

LEVELED BOOK • N



# Watching Earth From Space



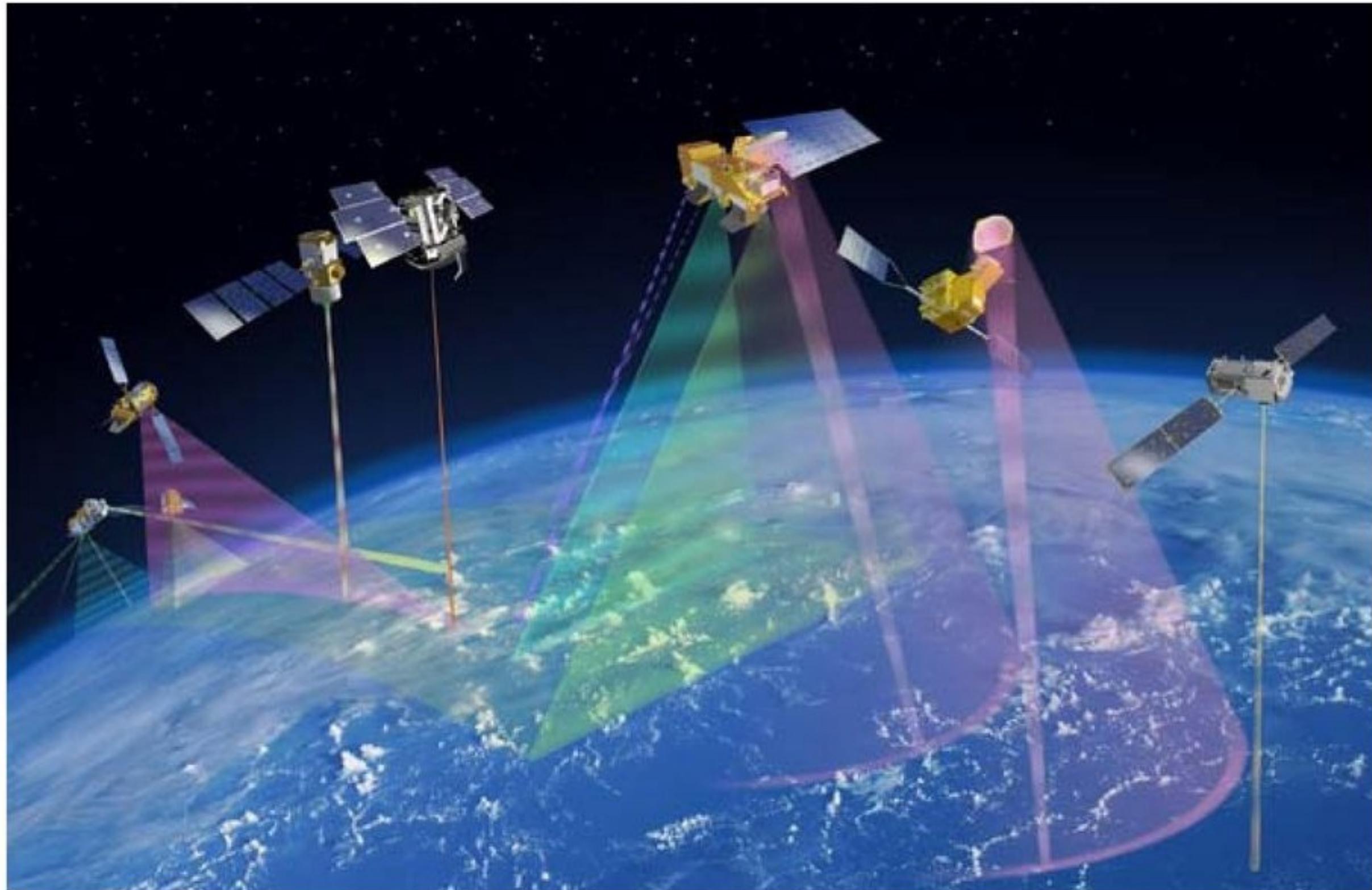
Written by David Dreier



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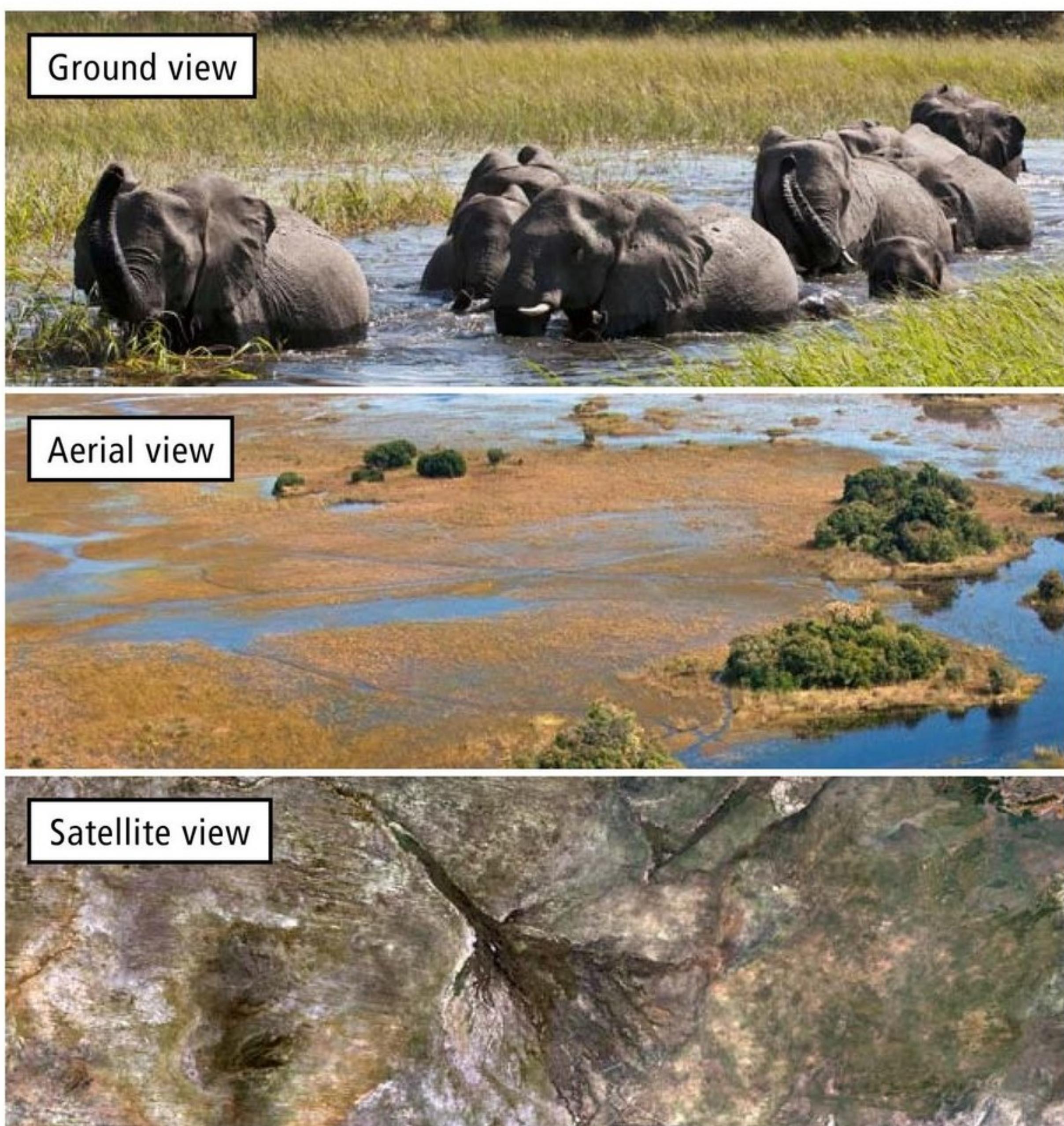


## 🔊 Introduction

The world right around you has hills, trees, homes, and buildings. Standing on the sidewalk, you can only see what is happening on your street. That is your normal view.

Imagine looking down at your town, or Earth, from space. You would have a much wider view. From space, you could see and photograph your entire country!

- 🔊 Scientists who study the **geography** of Earth's surface use cameras on **satellites in orbit**. The International Space Station is one satellite that has cameras. The Space Station's orbit is nearly 400 km (250 mi) above Earth.



On land, or from an airplane, we can see elephants grazing in Botswana's Okavango Delta. From a satellite, scientists can monitor the entire Delta environment.



Satellite images helped emergency agencies following the earthquake and tsunami that struck Japan in March 2011.



Images made by orbiting cameras track changes that happen to Earth over time. They see “the big picture.” These images record **pollution** damage, **climate** changes, and changes to land surfaces. They also show us the effects of too many people living in an area.

## 🔊 Weather Satellites Watch Storms

Large storms, such as hurricanes, can cause great damage and loss of life. Not all areas have storm warning systems to let people know a dangerous storm is coming—in time for them to escape the storm's path. Images from orbiting satellites help scientists predict where a storm will go.



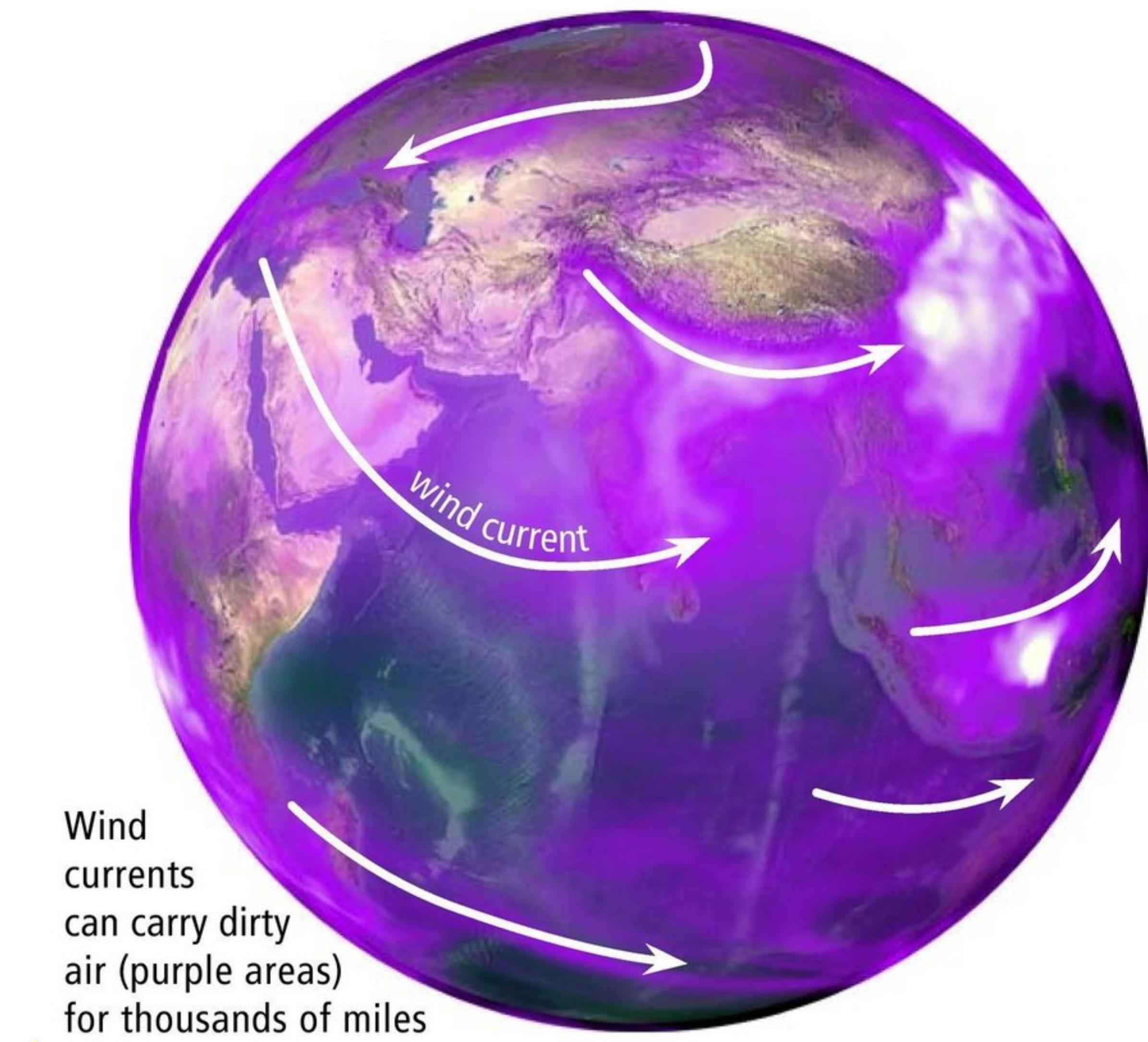
In 2004, an orbiting satellite saw a tropical cyclone forming off Brazil. As cyclones don't normally form here, there were no storm warning systems for that area. Brazilian officials used the satellite images as a guide for evacuation. Storm damage was severe, but only three lives were lost.



In 2011, two satellites recorded the path of a large oil slick spreading along the Louisiana coast.

## 🔊 Keeping Watch on Pollution

Images from space can show where air or water is being polluted. For example, they can show where oil from an oil spill is spreading. This information can help people who live nearby. It can also help with cleanup efforts. Images can record how long it takes for the environment to recover.



Air pollution can affect the health of large groups of people. Satellite images can show where the dirty air starts, and where it goes. For example, overcrowded cities in China have some of the world's dirtiest air. There are many causes, including the burning of coal for power. Images show the coal pollution drifting to other countries.

## 🔊 Watching Changes to the Land

Images from space show changes to land areas. For example, they show **deforestation**, or the loss of forests. They also show erosion, the wearing away of land by wind or water.



Systematic cutting down of rain forests in Brazil and other areas is a major environmental concern. Rain forests help to clear carbon dioxide from our air.

**Deforestation is a world problem.** Trees help keep our air clean and are home to wildlife. Photos from space show large forest areas that have been cut down or burned.



Erosion can be caused by deforestation. Satellite images show rivers and bays that should be blue water are clogged with red dirt. Without the forests, the land washes away into the water.



**Deforestation is also a cause of land erosion. That is because tree roots help to hold soil in place.**

Serious erosion has happened in Madagascar, an island nation near Africa. Entire forests have been cut down for fuel and new farmland. Photos show large amounts of soil being washed away and lost.

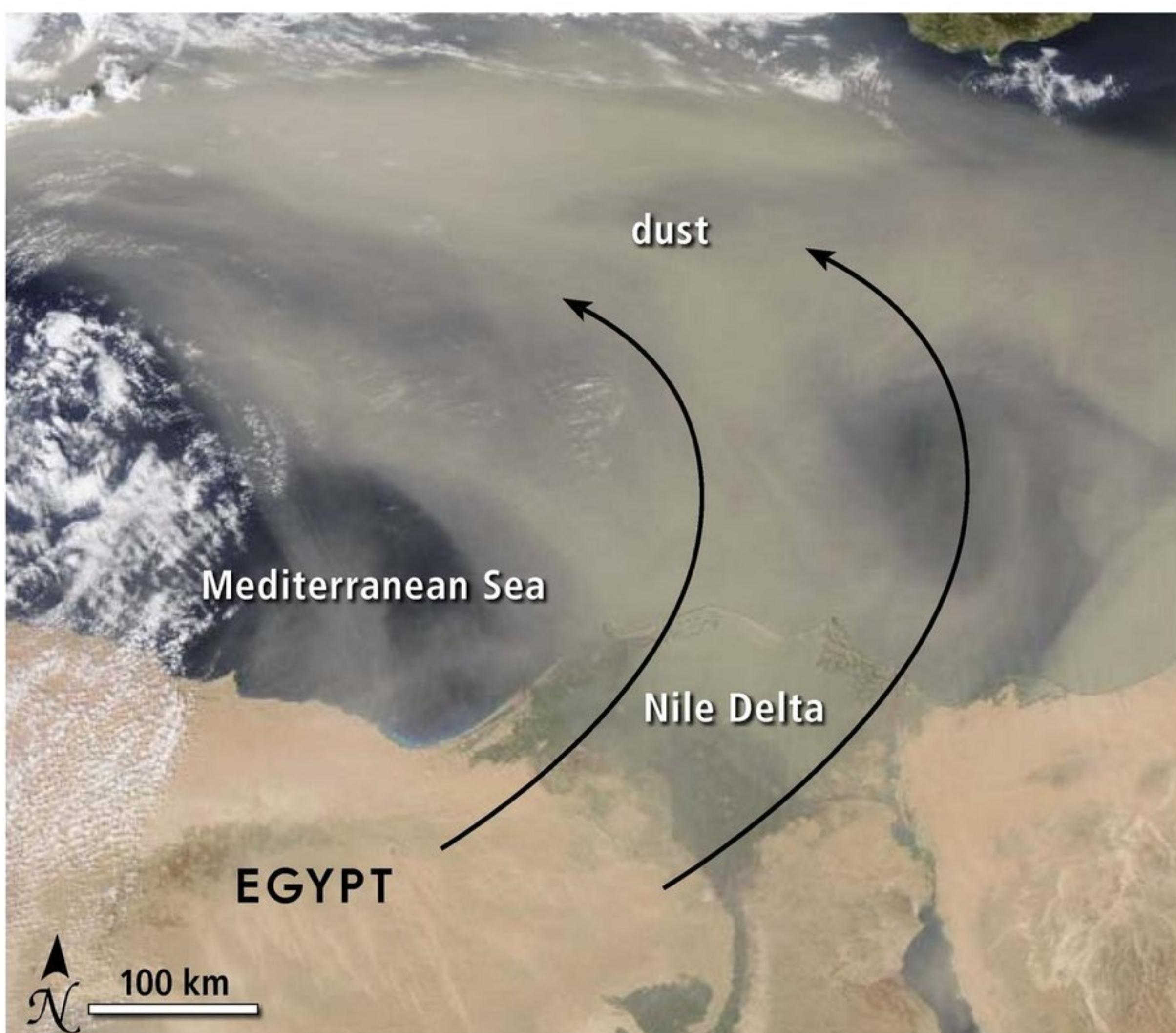


A warmer climate can cause icy glaciers to melt or break apart much faster than usual. Melting ice can raise water levels and change human and animal habitats.

## 🔊 Watching Climate Change Effects

Scientists say our use of fossil fuels creates most of the changes in Earth's climate. When we burn oil, coal, and natural gas we create harmful gas in the air. This type of gas traps more heat than usual above Earth. Images from space show us the effects of Earth becoming warmer. For example, they show where ice is melting or breaking apart.

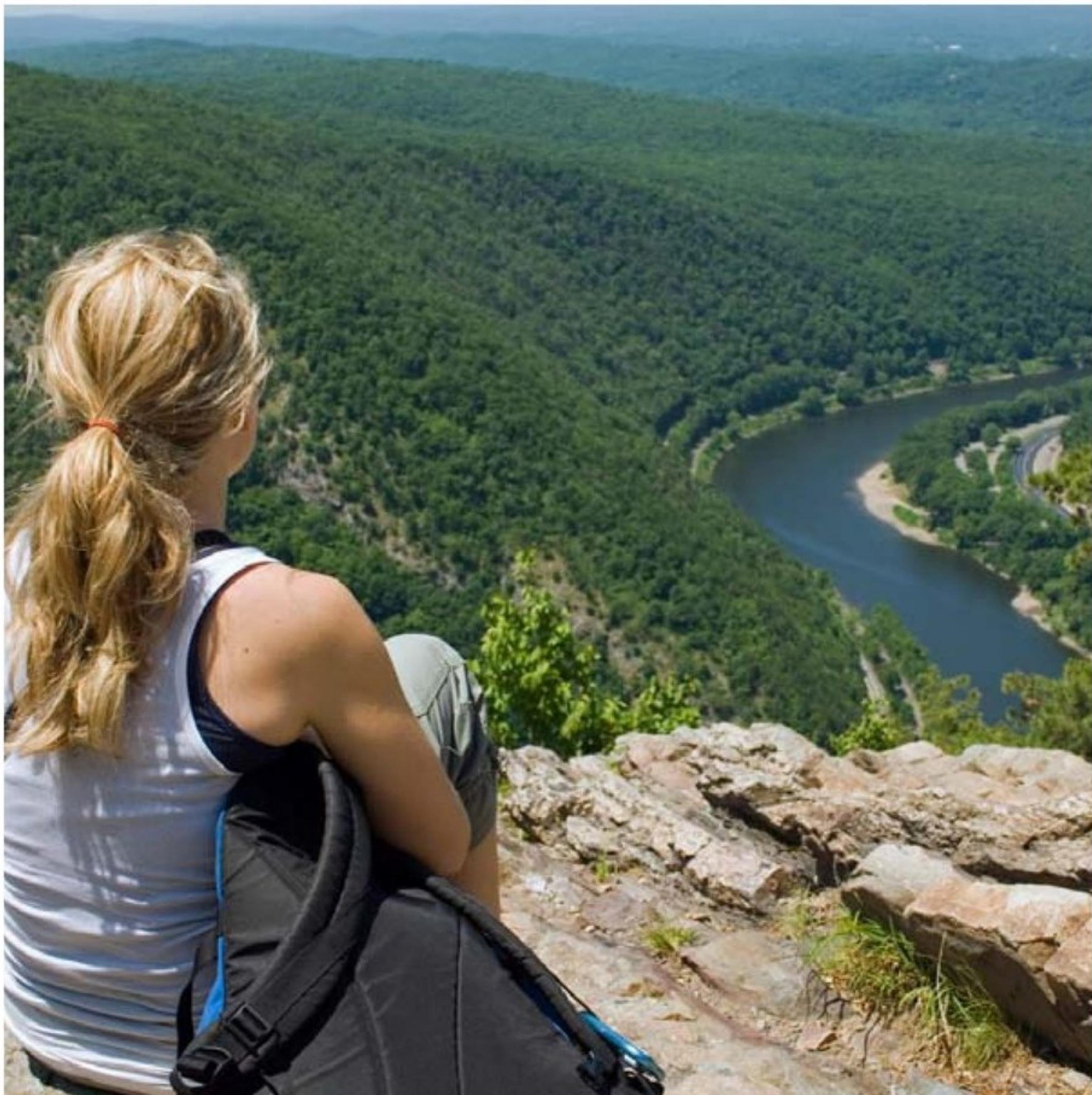
- Another result of Earth becoming warmer is the spread of deserts and other dry lands. Satellite images show where land is too dry to grow food or feed farm animals.



A warmer climate and lack of water dries out the soil so farmland is lost. Satellites monitor huge dust and sand storms that carry away the dry soil.

### Thinking Critically

What types of laws do you feel would help to control human-caused pollution and loss of natural resources?



## 🔊 Conclusion

For most of history, people could see and understand just a small part of the world. They viewed everything at eye level. Even a person who traveled, or a scientist, could only see what was right in front of him or her.

🔊 Today, with cameras orbiting in space, we can easily watch and track large areas of Earth. These images of Earth can tell us about its changing condition. They help us understand how changes happening far away might affect us. What we do with that knowledge may decide the future health of our planet.



Satellite images of erupting volcanoes can provide an early warning to leave an area. They can monitor lava flows and trace the path of volcanic ash.

## Glossary

<b>climate</b> ( <i>n.</i> )	the weather conditions in an area over a long period of time (p 6)
<b>deforestation</b> ( <i>n.</i> )	the clearing away of trees and other vegetation in an area (p 10)
<b>geography</b> ( <i>n.</i> )	the natural features of Earth's surface; the study of those features (p 5)
<b>orbit</b> ( <i>n.</i> )	the path taken by one object in space circling around another larger object (p 5)
<b>pollution</b> ( <i>n.</i> )	the act or result of putting harmful substances into the air, water, or soil (p 6)
<b>satellites</b> ( <i>n.</i> )	a natural or human-made object that orbits Earth or another object in space (p 5)

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Front cover: Satellites orbiting Earth have specific tasks. Some track environmental changes, others track storms or deforestation. This satellite is one of two that measure and track the effect of solar storms on communications and power supplies.

Back cover: Satellites can help to monitor natural resources in remote places. The Kondyor Massif, in Russia, is a natural circular formation with a high ridge. It has rich deposits of rare minerals such as platinum and gold. The river flowing from its center carries mineral deposits along its course.

Title page: The International Space Station has permanent cameras and sensors aimed at Earth's changing surface.

Table of Contents: Environmental satellites monitor natural and human-caused events and conditions that affect Earth's land, water, and air.

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