



**IMPACT: 1962**

## Storm's record snowfall bombarded Bangor

The Interstate was down to one barely passable lane, and hundreds of travelers abandoned their cars to huddle together in booths at the old Pilots Grill, waiting out the storm of the century.

On Dec. 30, 1962, Bangor was hit with 25.5 inches of snow in a single day, the highest daily tally in the history of climate records in Maine.

The forecast had been for "occasional snow or flurries," leaving residents utterly unprepared for the onslaught. Then the thermometer dropped 16 degrees in a single hour, and the flakes began to fall.

A pregnant woman went into labor during the storm, tied on her boots and walked several blocks to the hospital before giving birth. Another mother and her six children were rescued from their Dixmont home by a soldier on a snowmobile.

Plows traveled from more than a

hundred miles away to help clear away the 20-foot drifts of new snow.

"I've seen nothing like that one. Never," now-retired milkman Tom Spellman told a reporter on the 40th anniversary of the day he waded through waist-deep snow to make his rounds.

Snowstorms are a fact of life in Maine, regardless of small climate shifts, but in this case, there may be something to parents' arguments that their childhood was far colder, snowier and more onerous than that of their offspring.

More snow fell in 1962 than in any year before or since. The years from 1951 to 1972, clearly a cold, stormy phase in Maine's history, were tied to a shift in the atmospheric system that is responsible for much of Maine's weather, a pattern known as the North Atlantic Oscillation, state climatologist Greg Zielinski said.



About 600 travelers (inset) took refuge in Pilots Grill when a record blizzard buffeted Bangor late in 1962. Residents walk along a buried Main Street (above) after the storm.

Recent years have had mild weather because of the behavior of the North Atlantic Oscillation, but scientists predict the pattern could switch back to stormy cold weather in the near future.

Just a few years ago, central Maine spent the start of the new year at the mercy of nature.

On Jan. 6, 1998, freezing rain fell on Maine for three days. Then-Gov. Angus King declared a state of emer-

gency and called in the National Guard. Now, eight years later, it's known simply as the ice storm.

More than 300,000 people were trapped in their homes without heat or electricity, or were living as refugees at friends' houses or local motels. Mainers spoke of ice-covered "pine limbs going off like shotguns" as they snapped and crashed into cars and homes.

The ice storm was dramatic, but, according to Zielinski, it likely was unrelated to global warming or any other type of climate change. Although some climate models predict more ice and less snow in Maine if warming trends continue, the weather patterns that brought about the ice storm could occur again without such warming, he said.

"Things weren't moving, cold air was trapped in a vacuum — it was the classic textbook example of how freezing rain is produced," he said.

The recent warming trend in global average temperatures has affected Maine's climate. Temperature averages in coastal Maine are increasing, Zielinski said, while average temperatures in northern Maine may be cooling. Statewide in the 1990s, Maine experienced several of its hottest years.

But temperature records alone, like individual storms, don't represent climate change accurately. The record-high temperature in Maine's history occurred long before climate change was a common phrase — 105 degrees in North Bridgton on July 4, 1911.

**IMPACT: 1816**

## Volcanic eruption in Indonesia made for 'Year Without a Summer' in Maine

On June 6, 1816, more than 5 inches of snow fell in communities across Maine.

"The extraordinary cold state of the atmosphere during the week past, surpasses the recollection of the oldest person among us," reads the Portland Argus from the week after.

Historians call 1816 "The Year Without a Summer" or "Eighteen-Hundred-and-Froze-to-Death."

Temperatures didn't rise above the 40s for days, and a chill enveloped the world as ash and dust from massive volcanic eruptions drastically changed the global climate.

"We had a killing frost every month at this latitude. No crops came to fruition," said Harold Borns of the University of Maine Climate Change Institute.

Though people at the time were more likely to attribute the freeze to divine intervention, scientists now know that it was the result of one of the most violent volcanic periods in modern human history.

In 1815, Mount Tambora, located on the Sumbawa Island of Indonesia, sent tons of dust into the stratosphere in what geologists call "the most powerful eruption in recorded history."

The volcanic dust traveled around the world, blocking the sun and suddenly cooling average temperatures worldwide by about 5.5 degrees Fahrenheit.

"The volcano was positioned in the right direction that it shot ash right up into the atmosphere," Borns said. "It was just like a shade."

In circa 1816 New England, the growing season was truncated enough that crops could not mature, and food shortages resulted.

"We have heard that in some instances, the corn is totally

destroyed, the plant being frozen to the seed," reported the American Advocate in Hallowell after the snowstorm hit in June that year.

"Fears are entertained for the safety of various fruits and vegetables," wrote the Portland Gazette.

Some Mainers subsisted on clover heads stewed in butter when their grain crops failed. Hundreds of others became so disheartened that they packed up their belongings and left the state for the West — a condition known locally as "Ohio fever."

Historians estimate that as many as half of the people living in the

portion of Massachusetts that became Maine in 1820 fled to greener fields.

Larger eruptions have occurred, most notably a volcano called Toba that affected the global climate for centuries when it erupted 75,000 years ago. Even smaller eruptions, such as the 1991 eruption of Mount Pinatubo in the Philippines, have the power to change the world's weather for several years.

However, scientists today still turn to 1815-16 as the prime example of the lingering impact a volcano can have on Earth's climate.

### ARCHAEOLOGY

## Patchwork of past reveals what humanity has weathered

It was "an old ring-tail snorter of a snowstorm," wrote New Englander George Lang in his February 1893 diary — not exactly scientific precision, but a vivid statement nonetheless.

Descriptive climate observations can bring tallies of temperatures and rainfalls to life, but increasingly scientists are turning to historical accounts and archaeological digs to fill gaps in the climatological record.

Initially, scientists were hesitant to work alongside their counterparts in the humanities, and for historians, climate has rarely been considered a major factor. But over the past 20 years the two disciplines have converged.

Layers in ice cores can be precisely dated by tying a layer of volcanic dust to recorded human events, such as the eruption of Mount Vesuvius at Pompeii in A.D. 79.

Historic "instrument records" — the exact measurements of rainfall and snowfall — have survived from many cultures. European records were the first heralds of the Little Ice Age, which later was verified by ice core data. In China, centuries of observations are just now being analyzed by a growing community of climate experts. But precise measurements are limited.

"In the 1800s, there were just a couple of thermometers here and there," said Kirk Maasch,

an atmospheric scientist with the University of Maine Climate Change Institute.

In other cases, archaeological digs tell the tale. Dan Sandweiss studies climate change through the institute, but he has never taken an ice core, never visited a glacier. The University of Maine anthropologist studies climate change to understand ancient civilizations. His analysis of mollusk shells left behind in Peruvian settlements shed light on how the El Nino weather pattern functioned thousands of years ago and how it affected human societies.

About 5,000 years ago, at a time when El Nino was predictable, the culture flourished,

building temples and expanding its population, Sandweiss said. But when the El Nino cycle changed around 2,500 years ago, bringing dramatic and unpredictable weather shifts every few years, temple building stopped as the culture waned, he said.

Elsewhere, researchers tap records of the wine harvest, fluctuations in grain prices and personal diaries to bring the scientific data about the Little Ice Age and El Nino to life.

For many years, faculty and students at the Climate Change Institute have collected these accounts into an internal library of climate change in New England.

They have data from the

early weather station at Dartmouth College in New Hampshire and from climate-related entries from William Bradford's diary, written at Plymouth Plantation in 1623.

About 300,000 items have been digitized so that researchers can search by location or date. But that's just a fraction of the data that exist, untapped in the attics and basements of every small town, said state climatologist Greg Zielinski, one of the project's organizers.

"You could do this for years," he said.

To explore the database of New England climate records, visit [www.umaine.edu/oldweather](http://www.umaine.edu/oldweather).

#### 10,000 years ago

The Holocene Epoch begins, a warm phase in geological history that permitted establishment of agriculture and the growth of human civilization. The Holocene, which continues today, is known as an "interglacial" period — an acknowledgment on the part of scientists that ice will return someday.

#### 2200 B.C.

The Akkadian Empire in what today is Syria collapses in reaction to a drought that has been linked to climate change.

#### A.D. 750 to 900

The Maya civilization in present-day Mexico disappears. Scholars theorize many reasons for the collapse, including a significant drought throughout the hemisphere, which resulted from a shift in the El Nino-La Nina circulation.

#### 985 to 1000

Leif Ericson lands in what is now Labrador. Viking explorers established colonies in Greenland and North America, as icebound ports melted during a brief climate shift known as the Medieval Warm Period. Most of these settlements were abandoned by the 1350s, when ice returned.



#### 1315

The Little Ice Age begins, ushering in a period of at least 400 years in which average temperatures in Europe dropped significantly and wild weather wreaked havoc on the region's agrarian societies. In 1315, cold and torrential rain caused a wheat shortage known as "The Great Famine," which lasted for several years and killed hundreds of thousands of peasants.