

Greening Up Globally

Forests & Farms

Trees and plants are critical to life on Earth. They provide oxygen, food, and shelter for animals and humans, so it is no surprise that we have been harvesting them for thousands of years. What is surprising is that humans have actually been making the world greener lately.

Scientists measure Earth's **greenness** from space and use this information to figure out how much of the land is covered in healthy plants. When scientists looked at 20 years of satellite data, they noticed that India and China were looking greener. This led them to ask: "why?"

Vocabulary



greenness - A measurement of the health and abundance of forests, meadows, and farms based on how much infrared light plants reflect or absorb.

Seeing Green from Space

The different shades of green on the map show where there are more trees and plants than in 2000. The deeper the green, the more new plants there are. The brown areas are places that have lost plants and trees.

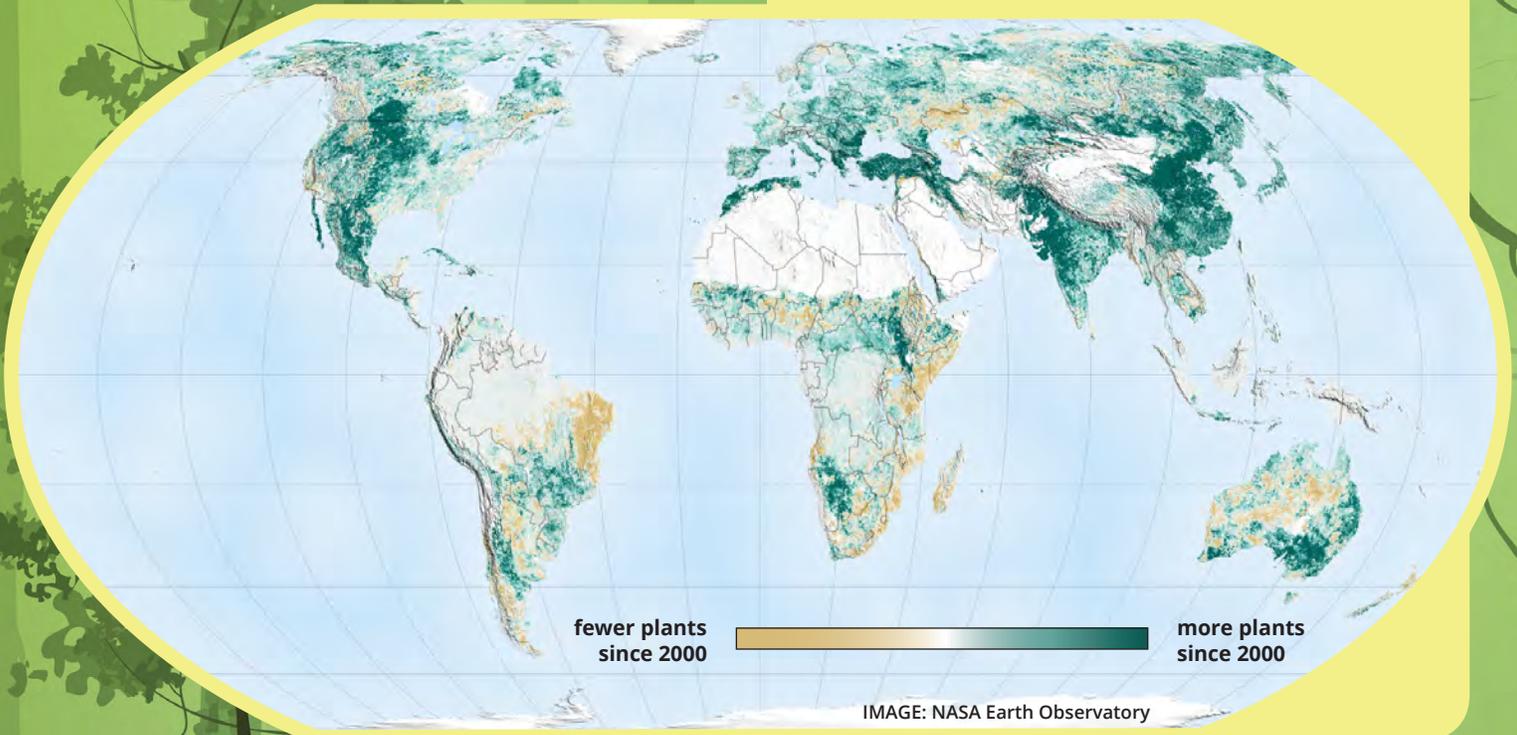


IMAGE: NASA Earth Observatory

Forests

Over the past 20 years, China has developed programs to conserve and expand forests. These programs were created to help stop the effects of soil erosion, air pollution, and climate change. One reason China is looking greener today is because of these tree-planting programs.



Stock Photo



Farms surround the city of Qoqek, China. The area is otherwise dry and would look similar to Kazakhstan.

Farms

People also depend on plants to provide food. One third of all people on Earth live in either China or India. In order to feed these large populations, both countries have increased how much food they grow. They are using new tools and technology to grow more crops in less space and in different seasons. This means the land is greener for more of the year. In fact, 82 percent of the recent greening in India comes from growing more crops.



IMAGE: NASA Earth Observatory

Is It Enough?

A greener Earth can mean great things. But even as China and India are looking greener, important tropical regions are still losing trees. It's not enough to think we can offset the loss of rainforests in Brazil or Indonesia by planting elsewhere. The world needs green space in the tropics and temperate areas.



Stock Photo

Vocabulary



temperate area - The area between the polar regions and the tropics. In this area, the temperature changes with the seasons. Summers are warm and winters are cool.

By the Numbers

33% of Earth's land is growing greener.

5% of Earth's land is becoming browner.

42% of China's increased greenness is because of its programs to conserve and expand forests.



For the Love of Mom and Trees

In Argentina, a guitar-shaped forest grows in the middle of farmland. Martin Ureta and his children created a forest in the shape of a guitar in tribute to his wife and their mother. This piece of living art is so large that it can be seen from space.



IMAGE: NASA Earth Observatory

Make a Difference: Arbor Day

Countries around the world celebrate trees by having holidays and festivals where people are encouraged to plant trees. In the United States, Arbor Day is celebrated on the last Friday in April. On the first Arbor Day in 1872, about one million trees were planted. You can help make America greener by planting a tree every April on Arbor Day.



Stock Photo

"Once people realize there is a problem, they tend to fix it. In the 1970s and 80s in India and China, the situation around vegetation loss was not good. In the 1990s, people realized it, and today things have improved. Humans are incredibly resilient. That's what we see in the satellite data."

— Rama Nemani, *NASA ecologist*

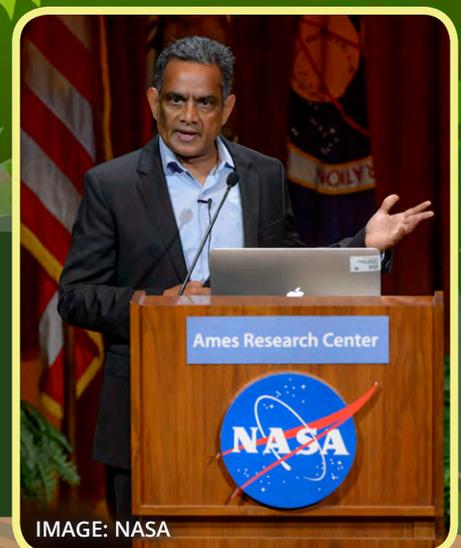


IMAGE: NASA

Data Detective

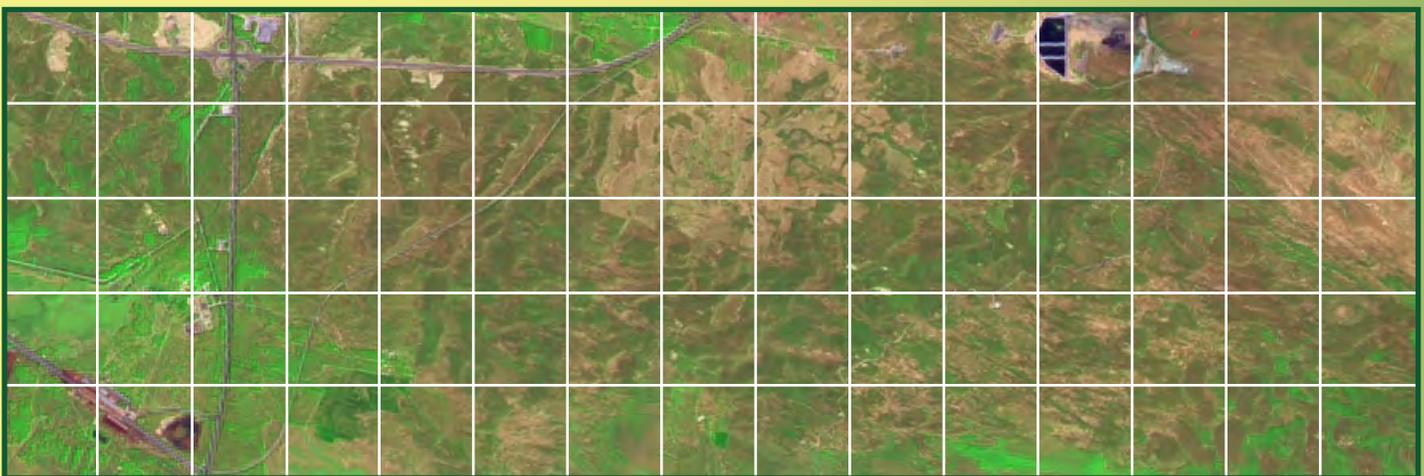
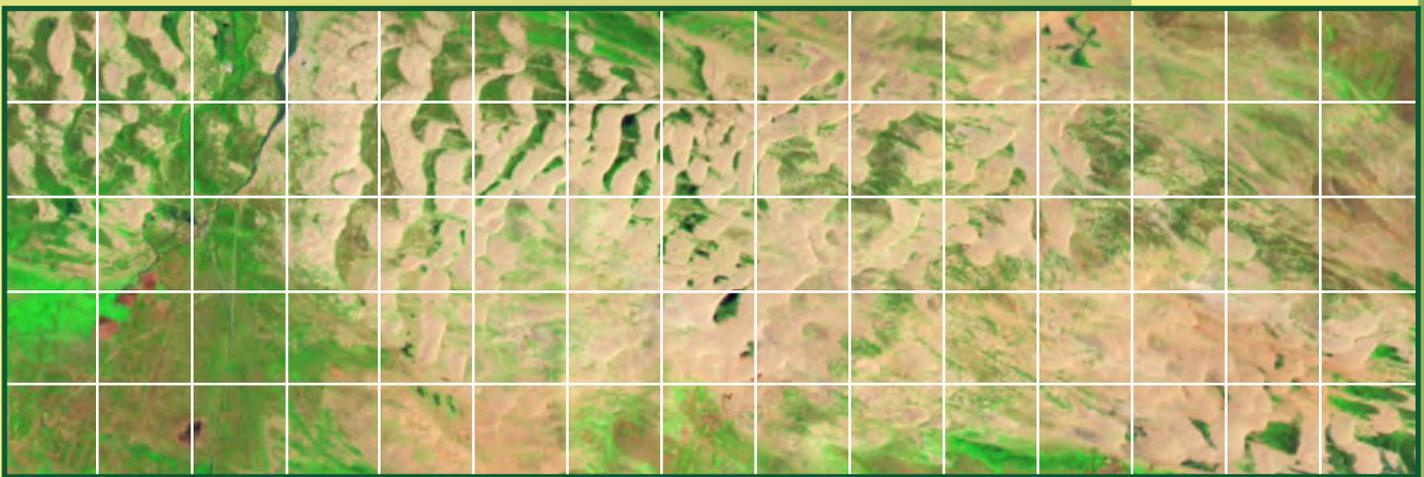
Being Greener



Gobi Desert, China

Zooming in on one area of northern China, we see green today where tan sand dunes covered the landscape. China's tree planting efforts near the Gobi Desert have been nicknamed the "Green Wall of China." These trees were planted to do an important job: the tree roots hold the sand and soil in place. When the desert winds blow, the sand and soil cannot be as easily carried away. In a way, these trees are acting like a wall holding back the shifting Gobi Desert sands.

The Landsat satellite captured the dramatic change in land cover from 2000 (top) and 2017 (bottom).



IMAGES: NASA Earth Observatory

Estimate how much of the area in the two satellite images was planted with trees or crops between 2000 and 2017.

1. How many squares are on each grid? _____
2. How many squares are mostly covered by green for each image? 2000: _____ 2017: _____
3. What percentage of each image is mostly green? 2000: _____ 2017: _____
4. About what percentage changed to green plants between 2000 and 2017? _____