

# Climate change threatens life in Shishmaref, Alaska

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**Shishmaref, Alaska (CNN)** -- When the arctic winds howl and angry waves pummel the shore of this Inupiat Eskimo village, Shelton and Clara Kokeok fear that their house, already at the edge of the Earth, finally may plunge into the gray sea below.

"The land is going away," said Shelton Kokeok, 65, whose home is on the tip of a bluff that's been melting in part because of climate change. "I think it's going to vanish one of these days."

Coastal erosion has been an issue for decades here, but rising global temperatures have started to thaw the permafrost that once helped anchor this village in place. Sea ice that protects Shishmaref's coast from erosion [melts earlier in the spring and forms later in the fall](#). As a result, the increasingly mushy and exposed soil along Shishmaref's shore is falling into the water in snowmobile-sized chunks. The crumbling land already toppled one house into the sea. Thirteen other homes -- nearly all of the Kokeoks' neighbors -- had to be moved inland. The land they stood on washed away.

Now the Kokeoks' wooden residence, which Shelton built by hand 20 years ago, stands alone -- only feet from the edge of this barrier island.



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Gallery: Couple's Alaska home in jeopardy



*Climate change explained*

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But safety is only one of Shishmaref's many concerns.

The [warming climate](#) and erosion threaten to steal the Kokeoks' centuries-old culture, their unique language and the viability of their entire village.

They're not alone. A dozen Alaskan villages, including Shishmaref, are at some stage of moving because of climate-change-related impacts like coastal erosion and flooding.

Around the world, as many as 150 million people may become "climate refugees" because of global warming, according to an Environmental Justice Foundation report, which attributes some of the moves to rising sea levels

People in Shishmaref are aware that world leaders will meet next week in Copenhagen, Denmark, to try to hammer out an international treaty on climate change.

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Most of the talk at the [United Nations Climate Change Conference](#) will focus on cutting the industrial world's emissions of heat-trapping gases, or trying to prevent climate disasters like those already seen here and in other coastal communities. Three students from Shishmaref will travel to Copenhagen as witnesses to the impact of climate change.

That doesn't give Shelton and Clara much comfort. Many of their neighbors have resigned themselves to having to leave Shishmaref because of the changes.

Not Shelton.

"This is my hometown," he said. "I don't want to go anywhere."

Shelton is afraid to budge from his perilous location on the front lines of the climate catastrophe. To move would be to give in, to lose everything.

Already, he's lost more than he can bear.

## Harsh environment

As far as outsiders are concerned, Shishmaref might as well be at the edge of the Earth.

Only 20 miles south of the Arctic Circle and less than 150 miles from Russian Siberia, the village's geography alone makes it seem uninhabitable.

Its 600 residents endure temperatures that drop to minus 40 degrees Fahrenheit in the winter. Polar bear sightings are common. Water is scarce. There's no plumbing in most homes; ice is harvested from lakes in microwave-size blocks and melted in buckets. No roads connect Shishmaref to the outside world.

It's a harsh, isolated and dangerous place but one Shelton has learned to love. Shishmaref's tundra environment provides everything he needs.

The village island, about a quarter-mile wide in the center, sits between the Chukchi Sea and the wide estuary of the Serpentine River. That's prime real estate for hunting and fishing, the main forms of survival and employment in the village.

In the winter, Shishmaref residents hack tiny cylinders of ice out of the estuary to fish for tomcod and smelt. In the summer, when the sun hangs in the sky almost 24 hours a day, locals harvest [cloudberry](#)s, which are orange, and blueberries; caribou and reindeer herds gallop across the vast expanse of inland tundra.

When Shelton was growing up, he looked forward to the springtime hunt for bearded seals, spotted seals and walrus, which took place out on the still-frozen sea. Dried meats and oils cured from those marine mammals sustained the community year-round, even when other hunts or fishing seasons went poorly.

Shelton's father taught him to hunt seals. They rode a dogsled toward an eerily flat horizon, where the thick slate of white sea-ice met an eternal blue sky. At the edge of the ice, they hunted sea mammals out of the frigid water below.

Shelton has raised his four children in Shishmaref's unique traditions. Clara, his wife, still sews seal slippers. They speak Inupiaq at home. Dried seal meat, black and crusty, hangs on a wooden rack beside their house. They keep seal oil in the kitchen. Their kids grew up eating both.

Norman Charlie, Shelton's youngest son, learned to chase down seals and fish as soon as he was old enough to handle the arctic elements.

The boy became a fine hunter. And that pleased Shelton.

On Norman, Shelton hung his hopes for the future.

## Forced adaptation

Because of its remote location and live-off-the-land lifestyle, it could appear that Shishmaref has remained the same for centuries, as time passed it by.

That's not the case. The village itself is an adaptation to outside influence.

Shishmaref's people were nomadic, following seals and caribou, until the U.S. Bureau of Indian Affairs built a school on the island in the early 1900s and forced Inupiat children to attend. Some residents still resent that school; they say it punished those who spoke Inupiaq and stifled other aspects of the Native culture.

Over the decades, though, the community adjusted to its new stationary existence. And today, people are attached to this place.

Change also has come from within.

When Shelton was young, Shishmaref was nothing but an outpost of one-room sod houses with no electricity; some villagers made windows out of "Eskimo plastic," the translucent intestines of the bearded seal.

It was difficult to import materials from the outside, so people got most of what they needed from the land and the sea.

Today, two stores in Shishmaref sell Cheez-Its, Coke, Tang, ramen noodles and Ruffles, all brought in by plane. In front of the local school complex, which has new computers and wi-fi Internet, snowmobiles and all-terrain vehicles drop kids off in the morning. In the past, dogsleds were the main mode of transit. A sign in a high school class where students learn to make carvings from walrus tusks reminds them to put their iPods away.

The modernization of Shishmaref angers some people, including Shelton. He worries that Shishmaref's youth don't speak Inupiaq as well as they should, and he says people in town are getting fat and lazy in part because soda is available.

He had to wrestle with the fact that younger generations are carrying on village traditions in new ways when Norman decided to move away from the village, to Fairbanks, Alaska, for work.

His son returned to Shishmaref to visit. He still worked on speaking the local language and tried to carry on his village's musical traditions by participating in a traditional dancing and drumming group. And, always, when he was home, he hunted.

But things were changing.

Shishmaref exists in a delicate balance with nature and with its own identity.

And, one morning in June 2007, that balance tipped for Clara and Shelton.

### **The storm**

Morris Kiyutelluk, a short man in an orange ski jacket, walked to the edge of the sea on a recent day, pointed to the slushy water behind Shelton's and Clara's home and said, "That's where I grew up."

The land where his house stood has vanished into the ocean.

It was the middle of a stormy night during the winter of 2002 when Shelton and Clara heard the waves slapping the side of their house with a force that vibrated the floors and shook the walls.

Next door, behind their house and even closer to the roiling sea, Morris was rushing to evacuate his family.

By the time his wife and children were out, waves were clawing at the ground underneath his house, to the point that it hung off the edge of the island by four feet, he said. Neighbors wrapped a rope around the body of the red wooden home and pulled in unison. They were able to scoot it back just enough to keep it from tipping.

After that storm and a series of others, Morris' home was among those moved to the other side of the island. At first he and his wife, Mildred, had a hard time adjusting to their new life on the sheltered side of the island. They joke that they're "eastiders" now, not "west side people," like they used to be.

Mildred had trouble sleeping in the new location because the soothing sounds of the sea were gone.

But, over time, she's learned to sleep through the silence.

"Apparently, I got used to it," she said.

In part because they've had to relocate once, Morris and Mildred are among many locals pushing for Shishmaref to move off of this tenuous island and onto an uninhabited location away from the sea.

Morris says the changes in Shishmaref -- the melting sea ice, the disappearing seals and polar bears, the crumbling coastline -- are beyond the village's control.

"We've got to move. There's no question about it," he said. "That seawall will stop erosion on this end, but the water will go around it. My ancestors said it will happen. It will happen."

But planning the move has been anything but easy.

The village voted in 2002 to relocate from the island. Seven years later, it has had little luck finding a suitable location or funding.

A place called Tin Creek, several miles inland, is the most talked-about relocation spot at the moment. But many of the same problems that plague Shishmaref could be issues there, too.

Tin Creek sits on permafrost, and permafrost melt across Alaska has been accelerating. The site is further from the sea mammals locals depend on. And, to make matters worse, Tin Creek may also be situated atop "ice lenses," thin sheets of underground frozen water that could melt and cause the ground to crater.

Earlier this decade, the people of Shishmaref applied for grants and [started a Web site](#) where the public could donate money for the village's relocation.

Those efforts haven't gotten the village far. That's partly because there's no federal or state government agency ready to pay for the coming wave of "climate refugees," like those in Shishmaref.

A [2009 Government Accountability Office report](#) found that 31 Alaskan villages face "imminent threats" because of coastal erosion, flooding and climate change. At least 12 are at some stage in the relocation process.

Moving an entire town is not cheap. The [U.S. Army Corps of Engineers estimates](#) that Shishmaref's relocation, if it happens, will cost up to \$200 million. Relocations of other Alaskan villages carry similar estimates.

Who's to blame is another contentious topic.

Residents of the industrialized world could be considered liable for the climate refugee problem, since they produce the bulk of the greenhouse gas emissions that alter the climate. Some say the government is responsible. Others say it's difficult to prove with absolute certainty that a problem in any single community was caused by climate change because other factors, like land use and natural erosion, could be at play.

The climate refugee problem gets all the more complicated when considered on a global scale. The [Environmental Justice Foundation estimates](#) that unchecked climate change will force 150 million people from their homes by mid-century.

In Shishmaref, when talk of relocation first surfaced, it seemed like the village would be able to adapt, to control its fate.

Lately, it appears the village's worst fear may come true.

Shelton and others are terrified that Shishmaref may have to merge with an existing town, like Nome or Kotzebue. Both are less than 100 miles away but worlds apart. Shishmaref residents say their entire way of life may disappear.

Without access to the sea, they might have to stop hunting. Their threatened dialect, spoken only in Shishmaref, could fizzle and die. The village's celebratory dances, its music, its walrus-ivory carvings and native food recipes, all of it could be flushed off the Earth and into history books.

### **Over the edge**

It was about 5 o'clock on a spring morning two years ago when Shelton got the phone call that changed his life.

His youngest son, Norman Charlie, had gone out duck hunting with a friend. They'd traveled by snowmobile across the estuary that separates Shishmaref from the mainland.

In the past, that stretch of water would have been frozen solid on the first week in June, Shelton said. But that year was warmer than usual.

Shelton waited and waited for his son to come home. Finally, the phone call came.

The ice cracked. Norman fell in. His friend couldn't save him.

Shelton blames climate change for taking his son.

"Something went wrong with me the last couple of years, after we lost that boy," Shelton said. "I think he's taken most of my life. ... I lost my baby."

Dozens of photos of the young man, who was 24, line Shelton and Clara's living room.

His grave is on this island.

### **Tradition**

Like the young man who clung to village traditions but whose life was taken by the melting ice, Shishmaref may become a memory.

For Shelton and Clara, solace is hard to come by these days. She had a heart attack last year. His knees are giving out. He's no longer able to hunt.

The death of their son pushed them over the edge.

Their only relief comes from a native tradition: Scattered around their village and beyond are perhaps a half-dozen children, born since their son died, who are named after Norman.

In Shishmaref, when a child is named after someone who's gone, that child takes on characteristics of his or her namesake.

Ken Stenek is Shelton's nephew and the local science teacher. He and his wife named their youngest boy after Norman.

Norman Charlie was one of Stenek's favorite students. He was a respected hunter. He was trying to learn the Inupiaq language. He was part of a native dance troupe. He was carrying Shishmaref's traditions onward.

Stenek says he's raising his son to do the same.

At supper time, he grinds up seal meat, a Shishmaref staple, and feeds it to his 7-month-old.

Baby Norman loves it.