ON THIN ICE: CLIMATE CHANGE IS A MATTER OF LIFE AND DEATH FOR IÑUPIAQ WHALING COMMUNITIES

BY CHARLES WOHLFORTH

The brink of the shorefast sea ice cut the water like the edge of a swimming pool. A white canvas tent, several snowmachines and big wooden sleds, and a sealskin *umiaq* whale boat waited like poolside furniture on the blue-white surface of the ice. Gentle puffs rippled the open water a foot or two below, except near the edge, where a fragile skin of new ice stilled the surface. Sun in the north reached from the far side of the lead, backlighting the water and highlighting the imperfections in this clear, newborn ice with a contrast of yellow orange and royal blue. It was after midnight on May 6, 2002, three miles offshore from the NAPA auto parts store in Barrow, Alaska.[1]

A hushed voice urged me on toward the edge. "Come on, there's a fox. They follow the polar bears."

The fox ran past the camp, beyond the ice edge, danced as it ran upon the new skin of ice floating on the indigo water. An hour or two earlier there had been no ice there at all and now it looked no thicker than a crust of bread. The fox used tiny, rapid steps. Its feet disappeared in motion. Its back arched high and its tail pulled up tall, as if strings were helping suspend it on that insubstantial film of hardened water. Somehow it knew how much weight a brand new sheen of ice could hold, and knew how to calibrate each step within that limit. The Iñupiaq whalers of Oliver Leavitt's crew watched and muttered with admiration as the fox pranced out of sight. All were experienced hunters, even the younger ones, but they were impressed by this skill. This animal knew something valuable, something they would like to know, something that could help them survive.

As a non-Native (but a lifelong Alaskan), I still felt uncertain standing on ice miles out in the ocean. I hadn't expected research on climate change to bring me to a whaling camp. But having set out to follow scientists studying dramatic warming in the Arctic, I discovered that those who knew this world best were the Iñupiat. A thousand years of hunting the bowhead whale from floating ice had instilled in them both a profound understanding of this environment and a special ability to perceive its changes.

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1 Editor's note: On December 1, 2016, after this article had been written, Barrow was officially renamed Utqiaġvik, its traditional Iñupiaq name.

The ice was bad that year. It had been bad for a decade and seemed to grow steadily worse. The shore ice should form in the fall as bergs left over from the previous year float near the beach and are sewn back together by new ice that freezes in the cooling temperatures. These big bergs are chunks of the previous year's ice pack that never melted over the summer. They usually form out of old pressure ridges, mountains of ice built by the collisions of huge ice sheets, becoming fresh-water ice as warm spring temperatures drain pockets of brine trapped inside. The surface becomes rounded and smooth and the ice becomes dense, hard, and brittle. The Iñupiat call it *piqaluyak*, or glacier ice. Under the surface whiteness it glows iridescent blue. Iñupiaq travelers use the fresh water for making tea far from home.

Whalers seek out multiyear ice because it provides a strong platform for pulling up whales and it anchors the shorefast ice in place with its great mass. In the winter of 2001–2002, however, as for several years prior, little multiyear ice appeared at Barrow. The shore ice didn't form as solidly as it should, and it lacked the big, solid anchors that multiyear ice, or even new ice with large pressure ridges, would have provided. And on March 18, something strange and unsettling had happened. The ice went out, leaving open water right up to the beach in front of Oliver Leavitt's house. No one could remember the ice going out that early. Normally, it goes out in July. A dozen seal hunters floated out to sea on the ice. Search and Rescue helicopters went out to find them and bring them home. Some didn't know they were floating off into the Arctic Ocean until the helicopters showed up. You can't tell you're moving when your whole world starts to drift away.

Later, ice returned and refroze to the shore, but it wasn't sturdy ice and it still lacked good anchors. As whaling season began, a strong west wind pushed the ice against the shore for several days, then a strong east wind tested it and cleared away some of the junk ice. Oliver's theory now was that these events had cemented the ice adequately for safe whaling. He had chosen a flat area of ice with a color and height above the water that told him it was strong enough to pull up a whale. But every so often he sent someone to look at the watery crack that was a little behind us, or to check the dark ice—weak, brand new ice—that lay a mile or two back between us and dry land.

Morning came (not dawn, for the sun had rolled lazily along the northern horizon all night instead of setting) and Oliver sat, as he had since the previous day, on a long wooden sled next to his thermos and VHF marine radio, silently gazing on the water and the ice chunks and bergs drifting by slowly on the calm surface. Besides the danger of breaking off, another threat occupied his mind: a big mass of ice we could see across the lead, which was moving very slowly by toward the southwest, but also seemed to be getting closer at an imperceptible pace. Oliver said, "That's the dangerous ice. If people start noticing it's coming in we'll be out of here in five minutes flat."

The momentum behind an ice floe, even if moving only slowly, is stupendous; when it hits the unmoving shore ice, the collision can be like an immense, mountain-building earthquake, a terrifying event called an *ivu*. Oliver was young at the time of the big ivu in 1957, but he remembered how the ice went crazy, with big multiyear floes standing up on end and shattering far from the edge, forcing the crews to scramble for their lives over miles of cracking, piling ice, leaving camps, boats, and dog teams behind—their entire means of supporting their families. He had told such cautionary stories to the youngest members of his crew, including his harpooner son, Billy Jens Leavitt.

In traditional spring whaling the umiaq perches on the ice edge. If a whale surfaces nearby, the crew launches as quickly and quietly as possible and

Super bags protecting City of Utqiaġvik, Alaska from the Arctic Ocean

Bowhead Whale remains, Point Barrow, Utqiaqvik, Alaska

paddles to the whale or to a spot where the captain expects the whale to resurface. For the harpooner to hit the whale's vulnerable spot, just behind the skull, the captain has to maneuver the boat right onto the whale's back or within touching distance alongside. The whale can move much faster than a boat driven by canoe paddles, so most of whaling is waiting quietly for a whale to come close enough to launch. That morning we saw only one whale, a far-off black back rolling across the surface, and heard another, a roaring blowhole exhalation from somewhere we could not see. Normally at this time of year, a crew would be seeing whales every few minutes. Crews farther down the lead were paddling in search of one, thinking the migration might be passing by on the other side of the big ice across the lead.

Iñupiaq chatter on the marine VHF radio began to flow with comments from nervous captains up and down the lead. They saw the big pressure ridges across the open water growing noticeably closer. Oliver uttered a few words of Iñupiaq on the radio and the discussion stopped. "You got to talk to them quick before they scare themselves," he said. Each captain's experience and expertise were well known, an important factor in how whalers evaluated conditions and safety. Oliver Leavitt's name carried unquestioned authority.

The radio box was a sturdy plywood case with a car battery and a tall boat antenna. Each camp could hear its "base," usually the captain's home, and other camps spread out along the twenty miles of the lead. Channel 72

Artist in Point Barrow, Utqiaqvik, Alaska

Artist working on *Plein Air Arctic Permafrost Landscape* in Point Barrow, Utqiaqvik, Alaska

was for whaling and channel 68 for routine in-town communication. VHF sets seemed always close at hand near kitchen tables and under the dash of pickup trucks. In the morning people said, "Good morning, good morning," to announce they were on the air, and the NAPA auto parts store—which carried harpoon parts and other whaling supplies—let everyone know when they were open for business. In the evening, each person said "Good night" when turning off the radio, and the children and grandchildren of whalers said good night to their fathers and grandfathers out in camp—sweet broadcasts of kisses and love names that the whole town could hear. During times of peril, the VHF allowed whalers to act almost as one, sharing observations about ice and water movements and dynamics from many perspectives.

The whalers handled these technical conversations in Iñupiaq, even though many younger people are not fluent. Some handy words don't exist in English, such as *mauragaq*, to cross open water by jumping from one piece of ice to the next, or *uisauniq*, an ice floe that breaks off with people on it. But more important, and untranslatable, are the meanings derived from the very structure of Iñupiaq, a language developed to deal with situations in a moving landscape without landmarks or any visible distinction between ocean and shore. In the absence of physical reference points, the speaker can position objects and events using movement, the relative location of speaker and listener, and the directional orientation of the ocean and rivers. For example, *pigna* indicates that the thing you are talking about is above, has a length less than three times its width, is visible and stationary, and stands

at equal distance between speaker and listeners. *Pagna* contains all the same information, except that the subject's length is more than three times its width. Iñupiaq word endings also aid coordination by allowing speakers to pass on oral information without losing nuances about the quality of the knowledge and how it was obtained. They cover a gradient roughly ranging from "I saw it myself and it is certain" to "Someone saw it and it might be true." (Contrary to popular belief, however, the Eskimos do not have 100 words for snow.)

As afternoon progressed the sun was bright and unseasonably warm. The ice reflected brilliantly while the deep, dark water swallowed light. The details of the pressure ridge mountains across the lead were clearly visible. The radio grew lively again. Oliver stood and watched the ice across the water intently. Everyone else stood too, waiting for what he would say. Then calmly, "We better start packing up."

The younger men began by emptying the tent. Oliver worked on disabling the weapons and putting away the radio. Now you could see the ice moving through the water directly towards us. Everyone knew his job without a word, but Oliver said, "Better hurry up. Billy." When speaking to the younger part of the crew, he addressed only Billy Jens, like an officer giving orders to a sergeant. Things not fitting in right, the boys started throwing stuff on the sleds haphazardly. "Better hurry up, Billy," the tone this time a little higher.

Billy Jens had too much to do. I tried to tie down one of the sled loads for him, using half-hitch knots for speed rather than the quick-release knots the Eskimos prefer. The load came loose—I had tied the lashing line to the wrong rope. Billy Jens came around to retie it, but my tight half hitches were tough to untie. The boat was ready to go on the sled. The ice was a hundred feet away and closing fast. Oliver said, "Billy, pick up the boat." Billy was still trying to fix my mistake, without saying a word. I tried to help with the boat, but I didn't know where to grab it. Billy Jens grabbed the gunwale, and we heaved the boat onto the sled and started strapping it down. I could see the crystal-thin rims of ice from each side approaching, with the lead of water almost closed. We needed to escape before a possible ivu could break our ice free from the shore. "Better hurry up, Billy." Miscellaneous gear was thrown in the boat. Oliver told me to grab the back of a sled, where I stood, holding the handles. The snowmachines moved into place to hitch up.

As I was jerked into motion behind a snowmachine, I could see the collision begin. The glassy film of new ice from each side made contact and the delicate tracery that had supported the fox shattered and disappeared into the ocean.

We bounced wildly down the ice road, the boats pitching up to crazy angles on their sleds before they topped the ridges and raced down behind the snowmachines. Then we stopped on a big flat pan of ice near town. Crew after crew filtered in from the trails and joined us, until rows of sleds and boats stood side by side as if in a big parking lot. It was sunny and warm and a good time for friends to meet—teens with teens, captains with captains—and to talk of guns, snowmachines, and ice conditions. No fear, no sense of relief. These days, with the bad ice and warm weather, an escape like this was routine.

Scientists predicted that global climate change would come first and strongest in the Arctic. They went there to learn how the sky, ice, snow, water, and tundra interact to drive changes in the world's environment. Scientists have measured Barrow more consistently than any other Arctic research site

Blane De St. Croix traveling along the Arctic Ocean Utqiaġvik, Alaska coastal highway, 2019.

in the world. You can hardly turn around without bumping into a science project. Fascinating discoveries accumulated along that path. But the Iñupiat already knew the patterns in the system and how they changed through time.

Arnold Brower, Sr., one of Barrow's most successful whaling captains, now in his eighties, had watched as the Arctic climate changed. "Unusually changed," he said. "And the pattern of animals, as to how they behave, like caribou and the fish, the seasons of spawning and season of ice forming on the surface.

"The current has been kind of unpredictable, because the current would change then it would change back, and sometimes it would quiet down and form into like a big pool of water, a lake out there in the ocean. And all of us sat there and without hardly any warning the current would shove out to one side and run for a week and then change over again. But in younger years it used to be two-way, and it would take time, and the wind wouldn't change it at all….So it's not predictable at all what it's going to do next."

Whaling captain Harry Brower, Jr., said, "It's hard to find a place to pull up a whale. If you have this first-year ice, it's not really thick enough to hold the whale, pulling it out of the water. With that multiyear ice, if you have a large pan identified, you could pull up a whale there. We had an area specifically last spring where one big pan had fastened itself to the first-year ice and it probably was grounded because of that weight. And I think we butchered like seventeen whales on that ice pan. If was the only one heavy enough to pull up the whales."

Arctic storm floods old Arctic Research Laboratory, Point Barrow, Utqiagvik, Alaska, 2019.

Arctic storm floods downtown, Utqiagvik, Alaska, 2019

Elder Thomas Itta, Sr., saw many differences while hunting, ranging far afield from the village of Atqasuk on his snowmachine. Hunting was no longer possible in June and July because the weather was too warm to keep the meat from spoiling. Far more seagulls and jaegers were flying in the area, and hawks appeared for the first time. Even the snow had changed. The snow on the tundra was thin and hard but in the bushy willows it built into soft, deep drifts, as deep as six feet. There never used to be so many willows. "They started growing out here, there, and all over now," Thomas said.

Oliver Leavitt took longer to convince than some others that the climate had warmed. He kept hoping the difference lay in the way people were perceiving the weather, or that the changes were part of a cycle that would finally swing back to normal. But if it was a cycle, it was such a long one that no one could remember conditions like these.

The Iñupiat had developed a collective body of knowledge over a thousand years of subsisting from their environment. They were trained observers and they knew how to process their disparate observations into useful information for making decisions. In a language perfectly suited to the problems it addressed, they held long talks that synthesized what many people had seen over broad spans of time and space.

Every Native home was an information node. It could be disorienting: the VHF competed with the local radio station, a pinochle game, a TV, and sometimes a computer; kids ran around and elder family members sat at the table sipping coffee and telling stories. At the Volunteer Search and Rescue base, many of those elements were present, plus a pool game in progress, a hunk of walrus boiling, a big wall map to coordinate rescues, and various conversations in two languages. Everyone seemed to share information all the time, from around town, out on the tundra or the ice, and around the world. As wildlife biologist Craig George observed, "There's conversation, conversation, conversation back and forth, and then there's this statement that comes out. 'We know this.'"

One whaling captain's intuitive understanding of the ice was the product of many minds over many centuries. But the word intuition could get you in trouble. Oliver Leavitt went out of his way to say intuition had nothing to do with how he handled himself on the ice. His skills were based on experience. I think he was responding to a pseudospiritual use of the word. Some Alaska Natives believed that indigenous people were born with environmental knowledge; that they were essentially better than whites down in their bones. Scientists and practical people like Oliver naturally steered clear of such beliefs, which were contradicted every time a rural white trapper knew more about the environment than a TV-bound urban Alaska Native.

But even without drawing on the supernatural, the success of the Iñupiat in their environment did suggest a spiritual foundation. "The biggest connection between traditional knowledge and the spiritual way of life is about respect; respecting the environment, respecting the land, respecting the animals," said Oliver's friend Richard Glenn. A geologist by training, Richard had grown up in California but decided to take his place among his mother's people in Barrow. Now he was cocaptain of a whaling crew. "Traditional knowledge to me is centuries of trial and error. So what looks like an elegant solution is something that has only been learned because we've tried to do it in the wrong way in the past and this way works better. And that is also built around respect. You think you're better than the weather? Let's see what the weather has got in store for you."

On May 8, 2002, Oliver Leavitt's crew went on the ice again. The ice collision that had prompted our escape had not caused an ivu, and the campsite was intact. The sun blazed, surrounded by sun dogs, and the temperature was too warm for parkas, up to thirty-four degrees. The snow was melting

and water stood in puddles in dips all over the sea ice. It was unnerving to run a snowmachine through water sitting on top of ice that was sitting on top of 130 feet of water.

Oliver had kept a haunch of caribou meat frozen in snow that was now disappearing. It was a traditional hunter's food: kill a caribou in cold weather, let it freeze, then carry the frozen haunch and snack on it, cutting chunks out with a sharp knife whenever energy flags or you feel cold. Techniques like these, using the Arctic cold to preserve food, helped the Iñupiat survive through long times of shortage and over journeys of great distance. But in this warm weather, Oliver's caribou had thawed. It was spoiled.

As the evening wore on, Billy Jens checked the ice crack behind us. He prepared to pack up for a quick escape. At 1 A.M., the entire ice sheet we were sitting on dropped a little with a jolt. Soon the camp was packed again and we were retreating, back down the trail with the sleds bouncing, crashing, and splashing over pressure ridges and through the slush and expanding pools.

The following day was warm again. The water was bright and motionless. The ice pack had receded dozens of miles from the shorefast ice. Many whalers on our part of the lead had given up. According to rules agreed to by the Barrow Whaling Captains Association, only the traditional, quiet style of whaling with the umiaq was allowed on the portion of the lead south of the tip of Point Barrow. North of there, whalers were permitted to use motorized aluminum boats—boats around fourteen feet long with thirty-five-horsepower outboards, about as large as could be fit on a sled and dragged to the ice edge. The motor allowed whalers to range far afield to find a whale, but the noise chased the whales away from the shore. They called it "boating," and called the boats "the aluminum." With so few

Bowhead whale carcasses, point Utqiagvik, most northern land in Alaskan Arctic, 2019

whales near the ice, there was a movement to allow the aluminum all along the lead. Oliver was one of very few still camped along the lead with an umiaq. He said that he'd rather quit and go hunting upriver than whale with the aluminum.

"I'm out here whaling," he said. "To me, that's not whaling."

At 5:15 P.M. a prayer of thanksgiving came over the VHF, the harpooner of George Ahmaogak's crew thanking God for a safe and successful hunt—they had killed a whale from their aluminum boat far to the north. The prayer came through the little radio with a tone as thin as wrinkled paper. It concluded, "In Jesus's name." Then a cheer came up from their boat, so many miles away across the water.

In accordance with tradition, the prayer not only announced the kill, it alerted everyone in town to come help pull the animal up with block and tackle and butcher it. All the whaling crews and the entire community would converge on the ice for a task that would take eighteen hours of continuous labor. Everyone helping would receive a share of the whale, as would elders and the infirm in town, and anyone who attended a public banquet at the captain's house or at the summertime Nalukataq festival, as well as relatives far away, who would get theirs in packages through the mail. A captain and crew win honor and respect for a successful hunt, but no one can own a whale.

The Ahmaogak boat gave coordinates from their GPS receiver and called for more fuel and more boats to pull the whale. Billy Jens and two other younger crew members would go up and help with the butchering and claim a share of the whale for Oliver's crew, but there was no rush. It would take all night to tow in the whale.

Clouds blanketed the sky as night fell. It began to rain. The crew put a tarp over Oliver's seating area on the sled. Oliver was disgusted. He recalled as a young man wearing two pairs of snow pants for spring whaling, standing night watch in temperatures twenty degrees below zero.

"Here's your global warming," he said. "It never rains this time of year. It melts the snow real fast."

The weather station in Barrow gives forecasts over the VHF during whaling season so crews can ask questions at the end. On May 10, not long after the rain, the meteorologist announced disbelief, "There is officially no snow on the ground." A foot-deep snow pack had disappeared in three days. As always, after the question-and-answer session, someone said, "Thank you, weatherman." And the weatherman said, "You're welcome."

Since 1940, Barrow's snowmelt has come ever earlier on an accelerating line. Adjusting for the human-caused changes around the weather station (road dust in town enhances snowmelt) and using conservative statistical analysis, scientists estimated that the snowmelt had gotten eight days earlier, moving from about June 18 to June 10. Snowmelt on May 10 was off the charts.

Barrow whaling crews butchered only one more bowhead that season. Those crossing the ice to help with the final whale had to drive their snowmachines through deep water. Soon the last whalers gave up hunting. Normally whaling goes on into June and the ice doesn't go out until July. The season's total catch of only three whales was far too little to sate the community's appetite; some years, they brought in twenty or more.

At least Barrow, unlike other villages, still had fall whaling to look forward to. The geography of Point Barrow brought the bowhead migration near

Super bags placed along the coastline to save the Utqiagvik community from the Arctic Ocean, Alaska 2019

Blane De St. Croix on Arctic coastline, plein air sculpture of erroding coastline, High Arctic, Alaska, 2020

shore in both directions. But fall whaling was different, because there was no ice from which to ambush passing whales. Crews patrolled the ocean in larger boats with powerful outboard engines looking for a spout and counting on horsepower to get them to the whale before it could escape. Some Barrow whalers claimed they had already adapted to climate change by acquiring bigger boats and engines for fall whaling. Knowledgeable white men foresaw the next step of adaptation as phasing out spring whaling to hunt only in big boats in the fall. Richard Glenn cringed when I suggested that prospect to him. He loved camping out on the ice.

When I had stood with Richard on the sea ice that warm spring, he admitted that climate change appeared to be a fact. But when I returned to Barrow in the fall he still clung to the possibility that this appearance, with its dreadful implications, would prove misleading. "I was always looking forward to a back side of this cycle," he said. "I'm still hoping that that back side is coming. And if it doesn't, then we have to change. If it's part of a one-way progression, then life is really going to change."

"What kinds of things do you think about that would change?" I asked.

"If we start losing the spring season we have to totally rethink ice safety. The rules change. . . . Things that were true for fathers won't be true for sons, and so it will always be experiencing something new."

"That's kind of been the case for the last 150 years anyway," I said.

"Oh yes, the culture has changed, always. But there's always been some things: the ice on the lake will get five to six feet thick every year. Or ice that's accreted to the shoreline with enough pressure ridges is probably going to stick around. Those kinds of things, those little rules of thumb, are going to change. And that will change how you travel, how you hunt, how you stay alive."

Climate change that happens gradually is difficult for people to perceive. Even in Barrow, where the Iñupiat depend on wildlife, ice, and the timing of the seasons for their livelihood, some hunters fought the realization until faced with the terrible spring whaling season of 2002. By then, the ice, the Earth, and the elders were telling the same story. A new and fundamental change was underway. Understanding climate change, as well as responding, happens inside individual human beings, in their minds and in their bones, through judgment and trial and error, in the way the Iñupiat, and all people, learn the truth by living it.

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