoral associate in recovery ecology at the Institute for Conservation Research, San Diego Zoo Global.

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Sustaining a future for polar bears across the Arctic

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