

## **Ice Cores - Evidence Supporting Climate Change**

### **What are ice cores?**

Scientists use drills, called augers, to drill deep into the ice sheet and pull out a sample. This sample is called an “ice core”. From this, scientists can study the ice to determine what happened in the past layers, just like scientists can do with layers of soil on land. The



layers in the ice cores preserve information about the climate at the time they were formed that scientists can use to determine how climate has changed historically.

### **Where do they come from?**

The ice sheets and glaciers near the North and South Poles are formed from years of snowfall accumulation in layers. The weight of the next year of snow compresses the layers underneath and after many years the pressure forms glacial ice. In some areas, these ice sheets can be several kilometers thick. Much of the ice cores collected by scientists are from Greenland and Antarctica.

Researchers and scientists will drill cores from deep in the polar ice sheets. These can be drilled kilometers deep into the ice sheet. Cores are collected from all over the world to study regional climate variability and compare global climates.

### **What does the ice tell us about past climates?**

Each layer tells a story about what the Earth was like the year that layer of snow fell. The temperature of the air imprints into the water molecules.

Ice layers hold particles - dust, ash, pollen, sea salt, and trace elements - that were in the atmosphere at the time. These particles remain in the ice thousands of years later. This also proves evidence of major world events, for examples volcanic eruptions.

As the ice compacts, tiny bubbles of the atmosphere are trapped. These bubbles include greenhouse gases like carbon dioxide and methane. These air pockets are like “fossils” and provide samples of what the atmosphere was like.

### **What is the oldest ice core sample?**

The oldest ice core samples are from East Antarctica. These provide an 800,000 year old record of the Earth’s climate history.

**After reading the information on ice cores, answer the following questions:**

1. How are these ice cores useful to scientists studying climate change?
2. Why would knowing what greenhouse gases are in the past atmospheres be important?
3. Why would finding evidence of major world events (ex. Volcanic ash) be useful to scientists? Would this evidence help validate anything scientists discover?
4. Why would scientists use evidence from ice cores to predict future climate changes and atmospheric conditions?

