

NATURAL DISASTERS

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DISASTER TRACKING

The people of Nepal, a small country in the Himalayas, were going about their regular routines just before noon on Saturday, April 25, 2015. Suddenly, the ground started shaking. It was an earthquake. Everyone

was caught off guard. The quake destroyed thousands of homes. Many lives were lost.

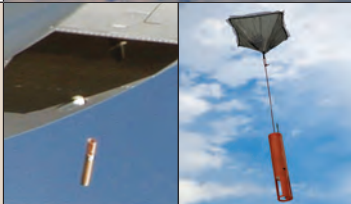
In contrast, when Superstorm Sandy barreled into the northeastern United States on October 29, 2012, New Yorkers were prepared. That's because the hurricane had been tracked by meteorologists. These scientists watched as the storm grew into a powerful hurricane.

The meteorologists were able to warn New Yorkers. The people in the most danger evacuated, or left their homes.

According to the *New York Times*, Sandy caused billions of dollars in damage. But thanks to the storm tracking and evacuations, very few lives were lost.

The Nepal earthquake and Superstorm Sandy were both terrifying natural disasters. But there was one big difference between them. Superstorm Sandy was tracked and the Nepal earthquake wasn't. Though there is no way of preventing natural disasters, tracking them in advance can help people prepare. That way, lives can be saved.

▼ Scientists use these tools to track hurricanes before and as they happen.

Type of Technology	Description	Purpose	See It!
Satellites	objects that orbit and communicate with Earth	to provide pictures of the path a hurricane is taking	
“Hurricane Hunter” Airplanes	jets that fly in, above, and around hurricanes	to bring scientists close to hurricanes to collect data and take pictures	
Dropsondes	small, light tubes attached to parachutes dropped into hurricanes	to send scientists data about air pressure, temperature, and wind speed	
Drones	unmanned planes controlled remotely	to stay in hurricanes for long periods and collect important information	
Sea Gliders	unmanned boats controlled remotely that dive underwater	to measure ocean temperature near hurricanes	

HURRICANE TRACKING

Hurricanes, also called tropical cyclones, are the most powerful storms on Earth. Their winds range from 120 to 320 kilometers (75 to 200 miles) per hour, and they can be as wide as 966 kilometers (600 miles). To form, hurricanes need warm water and wind.

In the United States, the National Oceanic and Atmospheric Administration (NOAA) tracks hurricanes. They predict how



▲ NOAA scientists use many kinds of information to track hurricanes.

many will occur and track their paths to guess where they will land.

Every year, NOAA scientists estimate how many hurricanes

A hurricane is a giant, rotating storm.



will form in the sections of the Atlantic and Pacific Oceans near the United States. These scientists know that higher sea surface temperatures mean more hurricanes. They also know that hurricanes need winds to be strong near the surface of the ocean and weak higher up.

According to NOAA scientists, a weather pattern called “El Niño” affects hurricane predictions. This pattern occurs when the surface water in the Pacific Ocean is warmer than normal. During an

El Niño year, hurricanes increase in the Pacific, but decrease in the Atlantic Ocean. This happens because El Niño affects the jet stream, a current of air that blows from west to east. This current brings strong, dry upper winds onto the Atlantic Ocean, making it harder for hurricanes to form there.

NOAA hurricane hunter airplanes like these are built to fly through powerful storms.



Hurricane Hunters at Work

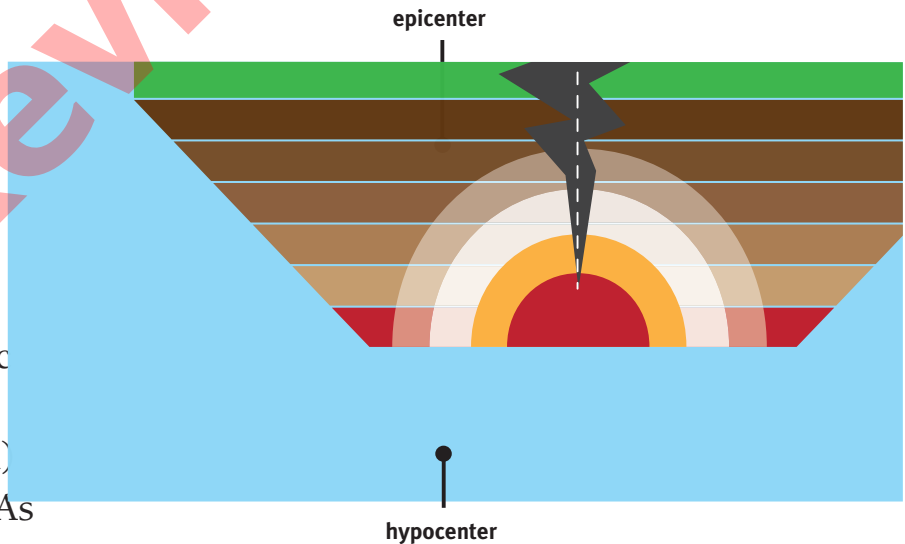
Teams of pilots and scientists called hurricane hunters fly specially equipped airplanes right into hurricanes. The information they collect helps scientists at the National Hurricane Center make accurate forecasts about these superstorms.



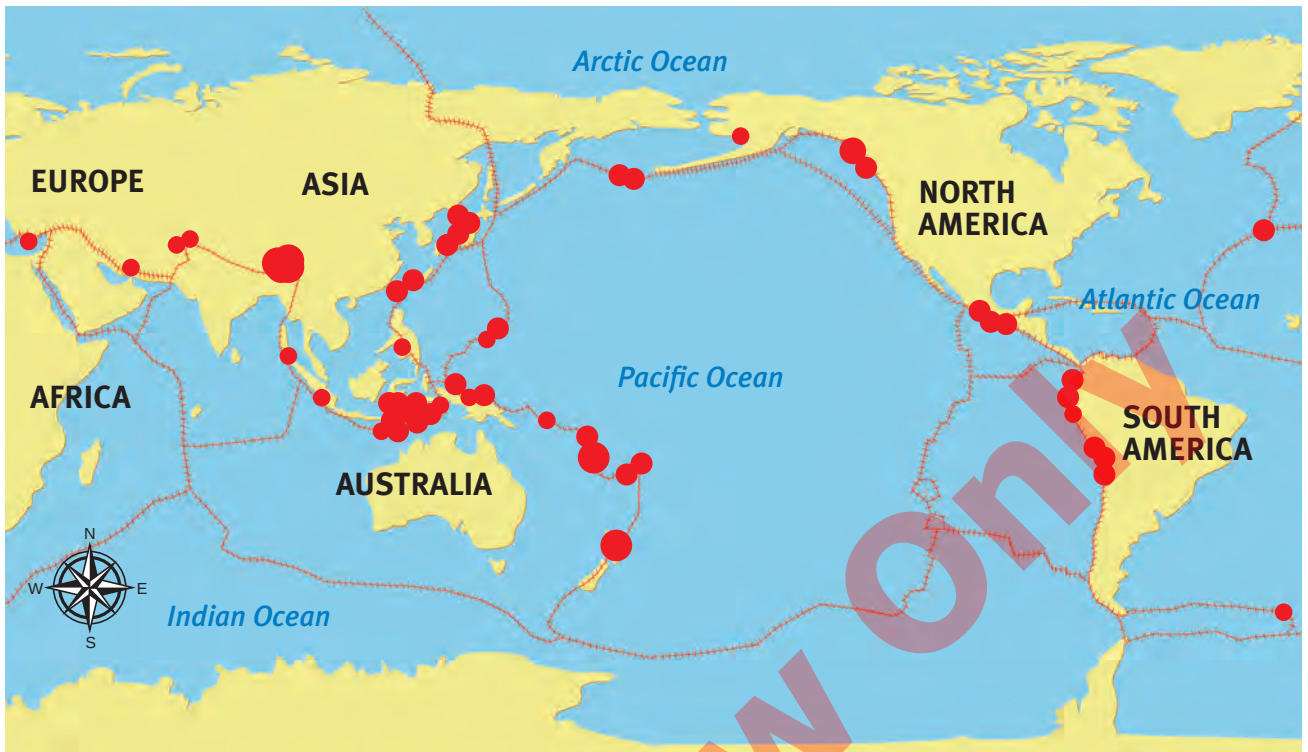
The cracks in this road were caused by an earthquake.

EARTHQUAKE TRACKING

Earth's surface is made up of many interlocking pieces of rock, called tectonic plates. These plates float on a layer of hot molten (liquid) rock and move very slowly. As they move, they rub against one another and build up pressure. When the plates shift and collide at their boundaries, Earth's surface can rumble and shake. This is an earthquake.



- ▲ The part of Earth's surface directly above the starting point of an earthquake is called the epicenter. The starting point is called the hypocenter.



▲ The map above plots all the earthquakes that occurred from April 24 to April 30, 2015. The red lines show the tectonic plate boundaries. The circles show the epicenters of the earthquakes.

Scientists who study earthquakes are called seismologists. Many work at the United States Geological Survey (USGS). These scientists cannot predict when earthquakes will hit. But they do generally know *where* earthquakes can happen. Seismologists use tectonic maps, which show the boundaries of the tectonic plates.

Seismologists have tools that help them find the exact spot on Earth's surface where an earthquake has occurred. This spot is known as the epicenter. With a machine called a seismometer, the seismologists measure ground movements. A moment magnitude scale (MMS) is used to measure the size of earthquakes in terms of the energy released. A magnitude 1 earthquake is weakest, while a 10 is strongest.