Take a Good Look at the Frozen Beauty of the Arctic Before It All Melts Away

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By Diane Tuft / Assouline
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My attachment to frozen water began with my first photographic series, Distillations in 1998. Snow and ice became the palette that I would use for the next eighteen years to visually record atmospheric effects on the Earth's landscape. Each snowflake and ice crystal is unique. When combined with another, they form an ever-changing palette. While exploring the Arctic this past year, I was transfixed by the panoramic vistas, with shapes and patterns that appeared as sculptures formed naturally by wind, air, temperature, moisture, and atmospheric conditions. As the sun changes its position, the colors of the ultraviolet, infrared, and visible-light spectrum are reflected, refracted, and absorbed within these ice sculptures.

The Arctic is melting faster than any other place in the world. I felt compelled to photograph its splendor before the effects of global warming cause this landscape to disappear. In order to get a comprehensive picture of the fragility of the Arctic, I traveled to the mountain glaciers of Svalbard, Norway, the Arctic Ocean's sea ice, and the icebergs and ice sheet of Greenland.

I began my Arctic exploration on June 4, 2015, at 78 degrees North in Svalbard, an archipelago in the Arctic Ocean located halfway between mainland Norway and the North Pole. Most of Svalbard's twenty-three thousand square miles remain untouched by civilization, and the majority of its twenty-six hundred inhabitants live in Longyearbyen, the world's northernmost settlement. After great difficulty arranging to rent the only helicopter in Svalbard, I was able to access the region's mountain glaciers and surrounding waters.

Circling the Konglomeratfjellet, a mountain in Wedel Jarlsberg Land that towers above the almost ten-mile Recherchebreen glacier, I became mesmerized by the strong ultraviolet shadows cast by the low sun. Through my camera lens, the glacier's pristine snowdrifts became soft gentle forms. The turquoise-blue meltwater ponds of the archipelago's Nathorstbreen and Wahlenbergbreen glaciers became otherworldly shapes. Viewed from above, remnants of snow on the Wordiekammen, a geological formation made of limestone rocks, appeared to outline the area, defining it from the surrounding blue-green of the Isfjorden inlet. Ice floes in Isfjorden created patterns of cracked ice resembling abstract paintings. Terracotta rivers of ancient Devonian sandstone branched throughout the valleys of the Abrahamsenbreen glacier.

Beyond the beauty of Svalbard, I was also aware that it is home to the Arctic's only international science research center, Ny-Ålesund. On a previous photographic journey to Antarctica, I had spoken with climate change scientists at the U.S. scientific research center, McMurdo. I was now interested in discussing the effects of climate change on the Arctic.

Because accessing Ny-Ålesund is restricted to the scientific community, I had to secure a letter of invitation from a scientist whose research would coincide with my visit. After several months, Vittorio Pasquali from the National Research Council of Italy wrote a letter on my behalf to the Norwegian government. Vittorio was studying the effects of light on the behavior of the Lepidurus arcticus—a small crustacean that only lives in Arctic ponds. This letter gave me access to interview the other research scientists who were stationed there.

These scientists were studying a range of subjects including: the effect of climate change on the ocean's kelp population and on Arctic greenhouse gases, pollution's effect on the DNA of Arctic birds, and the effect of increased radiation on phytoplankton.

While at Ny-Ålesund, I was fortunate to spend an afternoon in the Kongsfjorden inlet, boating through small icebergs while watching thousands of Arctic birds, including glaucous gulls and fulmars, nesting on steep rocks jutting out of the water. In the background I could hear the thunder of calving glaciers releasing chunks of ice into the sea.

I knew that the majesty of Svalbard would change, but I wondered if its mountain glaciers would exist by the end of the century.

I continued my journey on June 16 by traveling through the Arctic Ocean to the North Pole, where I would be able to experience the Arctic's sea ice. In order to reach the North Pole, I had to travel on a Russian nuclear-powered icebreaker leaving from Murmansk, Russia.

Once again, I was mesmerized by the Arctic's splendor. The vast frozen fields were absolutely breathtaking. My senses were stimulated as I watched, listened, and felt the ship break its way through the endless white expanse. Large blue-green blocks of ice lifted out of the ocean and fell back on themselves. Signs of melt were everywhere. Areas of open water were

studded with ice paddies that would be used as stepping-stones for the occasional polar bear. When I embarked on my journey, I thought that I would see several polar bears, but during my two-week trip, I encountered only three adults and three cubs.

The sporadic snow paddies were a clue to the difficulty the bears have in living and navigating the Arctic waters.

For thousands of years, the sea ice during the Arctic winters through the month of June was always too thick for surface vessels to access the North Pole. But now, because of climate change, our vessel was the third earliest to ever reach the Pole, and the only vessel to arrive during summer solstice. With a balmy temperature of 32 degrees Fahrenheit, the ice at the North Pole was too thin to disembark. It took several hours to find an ice floe that could support the weight of our group.

While this was an amazing experience, it disturbed me to know that my trip through the Arctic Ocean was only possible because of the Arctic melt

In 2007, I had photographed icebergs, glaciers, and the ice sheet in Ilulissat, Greenland. Nearly a decade later, I decided to return so that I could visually record the difference in the land- scape and document the impact climate change has had on the area. I was also afforded the opportunity to visit the northern part of Greenland's ice sheet and observe ice-core drilling.

During my first visit to Ilulissat, the temperature was 30 degrees Fahrenheit, and Disko Bay was spotted with colossal snow-covered icebergs that had calved from the Jakobshavn and surrounding glaciers. The ice sheet was blanketed with fluffy snow studded with cryoconite holes—cylindrical depressions caused by solar radiation being absorbed by sediment that has landed on the ice surface. When I returned to Ilulissat in 2016, the Jakobshavn glacier was calving at such a rapid rate that the entire inlet was filled with small icebergs that continually emptied into Disko Bay. They were in a constant state of melt: waterfalls tumbling from their tops and rivulets raining from their interiors. Icebergs cracked, split, and fell into the bay daily.

The majestic Eqi glacier, which I had photographed in 2007, had retreated so much that it was now almost entirely on bedrock. The constant calving no longer produced icebergs; instead, it released small sediment-colored pieces of snow. Taking the same aerial flight over the ice sheet that I took in 2007, I now saw rough peaks of snow and silt that were studded with hundreds of meltwater ponds, some so large that they could be considered lakes. The meltwater ponds would eventually empty into deep moulins, which became streams that drained into the waters surrounding Greenland.

The temperature in Ilulissat just nine years later was a temperate 65 degrees Fahrenheit.

Since 1955, Greenland's ice sheet has served as a unique research database with the introduction of ice-core drilling. Scientists analyze the data derived from ice-core segments to determine what the atmospheric conditions, temperature, and sea level were during a specific time period. This information is used to predict future climates under similar past atmospheric conditions.

Alan Stoga, the chairman of the Tällberg Foundation, invited me to watch the first ice cores being drilled at the East Greenland Ice Core Project (EGRIP), located at 76 degrees North. Tällberg's mission is to encourage global conversation about issues critical to the evolution of our societies, including climate change.

Our seven-member delegation met on July 16 in the town of Kangerlussuaq and flew in an LC-130 Hercules plane to the campsite, located directly over the North-East Greenland Ice Stream.

The Greenland ice sheet stretches for miles, providing an endless white vista with hints of ultraviolet blue. The horizon undulates in conjunction with the levels of underground streams. For four days we camped at EGRIP, learning the importance of the data that will eventually come from ice-core research. It would take three years to extract cores from the final depth of twenty-six hundred meters, equivalent to one hundred thousand years ago.

Scientists predict that the sea level could rise three to six feet or more by the end of the century, inundating coastal area world-wide and displacing tens of millions of people. The melting of mountain glaciers and Greenland and Antarctica's ice sheet will be significant factors to sea level rise.

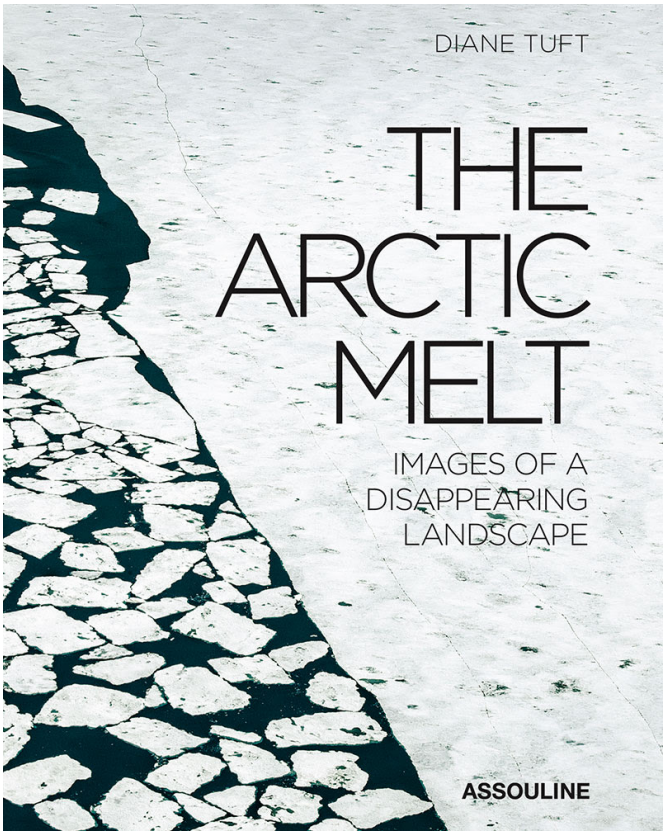
Will the Arctic ice become a "new wonder" of the world—a natural phenomenon that existed for a short period of time and then finally disappeared?

I think about the different forms of ice within the Arctic Ocean. I think about the soft, subtle folds in the snow within the Svalbard glaciers.

I think about the towering icebergs that I saw in 2007 that are now half the size.

I think about the glistening blue meltwater ponds now studding the glaciers.

This book is a visual testimony to the fragile and shifting landscape of the Arctic, which is now melting at an unprecedented rate. The photographs that follow serve as documentation of the expansive beauty of the Arctic now and the dire situation that it continues to face if we do not provide a sustainable environment for the future of our planet.



Diane Tuft is a mixed-media artist who has focused primarily on photography since 1998. She earned a degree in mathematics at the University of Connecticut before continuing her studies in art at the Pratt Institute, New York. Her work is included in the permanent collection of the Whitney Museum of American Art; the International Center of Photography, in New York City; the Parrish Art Museum, in Water Mill, New York; as well as numerous private collections. She lives and works in New York City.