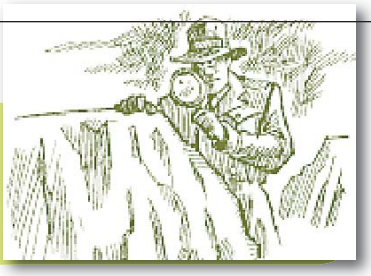
Continuing a series of articles on Climate Change

The Climate Detectives



Scientists have to think like detectives. They look for clues to help them understand how the world works. Then they investigate the clues to find evidence – real facts that can give them a better idea of what is going on. Here are some of the ways that scientists gather evidence about climate, both past and present:

Weather Stations

Weather stations help us find out the temperature on the surface of the Earth. Weather stations use special thermometers that tell us the temperature. They can be set up almost anywhere on land. Weather stations also can tell us how fast the wind is moving and how much rain falls on the ground during a storm.

Weather Balloons

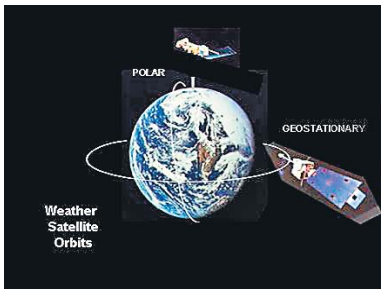
Almost everyone likes balloons – including scientists! Weather balloons are released to float high up into the atmosphere. They carry special instruments that send all kinds of information about the weather back to people on the ground.

Ocean Buoy

A buoy is an object that floats on water, and is often used to warn boats away from dangerous places in the ocean or on a river.

But some buoys have special instruments on them. These buoys can tell us the temperature and other things about the conditions of the atmosphere.

Weather Satellites



Humans send satellites into space to travel around the Earth. The satellites send back information to scientists on the ground. Some of the information they give us is about the weather and the Earth's temperature.

Ice Cores

Some scientists who want to find out more about climate, study ice for clues. Not just any ice – they are studying the ice from glaciers that have been around for a very long time.

They cut pieces of ice and look for air bubbles that were trapped in the ice hundreds or even thousands of years ago. The air bubbles help them discover what the climate used to be like on Earth. The evidence they uncover is creating a historical record of regional temperatures and greenhouse gas concentrations dating back 160,000 years.

Sediment Analyses

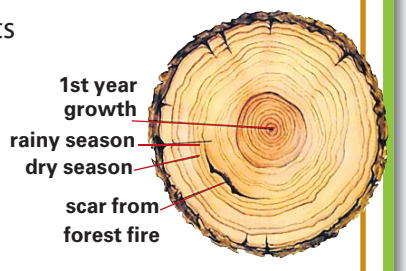
Sediment is the earth and rock that has built up in layers over time. Scientists are learning a great deal about past climate from studying these layers.

Sediment layering provides information about where glaciers have been in the past. Ocean sediments provide a map of how ocean currents have flowed in the past. And fossilized pollen found in sediment layers tells us about where different plants have grown in the past.

Tree Rings

You can tell how old a tree is by counting its rings because it grows a new ring every year.

Tree rings also can tell us how much precipitation fell each year in the place where the tree lives. Precipitation is rain or snow or any other moisture that falls to the Earth. Scientists study the sizes of tree rings. The different sizes of the rings tell us about changes in temperature and precipitation.



What does all of this mean?

Weather stations, balloons, ocean buoys, and satellites tell us the Earth's temperature today. Ice cores, sediment layers, and tree rings tell us about what the Earth's climate has been like in the past. With this evidence, scientists are learning how climate changes over time.

What are scientists still unsure about?

How do clouds respond to changes in temperature and precipitation? How do oceans transport heat? How do climate and intense weather events like hurricanes affect each other?

As scientists try to answer these and other questions, they will discover many more clues about how the Earth's climate system works.

Next: Can we change the climate?