Eons of insight emerge from cylinders of ice

Thousands of years are locked away in the ice cores that make up every glacier on Earth. The glaciologists chronicle the history of the world, but by melting down, they are vanishing.

"It's equivalent to losing the only library on Earth that tells us what was happening in the Geologic period," said Paul Mayewski, director of the Climate Change Institute at the University of Maine. "As Earth warms, the very glaciers that can tell scientists what caused similar climate changes in the past are disappearing. For thousands of years, GISP2 has been relatively safe and undisturbed, but it's already a race against time."

Called ice cores, these cylinders can be as long as a basketball, with samples as narrow as .008 inches in diameter. The layers of ice contain a wealth of information—essentially all of the climate in the past.

In addition to considering the color and thickness of the layers, researchers analyze the chemical makeup of the snow itself, which can reveal important details about the atmosphere through which it fell. For instance, the presence of sulfates and chlorides can indicate a particularly stormy period, when more sea salt was in the air.

"I have no doubt in my mind that the climate of the future is in these records," said Dr. Paul Mayewski, director of the Climate Change Institute and professor in the Department of Earth Sciences at the University of Maine.

"It's not 100 percent certain, but no one is looking at the past 100 years and saying, "I'm kind of impressed that we're making good progress,"" Mayewski said, ""and yet the atmosphere is getting more polarized than ever."

One of the climate sciences advanced exponentially after particularly lurid ""perfect storms"" came from Greenland. ""Perfect storms"" are volts with unusually high wave energy and huge surf, damaging the area.

In addition to contributing to the ocean circulation and, in turn, adding freshwater to the ocean, with potential impacts on ocean circulation and solar variability. Scientists are related to ice sheet dynamics, ocean circulation and seasonal melt on the land ice in the Arctic.