

Earthshots

Papua, Indonesia



Papua, Indonesia 1990-2002

Papua is a province of Indonesia, the world's second largest producer of palm oil. The growth of the palm oil industry—coupled with migration and logging activities—have transformed part of Papua's tropical rain forest into a checkered block of palm oil plantations. Roads radiate from this agricultural "oasis" into other parts of the dense forest, where new plantations will likely spring up.

date	Landsat	sensor	bands	res	WRS	paths	rows
20-Nov-90	5	TM	7, 4, 2	30	2	100	65
Oct-00/02	7	ETM+	7, 4, 2	30	2	100	65

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Isahaya Bay, Japan



Isahaya Bay, Japan 1993-2003

The Isahaya Bay reclamation project began in 1989 to segregate an area of tidal flats from the Ariake Sea so it could be turned into seaweed (nori) farms. The 1993 image shows the bay before the construction of a sea wall designed to hold back the ocean waters. In the 2003 image, reclaimed land extends into the area lying behind the 7-km (4-mile) wall.

date	Landsat	sensor	bands	res	WRS	paths	rows
15-May-93	5	TM	7, 4, 2	30	2	113	37
26-Oct-03	7	ETM+	7, 4, 2	30	2	113	37

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Sydney, Australia



Sydney, Australia 1975-2002

With over 4 million inhabitants, Sydney is Australia's largest city. Natural water boundaries to the east, north, and south have influenced the city's urban growth patterns. Over the past several decades, Sydney's expansion has been largely westward, toward the Blue Mountains.

date	Landsat	sensor	bands	res	WRS	paths	rows
12-Oct-75	2	MSS	5, 7, 4	79	1	95	84
10-Jul-02	7	ETM+	7, 4, 2	30	2	89	82

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Huang He Delta, China



Huang He Delta, China 1979-2000

China's second longest river, the sediment-choked Huang He (Yellow River), is the muddiest river on earth. Where the Huang He flows into the ocean, the sediments it carries are deposited at the river's mouth, where they slowly but surely enlarge the river delta.

date	Landsat	sensor	bands	res	WRS	paths	rows
27-May-79	3	MSS	5, 7, 4	79	1	130	34
2-May-00	7	ETM+	7, 4, 2	30	2	121	34

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Lake Hamoun, Iran



Lake Hamoun, Iran 1976-2001

Iran's Lake Hamoun receives most of its water from neighboring Afghanistan. In the mid-1970s, when rivers in Afghanistan were flowing well, the lake was full. Twenty-five years later, droughts in Afghanistan led to Hamoun's drying up and all but disappearing. Heavy rains and changes in water use policies led to the lake's reappearance in 2003.

date	Landsat	sensor	bands	res	WRS	paths	rows
14-Nov-76	2	MSS	5, 7, 4	79	1	169	38/39
24-Oct-01	7	ETM+	7, 4, 2	30	2	157	38/39

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Al' Isawiyah, Saudi Arabia



Al' Isawiyah, Saudi Arabia 1986-2004

These two images reveal the effects of center-pivot irrigation systems in Saudi Arabia's desert region known as Wadi As-Sirhan. Once so dry and barren that it could barely support the towns of Al' Isawiyah and Tubarjal (upper left of each image), the landscape was transformed from wasteland into cropland dotted with circular green fields.

date	Landsat	sensor	bands	res	WRS	paths	rows
2-Feb-86	5	TM	7, 4, 2	30	2	172	39
12-Feb-04	7	ETM+	7, 4, 2	30	2	172	39

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Toshka Project, Egypt



Toshka Project, Egypt 1984-2000

Begun in the mid-1990s, Egypt's Toshka Project was designed to double the size of the country's arable lands. The project created four lakes that became a water source for irrigation systems. What was once a hot, windswept desert is now a landscape of lush farmland hugging the lake shores.

date	Landsat	sensor	bands	res	WRS	paths	rows
Sep-87/84	5	TM	7, 4, 2	30	2	175/176	44
Aug-01/Sep-00	7	ETM+	7, 4, 2	30	2	175/176	44

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Iguazú, South America



Iguazú, South America 1973-2003

Sandwiched between Brazil and Paraguay, Argentina's Iguazú National Park contains the last remnants of the endangered Paranaense Rain Forest. In 1973, the forest spanned parts of all three nations. By 2003, it had been reduced to an island of green nearly surrounded by cropland and urban developments.

date	Landsat	sensor	bands	res	WRS	paths	rows
23-Feb-73	1	MSS	5, 7, 4	79	1	240	78
12-May-03	7	ETM+	7, 4, 2	30	2	122	76

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Dead Sea, Jordan



Dead Sea, Jordan 1973-2002

The Dead Sea has undergone dramatic change over the past four decades. Declining water levels, coupled with impoundments and land reclamation projects, have greatly increased the amount of exposed land—to the point of nearly closing off the Sea's southern end.

date	Landsat	sensor	bands	res	WRS	paths	rows
1-Jan-73	1	MSS	5, 7, 4	79	1	187	38
24-Mar-02	7	ETM+	7, 4, 2	30	2	174	38

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Santa Cruz, Bolivia



Santa Cruz, Bolivia 1975-2003

In a quarter century, the fertile lowlands surrounding Santa Cruz were transformed from dense virgin forest to into a grid-patterned expanse of agricultural lands. The transformation began when roads were built linking Santa Cruz to other population centers, enabling large numbers of people to move into the region.

date	Landsat	sensor	bands	res	WRS	paths	rows
17-Jun-75	2	MSS	5, 7, 4	79	1	247	72
6-May-03	7	ETM+	7, 4, 2	30	2	230	72

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Las Vegas, Nevada



Las Vegas, Nevada 1973-2000

Between 1973 and 2000, Las Vegas burgeoned from a small town to a city of more than a million people. Spurred by expansion of gaming and tourism industries, Las Vegas is currently the fastest growing metropolitan area in the United States, one that is steadily infringing on the arid ecosystems surrounding it.

date	Landsat	sensor	bands	res	WRS	paths	rows
13-May-73	1	MSS	5, 7, 4	79	1	42	35
03-May-00	7	ETM+	7, 4, 2	30	2	39	35

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Escondida, Chile



Escondida, Chile 1989-2003

Isolated in Chile's Atacama Desert, the open-pit Escondida Mine is the world's largest copper mine. To conserve water and minimize environmental impacts, Escondida created a tailings impoundment (white patch, lower left) that has expanded along with its mining operations.

date	Landsat	sensor	bands	res	WRS	paths	rows
27-Oct-89	4	TM	7, 4, 2	30	2	233	77
12-Dec-03	TERRA	ASTER	2, 3, 1	15	NA	NA	NA

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Gulf of Fonseca, Honduras



Gulf of Fonseca, Honduras 1987-1999

Honduras ranks as one of Latin America's top producers of cultured shrimp. Huge areas around the Gulf of Fonseca delta have been converted to shrimp farms, bringing tremendous environmental and social change to the region.

date	Landsat	sensor	bands	res	WRS	paths	rows
6-Jan-87	5	TM	7, 4, 2	30	2	17	51
15-Nov-99	7	ETM+	7, 4, 2	30	2	17	51

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Lake Chad, West Africa



Lake Chad, West Africa 1973-1987

Lake Chad, West Africa lies between Chad, Niger, Nigeria, and Cameroon. This area's prolonged drought has shrunk the lake from about 26,000 sq km to less than 3,000 sq km. Old dunes are again uncovered, and wetlands (shown as red) have replaced open water.

date	Landsat sensor	bands	res	WRS	paths	rows
Dec-72/Jan-73	1	MSS	7, 5, 4	79	1	189-200 50-51
Jan/Feb-87	5	MSS	4, 2, 1	79	2	184-186 50-51

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Mount St. Helens, Washington



Mount St. Helens, Washington 1973-1983

The eruption on 18 May 1980 devastated 150 square miles of forest, blew ash 15 miles into the air, and killed 60 people. The mountain's peak elevation dropped from 9,677 feet to 8,364 feet. Forest appears red; ash and mud appear gray. Ice and snow are white, and water is black.

date	Landsat	sensor	bands	res	WRS	paths	rows
15-Sep-73	1	MSS	4, 2, 1	79	1	49	28
22-May-83	4	MSS	4, 2, 1	79	2	46	28

Earthshots: Satellite Images of Environmental Change

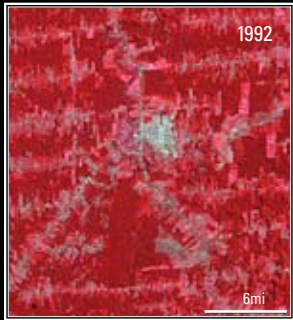
The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Rondonia, Brazil



Rondônia, Brazil 1975-1992

These images show tropical forest in western Brazil, where land has been cleared for farming and grazing. Cutting starts along roads and fans out to create a “fishbone” pattern. Deforested land and urban areas appear as light blue; healthy vegetation appears red.

date	Landsat	sensor	bands	res	WRS	paths	rows
19-Jun-75	2	MSS	4, 2, 1	79	1	249	67
22-Jun-92	4	TM	4, 3, 2	30	2	232	67

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Filchner Ice Shelf, Antarctica



Filchner Ice Shelf, Antarctica 1973-1986

Ice shelves form where glaciers flow into the ocean. In 1986 an area the size of Connecticut broke off the Filchner Ice Shelf, forming several large icebergs which traveled as far as South America. These images show near-infrared reflectance, which discriminates well between ice and water.

date	Landsat	sensor	bands	res	WRS	paths	rows
11-Nov-73	1	MSS	4	79	1	194	117
10-Nov-86	5	MSS	4	79	2	187	116

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Great Salt Lake, Utah



Great Salt Lake, Utah 1972-1987

Rising waters of the Great Salt Lake have threatened Salt Lake City and caused millions of dollars of damage by flooding highways, homes, and wildlife refuges. One solution has been to pump water into the Newfoundland Evaporation Basin, partially visible in the lower left of the 1987 image.

date	Landsat	sensor	bands	res	WRS	paths	rows
13-Sep-72	1	MSS	4, 2, 1	79	1	42	31
18-Dec-87	5	MSS	4, 2, 1	79	2	39	31

Earthshots: Satellite Images of Environmental Change

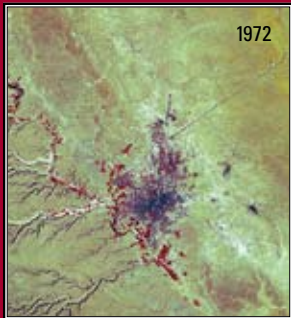
The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Riyadh, Saudi Arabia



Riyadh, Saudi Arabia 1972-1990

These images of Saudi Arabia's capital show its growth, from under a half million people in 1972 to almost two million people in 1990. The street patterns appear as dark grids, and vegetation appears red.

date	Landsat	sensor	bands	res	WRS	paths	rows
24-Sep-72	1	MSS	4, 2, 1	79	1	178	43
31-Aug-90	4	TM	4, 3, 2	30	2	165	43

Earthshots: Satellite Images of Environmental Change

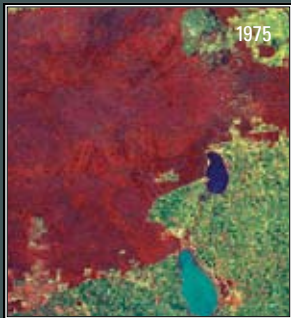
The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>

Earthshots

Wyperfeld National Park, Australia



Wyperfeld, Australia 1975-1985

Eucalyptus shrubland, represented by deep red, distinguishes Wyperfeld National Park in western Victoria, Australia, from surrounding sheep and wheat farms. Despite fire prevention activities, fires often sweep the park. The “scars” or regrowth from several fires are represented by the light red areas on the 1985 image.

date	Landsat	sensor	bands	res	WRS	paths	rows
14-Jun-75	2	MSS	4, 2, 1	79	1	101	85
11-Jun-85	5	MSS	4, 2, 1	79	2	95	85

Earthshots: Satellite Images of Environmental Change

The U.S. Geological Survey Center for Earth Resources Observation and Science archives data from the Landsat satellites (1972-present). Earthshots presents environmental changes using Landsat images.



<http://eros.usgs.gov>