Country Profile: Brazil

Country Profile (PDF)

Country Resources

Topographic

Series	Publisher	Scale	Years	Sheets
Brazil 1:25,000 Scale Topographic Maps (DSG)	DSG	1:25,000	1957 – 1983	24
Brazil 1:50,000 Scale Topographic Maps (DSG)	DSG	1:50,000	1966 – 2007	903
Brazil 1:100,000 Scale Topographic Maps (DSG)	DSG	1:100,000	1961 – 2006	2,122
Brazil 1:250,000 Scale Topographic Maps (DSG)	DSG	1:250,000	1960 – 2009	323
Brazil 1:25,000 Scale Topographic Maps (IBGE)	IBGE	1:25,000	1936 – 1998	440
Brazil 1:50,000 Scale Topographic Maps (IBGE)	IBGE	1:50,000	1966 – 1992	771
Brazil 1:100,000 Scale Topographic Maps (IBGE)	IBGE	1:100,000	1965 – 1998	677
Brazil 1:250,000 Scale Topographic Maps (IBGE)	IBGE	1:250,000	1950 – 1999	221
Brazil 1:1,000,000 Scale Topographic Vector Data	IBGE	1:1,000,000	2025	48
Rio de Janeiro 1:2,000 Scale Vector Data	IPP	1:2,000	1997 – 2000	902
Rio de Janeiro 1:10,000 Scale Vector Data	IPP	1:10,000	2000	64
Sao Paulo 1:1,000 Scale Vector Data	PSP	1:1,000		3,826
Sao Paulo 1:5,000 Scale Vector Data	PSP	1:5,000		100

Nautical

Series	Publisher	Scale	Years	Sheets
Brazil Nautical Charts	DHN	Varies	1956 – 2021	589

Aeronautical

Series	Publisher	Scale	Years	Sheets
Brazil 1:250,000 Scale Aeronautical Charts	ICA	1:250,000	1981 – 2014	545
Brazil 1:500,000 Scale Aeronautical Charts	ICA	1:500,000	1985 – 2013	125
Brazil 1:1,000,000 Scale Aeronautical Charts	ICA	1:1,000,000	2004 – 2016	46

Geoscientific

Series	Publisher	Scale	Years	Sheets
Brazil 1:1,000,000 Scale Geological Maps	CPRM	1:1,000,000	2004	45
Brazil 1:250,000 Scale Geological Maps	DNPM	1:250,000	1976 – 2007	53

Thematic

Series	Publisher	Scale	Years	Sheets
The World 1:30,000,000 Scale Topographic Map Series 1145 (NGA)	DMA	1:30,000,000		2
Brazil State Political Maps (various scales)	IBGE	Varies	2007 – 2015	13
Brazil 1:5,000,000 Scale Political Map	IBGE	1:5,000,000	2020	1
Brazil 1:5,000,000 Scale Transportation Map	IBGE	1:5,000,000	2014	1

Global Census Archive: GIS Census Data

Year	Questions / Answers	ADM Level	Polygons at ADM	Data Points
2010	6 / 4,190	6	316,570	1,326,428,300

Global Resources

Topographic

Series	Publisher	Scale	Years	Sheets
Soviet Military City Plans	VTU GSh	Varies	1944 – 2003	3,020
Soviet Military 1:100,000 Scale Topographic Maps	VTU GSh	1:100,000	1947 – 1999	24,897
Soviet Military 1:200,000 Scale Topographic Maps	VTU GSh	1:200,000	1949 – 2009	17,799
Soviet Military 1:500,000 Scale Topographic Maps	VTU GSh	1:500,000	1953 – 1998	3,093

Nautical

Series	Publisher	Scale	Years	Sheets
NGA Nautical Charts POD Certified (All Scales)	NGA	Varies	1943 – 2013	4,517

Aeronautical

Series	Publisher	Scale	Years	Sheets
Joint Operations Graphic (JOG 1501A) 1:250,000 – Aeronautical	DMA	1:250,000	1958 – 2007	4,204
Tactical Pilotage Chart (TPC) 1:500,000 Scale – Aeronautical	DMA	1:500,000	1967 – 2006	598
Operational Navigation Chart (ONC) 1:1,000,000 Scale – Aeronautical	DMA	1:1,000,000	1969 – 2001	243
Jet Navigation Chart (JNC) 1:2,000,000 Scale – Aeronautical	DMA	1:2,000,000	1971 – 1999	117
Global Navigation and Planning Chart (GNC) 1:5,000,000 Scale – Aeronautical	DMA	1:5,000,000	1981 – 1999	27

Geoscientific

Series	Publisher	Scale	Years	Sheets
Soviet Military 1:1,000,000 Scale Topographic Maps	VTU GSh	1:1,000,000	1948 – 1994	1,089

Note: East View Geospatial is continuously sourcing new resources that may not yet be listed in Global Explorer. Please contact us if you have geodata needs beyond what is listed above and we will be happy to discuss available off-the-shelf and custom solutions.

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Historical Country Mapping Information

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Country Profile (PDF)

Topographic

Two organizations, one civilian and one military, share responsibility for most, but not all, of the official topographic mapping of Brazil. The **Instituto Brasileiro de Geografia Estatística (IBGE)**, Rio de Janeiro, originated in 1937 as the **Conselho National de Geografía**, with the mission to plan and expedite the mapping of the country, beginning with a modern version of the 1:1,000,000 scale map constructed from new trimetrogon photography and completed in 1946. The agency was established under its present name in 1971 and is now responsible for the collection, analysis and production of census statistics as well as geodetic and topographic survey. The **Diretoria de Serviço Geográfico (DSG)**, of the Ministério do Exército, Brasília, originated in 1890, but acquired its present name and structure in 1946. Today, in order to avoid overlaps, **IBGE** and **DSG** work cooperatively on the systematic mapping of the country, which conforms to a unified National Cartographic System.

Administratively, Brazil comprises 26 states and one Federal District (Brasilia) which in turn are grouped into five regions, and

consequently some topographic mapping of this huge country has also been carried out on a state or regional basis. However, all official topographic mapping activities are coordinated by the **National Commission of Cartography** (**CONCAR**, formerly **COCAR**), which was reformulated in 1994.

The largest scale map to cover the entire country remains the 1:1,000,000 scale series, redrawn to the *International map of the World (IMW)*, Bonn specification in 1971-2. This map covers Brazil in 46 sheets, which are revised on a roughly 10-year cycle. The series also forms the basis for many thematic maps. Sheets cover the usual 6° x 4° area and the projection is Lambert conformal conic. From 1946 until 1967, a 1:500,000 scale series covering the eastern part of the country was in production, but has been discontinued.

A 1:250,000 scale series was started in 1949, but after a hiatus was re-launched in 1972, and now covers 80 percent of the country. Part of the Amazon Basin is only available as radar image maps at this scale, completed between 1971 and 1983. Sheets cover 1° 30′ longitude by 30′ latitude, 16 sheets covering the equivalent area of an IMW sheet. Projection was originally polyconic, but today the UTM is favoured. Sheets are printed in six colors, with contours at 100 m or 50 m intervals.

1:100,000 scale mapping on the UTM projection covers 75 percent of the country, and has been undertaken partly by **IBGE**, and partly by **DSG**. Regional mapping organizations have also contributed to the mapping at this scale. Sheets cover 30′ x 30′ and the contour interval is generally 50 m. In the Northeast region this mapping has been undertaken by the government development agency for this area, the **Superintendência de Desenvolvimento do Nordeste (SUDENE)**, founded in 1959 to develop the infrastructure of this region.

1:50,000 scale mapping is undertaken in areas with relatively great population density. Sheets covers about 14 percent of the country, mainly coastal areas of the southeast. Sheets are produced by photogrammetric survey and are on the UTM projection, with 20 m contours.

1:25,000 scale topographic mapping was initiated in 1984 but covers only the Federal District and some parts of Goiás and of the Northeast and South regions.

Soviet military topographic mapping of Brazil is available at the following scales: 1:1,000,000 (49 sheets, complete coverage, published 1962-1990); 1:500,000 (162 sheets, complete coverage, published 1964-1994) and city (1:25,000) topographic mapping of Belo Horizonte, Brasilia, Canos and Sao Paulo published between 1978 and 1980. These products are availabe in print, digital raster and digital vector GIS formats from **East View Geospatial**.

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Nautical

The **Diretoria de Hidrografia e Navegação (DHN)**, created in 1976, maintains nearly 400 charts of the east coast of South America and the west coast of Africa. A series of bathymetric charts at a scale of c. 1:300,000 cover some of the coastal waters of Brazil. **DHN** has also published about 100 charts of the Amazon river. Since 1987, **DHN** has been working with **Petrobrás**, the Brazilian state monopoly for oil exploration and exploitation, on *Projeto LEPLAC* to establish the limits of the Brazilian continental platform – this has implications for the definition of the Brazilian Exclusive Economic Zone. **DHN** is carrying out bathymetric survey, while **Petrobrás** is concerned with geology and geophysics.

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Aeronautical

Aeronautical charting is undertaken by the **Diretoria de Eletrônico e Proteção ao Vôo (DEPV)** of the Ministry of Aeronautics. There is a complete cover of Brazil in the 1:1,000,000 *WAC Series*.

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Geological/Scientific

IBGE publishes a number of mostly single-sheet maps of various states at scales varying with the size of the state. A fuller set of maps of the individual states is published by the commercial company **GEOMAPAS** at scales usually corresponding to those used by **IBGE**. Maps of the Federal District are produced by **CODEPLAN**.

Earth science mapping has primarily been undertaken by the **Departamento Nacional de Produção Mineral (DNPM)** in association with the **Companhia de Pesquisa de Recursos Minerais (CPRM)**. **CPRM** was founded originally in 1969, but became a public company in 1994 and was restructured in 1996 to incorporate the **Serviço Geológico do Brasil**. It is responsible for the *Programa de Levantamento Geológico Básico do Brasil (PLGB)*, which began in 1987, and has resulted in series of geological, geochemical and metallogenic maps at scales of 1:250,000; 1:100,000 and 1:50,000.

DNPM has published a number of small scale maps of the country, including 1:5,000,000 scale hydrogeological and metallogenic maps, and a 1981 geological map at 1:2,500,000 scale in four sheets. The latter was a major synthesis of geological knowledge, and included mapping of the adjacent ocean floor. It was accompanied by a 500-page monograph *Geologia do Brasil*.

A systematic series of geological maps of the Amazon Basin at 1:1,000,000 scale was prepared by **DNPM** as part of the **RADAMBRASIL** project. These are on IMW sheet lines, and 20 sheets were issued between 1973 and 1980. Additionally, and in the same time period, 17 sheets covering the southern part of Brazil were also issued. A more detailed mineral resource survey, *Projecto mapas metalogenéticos e de previsão de recursos minerais*, was undertaken by **DNPM** in the period 1985 to 1990, and published as sets of black and white metallogenic, and mineral forecast maps together with texts.

A series of geological maps of individual states was also undertaken, usually prepared by **DNPM** in collaboration with state authorities. Scales vary between 1:100,000 and 1:1,000,000 according to the size of state. Some state geological surveys have also published more detailed series. For example, the State of Rio de Janeiro has had a 1:50,000 scale series in progress since 1978, and Paraná also published a number of sheets in a 1:70,000 scale series in the 1960s. Geological institutes in Brazilian universities have also conducted significant mapping programs.

In 1991, a partnership to promote integrated development of the southern cone countries, **MERCOSUL**, was established under the Treaty of Asunción. The signatories were Brazil, Argentina, Paraguay and Uruguay. As a contribution to **MERCOSUL**, **DNPM** and **CPRM** are coordinating the production of a map of integrated geology, mineral resources and hydrogeology of the Bacia do Prato and adjacent areas at 1:2,500,000 scale.

Studies of coastal and marine geology are undertaken by the **Centro do Estudos de Geologia Costeira e Oceânica (CECO)** in the Institute of Geosciences at the Federal University of Rio Grande do Sul. The focus is on the coastal and marine margins of southern Brazil, and also in Antarctica as part of the Brazilian Antarctic program. A geological atlas of the coastal province of Rio Grande do Sul was published in 1984, and a 1:1,000,000 scale geological map of the coastal and marine geology of the state is in preparation.

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Imagery

DSG has invested in automated cartography and digital restitution of aerial photographs and satellite imagery. Currently, three projects are being undertaken which all involve digital cartography. In the *Projeto Fronteira Amazônica*, preliminary 1:250,000 scale satellite image maps are being prepared using LANDSAT TM imagery. *Projeto Fronteira Ocidental* is producing 1:100,000 scale topographic maps from SPOT imagery, and *Projeto Fronteira Sul* is producing topographic maps at scales of 1:25,000; 1:50,000 and 1:250,000 using aerial photogrammetry.

An important contribution both to topographic mapping and to resource surveys in Brazil has come through the use of side looking airborne radar (SLAR) which provided cloud-penetrating imagery of the Amazon Basin in the 1960s and 1970s. A project initially known as **RADAM**, set out to map the Amazon Basin with radar, and semi-controlled radar mosaics were constructed at scales of 1:250,000 and 1:1,000,000. In 1975 the project was renamed **RADAMBRASIL** with a remit to cover the country in a series of 1:1,000,000 scale thematic maps on IMW sheet lines. Five regional centers were set up to carry out the intensive field-work needed to support the imagery

interpretation, with headquarters at Salvador, Bahia. The themes comprised geology, geomorphology, soil, vegetation and land capability, and were interpreted partly from LANDSAT imagery. These maps were issued with accompanying volumes of text, usually one for each IMW sheet, but with some rationalization of sheet lines to give a planned series of 38 volumes, of which 34 were published.

Many programs using satellite imagery have changed focus from resource inventory to sustainable development and the monitoring of environmental change.

RADARSAT satellite data has been used to develop techniques for monitoring forest clearance, the distribution of primary and secondary forest, and to study river regimes and floodplain dynamics. This work has been conducted through an international program called *ProRADAR* and other similar programs.

The **National Institute for Space Research (Instituto National de Pesquisas Espaciais (INPE))** originated in 1961, but took its full present name in 1990. **INPE** is concerned with the processing of remotely sensed imagery, and undertakes projects using remote sensing applications, such as *Projeto PRODES* which is monitoring human impact on the forests of the Amazon Basin. Results are mapped at 1:25,000 scale, referenced to the **IBGE** maps at this scale. **INPE** is also a UNEP-GRID center and disseminates a number of spatially coded data sets, including soil and vegetation maps of Brazil in ARC/INFO export format.

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Vegetation/Forestry

The **Brazilian Agency for Agricultural Research (Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA))** is a public company linked to the Brazilian Ministry of Agriculture. It develops new technology to support sustainable agriculture and forestry and and has numerous units in various parts of Brazil. It includes an **Environmental Monitoring Center** whose role is the diffusion of spatial data, and their application for agriculture and the environment. The **Centro Nacional de Pesquisa de Solos (CNPS)**, formerly the **Serviço Nacional de Leventamento e Conservação de Solos**, is also a unit within **EMBRAPA**, responsible for the national soil survey, *Programa Nacional de Levantamento de Solos*. Small scale, 1:5,000,000 maps of soil and land capability for agriculture have been produced, and 1:1,000,000 scale soil maps formed part of the **RADAMBRASIL** program. Additionally many, more local surveys have been undertaken.

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Thematic

As the most populous state, with the largest city in South America, São Paulo has an especially well-developed state mapping system, undertaken by the **Instituto Geográfico e Cartográfico (IGCSP)**, established under that name in 1979 when it was separated from the **Instituto Geológico**. Its predecessor, the **Instituto Geográfico e Geológico** was founded in 1866 and carried out early topographic mapping at 1:100,000 scale. **IGC** deals with territorial, geographical and mapping problems of the state, although **IBGE** now takes responsibility for the topographic series. It publishes a systematic base map at 1:10,000 scale which currently covers about half of the state and will eventually comprise about 8,000 sheets. Contoured maps of urban areas are being produced at the scale of 1:5,000, and maps of individual municipalities at scales of 1:100,000 to 1:25,000. **IGC** is also producing full color map series of land use and soil. The former, at 1:250,000 scale has been in progress since 1980, and so far 13 of the 19 sheets have been published. Soil maps are prepared in association with the **Agronomic Institute of Campinas** at 1:100,000 scale. Four sheets have so far been published. An atlas, *São Paulo em temas*, has also been published. The **Instituto Geológico (IGSP)** continues to be responsible for a basic 1:50,000 scale state geological series, and has also undertaken 1:500,000 scale mapping of environmental sensitivity to pollution.

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Tourist/Reference

GEOMAPAS, São Paulo, is the major commercial map publisher in Brazil and produces city maps, administrative maps, and maps of the states and regions. For São Paulo it has produced a 20-sheet map at 1:10,000 scale, as well as a single-sheet tourist map. **Quatro Rodas (QR)** is another commercial map publisher, and has produced recent high quality road maps and atlases.

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Census/Demography/Statistics

Demographic and economic censuses are a responsibility of **IBGE**. A national atlas was first published by **IBGE** in 1966, and a second edition appeared in 1992. This has 17 thematic chapters which include about 250 maps, with a principal scale of 1:10,000,000. An index of toponyms appearing on the 1:1,000,000 scale map was published by **IBGE** in 1971. In addition a gazetteer of toponyms in the Federal District has been published by the **New York Botanical Garden (NYBG)**.

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