


A 52' TELEVISION DOCUMENTARY FOR CBC'S  
*THE NATURE OF THINGS* AND INTERNATIONAL PRESALES.



# FROZEN IN TIME

THE SCIENTIST WHO LOST HER MIND,  
AND THEN FOUND IT AGAIN. ALONG WITH ANOTHER WORLD.

 Handful of Films



 CREATIVE  
BC

 PBS  
Distribution

# Synopsis

*Frozen in Time* is the story of a fallen star of science – paleobiologist Natalia Rybczynski – who stood at the forefront of her field when she was stopped in her tracks by a traumatic brain injury. In the first decade of her spectacular career, she reported a series of intoxicating discoveries from her fieldwork in the remote High Arctic, each one hinting at a rich forest world full of surprising creatures before the Ice Age.

The land-walking ancestor of seals, the evolutionary origins of desert camels in Arctic snows, the first appearance of dam-building beavers, and the emergence of mammalian night vision. Even the “Mother Bear” – the single species ancestral to almost all bears we know on Earth today.

## WHAT WAS THIS WEIRD LOST WORLD, AND WHAT HAS IT GIVEN TO US TODAY?

Once the fog of her brain injury obscured her ability to read, write and move through the world, these became unsolvable questions. But over time, Natalia learned to carve out moments of lucidity, and to use that time wisely. Now, she has arrived at a stunning and novel idea about the last Arctic forests.

They were, she believes, the paleontological Garden of Eden that gave birth to the living world around us today. Ancient boreal forests, where the sun set below the horizon for six months of the year, were a training ground for the plants and animals we think of as quintessentially Canadian. When boreal forests show off their autumn colours and drop their leaves, and mammals go into winter hibernation, these are evolutionary echoes of life in the last forests of the Pliocene.

Natalia’s big idea took form in her damaged brain. In 2023, she will finally return to High Arctic to test it in practice.

This science-in-progress documentary unveils a deeply personal portrait of a perfectly human scientist, struggling with disability while pushing forward at the very limits of knowledge. Join Natalia on her journey back to the Arctic to reclaim her identity and prove her scientific worth. At the same time, be amazed by a world of lush Arctic forests and fascinating ancient creatures, revealed in gorgeous, animated reconstructions by renowned paleoartists and a team of leading Canadian animators.



*Natalia on fieldwork in Canada's Arctic before her head injury*

# Documentary Outline

Natalia Rybczynski always dreamed of ancient mammals. As a PhD student in vertebrate paleontology at Duke University, she made headlines when she discovered the fossils of a land-walking seal ancestor, the “missing link” between land mammals and present-day ocean-dwelling seals. This led to a prestigious research position at Canada’s Museum of Nature. Canada’s natural history museum in Ottawa holds one of the world’s greatest collections of Arctic fossils, the remains of all the living worlds that once flourished under the midnight sun. Natalia was stepping into the shoes of generations of pioneering scientists who gathered that collection; her childhood dreams were taking form.

By her early 30s, she was leading annual expeditions to Canada’s northernmost islands to search for the remnants of tropical forests and ancestor animals from millions of years ago, before the Ice Age. Because Ice Age glaciers scoured the landscape, destroying fossil evidence, we

know less about the living world 3 million years ago than we do about the Age of Dinosaurs, which ended 64 million years ago. But in evolutionary terms, the last forests before the Ice Age are much closer to us, and their plants and animals much more tightly linked to those of the present.

**NATALIA WAS LOOKING FOR THE KEYS TO A LOST WORLD, AND ON A SERIES OF GRUPELLING ARCTIC EXPEDITIONS, SHE SOON MADE A SERIES OF SPECTACULAR DISCOVERIES.**



Following her discovery of ancient land-walking seals, she found the skull of a 3-million-year-old-bear. Analyses revealed that this was the “Mother Bear” – the ancestor of almost all bears living today, from Canada’s own polar and grizzly bears, to spectacled bears of the Andes, sun bears of Southeast Asia, and sloth bears in India. That the full diversity of bears on Earth today emerged from a single northern species that lived only three million years ago was an arresting discovery. But it also hinted at the pivotal importance of the last Arctic forests for the living world that followed them.

Next, Natalia and her team uncovered a site on Ellesmere Island – called Beaver Pond – packed with the remains of ancient beaver dams: sticks cut by the teeth of beavers. Beavers are monumental shapers of the modern boreal forest, and their dams and ponds are a pillar of boreal biodiversity and the planetary carbon balance. But when and why *Ursidae* shifted from eating vegetation to building habitats with it has long puzzled scientists. Dam-building creates both winter habitat – ponds of water below the ice – and lodges in which to raise young and hibernate. If Natalia had discovered the first beaver dams, could this be a clue to how forest animals were adapting to the cold as the Ice Age approached? Did hibernation evolve in the last Arctic forests, before spreading throughout the temperate forest ecosystems familiar to us today?

**THEN, NATALIA MADE A TRULY HEADLINE-GRABBING DISCOVERY: THE FRAGMENTS OF LEG BONES BELONGING TO THE ANCESTORS OF CAMELS.**

How could the animal we consider a consummate master of the desert have any place in a forest world with six months of freezing darkness and deep snows? But the evidence was there, and Natalia soon realized how the camel’s desert adaptations may in fact have originated in the Arctic. Their fatty hump would have kept them alive through the long, dark winter. Their wide, padded feet would have been just as helpful in snow as they are in sand today. And as any zookeeper knows, camels have extraordinary night vision: perfect for life in six months of darkness.

**With this series of astonishing discoveries, Natalia was assembling the evidence of a mysterious lost world, the last forests before the Ice Age.** But the puzzle pieces didn’t yet fit into a bigger picture. What it meant still lay beyond her understanding.

On a cold Saturday morning in 2011, Natalia collided with another cross-country skier near her home in Gatineau, fell, and hit her head on the packed snow. But without understanding the pathology of a brain injury, she soon left on a long-planned expedition to Antarctica with



*Camels, it turns out, evolved in Arctic forests*

a student group from Ottawa. When Natalia returned to Canada, what had begun as splitting headaches became a dark and heavy blanket, settling on her mind. As she returned to work at the Museum of Nature, she was haunted by extreme fatigue and brain fog. All her doctor could say was, "Brain injuries can be life changing – good luck."

Natalia's research position at the Museum of Nature turned into a long-term disability pension. Her paleontologist colleagues were sympathetic, but years passed, projects wrapped up without her, and papers were published without her contributions.

Whenever the body loses a part of itself, an echo remains. So it was with Natalia's brain – in its own way, it turned and cogitated. In the countless hours she spent lying on the floor of her darkened living room, eyes closed against the busy world, she returned to her dreams of ancient mammals.

LIKE A TIME-TRAVELLER, SHE WALKED THROUGH THE LOST FORESTS OF THE ARCTIC, WITNESSING THEIR ETERNAL SUMMERS AND THEIR LONG DARK WINTERS AS HER BRAIN SCARRED OVER ITS INJURIES.



Natalia thought about the meaning of these poignant last forests, the final act of a hotter time, before Ice Age glaciers erased all life. With time, she arrived at a new vision of the ancient Arctic. Now, the fascinating species she had discovered as a young scientist had synthesized into a joined-up picture. **She imagined the last forests as a paleontological Garden of Eden.** With its extremes of lightness and darkness, unlike any forest world on Earth today, these ecosystems must have formed much of the living world we have inherited.

WHY WOULD TREES LOSE THEIR LEAVES IN WINTER? **WHY WOULD ANIMALS HIBERNATE?** WHY DO BEAVERS BUILD DAMS AND TRANSFORM STREAMS INTO LAKES? **WHY DO CAMELS HAVE HUMPS AND SEE IN THE DARK?**

In this documentary, we join Natalia ten years after her brain injury. Will she lie on her living room floor for the rest of her life on a Government of Canada pension? Or can science meet her where she is? Is there some way that Natalia can bring her meditations back into the world of shared ideas? Can she ever return to the Arctic she loves, to search for evidence to support her theory?

In 2023, we will follow Natalia's monumental struggle to reconcile a damaged brain and her dream of science, accompanying her on an arduous expedition to the most remote corner of the High Arctic. Unable to look out a helicopter window or read a page of text, Natalia hopes her mind will accomplish the slow and painstaking work of scanning the tundra for fossils. Now, a team of geneticists will join her to search for the ancient DNA of lost ecosystems, equipped with the ability to recover DNA from frozen dirt millions of years old. If they



*The 'Mother Bear', the single ancestor species from which all bears today evolved.*

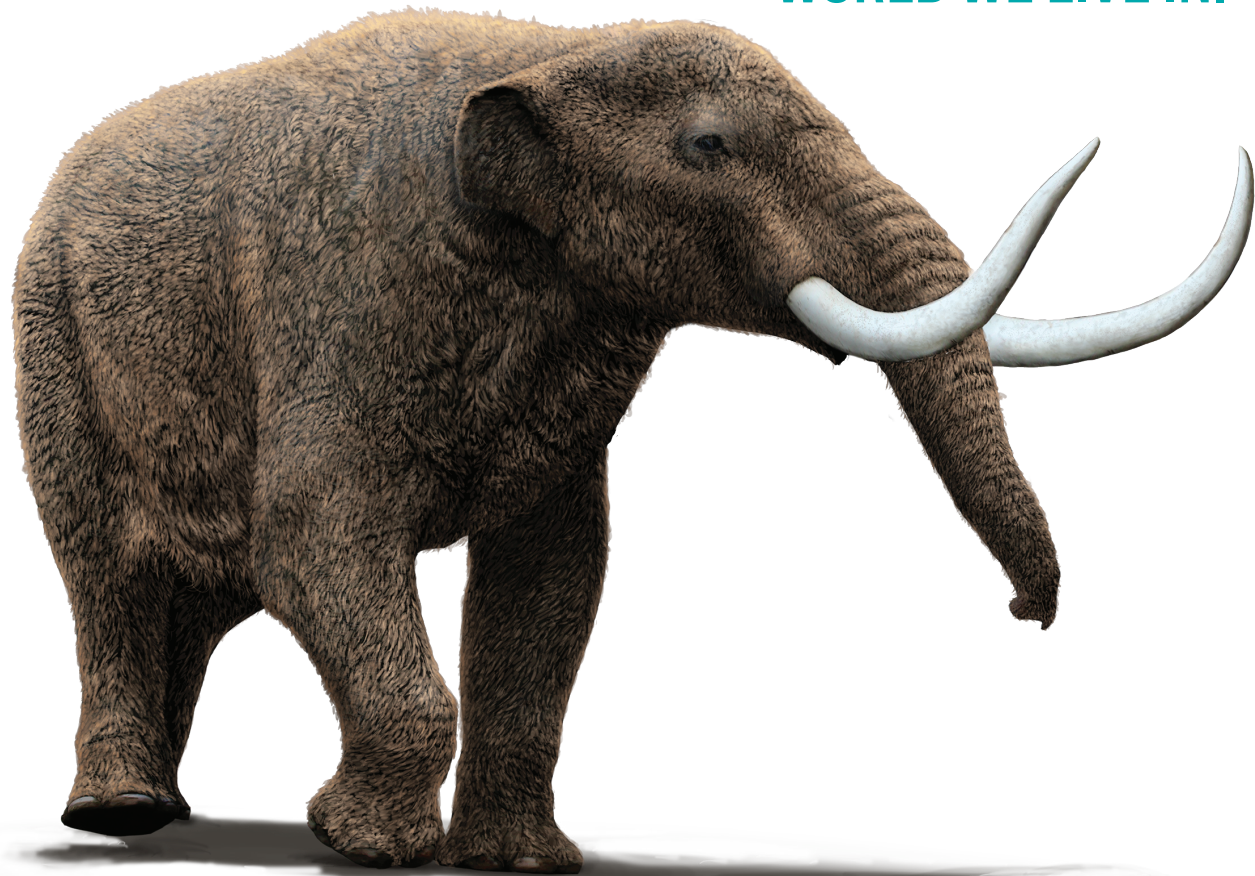
succeed, Natalia will be part of an historic endeavour to reconstruct a rich and detailed picture of the last Arctic forests. Perhaps she will even recover the genomes of ancestor camels, bears and beavers.

THE ANCESTOR CAMEL, THE GIANT BEAVER, STRANGE BLACK GEESE AND THE MIGHTY MASTODON **WILL POPULATE THE PAGES OF NATALIA'S MIND AND FILL OUR SCREEN.**

*Frozen in Time* is an intimate narrative of loss and reinvention, capturing through observational film techniques Natalia's pain and determination, and witnessing her return to the gruelling work of an Arctic field scientist. As her journey unfolds, the wonders of the last forests will blossom around her in exquisite, animated detail. The treeless tundra will transform into the lush and variegated boreal forests of the Pliocene Epoch. As Natalia discovers the mother of bears, sleeping through six months of darkness, we will meet its animated equivalent. The ancestor camel, the giant beaver, strange black geese and the mighty mastodon will populate the pages of Natalia's mind and fill our screen.

This documentary is both a genuine science-in-progress exploration of our evolutionary past and an emotional and meaningful character portrait. It contains a novel and ground-breaking interpretation of our northern world on the cusp of the Ice Age, a lost world we know less about than the Age of Dinosaurs 65 million years ago. We will transport our audience to the most remote corner of the Canadian Arctic, where NASA trains for the exploration of Mars. And we will journey into the scientific imagination of a fallen star of paleontology, where this lost world takes form in animations.

AS WE WITNESS NATALIA'S PHOENIX-LIKE RETURN TO SCIENCE – IN A REINVENTED FORM – OUR AUDIENCE WILL CONFRONT QUESTIONS FUNDAMENTAL TO ANY HUMAN LIFE. **QUESTIONS ABOUT DISABILITY, DIVERGENT MINDS, AND THE HIDDEN POWERS OF PEOPLE WHO THINK DIFFERENTLY TO CHANGE OUR UNDERSTANDING OF THE WORLD WE LIVE IN.**



## Diversity & Representation

*Frozen in Time* is the story of a neurodiverse female scientist who suffers a career-ending brain injury and whom we meet in the process of trying to reclaim a place in the scientific world. Natalia Rybczynski's story is authentic and intimate, and it will inspire us to think about the work of scientists in new ways: scientists are women, scientists have personal setbacks, scientists are risk-takers, and scientists can do science in non-traditional ways. Natalia's story show us that there is room for disability in science.

SCIENCE IS DONE BY PEOPLE JUST LIKE YOU AND ME, **PEOPLE WHO DREAM, DISCOVER, AND SOMETIMES FALL TO PIECES.**

Behind the camera, emerging Jamaican-Canadian cinematographer Ryan Wilkes will assume the role of Director of Cinematography, after a successful one-year fellowship at Handful of Films (2022). Wilkes recently completed a PhD in biomedical engineering, before approaching our company with a desire to learn documentary filmmaking and joining *True Survivors* (CBC) and *Before the Ice* (PBS/D/ZDF) as Cinematographer-in-Training.

Squamish-based Jen Randall will edit the documentary, after her own recovery from a COVID-triggered brain injury in early 2022. Randall was slated to edit the CBC documentary *True Survivors* before suffering a stroke while that documentary was in production. She has a portfolio of original, sensitive, and award-winning feature and short-form documentaries in the adventure and mountain genre. She is also now back to form, and ready to take on this personally meaningful project.

The very experienced production managers Sandra Tober and Ally Barry will serve as Producers, alongside Chinese-Canadian Production Coordinator Linda Rosenstrøm Chang. One of our favourite composers, Jonathan Kawchuk (*Fast Horse*, *Carbon – The Unauthorised Biography*) will provide the original score. Renowned Animation Director Bruce Alcock (*Carbon – The Unauthorised Biography*, *Before the Ice*) will lead our animation team.



Natalia with her fossil collections at the Museum of Nature, 7 years after her head injury

# Visual Style

*Frozen in Time* is a hybrid documentary, relying on a combination of observational documentary techniques and playful and evocative animations to build a revealing portrait of the main character, paleontologist Natalia Rybczynski. Meanwhile, ambitious and scientifically accurate animations will bring the lost world of the Pliocene Arctic to life.

Director Niobe Thompson's Emmy-nominated medical documentary *Transplanting Hope*, which aired on PBS NOVA in 2017, offers an example of the power of non-intrusive *verité* filmmaking to reveal the vulnerability and resilience of characters on screen. This approach begins with the formation of a bond of trust between filmmaker and subject. Niobe and Natalia have been building their relationship for over a year. Through her own testimony, we will reconstruct Natalia's early scientific career and the events surrounding her brain injury. We will film with her as she prepares for the 2023 Arctic expedition and follow her into the field this summer.

Natalia is conjuring the lost world of the Pliocene Arctic, and we will penetrate her scientific imagination and bring that past to life

be collaborating with some of Canada's leading paleoartists and animators. Acclaimed scientific illustrator Julius Csotonyi, whose depictions of ancient creatures and habitats are sought by museum curators and scientists alike, will inform our visual depictions of the Pliocene. Artist and animator Bruce Alcock, the Creative Director of Vancouver animation studio Global Mechanic (*Carbon – the Unauthorized Biography* for CBC/ABC/ARTE and *Before the Ice* for PBS/ZDF) will direct an ambitious 2D and 3D animation approach to bring movement to Csotonyi's exquisite drawings.

The animations of the Pliocene and its creatures – from camels, to bears, to mastodons – will be created in part through the repurposing and reimagining of raw artwork from a parallel blue-chip documentary commissioned by Tangled Bank Studios and PBS NOVA called *Before the Ice*. Already in production, that documentary has an animation budget of roughly USD\$750,000.



*Dam-building beavers emerged in Arctic forest wetlands millions of years ago*

# Filmmaker Biography

The documentaries of anthropologist and filmmaker **Niobe Thompson** reach back to our human origins, explore the mysteries of evolution, and tackle the environmental dilemmas of the Anthropocene. As a science and adventure host, he has made a laboratory of his body and mind. As a Producer and Director, he brings unique and powerful moments in the human experience to the screen, from Siberian reindeer herders, to ancient DNA laboratories, to organ transplant surgeries. Raised by a canoe-building family in the northern Canadian Cree community of Wabasca-Desmarais, Niobe's fascination with indigenous experiences and knowledge led to a PhD in Anthropology at the University of Cambridge.

Niobe's work as a Director and Producer has been awarded Canada's highest honour for "Best Science and Nature Documentary" three times, as well as wins at Sundance and Jackson Hole, and two Emmy nominations. After co-directing and co-producing Canadian-Australian feature documentary *Carbon – The Unauthorised Biography* (2022), Niobe is co-producing and directing the ancient-DNA breakthrough documentary *Before the Ice* with Tangled Bank Studios for PBS NOVA.



*Anthropologist and Director, Dr. Niobe Thompson*

# Production Schedule

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JANUARY - APRIL 2023	PRE-PRODUCTION
MAY - DECEMBER 2023	PRINCIPAL PHOTOGRAPHY
JANUARY - JUNE 2024	POST-PRODUCTION
JUNE 2024	DELIVERY

## Our Company

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Specialist science and nature producer **Handful of Films** is known for intelligent, ambitious, and impactful documentary storytelling. Winner of 7 Canadian Screen Awards for “Best Science and Nature Program”, “Best Cinematography” and “Best Original Score” for the recent documentaries *The Great Human Odyssey*, *The Perfect Runner*, and *Equus - Story of the Horse*, we reached new heights in 2019, with a win at Sundance for *Fast Horse* and our second Emmy nomination for *Transplanting Hope*.

Our 2022 feature documentary *Carbon - The Unauthorized Biography* is now touring film festivals and broadcasting on CBC, ABC and ARTE. We are currently co-producing with **Tangled Bank Studios** the behind-the-scenes story of a spectacular ancient DNA discovery, called *Before the Ice*, for **PBS NOVA**.

**DELIVERY IN JUNE 2024.**

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