

Reading About the Past Before There Were Books

Ice cores provide scientists with a way to learn about environmental conditions in the past before people were around to write records. Snow falls on a glacier each year creating a new layer of snow. As time passes more layers are created, one each year. This results in a “layer cake” of snow. The weight of the snow at the top of the glacier starts to compress the snow below. This ultimately results in a “layer cake” of ice.

Scientists can see the layers where the glacier breaks open at places called crevasses, but using hollow drills, they can drill ice cores at other locations that allow them to see more layers. The benefit of drilling ice cores is that the core can be taken back to the laboratory to analyze and, since a new layer is created each year, the more layers that scientists can observe the more years into the past they can investigate.

The layers of ice provide information about the amount of snow that the glacier received in a given year. A thicker layer means that the glacier received more snow; a thinner layer means that the glacier received less snow. The layer of ice also contains materials such as debris from forest fires and volcanoes, dust picked up by winds, and living materials such as pollen, leaves, and insects. Many of these materials can be seen with the naked eye. Other materials, such as chemical tracers, cannot be seen with the naked eye and more sophisticated ways are used to analyze for these materials.

Scientists can use different clues in the ice to determine the exact year a particular layer was created. Knowing the age of one layer and keeping in mind that deeper layers are older than shallow layers, scientists can use their observations and inferences to determine a timeline of environmental conditions for the past.

