Summary Article: Amazon
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River in South America, the second longest in the world, after the Nile; length 6,516 km/4,050 mi. The Amazon ranks as the largest river in the world in terms of the volume of water it discharges (around 95,000 cu m/3.3 million cu ft every second), its number of tributaries (over 500), and the total basin area that it drains (7 million sq km/2.7 million sq mi – almost half the landmass of South America). It has 48,280 km/30,000 mi of navigable waterways. The river empties into the Atlantic Ocean on the Equator, through an estuary 80 km/50 mi wide. Over 5 million sq km/2 million sq mi of the Amazon basin is virgin rainforest, containing 30% of all known plant and animal species. This is the wettest region on Earth, with an average annual rainfall of 2.54 m/8.3 ft.

The Amazon's principal headstreams, the Marañón and the Ucayali, rise in the Andean highlands of central Peru, and unite to flow in a general easterly direction for about 4,000 km/2,500 mi across northern Brazil.

Loss of tropical forest The opening up of the Amazon River basin to settlers from the overpopulated northeast region or coast of Brazil has resulted in a massive burning of tropical forest to create both arable and pastoral land. The problems of soil erosion, the disappearance of potentially useful plant and animal species, and the possible impact of large-scale forest clearance on global warming of the atmosphere have become environmental issues of international concern. In June 1990 the Instituto Nacional de Pesquisas Espaciais (INPE)(National Space Research Institute) announced that 8% of the rainforest in the area had been destroyed by deforestation, amounting to 404,000 sq km/155,944 sq mi – an area almost the size of Sweden. More recent data from INPE has highlighted continued increases in the rate of deforestation throughout the 1990s.

Course and tributaries From their sources in the high Andes, the Amazon's two main headstreams flow northeast until they join near the town of Nauta in eastern Peru. Beyond Iquitos, some 100 km/62 mi further downstream, the Amazon is joined by its first major tributary, the Napo, which flows from Ecuador. Between Iquitos and Manaus in north-central Brazil, a distance of over 2,000 km/1,243 mi, the Amazon is known as the Solimões. At the mouth of the river, the 3 million tonnes of sediment that the Amazon deposits daily have formed a delta comprising a large number of islands, which divide the estuary into many branches. The main estuary lies to the north of the island of Marajó (area 36,000 sq km/14,000 sq mi and one of the world's largest fluvial islands); below this island lies the southern branch of the estuary, which is known as the River Pará. So immense is the amount of water discharged by the Amazon that completely fresh water remains at the surface as far as 64 km/40 mi out into the Atlantic Ocean. Well beyond this point, at a distance of about 320 km/206 mi from the river's mouth, the ocean's salinity and colour is still affected by the river's outfall.
The Amazon's many tributaries are fed by either tropical rainfall or the melting snow of the Andes. On the left bank, the most important of these, from west to east, are: the Santiago, Morona, Pastaza, Tigre, and Napo, all of which flow from Ecuador; the Içá and Japurá, which rise in Colombia; the Negro (largest by far of the left-bank tributaries); and the Trombetas, Paru, and Jari, which descend from the highlands of northern Brazil. The right-bank tributaries are more numerous and generally larger, and include the Javari, Juruá, Purus, Madeira (the greatest of all the tributaries), Tapajós, and Xingu. During the rainy season, in June and July, the water level rises considerably, flooding vast areas on either side of the river. Disregarding the effects of such flooding, the width of the Amazon varies from 1.6 km/1 mi to 16 km/10 mi up to the mouth of the river, where the total width of the delta is about 240 km/149 mi.

**Navigation** Large ocean-going ships can travel for 1,600 km/994 mi up the Amazon to the port of Manaus, which was developed from the mid-19th century to export rubber from the rainforest. Upstream from here, riverboats can navigate as far as Iquitos in Peru. This is the furthest point up the course of any river in the world that is served by sea-going vessels. Most of the tributaries of the Amazon are navigable by smaller river craft, but waterfalls and rapids (generally found near the tributaries' junction with the main river) prevent unimpeded travel throughout the whole river system.

**Human impact** The dense tropical rainforest of the Amazon watershed is intensely inhospitable, and remains one of the least populated and developed regions on Earth. To date, no bridge spans the Amazon along its entire length. For centuries, the only humans to live here were small groups of indigenous hunter-gatherers. Though the 19th century saw the development of commerce along the river, especially to the rubber capital of Manaus, this encroachment remained strictly confined to isolated settlements along the main stream. In more recent times, roads such as the Trans-Amazonian Highway (BR-230) on the southern fringe of the rainforest have made access to the region far easier than before. The numbers of settlers (fazendeiros) in the region are not great, but their use of slash-and-burn techniques to clear tracts of rainforest ready for cattle ranching and arable farming has caused serious damage to the area's ecosystem. In addition, the influx of large multinational agricultural and industrial concerns to the region has further augmented environmental problems. In Amazonia, vegetation quickly grows to cover clearings, but the new growth is not nearly as diverse as the original forest.

Another threat to the rainforest is posed by opencast-mining concerns prospecting for valuable mineral deposits. The activities of both ranchers and miners have created problems of soil erosion and siltation, and threatened the extinction of many plant and animal species. Gold-mining has caused mercury contamination of the rivers which poses a serious health threat to local human/animal populations. The situation is particularly grave in Roraima state. Desertification is a real threat in the extensively cleared areas. On a wider scale, large-scale tree-felling contributes to global warming of the atmosphere. The impact of these activities on the isolated indigenous peoples of Amazonia has been devastating, leading to violent conflicts over land rights between incomers and native peoples. Introduced diseases also pose a threat to the indigenous peoples. The exploitation of the rainforest is being closely monitored by international agencies and the Brazilian government (the Brazilian Environment Agency, and the National Foundation for Indians which aims to protect indigenous Indians' rights).

**History of exploration** In 1639, Pedro Teixeira travelled 2000 miles up the River Amazon claiming the lands east of Equador for Portugal. However, it was only following the Treaty of Madrid in 1750 that true political possession of these lands was concretized. It took until 1822 (with Brazilian
Independence) for the Amazon region to be fully recognized and integrated politically, although this ‘union’ was threatened by the Cabanagem Rebellion 1835–1836. The rebellion, a revolt by the poor black/mestizo population against racial injustice and white domination, commenced in Belém, Pará state, and rapidly spread, creating instability throughout the region. It sought, albeit unsuccessfully, to establish an independent state. It is estimated that nearly 30,000 people died – one third of the region’s population at that time. The discovery of rubber transformed the region economically. Aided by the invention of the rubber tyre and developments in steamboat navigation on the River Amazon in 1858, the region witnessed massive growth. In the 1900s, Manaus and Belém became the focus of the wealth generated in the region. The boom however did not last, as the establishment and growth of rubber plantations in East Asia by 1912, lessened the region’s economic importance.

Recent developments It was only in the latter part of the 20th century that an economic resurgence occurred, albeit with dramatic environmental effects. Deforestation, the influx of multinational companies and immigration by peoples from other regions (primarily northeast Brazil) in search of land have been a major force in the region’s contemporary economic development. Former government relocation policies were also instrumental in populating the region in the 1970s. Contemporary economic development of the region however has come with huge social and environmental costs. Road construction, peasant settlement, forest fires, cattle-ranching by ranchers all lead to substantial forest loss. The plight of indigenous tribal peoples, landlessness, disease transmission, physical attacks and violence are less documented. Huge hydroelectric power schemes have submerged vast areas and large industrial schemes (for example Carajás and southern Pará and gold-mining have caused considerable environmental pollution of the land, air and rivers.

Biodiversity The biodiversity of the River Amazon and its surrounding forest is huge; here there are 3,000 known species of land vertebrates, 2,000 species of freshwater fish, 80,000 known species of trees, and 55,000 species of flowering plant (of which half are exclusive to Amazonia). It is estimated that each species of tree supports over 400 unique species of animal. Countless species of flora and fauna have yet to be categorized; many of the fish caught in the abundant fishing grounds off the mouths of the Amazon, for example, still have no official classification. It is therefore difficult to monitor threatened species as well as species which have potential medicinal benefits.

Between 1993 and 1997 Brazilian and US researchers studying Amazonian fauna took samples from 2,500 nautical miles of river and discovered 30 new fish species, including 2 new genera. In 2000, new species discovered along the Amazon, in an area near the Rio Madeira, included 12 monkey species, 5 kinds of birds, a deer and a peccary species.

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