

# ARAGUAIA

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## THE ARAGUAIA-TOCANTINS FLUVIAL BASIN

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The drainage area of the Araguaia-Tocantins was estimate to be 777,308 km<sup>2</sup>. Nevertheless the river be geographically named Tocantins from the confluence between the Tocantins and the Araguaia rivers to the mouth, geomorphologically could be more correct to named Araguaia to the main channel in that reach. The Araguaia is the main river and in reality we can consider the Tocantins like its more important tributary (figure 1). The drainage area of the Araguaia-Tocantins basin widespread on the central highlands of Brazil, and is geologically dominated by the Precambrian Rocks of the Brazilian Shield (figure 2). The area is covered by the Brazilian savannahs ("Cerrado"), and by the Amazon rainforest in the lower course of the Tocantins (Table 2 and figure 3). The precipitation varies between 1200 and more than 2000 mm/year.

Table 1

Ages	Dominant lithologies	Area (km <sup>2</sup> )	Area (%)
Precambrian (Pz)	schists, gneiss, migmatites, granulites, quartzites	412,564	53.08
Palaeozoic (Pz)	sandstones, silstones, shales, limestones, evaporites, diamictites	158,990	20.45
Mesozoic (Mz)	sandstones, siltstones, shales, limestones	54,085	6.95
Mesozoic (Mz)	Basalts	10,487	1.37
Tertiary (T)	terrigenous sediments, alluvium, laterites	158,990	6,15
Quaternary (Q)	mainly alluvium	93,527	12,00
<b>TOTAL: BASIN AREA</b>		<b>777,308</b>	<b>100,00</b>



FIGURE 1

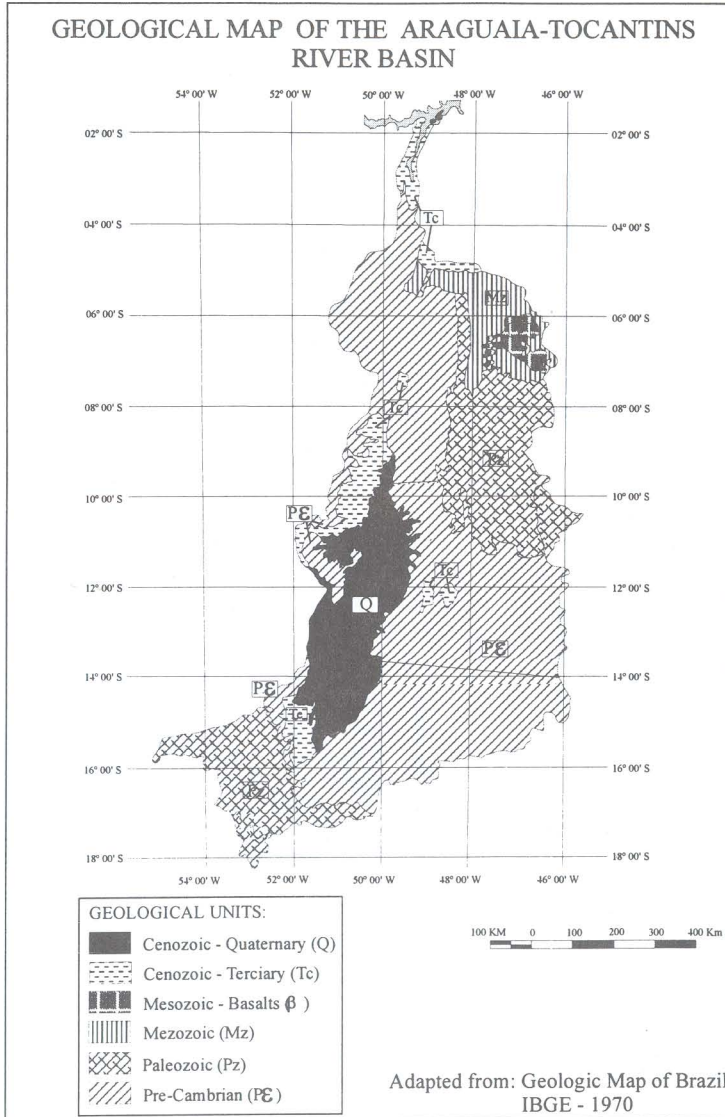


FIGURE 2

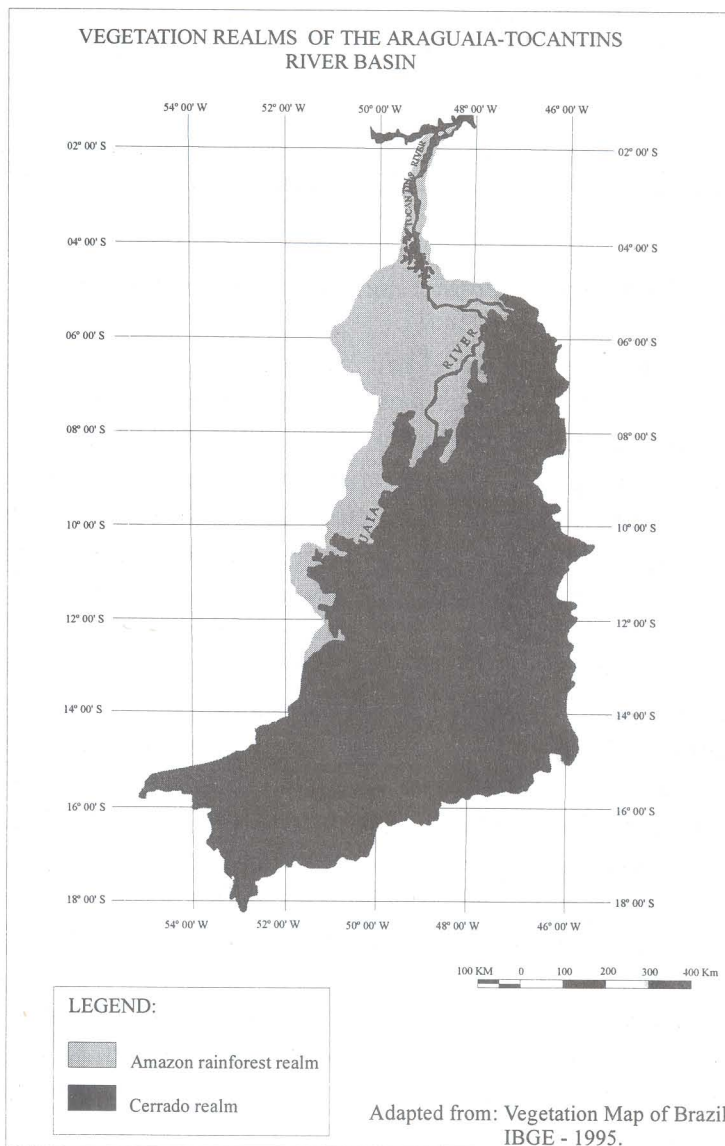


FIGURE 3

Table 2. Vegetation realms in the Araguaia River Basin

VEGETATION REALMS/OCCUPIED AREAS	CERRADO REALM	AMAZON RAINFOREST REALM	TOTAL
Area (km <sup>2</sup> )	612,137	165,171	777,308
% of the basin	78.75%	21.25%	100%

### The alluvial belt and the Quaternary sediments

The Araguaia River alluvial belt is strongly controlled by geological structures. In the middle reach occurs the Bananal Plain. This area of sedimentation extends between the Rio das Mortes in the West to the Araguaia and Araguaia minor branch to the East. This quaternary sedimentary unit widespread on more than 90,000 km<sup>2</sup> occupying approximately 12% of the fluvial basin. The quaternary sediments reaches locally more than 100 km in width and extend more or less continuously, in the north-south direction for about 700 km. The sediments of this wide sedimentation basin are almost unknown. The quaternary sediments are included in the Bananal Formation. Many inactive alluvial paleochannels and other fluvial and swampy/ lacustrine features occur in the alluvial plain. Underfit rivers are at present day, occupying paleo-alluvial belts of the Araguaia river and a underdeveloped drainage installed in the plain on the Bananal Formation.

The Araguaia is a low-sinuosity river with a tendency to braided. Mid-channel bars, and point bars are the main alluvial features along the channel.

The Rio das Mortes is the more important tributary of the Araguaia River. Today the Rio das Mortes show a sinuous pattern flowing along the Bananal Plain, in a more or less parallel direction to the Araguaia River for about 380 km.

## Hydrology

The Araguaia river , close to the confluence with the Tocantins (Araguatins gauge station) have a drainage area of 376,660 km<sup>2</sup>. At this point, the mean annual discharge during the period 1975-1997 was 6,414 m<sup>3</sup>/s. The River show a high seasonal discharge variability (Table 3) The peak discharges occur during March and April.

The Tocantins river close to the confluence with the Araguaia Rivers at the Descarreto gauge station has a drainage area of 298,559. At this point the mean annual discharge for the 1974-1997 period was 4803 m<sup>3</sup>/s. The peak discharge occur in February or March and, occasionally in January.

After the confluence between the Tocantins and Araguaia, the river continue to be named Tocantins until the mouth, close to the Marajo Island in the Para State. The Tocantins-Araguaia is not consider a tributary of the Amazon river because its waters are discharged mainly to the Atlantic ocean, along the channel situated to the South of the Marajo Island. The mean monthly discharges (1978-1995) at Maraba gauge station are shown in figure 4.

Table 3 (source data: CPRM/AANEL)

Rivers	Gauge station and recorded period.	Drainage area (km <sup>2</sup> )	Mean annual discharge (m <sup>3</sup> /s)	Maximum of the historical record	Minimum of the Historical record	Average of the annual discharge variability
Araguaia	Araguatins (1975-1997)	376,659 km <sup>2</sup>	6,414 m <sup>3</sup> /s	32,081 m <sup>3</sup> /s (mean monthly discharge estimated, April, (1997)	715 m <sup>3</sup> /s - 03/10/75	15.6
Tocantins	Descarreto (1974-1997)	298,559 km <sup>2</sup>	4,803 m <sup>3</sup> /s	27,575 m <sup>3</sup> /s-03/01/86	1,172 m <sup>3</sup> /s -25/09/96	13.5
Araguaia-Tocantins	Marabá (1978-1995)	688,090 km <sup>2</sup>	11,450 m <sup>3</sup> /s	51,506 m <sup>3</sup> /s 02/03/80	1,978 m <sup>3</sup> /s-01/4/87	12



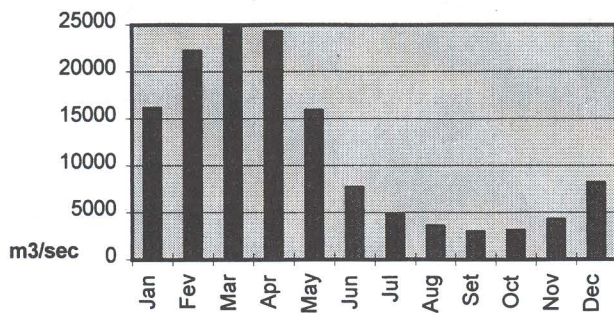


Figure 4. Monthly Mean discharges at Marabá Gauges Station, Tocantins River ( 1978-1995)