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Global Land Cover for the Year 2000

Land cover classification produced with data acquired in 2000 from the VEGETATION instrument, onboard the SPOT4 satellite.

Developed by the European Commission's Joint Research Centre, in association with the United Nations Environmental Programme and the Food and Agriculture Organisation, on behalf of the Global Land Cover 2000 partnership.

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Map Information:
Legend compatible with FAO Land Cover Classification System (LCCS)
Projection: Interrupted Goode Homolosine

Approximate Scale 1:40,000,000

Note: The delineation of national boundaries must not be considered authoritative.

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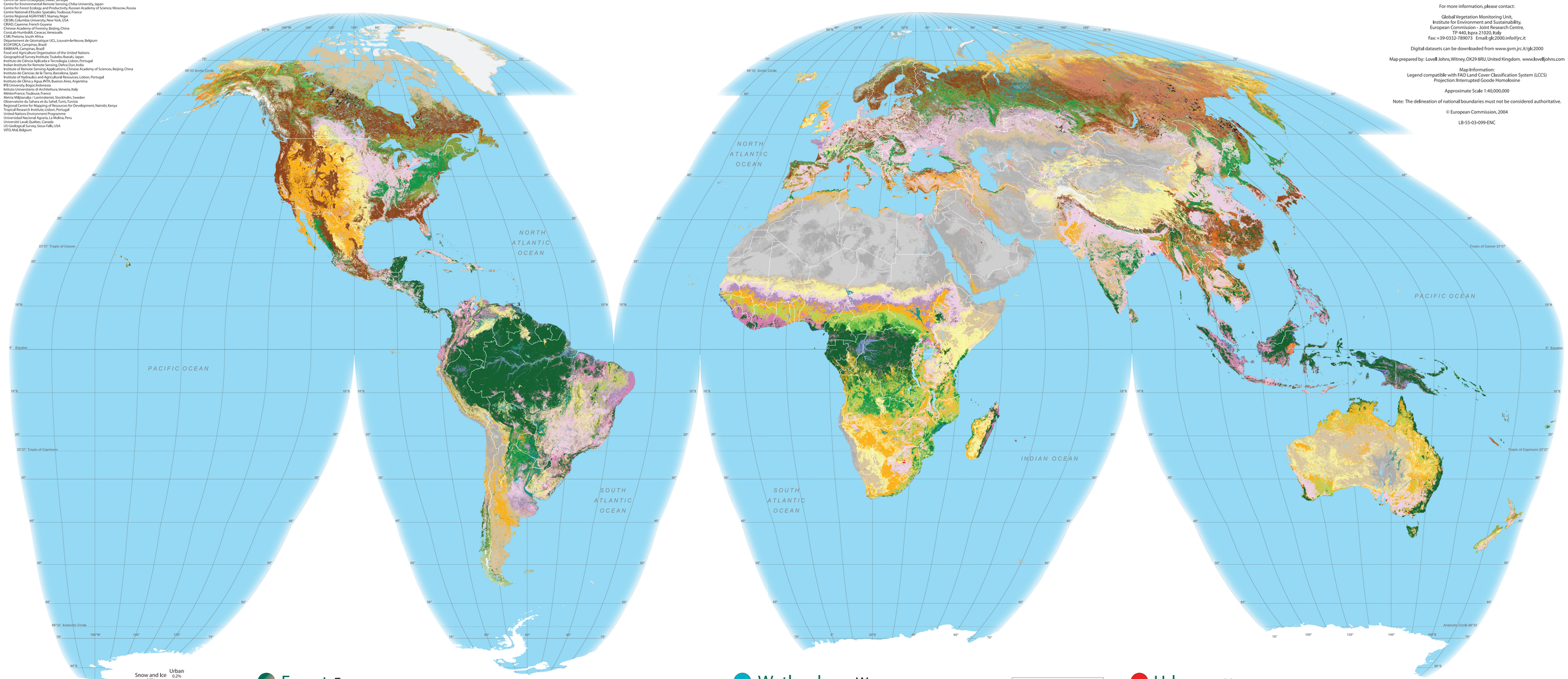
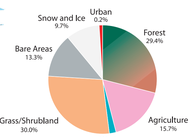


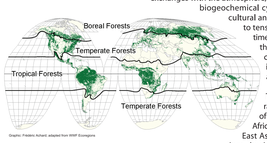


Land Cover Themes — GLC2000 Global Legend

- Forest (boreal, temperate, tropical)
  - Tree Cover, broadleaved, evergreen
  - Tree Cover, broadleaved, deciduous, closed
  - Tree Cover, broadleaved, deciduous, open
  - Tree Cover, needle-leaved, evergreen
  - Tree Cover, needle-leaved, deciduous
  - Tree Cover, mixed leaf type
  - Mosaic: Tree cover / Other natural vegetation
  - Tree Cover, burnt
- Agriculture
  - Cultivated and managed areas
  - Mosaic: Cropland / Tree Cover / Other natural vegetation
  - Mosaic: Cropland / Shrub or Grass Cover
- Wetlands
  - Tree Cover, regularly flooded, fresh and brackish water
  - Tree Cover, regularly flooded, saline water
  - Regularly flooded Shrub / Herbaceous Cover
- Grassland/Shrubland
  - Shrub Cover, closed-open, evergreen
  - Shrub Cover, closed-open, deciduous
  - Herbaceous Cover, closed-open
  - Sparse Herbaceous or sparse Shrub Cover
- Bare Areas
  - Bare Areas, Sandy
  - Bare Areas, Gravel
  - Bare Areas, Rocky
- Snow and Ice
  - Snow and Ice
- Urban
  - Artificial surfaces and associated areas

Forest

Forests cover almost one third of the Earth's land surface. They range from the broadleaved evergreen tropical rainforests in the equatorial belt, to the boreal forests of Russia and Canada. Forests play an important role in regulating our climate through their influence on energy, water and gas exchanges with the atmosphere, and through acting as a source and sink in biogeochemical cycles. They play a key part in our social, cultural and economic lives and are home to tens of millions of people. In recent times, all our forests have come under threat from agricultural expansion, commercial logging, urban and industrial development, mining, and energy production.



Graphic: Frédéric Achard, adapted from WWF Ecoregions

The world's largest tropical humid rainforests are found in the Amazon basin of South America, the Congo basin of Central Africa, and on the continent and islands of South East Asia. They cover an area approximately 1.5 times the size of Australia (11.5 million km²). The tropical rainforest biome contains the most diverse life forms on Earth, providing habitats for at least half of the world's plant and animal species. In one hectare alone, hundreds of tree species can be found, an amount considerably larger than found in the whole of Europe. One quarter of our world's medicines used today come from tropical rainforests, and the full extent of this biological resource has yet to be determined.

Photo: Christoph Dürner

Boreal forests are the largest continuous forest area on Earth. They are located in North America and Northern Eurasia in areas where the summer temperatures rarely, if ever, rise above 10°C. They contain mostly needle-leaved evergreen forest types, such as spruce and pine in Canada and Scandinavia, or needle-leaved deciduous forest types, such as larch in Siberia. The boreal forests contain some of the most remote, inaccessible and largely "untouched" forests of our planet, yet these regions are increasingly a focus for many economic activities.

Broadleaved deciduous and needle-leaved evergreen trees largely make up the temperate forests of the world. The history of human presence in these regions means that only fragments of natural forest remain, and the majority of temperate forests are heavily managed. The temperate forests are the backbone of modern industry and at the same time provide a valuable recreational and wildlife resource.

Photo: Hugh Eva

Grass/Shrubland

Grasslands and shrublands cover almost the same land area of our planet as is covered by forest. The grasslands of the world can be found in hot and cold climates, over all continents. Extensive areas of grasslands can be seen on the map in sub-Saharan Africa, the prairies of North America, the Llanos and Pampas of South America, the outback of Australia, and the steppe grasslands of Central Asia, extending into Central Europe. In many cases, the world's shrublands are part of an environmental gradation from desert to grass and shrublands, to forest. This gradation can be clearly seen in the Sahel region of Africa, south of the Sahara desert, which contains a component of grassland underneath the shrub layer, as well as scattered shrubs within grassland. These landcover types make up the savannahs of Africa and South America, which are maintained by regular annual burning. It is estimated that more than 2.5 million km² of Grasslands and Shrublands burn each year. Much of the carbon released from these fires is recovered by new plant growth in subsequent years. Nevertheless the scale of these fires is such that they play an important role in the global climate system. Both of these land cover types are also an important part of the social life of many nomadic peoples and have been used throughout human history for grazing and hunting.

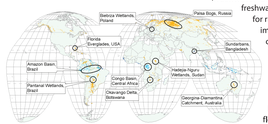
Photo: Philippe Mayaux

Photo: Hugh Eva

Photo: Philippe Mayaux

Wetlands

Wetland ecosystems represent only a tiny fraction of our planet's surface. The map shows how sparsely distributed they are. The vegetation of wetlands varies greatly across the globe embracing grasslands, shrublands, forests (freshwater and mangrove) and bogs. They can be freshwater or saline. They not only provide a habitat for rich plant and animal life, but also hold great importance in terms of regulation of the water cycle, and the global climate as the world's largest emitter of methane (an important greenhouse gas). Wetlands are hot spots of biodiversity, providing nesting grounds for migrating birds, and a home for reptiles and amphibians. Wetlands cover a large range of landscape conditions. They can be inundated grasslands, such as the flooded savannahs of the Pantanal in South America and the Georgina-Diamantina river catchment of Australia, flooded sedges of the palsa bogs of northern Russia, or flooded shrublands, such as the Hadejia-Nguru wetlands of Southern Sudan. Mangroves, like the Sundarbans of Bangladesh are dense coastal forests, inundated by sea water. Swamp forests, such as in the Congo basin of Central Africa, or Amazon basin of South America, are created by regular freshwater flooding.



Graphic: Andreas Hartley

Photo: Christoph Dürner

Photo: Philippe Mayaux

Agriculture

15.7% of the Earth's land surface is responsible for feeding most of the people most of the time. Human ingenuity has overcome natural limitations to grow food crops in almost all conditions. Agriculture is thus found across all continents; the grain belt of North America, the agricultural belt stretching from Europe across central Asia to Kazakhstan, the large areas in northern India, eastern China, and central Brazil are particularly evident.

Photo: Philippe Mayaux

Agricultural land is used for both subsistence farming, where the farmer produces food for his or her own family, and commercial agriculture, where the food is produced for national or international markets. Subsistence agriculture, in which traditional methods such as long fallows are practiced, is still dominant in Africa, and South East Asia.

Large commercial agricultural areas are found in the Americas, and Europe. These serve the urban food markets. The global import and export of food to the consumer markets of the developed world means that nearly any type of food product is available, during any season. This has been made possible, for example, by the use of 85% of the world's freshwater for irrigation. On the other hand inappropriate agricultural practices can have catastrophic environmental consequences such as desertification, soil erosion, and affecting the quality of our water in the ground, in rivers, in lakes, and in the sea.

Urban

Urban areas are home to 3 billion of the world's 6 billion inhabitants, but they only cover 0.2 % of our planet's land surface. Urban areas have experienced almost a 15-fold increase in population over the last century. In comparison, rural populations have only doubled. Africa and Asia have the world's lowest urban population (approximately 37%), whereas in the urban sprawl of Europe and North America, about 76% of the population live in urban areas. According to UN predictions however, the urban population of Africa and Asia will significantly increase from 37% to 55% by the year 2030, whilst the situation in Europe and North America will remain much as it is today.

Graphic: Steffen Fritz, based on World - Dotmap

Photo: Dominik Brunner

The process of urbanisation is usually related to economic growth, and it typically goes hand in hand with large changes in social, political and demographic conditions. Improvements in communications and infrastructure have connected urban centres around the world, creating command and control centres for global and regional economies. In the developing world, people continue to move to urban areas either because of the perceived economic, and social benefits (pull factors), or to escape hardship in rural areas (push factors). Due to the migration of people into urban areas and out of the countryside, the demand for food, fuel, and shelter in the urban area increases. This has a profound impact on the way in which the surrounding land cover is managed and maintained.

In addition to the effects on the world's economic and social life, urban areas directly influence the planet's climate system. Each day, urban areas are literally hot spots for energy consumption, and thus emission of pollutants and greenhouse gases. The thermal properties of artificial surfaces, such as buildings or roads, create higher temperatures in urban landscapes, by acting as a store of solar energy. Furthermore, the removal of natural vegetation eliminates the natural cooling effects of evapotranspiration and shading.

The inset map shows the location of the 32 urban areas with a population greater than 8 million inhabitants. It is notable that Asia, which has around 60% of the global population, accounts for half of these large cities.

Photo: Hans-Jürgen Stibig

Bare Areas

23% of our planet's land surface has little or no vegetation (Desert, Snow and Ice). Deserts are areas that experience small amounts of rainfall. The Sahara is the world's largest desert followed by the Gobi desert of the south of Mongolia and the north of China. Because of the hostile conditions and very low population densities, the deserts are amongst the least well surveyed and monitored land cover types, yet they play an important part in our climate. Deserts can also impact surrounding areas; for example, the desert locust can cause severe damage to agriculture and vegetation in neighbouring regions. They are home to globally important minerals, as well as specialist plants, animals, and even humans, which have adapted to the lack of water and the extreme hot or cold. Plants have adapted by having very brief, but remarkably fast growing periods on the rare event of rain in the desert. The dominant animal life in a hot desert is usually nocturnal, carnivorous, small animals, which hide themselves from the sun by burrowing into the ground.

Photo: Alistair Dieks

Photo: Etienne Bertrolone

Snow & Ice

Around a third of the Earth's land surface can be covered seasonally by snow, and 10% of the land is permanently covered. The largest expanse of ice in the world is found in the ice sheets of Antarctica. As well as in polar ice caps, ice and snow are also found in the mountainous regions of the world. Ice and snow, like deserts, not only play an important role in the global climate system, by affecting solar energy and influencing surface temperatures, but are also the largest store of freshwater in the world and affect soil moisture and run-off. Whilst only 2% of the world's water is stored in ice, the freeze/thaw cycles are very important in the global hydrological cycle and are a regionally important source of water for crop irrigation. The snow cover also plays an important role in determining permafrost zones and rates of glacier advance and retreat. The advance and retreat of polar and high mountain glaciers is also a vivid indicator of climate change.

Photo: Frédéric Achard

Photo: Christoph Dürner