

World Atlas

2026-2027

The Complete Global Reference to Countries, Political & Physical Maps, World Statistics, Rankings, and Emerging Geopolitical Trends

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SECTION 1

INTRODUCTORY SECTION

The World at a Glance

World map (political)



As of 2026, the political world map accurately and clearly depicts the world's sovereign states, territories, and internationally recognized borders. It emphasizes how the area was divided into separate countries, each with its own capital city, government, and administrative framework. These borders are a reflection of cooperative treaties, historical occurrences, regional conflicts, and centuries of diplomatic accords. The generated map offers a fundamental point of reference for comprehending the distribution of political power across continents and oceans.

The sites of large cities and national capitals, which function as the administrative, commercial, and cultural centers of their respective nations, are also highlighted on political maps. Readers can quickly grasp the centers of government since capitals are depicted using unique symbols that set them apart from other significant communities. Population concentrations, established trade routes, and the impact of geography on human settlement particularly along coasts, river valleys, and fertile plains are all seen in the global pattern of city distribution.

The map shows wider geopolitical areas in addition to national borders, which aids readers in understanding worldwide political trends. These geographical areas—such as North Africa, Southeast Asia, Western Europe, or Central America—offer information about common histories, cultural ties,

and economic connections. Many of these areas are home to cooperative organizations or political alliances, such as the European Union, African Union, and ASEAN, whose influence transcends state boundaries and influences international trade, diplomacy, and policy.

Areas with particular political situations, such as disputed boundaries, contested territories, and regions with special administrative or autonomous status, are also included on the map. To preserve objectivity and clarity, these regions are depicted using common cartographic symbols. These territories are displayed in line with commonly accepted worldwide data, even if they may be the subject of negotiation or controversy. This enables readers to maintain an informed, impartial grasp of how territorial claims are conveyed in contemporary mapping while simultaneously appreciating the complexities of global political geography.

World map (physical)



The distribution of continents, seas, mountain ranges, deserts, plains, and significant water bodies are all depicted on the physical map of the world as they exist now. It enables readers to comprehend the actual shape of the landscape by emphasizing the planet's physical structure without making reference to political boundaries. The tectonic activity, erosion, climate change, and volcanic processes that have sculpted the Earth over millions of years are all depicted on this map.

The main mountain ranges that define the continents are plainly visible on the map. With Mount Everest being the highest peak, the Himalayas in Asia continue to be the world's tallest and most striking range. The Andes in South America, the Rockies in North America, the Alps in Europe, and the Great Dividing Range in Australia are some more notable ranges. Human settlement, water movement, and climate are all impacted by these mountain systems. They also delineate areas of continuous geological activity and the borders of tectonic plates.

Large river systems and lakes are also featured prominently on the physical map. The Nile, Amazon, Yangtze, Mississippi, and Congo rivers remain among the most important waterways due to their role in agriculture, transportation, and population concentration. Major lakes such as Lake Victoria, the Caspian Sea, Lake Superior, and Lake Baikal illustrate the global distribution of freshwater reserves. Oceans are shown with depth shading to represent the continental shelves, deep trenches, and underwater mountain chains that shape the floor of the sea.

The continents' characteristics are further defined by their plains, deserts, and forest areas. While the Arabian Desert, the Gobi Desert, and the Great Victoria Desert continue to influence local climates and vegetation patterns, the Sahara in Africa continues to be the continent's greatest hot desert. Large plains that are suitable for cultivation and settlement are also shown, such as the Pampas of South America, the Russian Steppe, and the Great Plains of North America. The map clearly shows the variety of natural habitats that sustain life on Earth, including savannah areas, boreal forests, and tropical rainforests.

Major world regions

The distribution of people, cultures, landforms, and economic activities can be explained by dividing the world into a number of major regions. These areas function as geographical and cultural groupings that make the study of the world more structured and significant, rather than as political units. Every region has unique environmental features, patterns of settlement, and historical influences that impact how societies evolve and engage with each other.

Africa is renowned for its extraordinary geographic diversity, which includes savannah landscapes in the east and south, tropical rainforests in Central Africa, and the Sahara in the north. Along with quickly expanding urban areas, it is home to a diverse spectrum of languages and ethnic groups. With its extensive mountain systems, significant river valleys, and long-standing civilizations, Asia continues to be the planet's largest and most populated region. Asian nations have a significant impact on economic growth, cultural influence, and worldwide demographic patterns.

Europe is distinguished by its diverse landscapes, which include mountain ranges, uplands, and coastal plains, as well as its advanced economies and historical legacy. The region continues to be a major hub for international finance, research, and cultural expression, and it has significant political and economic cooperation in many areas. From the tropical jungles of the Amazon Basin to the Arctic in the far north, the Americas—which comprise North America, Central America, the Caribbean, and South America—showcase striking natural contrast. Leading economies in the world are found in these locations, which also have substantial natural resources, agricultural output, and strong cultural traditions.

Australia, New Zealand, and thousands more Pacific Island countries make up Oceania. The area is home to vast desert regions, coral reefs, tropical jungles, and distinctive ecosystems that are unmatched worldwide. The Arctic in the far north and Antarctica in the far south are examples of the Polar Regions. Extreme cold, substantial ice cover, and delicate environmental conditions that are directly impacted by global climate trends characterize these regions. When taken as a whole, these major global areas provide a framework for comprehending the Earth's physical and human geography as well as how various societies interact with their natural surroundings.

Continents and oceans overview

Traditionally, the Earth is separated into five major oceans and seven continents, each of which has unique climates, physical traits, and human activity patterns. In order to assist readers comprehend the distribution of land, water, and life, these divisions aid in organizing the earth into understandable geographic units. While the oceans comprise the majority of the Earth's surface and are essential to global ecosystems, transportation, and climate management, the continents differ significantly in size and population.

Despite being recognized as distinct continents due to cultural and historical distinctions, Africa and Eurasia together make up the biggest continuous landmass on Earth. Africa is renowned for its abundant biodiversity, lush river basins, and enormous deserts. Together, Europe and Asia comprise a diverse spectrum of ecosystems, ranging from tropical zones in the south to tundra regions in the far north. Major mountain ranges, river systems, and agricultural areas can be found in North and South America, which span nearly every climate zone. Australia is the smallest continent and is renowned for its vast interior desert regions and distinctive wildlife. Despite having no permanent population and being mostly covered in ice, Antarctica is crucial for international scientific study.

The continents are surrounded by a continuous body of saltwater called the world's oceans. They are separated into the Arctic, Pacific, Atlantic, Indian, and Southern oceans. With numerous island groups and active tectonic regions, the Pacific is the biggest and deepest ocean. Major commercial routes between the Americas, Europe, and Africa are connected by the Atlantic. East Africa, South Asia, and Southeast Asia are connected by the Indian Ocean. Antarctica is surrounded by the Southern Ocean, whose strong currents have an impact on world climate patterns. With sea ice that grows and contracts according to seasonal variations, the Arctic Ocean continues to be the shallowest and smallest.

The continents and oceans work together to influence how humans engage with the earth. While seas provide resources, control climate, and sustain aquatic life, continents offer land for habitation, agriculture, and industry. Global trade, biodiversity, and weather systems are all impacted by the interaction between land and water. Exploring the more in-depth geographic information provided throughout this atlas requires an understanding of the fundamental structure of the continents and oceans.

Cartography and Methodology

Scale, symbols, and labeling conventions

To aid readers in precisely interpreting distances and the relative sizes of features, the maps in this atlas adhere to precise and uniform scale standards. Both words and a graphic bar that displays distance in miles and kilometers are used to communicate scale. Larger size maps occur in parts at the regional and national levels to provide more detail, whereas smaller scale maps are utilized for global and continental views where enormous areas must be displayed at once. Knowing the scale enables readers to confidently compare the sizes of various landforms and areas and determine real-world distances.

The atlas uses symbols to clearly and simply depict both natural and man-made characteristics. Soft blue tones are used to depict rivers, lakes, and beaches; elevation-indicating shading is used to depict mountain ranges and highland regions. Distinctive icons are used to identify cities, capitals, airports,

seaports, national parks, and transit lines on all maps. Each map page has a key that explains these symbols, which were selected to be simple to recognize.

Place names are presented in an understandable and systematic way thanks to labeling guidelines. National capitals are highlighted in bold text, and country names are written in capital letters to set them apart from cities and other places. Smaller towns and local characteristics appear in smaller fonts to prevent crowding, whereas major cities have medium-sized writing. In order to visually distinguish water bodies from land-based objects, they are designated in blue italics. This methodical approach to labeling enhances readability and facilitates precise map interpretation.

To ensure accuracy and clarity, all of the maps in the atlas adhere to international cartographic standards. For long features like rivers or mountain ranges, curving labels are employed, and names are positioned to minimize overlap with symbols. Careful modifications guarantee that the text is readable without changing the underlying topography when several characteristics appear near to one another. In addition to ensuring that users may confidently and easily explore the atlas, these rules represent best practices in contemporary map design.

How physical and political boundaries were defined

The planet's natural characteristics serve as the basis for the physical borders on the maps in this atlas. Mountain ranges, rivers, coastlines, deserts, and significant landforms that hold steady over extended periods of time are examples of these. The precise location and size of these features can be ascertained with the aid of geological research, satellite images, and ground investigations. Physical limits represent the actual structure of the Earth's surface since natural formations are produced by processes like erosion, tectonic movement, and climate change. Their general form offers a trustworthy way to define the natural arrangement of continents and regions, even when some elements gradually change over time.

Governmental choices, diplomatic agreements, and historical occurrences all contribute to the formation of political boundaries. They stand for the boundaries of a nation's territory and the domain that a government has jurisdiction over. While many political boundaries are the outcome of treaties, negotiations, or times of war and resolution, they can also be defined along natural features like rivers or mountain crests. The information used to pinpoint the precise locations of the political boundaries displayed in this atlas comes from official government documents and international organizations.

To guarantee correctness, the atlas displays both kinds of boundaries using precise and uniform cartographic standards. Political boundaries appear as exact lines that adhere to recognized international data, whilst physical boundaries are depicted utilizing landform representation and natural coloring. In areas where political boundaries correspond with physical characteristics, the map presents both aspects in a way that enables readers to comprehend the connection between the topography and the choices that established national borders. It is simpler to understand how geography affects political organization because of this dual presentation.

Areas where claims overlap or political boundaries are contested receive special attention. In these situations, the atlas maintains objectivity and factual accuracy while providing the most well recognized international representation. In order to preserve clarity without adopting a political stance, notes on these areas are included as needed. This method guarantees that readers get a fair and accurate picture of how the world's political and physical borders were established, how they interact, and how they are still changing.

Data sources (UN, IMF, World Bank, WHO, NASA, FAO)

To guarantee quality and consistency, the data in this atlas is sourced from the most reputable and well-known international data providers. Global databases that monitor population, economic performance, environmental circumstances, public health, and scientific advancements are kept up to date by these organizations. They are vital resources for any thorough reference study since their work benefits governments, academics, and organizations worldwide. This atlas presents up-to-date information that represents the global situation for the years 2026 and 2027 by utilizing well-established global data systems.

Population, human development, migration, education, and global policy trends are all covered in great detail by the United Nations. The United Nations is one of the most reliable sources for global demographic and socioeconomic indicators since its departments and specialized agencies collect data from national governments and field missions. Comprehensive economic statistics, such as GDP, currency performance, inflation, development financing, and international commerce, are available from the World Bank and the International Monetary Fund. These economic indicators aid readers in comprehending the financial environments of various nations and areas.

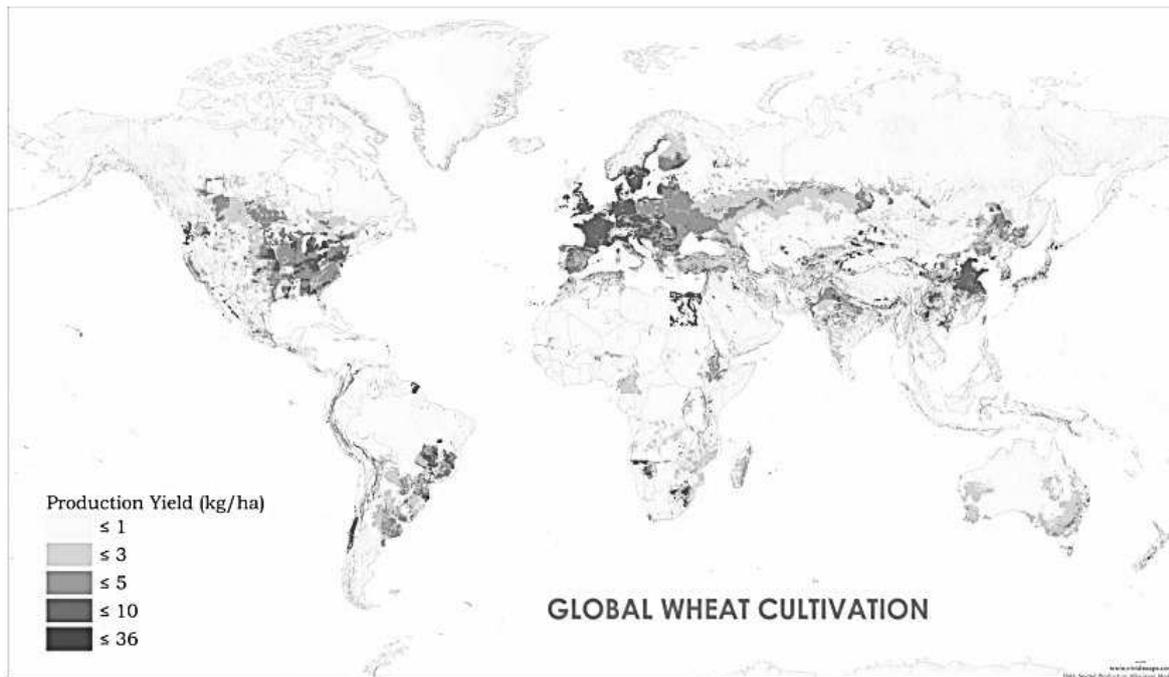
The World Health Organization provides current data on life expectancy, disease prevention, health system performance, and worldwide health conditions. International monitoring networks and national health ministries are the sources of its reports. NASA provides scientific data about Earth's physical structure, environmental change, satellite photography, and climatic patterns. High-resolution photos and measurements from its observation systems enhance the accuracy of maps, particularly those that depict landforms, patterns of sea level, and atmospheric conditions.

The Food and Agriculture Organization provides information about crop production, land use, food security, and environmental sustainability to support the atlas. Its research contributes to the understanding of how regional economies and population distribution are influenced by agricultural systems. This atlas provides readers with a clear and reliable overview of the world by merging data from various reputable organizations. These resources guarantee that each map, chart, and statistical profile is supported by data and represents the most up-to-date information.

Major crop belts (wheat, rice, maize)

Economies and communities are largely shaped by agriculture, and some parts of the world are better suited for growing particular crops than others. Crop belts are regions that support large-scale, productive farming due to their climate, soil fertility, and water availability. Three of the most significant staple crops wheat, rice, and maize are the foundation of both trade and food security in many nations. Readers can better grasp how geography affects agricultural productivity and economic development by knowing how these crops are distributed throughout the world.

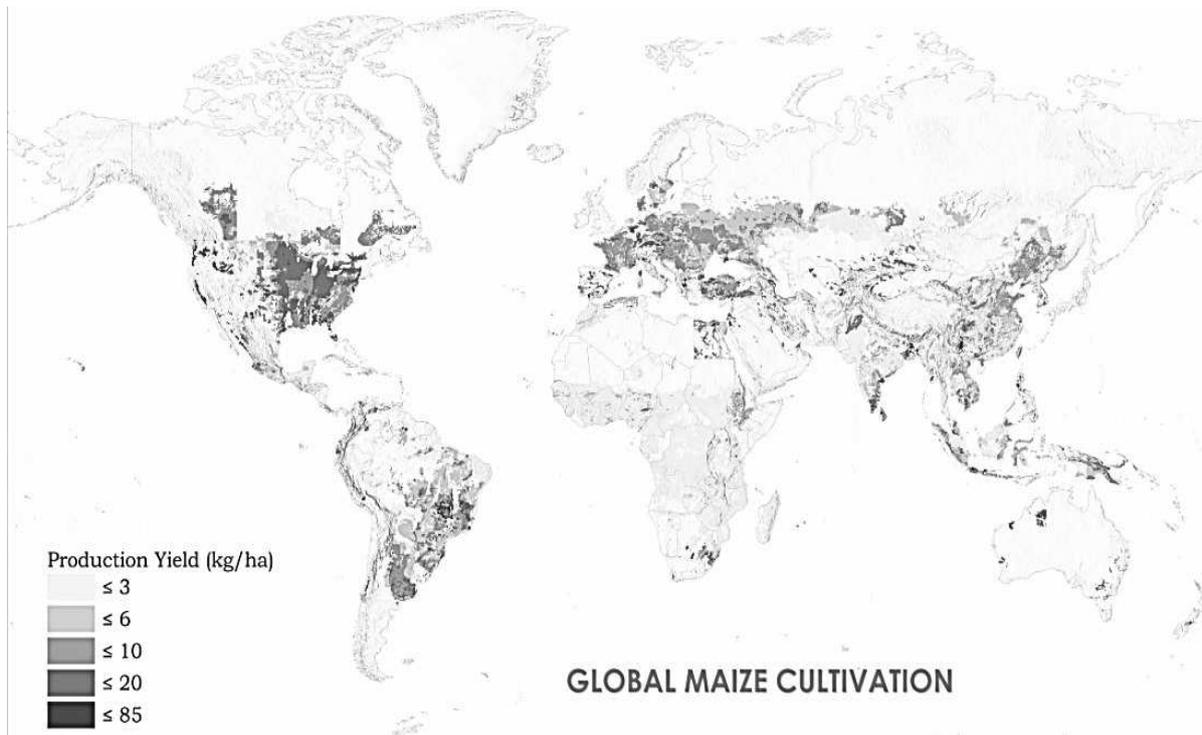
The wheat belt includes portions of Asia, Europe, and North America. The heart of the wheat belt in the United States is made up of states like Kansas, North Dakota, and Montana, which produce millions of tonnes of wheat a year for export and domestic use. Due to their moderate climates and fertile soils, France, Germany, and Ukraine are the three largest producers of wheat in Europe. The production of wheat contributes significantly to the economies of these nations by ensuring national food security, creating jobs in rural areas, and generating sizable export earnings.



Today, China, India, and Russia top the production list.

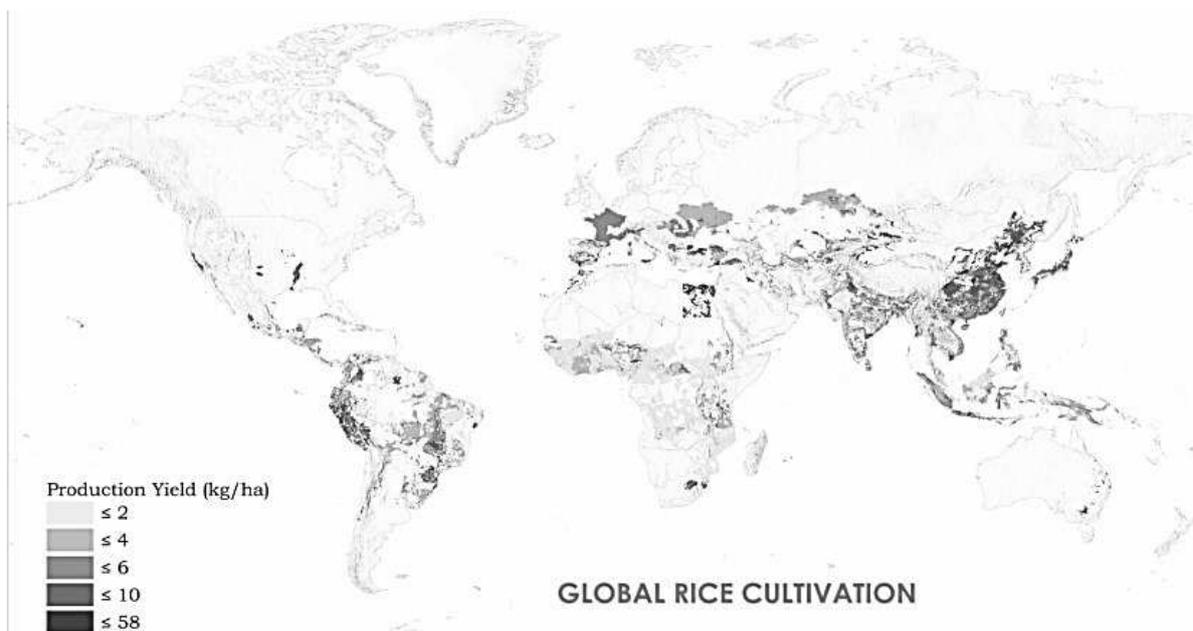
Asia is the region where most rice is grown because of the region's mild temperatures, copious amounts of rainfall, and river deltas. The top producers of rice are China, India, Indonesia, Vietnam, and Thailand. For hundreds of millions of people in China and India, rice is a staple item that forms the foundation of their daily diets and cultural customs. In addition to ensuring food security, rice growing boosts local economies and gives millions of smallholder farmers a living. Large-scale rice exports from nations like Vietnam and Thailand generate foreign exchange that improves their trade balances.

Belts of maize, sometimes known as corn, are common in Africa, portions of Asia, and North and South America. One of the biggest corn belts in the world is found in the United States, especially in Iowa, Illinois, and Nebraska. Corn is grown for food, animal feed, and industrial applications including biofuel. Due to their large-scale farming and fertile soils, Brazil and Argentina are also significant producers of maize. Large-scale maize cultivation is used in African nations including South Africa, Zambia, and Nigeria to sustain regional trade as well as local diets. A key part of national economies, maize farming supports industrial processing, livestock production, and food security.



Additionally, crop belts promote the growth of trade networks and infrastructure. In order to get products from farms to markets, areas with concentrated production of wheat, rice, or maize frequently have effective transportation networks, including highways, railroads, and storage facilities. Both domestic and foreign exports are facilitated by this infrastructure.

These important crop belts offer advantages beyond economic expansion and nutrition. They impact settlement patterns and cultural habits, help stabilize food prices, and provide employment in rural areas. For instance, staple crops like rice in Asia or maize in Africa are central to many nations' festivals, cuisines, and farming customs. Understanding the function of crop belts enables readers to observe how geography, society, and agriculture interact.



Lastly, climatic adaptation and technological advancements are increasingly influencing agricultural belts. In areas that grow wheat, rice, and maize, productivity is increased by irrigation projects, mechanized farming, and improved seed types. However, climate change presents difficulties that need cautious management of soil health and water supplies. Major crop belts have seen increases in output due to new seed varieties, irrigation projects, and technological advancements. Higher yields and more effective use of land are made possible by mechanization and contemporary farming techniques. Water management and climatic unpredictability are also important factors, especially in areas where agriculture depends on river systems or seasonal rainfall.

Global food production, trade, and economic stability all depend on the wheat, rice, and maize crop belts. They sustain both the domestic food supply and global export markets, propel rural development, and serve as the foundation of agricultural economies in many nations.

Fishing zones

Fishing zones are regions of the world's great lakes, seas, and oceans where artisanal and commercial fishing is most prevalent. The abundance of fish stocks, ideal water temperatures, nutrition availability, and ocean currents all influence these zones. Fishing zones are crucial for providing human populations with protein, sustaining livelihoods, and boosting country economies through exports and domestic consumption.

One of the world's most prolific fishing zones is the North Atlantic. Rich stocks of cod, herring, mackerel, and haddock are exploited by nations including the United Kingdom, Norway, and Iceland. These species thrive in the cold, nutrient-rich waters that are shaped by currents such as the Gulf Stream. In addition to providing seafood for both internal and foreign markets, the fisheries in this area help to sustain jobs in coastal communities.

The U.S., Canadian, Russian, and Japanese coasts are all part of the North Pacific fishing zone. Salmon, pollock, tuna, and crab are abundant there. Large fish populations are maintained by a combination of upwelling zones, cold currents, and vast continental shelf. This area plays a vital role in the economies of the coastal countries in the region and makes a substantial contribution to the worldwide seafood trade, particularly canned and frozen goods.

The waters off India, Sri Lanka, Indonesia, and East Africa are all part of the Indian Ocean fishing zone. It is abundant in mackerel, sardines, shrimp, and tuna. High fish productivity is supported by warm tropical waters and seasonal monsoon breezes. Particularly in nations like India, Indonesia, and the Maldives, fishing in this area is essential for employment, export, and the domestic food supply.

Coastal waters off Australia, New Zealand, and the areas surrounding Antarctica are included in the South Pacific and Southern Ocean fishing zones. These regions are well-known for their krill, hoki, squid, and tuna. The Southern Ocean's krill is a valuable resource for aquaculture's fish meal and feed. Because of the ecological sensitivity of the areas, fishing in these zones is regulated to avoid overexploitation and guarantee sustainability.

In Africa, Asia, and South America, inland freshwater fishing zones are important in addition to maritime zones. Fish resources are plentiful in large lakes like the Amazon basin in South America, Lake Tanganyika, the Mekong River in Southeast Asia, and Lake Victoria in East Africa. In many developing nations, freshwater fisheries are essential to food security because they sustain local diets, livelihoods, and small-scale trade.

Economic policies and international relations are also impacted by fishing zones. According to the United Nations Convention on the Law of the Sea, nations have the right to utilize marine resources inside Exclusive Economic Zones, which are 200 nautical miles offshore. The geopolitical and economic significance of shared or contested waterways, like the South China Sea, is underscored by disputes over fishing rights.

Food export/import regions

The global food trade is focused in certain areas where countries depend on imports to meet demand or where agricultural production surpasses domestic consumption. Fertile soils, ideal climates, cutting-edge agricultural technology, and robust infrastructure are characteristics of export regions. Import areas frequently have high population densities, little arable land, or temperatures that are unsuitable for producing crops on a big scale. International trade, economic growth, and global food security are all aided by the movement of food between regions.

One of the world's major exporting regions for food is North America. Wheat, maize, soybeans, and meat products are produced in excess in the US and Canada. These nations provide food to markets in Asia, Europe, and Latin America. North America is able to sustain steady export numbers and make a substantial contribution to global food supply chains because of sophisticated mechanized farming, massive irrigation, and effective transportation infrastructure.

The European Union is a significant importer and exporter of food. Wheat, dairy products, and processed foods are exported by nations like France, Germany, and the Netherlands. Fruits, vegetables, and olive oil are exported by nations in southern Europe, such as Spain and Italy. At the same time, South America, Africa, and Asia supply Europe with tropical goods like sugar, coffee, and cocoa. The EU's position in the world food market is shaped by its infrastructure, standards, and trade regulations.

A major exporter of coffee, soybeans, meat, and cereals is South America. Colombia produces a lot of coffee, and Brazil and Argentina are important exporters of corn and soybeans. Chile exports seafood, fruits, and vegetables. These exports boost the economy of the nations that produce them and help ensure that there is food available everywhere, especially in Asia and Europe.

Asia encompasses both important regions for imports and exports. While Indonesia exports palm oil, Thailand, Vietnam, and India are major exporters of rice. To meet domestic demand, China and Japan import a lot of pork, soybeans, and wheat. Regional trade agreements, culinary habits, and population growth all affect the flow of food goods throughout Asia.

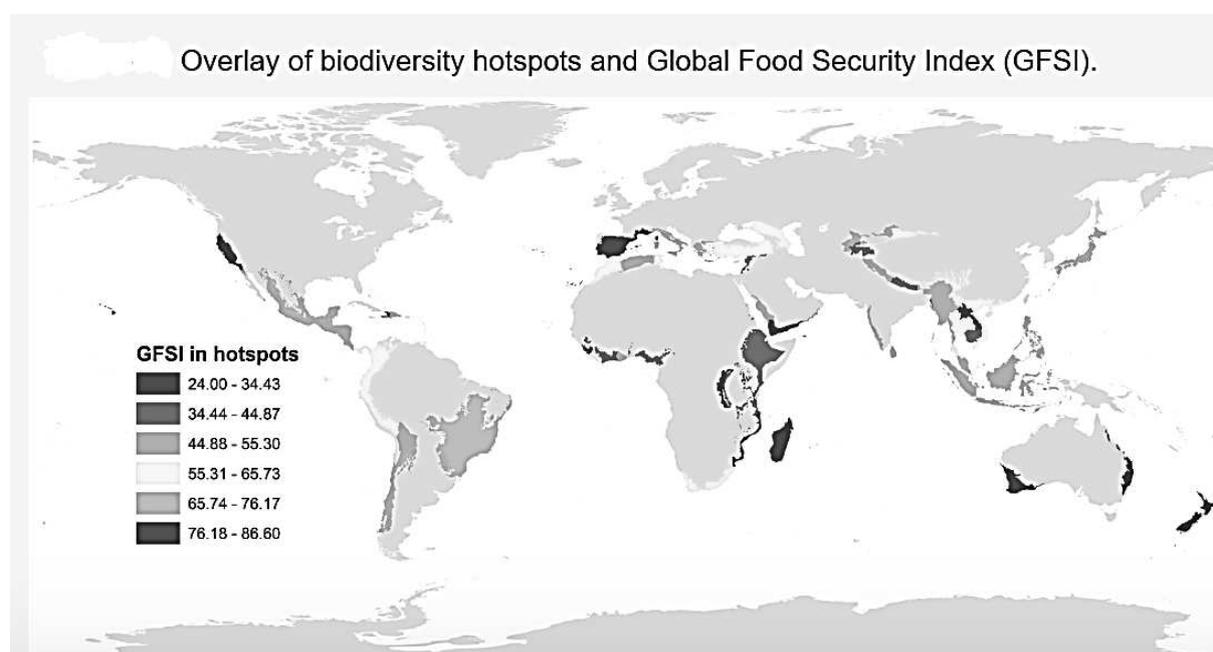
Africa is mostly a food-importing continent, while certain nations export particular goods. While many other nations mostly rely on imports to augment domestic production, Egypt, South Africa, and Morocco export wheat, fruits, and vegetables. Asia, North and South America, and Europe are the importers. Although trade in Africa promotes food security, it also draws attention to the problems of limited arable land, erratic weather patterns, and inadequate infrastructure.

Wool, dairy, cattle, and wheat are all key exports from Oceania, which includes Australia and New Zealand. These nations provide goods to markets in Europe, the Middle East, and Asia. Large tracts of fertile land, mechanization, and effective port infrastructure assist their agricultural exports. Tropical fruits and processed foods are imported to diversify domestic consumption, but import requirements are low in comparison to output.

In general, the distribution of natural resources, population density, and economic potential are reflected in the regions that import and export food. While importing regions rely on foreign markets to supply the demand for food, exporting regions support global trade and economic expansion. Mapping these areas demonstrates the huge international movements of agricultural products and the interdependence of nations in preserving the world's food supply.

Food insecurity hotspots

In areas where people do not have consistent access to enough food that is safe and nourishing, food insecurity arises. Conflict, climate change, unstable economies, and inadequate agricultural capacity are frequently associated with hotspots of food insecurity. Food availability and access are restricted in these regions due to issues like drought, floods, pest outbreaks, and broken supply systems.



One of the most impacted areas is Sub-Saharan Africa. Chronic food insecurity is a problem in nations like South Sudan, Ethiopia, Nigeria, and Somalia because of protracted conflict, unstable governmental systems, and frequent droughts. Low agricultural yields are the result of smallholder farmers' struggles with inadequate irrigation, unstable rainfall, and poor soil fertility. Furthermore, food shortages are occasionally made worse by locust infestations and flooding. International assistance and humanitarian aid are vital for the people living in these nations.

There is also a great deal of food insecurity throughout the Middle East and North Africa. Food production and trade are disrupted by ongoing conflicts in Yemen, Syria, and Iraq. The issue is made worse by rising food costs, a collapsing economy, and population displacement. Arid temperatures and scarce water supplies further limit domestic agricultural output, making imports and aid more necessary.

There are hotspots in South Asia in places like Afghanistan, sections of Pakistan, and parts of Bangladesh and India. In these regions, poverty, climate change, and frequent natural catastrophes like floods and cyclones are frequently associated with food insecurity. Agriculture plays a major role

in rural communities, and crop failures can have an instantaneous effect on the amount of food available to households.

Haiti, Honduras, and Guatemala are among the nations in Central America and the Caribbean that experience food insecurity. Food production and distribution are impacted by hurricanes, economic instability, and restricted access to agricultural supplies. Because of their reliance on subsistence farming and restricted access to markets, rural inhabitants are especially vulnerable.

Parts of Southeast Asia and the Pacific are also at risk, as small island nations like Timor-Leste and Papua New Guinea experience food insecurity as a result of their reliance on imports, lack of arable land, and susceptibility to severe weather.

Hotspots for food insecurity are impacted by a confluence of social, economic, and environmental factors. In order to support local production, these areas frequently rely on regional trade, international aid, and food assistance programs. Identifying these hotspots draws attention to the regions that are most vulnerable and underlines the worldwide problem of guaranteeing that all populations have access to enough wholesome food.

Satellite mapping

Using satellites in orbit to take pictures and gather information about the Earth's surface is known as satellite mapping. In terms of geography, land use, climate, vegetation, water bodies, urban areas, and natural resources, it offers precise, comprehensive, and current information. In order to create contemporary maps, track environmental changes, and assist scientific study, satellite mapping has become a vital tool.

Sensor-equipped satellites use radar, infrared, and optical technologies to gather data. Optical sensors are excellent for monitoring land cover, towns, and agricultural areas because they produce visuals that resemble photographs. By detecting heat and vegetation health, infrared sensors enable evaluation of droughts, forests, and crop situations. Radar sensors provide precise information on topography, soil moisture, and flood zones since they can penetrate clouds and operate in all weather.

In agriculture, satellite mapping is frequently used to track crop health, calculate yields, and pinpoint irrigation requirements. Governments and organizations can effectively track large-scale crop belts, forests, and fisheries to plan food production and manage resources. Additionally, this technology facilitates the tracking of environmental damage, desertification, and deforestation.

Satellite mapping is used in disaster management to provide up-to-date information on earthquakes, wildfires, hurricanes, and floods. This makes it possible to conduct damage assessment, rescue operations, and early warning systems more successfully. Satellite data is used by governments and aid agencies to plan relief operations and distribute funds to impacted areas.

Satellite mapping is also useful for infrastructure development and urban planning. Traffic patterns, land use changes, and city growth can all be tracked. Accurate mapping of ports, energy facilities, and

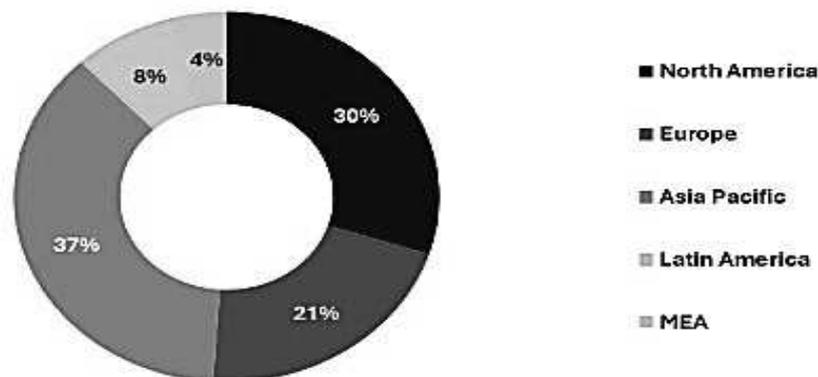
transportation networks aids governments in allocating resources effectively and planning for sustainable growth.

Climate research, environmental monitoring, and worldwide navigation have all benefited from satellite mapping. The study of ice caps, sea level rise, and trends in global temperature is supported by data from remote sensing. It is an essential tool for thorough world maps and atlases since it helps map inaccessible places including arctic regions, deserts, and dense woods.

All things considered, satellite mapping improves the timeliness, accuracy, and detail of geographic data. It facilitates resource management, enables accurate mapping of both natural and man-made characteristics, and offers insightful information on global environmental and social shifts.

GPS systems

Global Positioning Systems (GPS) are satellite-based navigation systems that provide precise location, speed, and time information anywhere on Earth. They are run by a system of satellites in orbit, ground control centers, and terrestrial receivers. In order to pinpoint precise locations in latitude, longitude, and altitude, GPS systems employ trilateration, which measures the distances from several satellites. Mapping, navigation, transportation, military operations, scientific research, and disaster relief all depend on this technology.

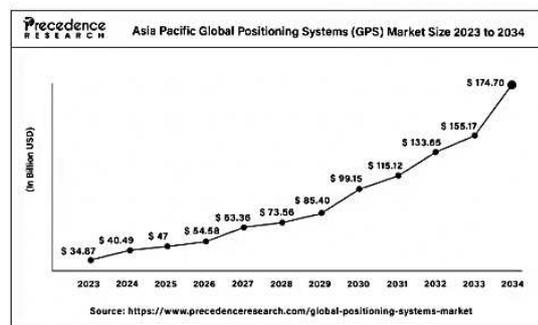
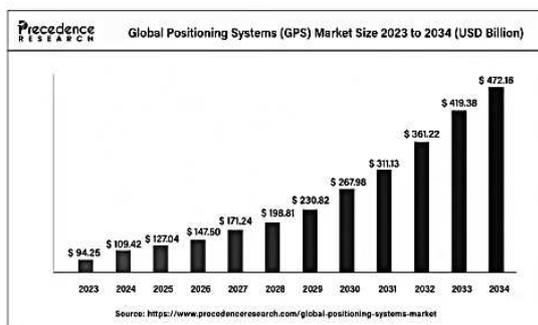


With more than 30 satellites offering worldwide coverage, the United States runs the first GPS network, called the Global Positioning System. Its method provides unparalleled accuracy and dependability for both military and civilian uses. GLONASS, a fully functional GPS network run by Russia, has worldwide coverage and frequently acts as a fallback for international navigation. China has created BeiDou, a regional GPS system with global coverage that is utilized for national defense, urban planning, and transportation. Galileo, which is operated by the European Union, is built for high accuracy and precise civilian navigation in urban settings. A regional GPS system that covers the Indian subcontinent, NavIC, was introduced by India.

Advanced GPS systems are used by nations to improve infrastructure and economic prosperity. Precision agriculture in the US is guided by GPS, which helps farmers maximize crop yields while

cutting expenses through planting, irrigation, and harvesting. In order to improve traffic flow, lessen congestion, and improve logistics, China uses GPS for intelligent transportation systems and urban planning. In order to increase efficiency and lower emissions, Europe incorporates Galileo into energy management, public transportation, and smart city design. By expediting shipping routes, tracking cargo, and cutting down on delays, GPS also improves trade.

In terms of national security, GPS devices offer significant benefits. GPS is used in military navigation, missile guidance, troop movements, and surveillance by the US, China, and Russia. Accurate geolocation boosts intelligence capabilities, lowers operational risk, and improves coordination. Additionally, GPS facilitates sensitive area monitoring, border control, and anti-smuggling activities. These networks can be adopted or leased by nations with less robust GPS infrastructure to enhance defense readiness, track assets, and enhance security operations.



KEY PLAYERS



When responding to natural catastrophes like earthquakes, hurricanes, floods, and wildfires, GPS devices are crucial. GPS is used by nations like the US and Japan to track emergency services, plan evacuation routes, and keep an eye on disaster-prone areas. By charting impacted areas and directing the provision of supplies, GPS helps manage floods in India. GPS saves lives and dollars by enabling quick damage assessment and real-time agency collaboration. By incorporating GPS technology, countries with weak GPS infrastructure can enhance humanitarian response and disaster preparedness.

GPS improves transportation planning and navigation. GPS helps with ride-hailing apps, public transportation scheduling, traffic control systems, and shipping logistics in urban areas. GPS is used in South Korea and Singapore to improve delivery efficiency, ease traffic, and optimize bus routes. Precision farming in areas with extensive mechanical operations is made possible by GPS in agriculture. Other nations can use GPS to plan urban expansions, track public transportation, lower traffic accidents, and effectively manage vital infrastructure like ports, pipelines, and power lines.

GPS systems can help nations in a variety of areas related to development. By monitoring ice melt, desertification, and deforestation, they make environmental monitoring easier. They support mining operations, water distribution, and fisheries, among other aspects of resource management. By facilitating precise location tracking, surveillance, and emergency response, GPS also contributes to public safety and criminal prevention. Developing countries can close the technology gap with developed nations by using GPS for national security, disaster mitigation, supply chain optimization, and rural development. Countries enhance social stability, economic efficiency, and environmental management by incorporating GPS into industry and governance.

Space agencies around the world

Organizations backed by the government or the state that are in charge of exploring, researching, and using space are known as space agencies. They oversee the development of cutting-edge space technologies, planetary exploration, satellite launches, and space research. These organizations are essential to scientific research, environmental and climate monitoring, international communications, navigation, national security, and economic growth. Additionally, they organize worldwide cooperation, supporting major projects like the worldwide Space Station, Mars exploration, and international networks for Earth observation.

One of the most sophisticated and significant space organizations in the world is the National Aeronautics and Space Administration (NASA) of the United States, which was founded in 1958. NASA has accomplished many significant achievements, such as sending rovers to Mars, launching the Hubble Space Telescope, landing humans on the Moon with the Apollo program, and running the Mars Perseverance and Curiosity missions. While satellite technology facilitates communication networks, GPS services, and agricultural planning, its Earth observation satellites keep an eye on natural disasters, weather patterns, and climate change. In order to support the expansion of the commercial space industry in the United States, NASA also works with private space firms.

Russia's vast space program is overseen by the Russian Federal Space Agency (Roscosmos), which also continues the Soviet Union's space legacy. Roscosmos sent the first satellite, Sputnik, into orbit and launched the first human, Yuri Gagarin, into space in 1961. It currently develops cutting-edge rocket technology, runs Earth observation and communication satellites, and regularly sends crewed trips to the International Space Station. In addition, Roscosmos contributes to international space projects and maintains a significant presence in space science worldwide through its involvement in interplanetary missions and lunar exploration.

An international agency with 22 member states, the European Space Agency (ESA) carries out technology development, satellite deployment, and scientific research in space. ESA is well-known for its Earth observation satellites, such as the Copernicus program, which tracks climate patterns, deforestation, and environmental change. The Galileo navigation system is run by ESA, which offers extremely precise positioning services throughout Europe and beyond. It works with NASA, Roscosmos, and JAXA on significant scientific and exploratory projects and has taken part in deep space missions, including the Rosetta mission, which landed a probe on a comet. Additionally, ESA supports technological innovation, research institutes, and the European aerospace businesses.

With an emphasis on crewed missions, satellite launches, lunar exploration, and interplanetary research, the China National Space Administration (CNSA) oversees China's quickly expanding space program. The BeiDou Navigation Satellite System, which rivals GPS in accuracy and coverage, has been effectively deployed by CNSA. In addition to conducting robotic lunar missions, such as Chang'e 4, which made the first soft landing on the Moon's far side, it has constructed and run its own space station, Tiangong. Additionally, CNSA launched the Tianwen-1 mission to Mars, successfully landing the Zhurong rover and showcasing China's cutting-edge space technology development and exploration capabilities.

The Indian Space Research Organization (ISRO) has become well-known throughout the world for its extremely effective and reasonably priced space missions. Since its founding in 1969, ISRO has launched communication, meteorological, and Earth observation satellites. It carried out the Mars Orbiter Mission (Mangalyaan), which made India the first nation to reach Mars orbit on its first try, and the Chandrayaan-1 lunar mission, which found water molecules on the Moon. In addition, ISRO oversees the NavIC navigation system, offers satellite launch services to other nations, and uses its satellite technology to promote agriculture, disaster relief, and climate monitoring.

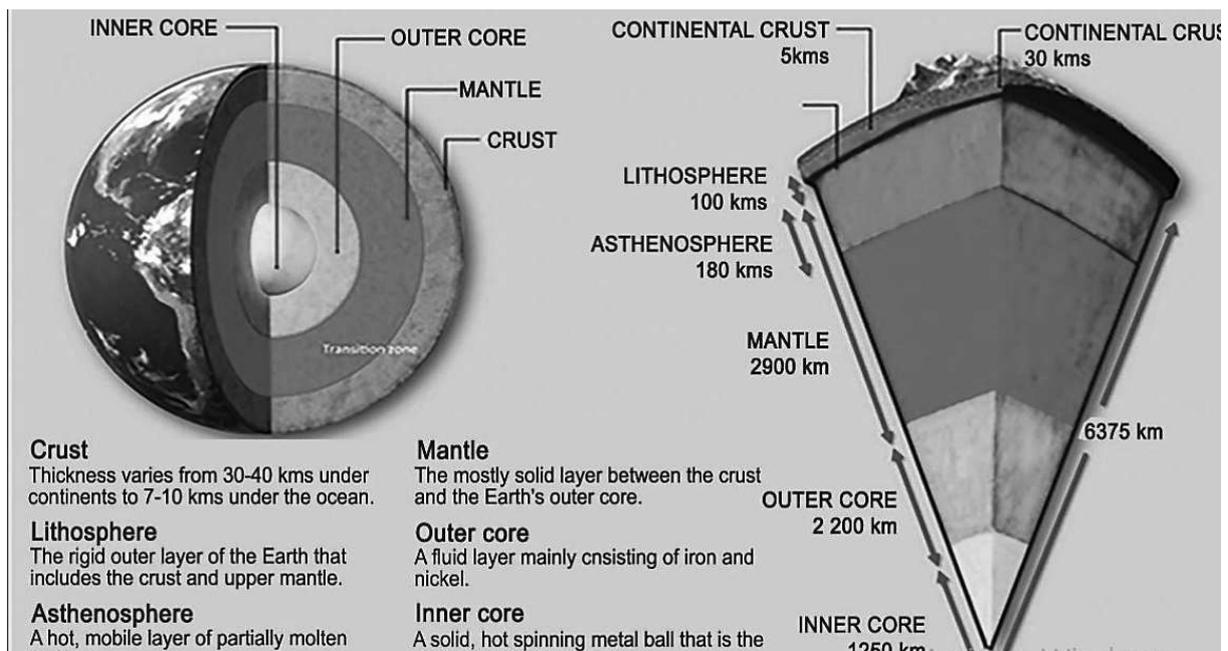
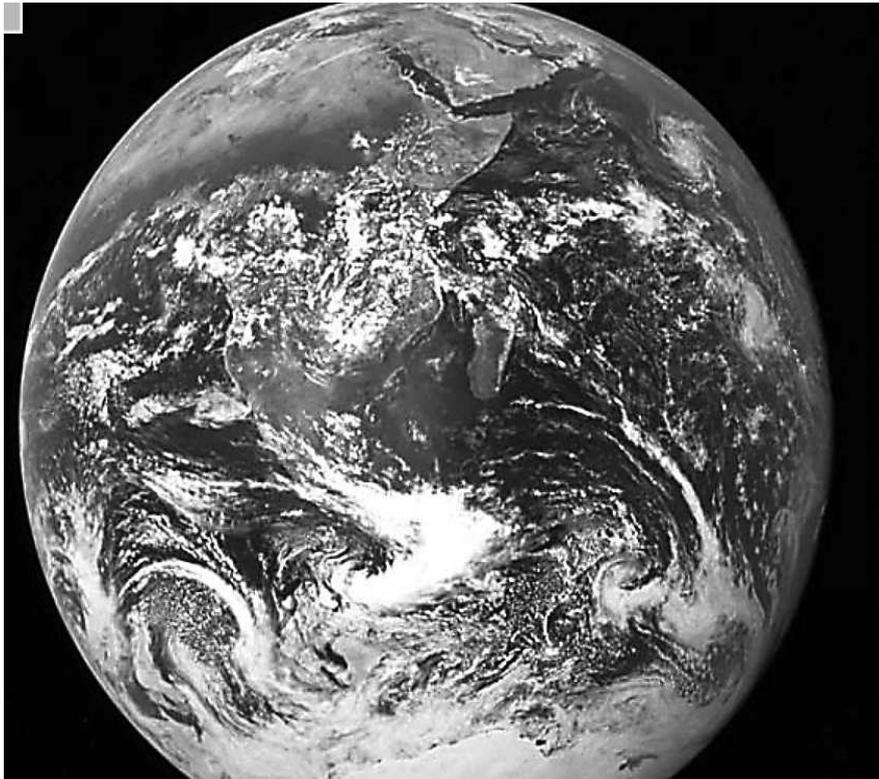
Other prominent space agencies include the Canadian Space Agency (CSA), which is renowned for its contributions to robotic technology, including the Canadarm used on the Space Shuttle and the ISS; the Japan Aerospace Exploration Agency (JAXA), which carries out satellite development, Earth observation, and lunar and planetary exploration; and up-and-coming organizations in the United Arab Emirates, South Korea, Brazil, and South Africa that are creating satellite technology, space research initiatives, and regional partnerships. These organizations advance technological advancement, scientific understanding, and international space collaboration. Together, space agencies worldwide promote economic and security endeavors, further research, and improve humankind's comprehension and use of space.

SECTION 2

GLOBAL THEMATIC CONTENT

The Earth and Natural Environment

Earth's structure



The composition, temperature, and physical state of the several layers that make up the Earth vary. The planet's surface characteristics and geology are still shaped by these layers, which were created over billions of years by natural processes. The movement of continents, the creation of mountains, the occurrence of earthquakes, and volcanic activity may all be explained by an understanding of the Earth's structure. The outer core, inner core, mantle, and crust are the main layers.

All life is found on the solid surface of the crust, which is the outermost layer. It fluctuates in thickness beneath continents and seas and is rather thin in relation to the rest of the world. Whereas continental crust is thicker and composed of lighter materials, oceanic crust is often thinner and denser. The mantle, a huge area of partially solid and partially molten rock that extends to a tremendous depth, is located under the crust. Tectonic plate motion and continental structure are driven by slow motions within the mantle.

Beneath the mantle is a highly hot layer of liquid metal called the outer core. It is primarily made of iron and nickel and is essential to the creation of the Earth's magnetic field. A magnetic field that extends much beyond the planet's surface is produced by electric currents created by the continuous movement of liquid metal within the outer core. In addition to guiding migratory species, navigation systems, and atmospheric processes, this magnetic field shields the planet from damaging solar radiation.

The Earth's inner core, a solid sphere primarily composed of iron, is located in its center. Despite its extremely high temperature, the inner core is kept solid at this depth by extreme pressure. The magnetic field is maintained by the inner core's slow rotation and interactions with the outer core. The Earth's layers work together to create a dynamic system that affects everything from the behavior of the atmosphere to the movement of continents. The geological and environmental patterns displayed throughout this atlas require an understanding of this structure.

Plates and tectonics

Tectonic plates are the huge, hard sections that make up the Earth's surface. These plates come together like a worldwide puzzle to form the planet's outer shell. Each plate can move over time because they float on the slower-moving, softer mantle beneath them. The Earth's physical landscape is largely shaped by this slow but constant migration. The African, Eurasian, Pacific, North American, South American, Indo-Australian, and Antarctic plates are the main plates.

Many of the most striking geological structures on Earth are the result of tectonic plate interaction. Subduction is the process by which two plates contact and push one beneath the other. Volcanic activity, ocean trenches, and mountain ranges are produced as a result. Mountains created by this process include the Alps, the Andes, and the Himalayas. Magma rises to fill the void left by the separation of plates, creating rift valleys and a new ocean floor. An obvious illustration of this kind of border is the Mid Atlantic Ridge.

Another immediate consequence of plate movement is earthquakes. Stress accumulates along the boundary as plates slide past one another until it is released as seismic energy. Abrupt earth shaking and, under certain situations, extensive damage may result from this. One of the best researched instances of this kind of plate boundary is the San Andreas Fault in California. Additionally, volcanic eruptions happen in places where magma can rise to the surface, particularly at plate boundaries or in places with weak crust.

The Earth is still being shaped by tectonic action now and will continue to do so for a very long time. The distribution of oceans, the development of continents, and the patterns of earthquakes and volcanic eruptions are all impacted by these motions. By releasing gases from the interior and recycling crustal material, they also aid in controlling the globe. Recognizing the natural processes that shape the terrain depicted throughout this atlas and interpreting global geological patterns are made easier with an understanding of tectonic plates.

Mountains, rivers, and deserts

The Earth's surface is shaped by mountains, rivers, and deserts, which also have an impact on ecosystems, climate, and human settlement patterns. These landforms help shape how people interact with the environment and define the natural character of large regions. Deserts regulate vegetation and population distribution, rivers facilitate transportation and agriculture, and mountain ranges influence weather systems. When taken as a whole, these characteristics are crucial to the physical geography shown in this atlas.

Every continent has mountain systems, which frequently indicate the borders of tectonic plates. Mount Everest continues to be the highest peak in the Himalayas in Asia, which is still the world's tallest mountain range. One of the longest continuous mountain ranges is the Andes, which stretch along South America's western border. The Alps are in Europe, whereas the Rockies are in North America. Australia has the Great Dividing Range, whereas Africa has the Ethiopian Highlands and the Atlas Mountains. By obstructing air masses, producing rain shadows, and influencing regional temperature trends, these mountain systems have an impact on the climate.



Mount Kilimanjaro

River systems sustain major population centers and supply essential freshwater supplies. Because of their length, discharge, and economic importance, the Nile in Africa, the Amazon in South America, the Yangtze in China, and the Mississippi in North America continue to rank among the most significant rivers. Rivers provide transportation channels, rich floodplains, and water for daily living, industry, and agriculture. Significant ecosystems that sustain fish, animals, and human communities worldwide are formed by lakes and associated river networks.

Large portions of the planet are deserts, which are distinguished by extremely low rainfall rather than only temperature. Stretching across the northern portion of the continent, the Sahara is Africa's largest hot desert. While the Gobi Desert spans northern China and Mongolia, the Arabian Desert encompasses a large portion of the Arabian Peninsula. The Atacama Desert in South America is still among the driest places on Earth, while Australia's central region is home to major desert regions. Deserts have shaped population patterns for thousands of years and are home to unique plant and animal species despite their severe environment.



Oregon Natural Desert

Climate zones of the world

Temperature, precipitation, and seasonal variations are reflected in the various primary climatic zones that make up the planet. The global distribution of wildlife, vegetation, and human activity can all be explained by these zones. Latitude, height, distance from the ocean, and the movement of global wind systems all affect climate trends. Comprehending these zones offers a basis for analyzing the actual surroundings and how individuals adjust to various natural circumstances.

The equator is surrounded by the tropical zone, which has year-round warm temperatures and heavy rains. Dense rainforests, abundant biodiversity, and some of the planet's most productive ecosystems may be found in this area. Rich vegetation thrives in tropical climates because of regular sunshine and copious amounts of rainfall. Savannah regions and other areas with seasonal rainfall changes are part of the larger tropical zone, but they have distinct wet and dry seasons that affect wildlife and agriculture.

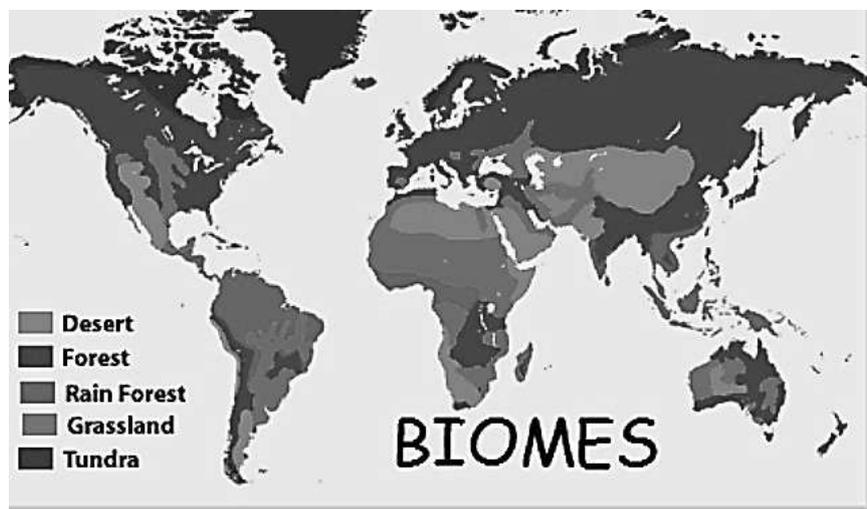
The polar regions and the tropics are separated by the temperate zone. It encompasses areas with moderate rainfall, temperate to mild winters, and warm summers. This zone includes most of North America, Europe, and portions of Asia and South America. Large population centers and a variety of crops are supported by the moderate environment. Seasonal differences in temperature, daylight, and precipitation that affect transportation, energy usage, and agriculture are evident in this area.

The polar zones, which are located in the extreme north and south, are characterized by extremely low temperatures, protracted winters, and brief summers. While Antarctica is covered by a massive ice sheet, the Arctic region has tundra landscapes with permafrost. These regions have drastic differences in daylight between summer and winter and receive little sunlight for a significant portion of the year. The polar zones sustain specialized animals despite the extreme conditions, and through sea ice and atmospheric circulation patterns, they significantly contribute to the regulation of the global climate.

Biomes and ecosystems

The main natural communities that cover the Earth and the interactions between living things and their physical surroundings are referred to as biomes and ecosystems. While ecosystems define the interactions between these groups, each biome represents long-term patterns of climate, soil, vegetation, and fauna. When combined, biomes and ecosystems offer a framework for comprehending the distribution of life on Earth and how environmental factors influence the diversity of plants and animals that inhabit the globe.

Major biomes include grasslands, tundra regions, savannahs, deserts, temperate woods, tropical rainforests, and mountain ecosystems. Warm temperatures and heavy rainfall sustain lush vegetation and some of the planet's highest biodiversity in tropical rainforests. Large herbivores and predators can be found in the broad plains and sporadic trees of savannahs and grasslands. Trees that lose their leaves in the winter are found in temperate woods, which have distinct seasons. Specialized plants and animals that can survive with little water are found in desert biomes, which are characterized by exceptionally low rainfall.



These biomes have intricate food webs, nutrient cycles, and interspecies interactions. Fish, birds, and aquatic plants can be found in freshwater ecosystems like rivers, lakes, and wetlands. Coral reefs, coastal regions, and deep ocean habitats are examples of marine ecosystems that sustain a remarkable diversity of species and have an impact on global climate trends. While grassland ecosystems are influenced by grazing animals, fire cycles, and sporadic droughts, forest ecosystems rely on soil nutrients, light, and rainfall to sustain tree development.

Climate, land use, and human activities all have an impact on biomes and ecosystems. The balance of these systems can be upset by overfishing, pollution, deforestation, and habitat loss. Temperature, precipitation, and seasonal patterns are all impacted by climate change, which has an impact on species distribution and the overall health of ecosystems. Readers can better appreciate the diversity of life on Earth and the significance of protecting natural areas for future generations by having a basic understanding of biomes and ecosystems.