Howden Re

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HOWDEN

Climate overview in Brazil and South America

Q4 2025 - February 2026

Content

Editorial

The Q4 2025 Howden Re Climate Report presents an integrated view of the weather conditions observed at the end of 2025 and the outlook for the summer of 2026 in Brazil.

The recent period has been marked by a complex climate scenario in Brazil, influenced by a weak La Niña, persistently elevated global temperatures, and the combined effect of multiple teleconnections, which have shaped contrasting patterns of precipitation and temperature across the country.

Between September and December 2025, above-average rainfall was observed in the South and in the Amazon region, while the Southeast, Central-West and the interior of the Northeast experienced persistent deficits, exacerbating drought, reducing reservoir levels and favouring the expansion of burned areas, particularly in the Cerrado and Caatinga biomes. The recurrence of extreme events — such as severe storms, windstorms, heatwaves and episodes of intense rainfall — produced significant impacts on infrastructure, water security, the energy matrix and agricultural production.

In the Northeast and Southeast regions, the combination of negative precipitation anomalies and higher temperatures has markedly reduced soil moisture, increasing risks to agricultural production, water resources and regional supply. For the summer of 2026, rainfall is projected to remain below average and temperatures above climatological norms in these areas, alongside signs of still-limited hydrological recovery in the Southeast and Central-West. In the North, rainfall is expected to become more regular, while the South is likely to alternate between periods of precipitation and heat.

This set of climate signals underscores the need for continuous monitoring, adaptive planning and proactive risk management, particularly for the insurance and reinsurance sectors, whose exposure to atmospheric extremes continues to expand in the context of increasing climate variability. In-depth climatological analysis, combined with statistical techniques and monitoring tools, can support the development of parametric solutions capable of mitigating the expected impacts on agricultural production and other vulnerable sectors.

Raidel Báez Prieto
Climate Risk Specialist
raidel.prieto@howdenre.com

Recent climatic events in Brazil and South America

Rainfall in Brazil between September and December 2025

The transition period to spring in Brazil, which takes place from September to November occurred under initially neutral ENSO conditions, evolving into weak La Niña conditions from September onwards. This favoured progressive changes in the large-scale circulation, with increased humidity, greater variation in winds at different levels of the atmosphere and greater frequency of convective systems, typical of the seasonal transition, associated with the occurrence of thunderstorms and severe wind events in different regions of the country. During the quarter, there was a clearer expression of the precipitation signal typically associated with La Niña in the precipitation anomalies on a regional scale, albeit with high spatial variability, characteristic of the period (figures 1 and 2).

Figure 1 - Rainfall forecast for September to November 2025, using the September 2025 run (Source: MIA Climate)

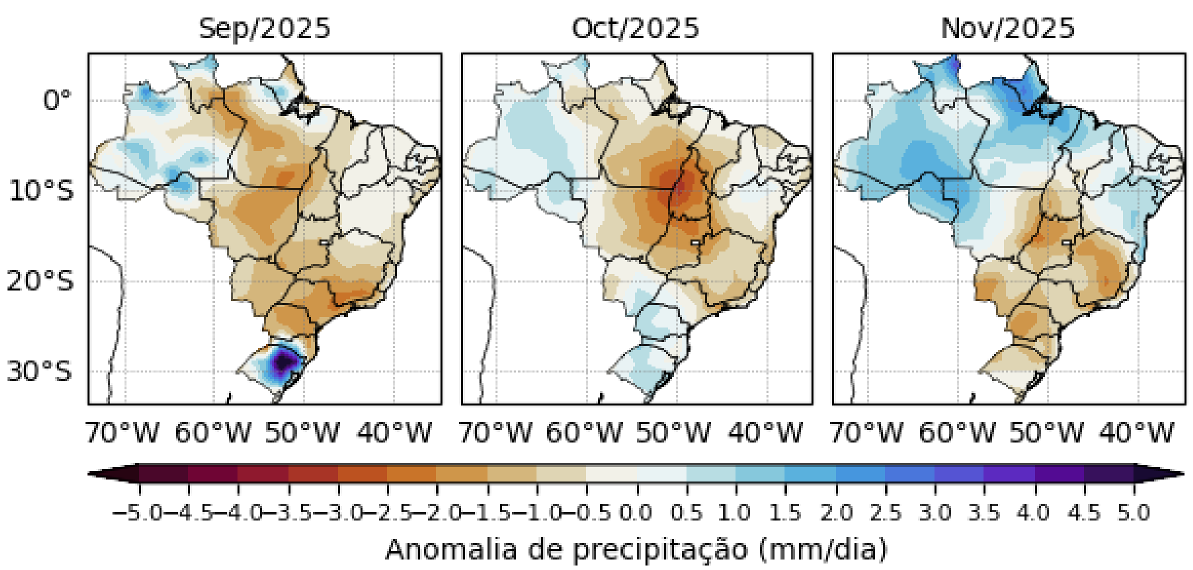
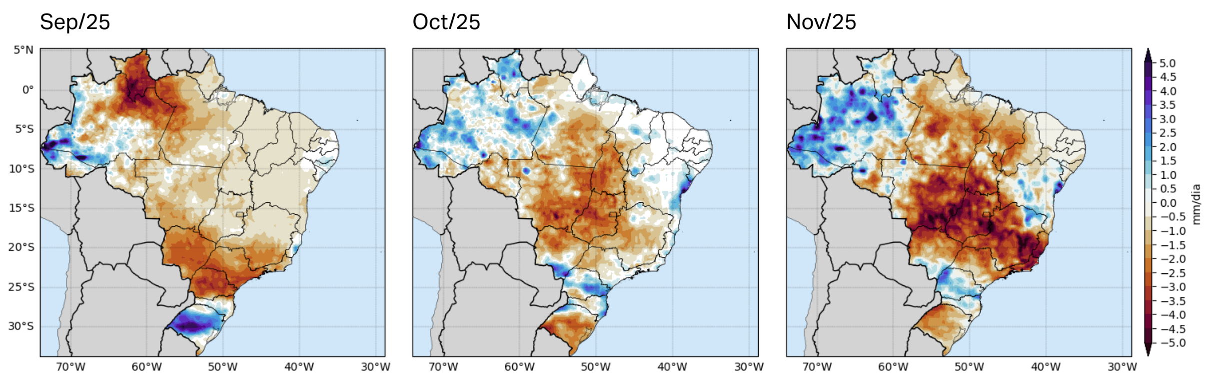


Figure 2 - Rainfall observed between September and November 2025 (Source: ERA5/ECMWF)



As seen in figures 1 and 2, September in the South was marked by above-average rainfall, especially in Rio Grande do Sul, with significant accumulations recorded in the state. Throughout October and November, there was greater spatial heterogeneity, with alternating drier periods in the south of Rio Grande do Sul and episodes of rain above climatology in Santa Catarina and Paraná, associated with the passage of frontal systems and convective instabilities. This variability reflected the transitory nature of the season and the rapid reorganisation of atmospheric patterns.

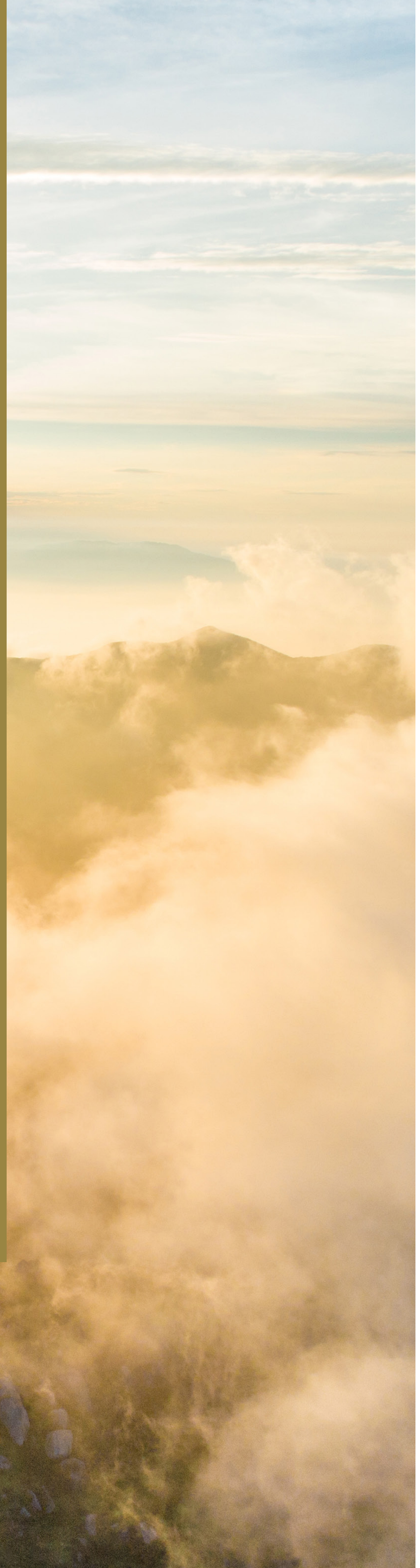
In the Centre-West and Southeast regions, a rainfall pattern close to or below climatological average prevailed, especially between October and November. States such as Mato Grosso, Goiás, Minas Gerais and areas of inland São Paulo recorded persistent deficits in November, with average negative anomalies of around 2 to 4 mm/day below average, indicating a less favourable distribution of convection and irregular behaviour of the mechanisms typical of the rainy season.

For most of the quarter, rainfall in the Northeast was at or slightly below average, especially in inland areas. Exceptions occurred in sectors of the eastern coast, between Alagoas, Pernambuco, Bahia and Sergipe, where episodes of heavier rainfall highlighted the high spatial variability and the influence of mesoscale atmospheric systems.

In the North, the quarter was marked by regional contrasts. The west of the Amazon, including areas of Amazonas and Acre, recorded above-average rainfall at different times during the period, while the centre-east of the Amazon, including the border between Pará and Tocantins, demonstrated more frequent deficits. In September, the most intense negative anomalies were observed in Roraima and Amapá, reinforcing the non-uniform nature of rainfall distribution during the seasonal transition.

In terms of maximum temperatures, the quarter was characterised by strong thermal contrasts. In September, anomalies generally remained below or close to the climatological average in most of the country, with the exception of Mato Grosso do Sul, where positive deviations reached around +2 °C.

In October, the cooling was most pronounced in the south of Brazil, with negative anomalies of up to -3 °C in inland areas of Paraná and Santa Catarina, while much of the national territory showed highs of between 1 °C and 2 °C below average. The month of November marked a phase of thermal transition, with a reduction in the intensity of the anomalies and temperatures closer to the climatological standard, although some regions maintained slightly milder conditions.



The transition to summer in December 2025 was marked by intensified rainfall in several regions, with positive anomalies that, in specific areas of the South, Southeast, Centre-West and North, exceeded 100 mm in relation to the monthly climatological average.

At the same time, a warmer thermal pattern was observed, with above-average maximum temperatures in states such as São Paulo, Paraná, Rio Grande do Sul and eastern Santa Catarina, indicating more persistent warming and favourable conditions for prolonged heatwaves.

In summary, the period was characterised by a progressive transition in atmospheric patterns, with good definition of the regional climate signal, high spatial variability in precipitation and a gradual change from an initially milder quarter to a scenario of greater warming and intensification of the convective regime at the start of the summer of 2025.

Update on drought conditions and the status of river basins

Analysis of the Drought Monitor maps (figure 3, 4, 5 and 6), drawn up using data from the National Water and Sanitation Agency (ANA), shows the spatial and temporal evolution of drought conditions in Brazil over the period analysed. These conditions are directly reflected in water availability, reservoir storage levels and the intensification of fires, in close association with rainfall patterns and temperature anomalies observed in previous months.

In August, conditions of weak to moderate drought prevailed in a large part of the Southeast, as well as in areas of the North, especially the states of Amazonas, Acre and Rondônia. In September, there was an expansion of severe drought areas in the Southeast and Northeast, affecting the interior of the state of São Paulo, portions of the Triângulo Mineiro region and large areas of the Northeastern interior. This worsening reflected the persistence of below-average rainfall and the delay in water recovery in regions that were already more vulnerable.

The following months saw the emergence and intensification of extreme drought across Piauí and the interior of Bahia, a condition that progressively spread to the Northeast. In November, areas of extreme and severe drought also hit Pernambuco, Paraíba and Rio Grande do Norte, creating severe water stress, with significant impacts on water resources, agricultural production and urban supply.

At the same time, in November, the area affected by severe drought expanded in the Southeast, covering the interior of São Paulo and a large part of Minas Gerais. In the Centre-West, there was an increase in areas classified as weak drought, associated with below-average rainfall performance during the transition from the dry to the rainy season. In contrast, over the period analysed, there was a reduction in the areas affected by drought in the north of the country, indicating a gradual improvement in hydrological conditions in this region, especially west of the Amazon.

Figure 3 - Drought monitor in the month of August (Source: ANA)

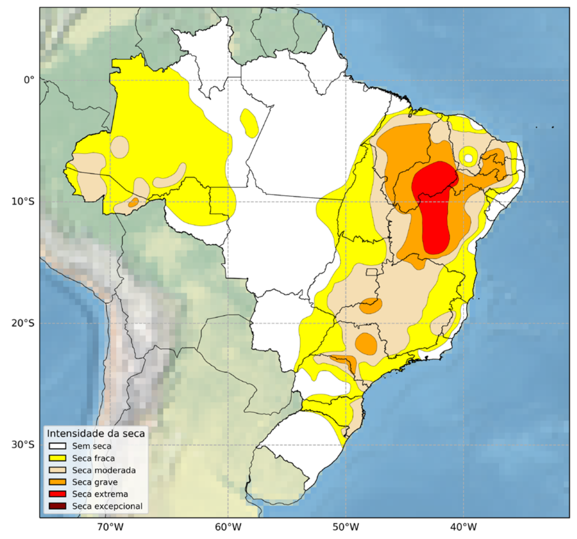


Figure 4 - Drought monitor in the month of September (Source: ANA)

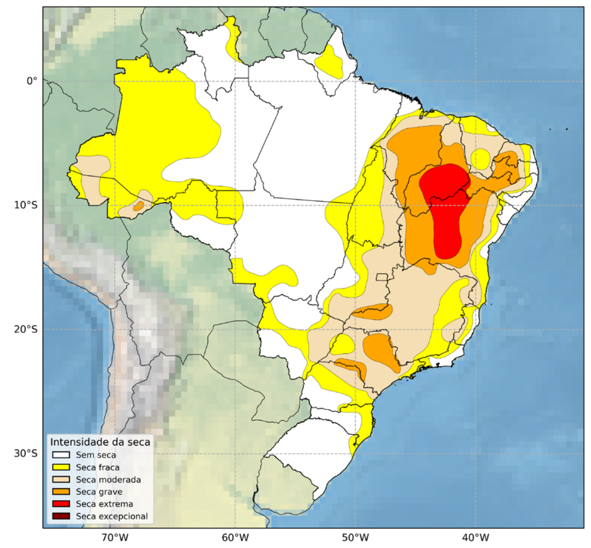


Figure 5 - Drought monitor in the month of October (Source: ANA)

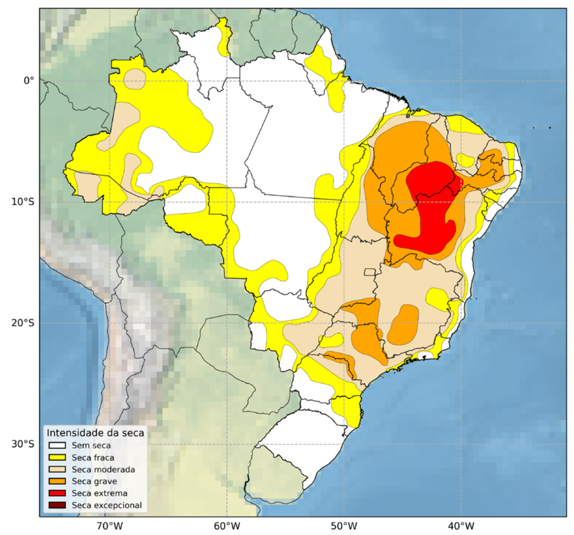


Figure 6 - Drought monitor in the month of November (Source: ANA)

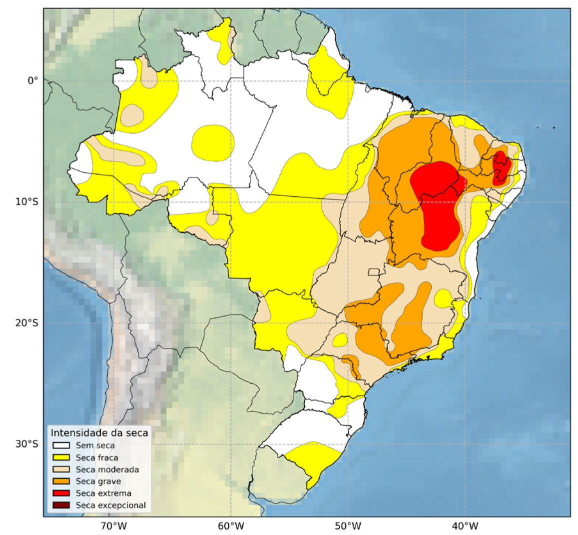
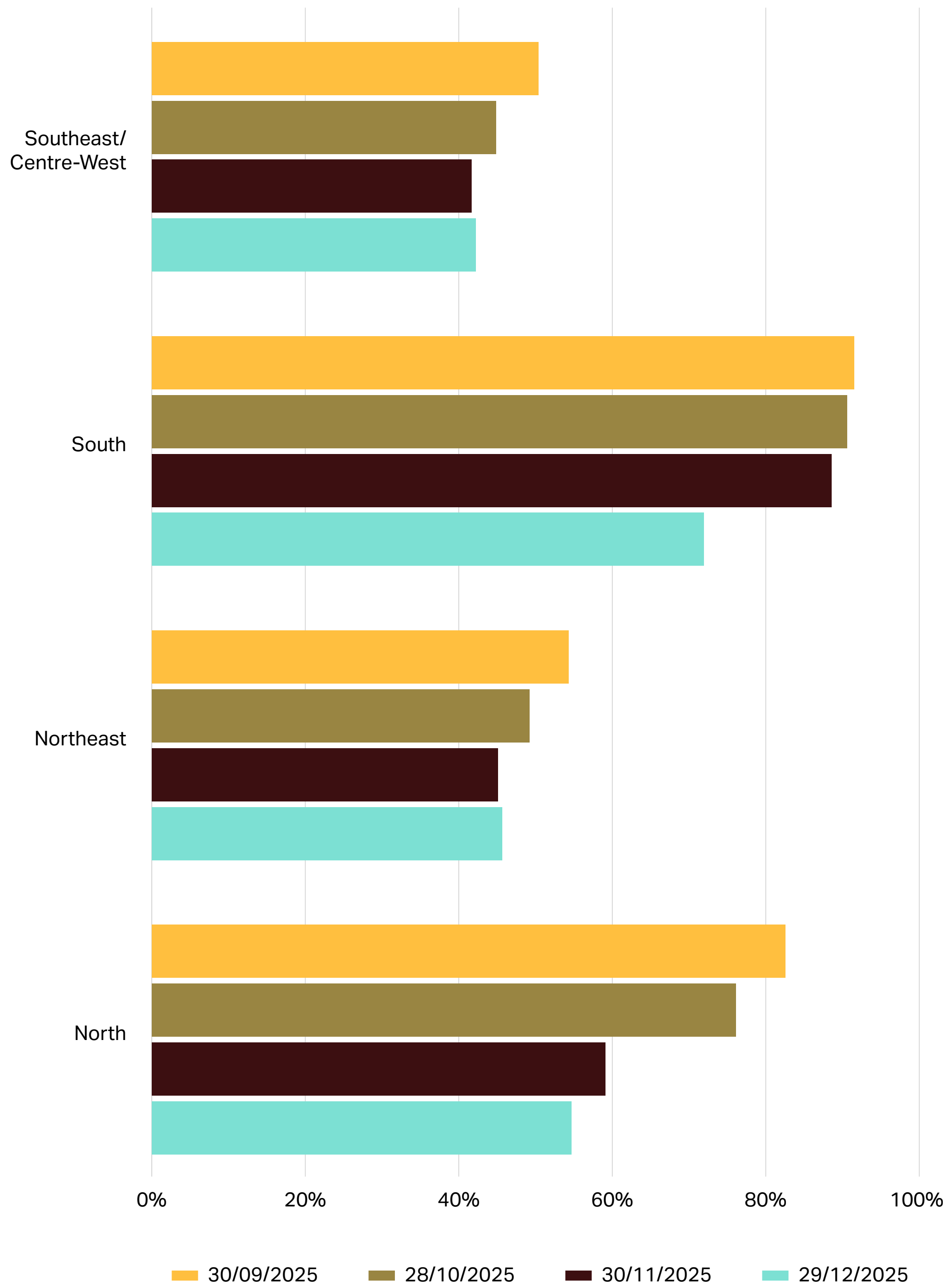
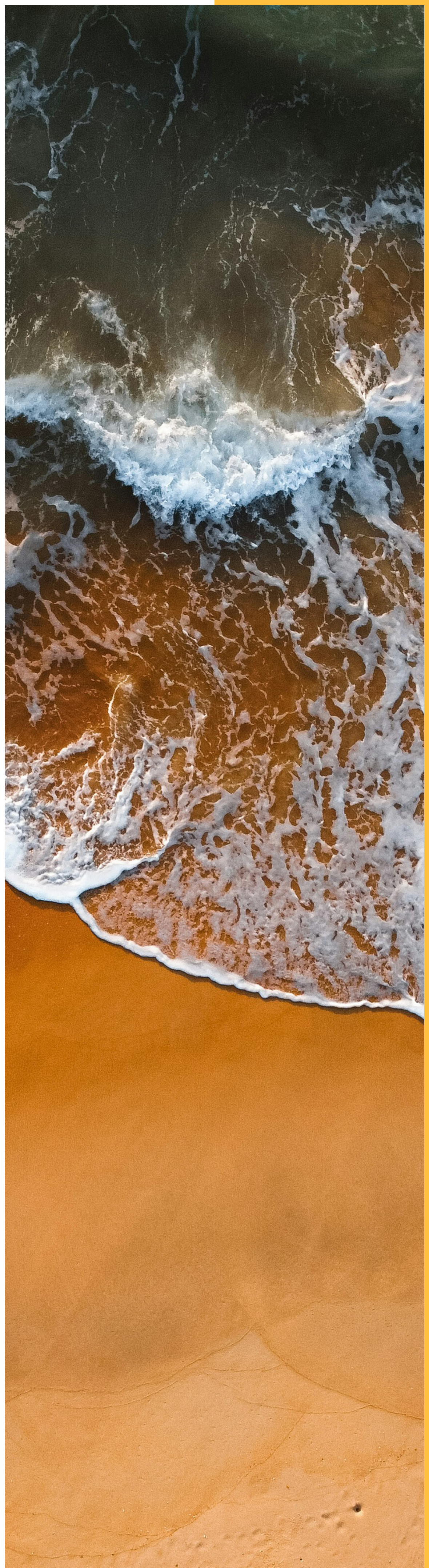


Figure 7 shows the evolution of the storage levels of the main reservoirs of the Brazilian electricity subsystems over the transition period between spring and summer, helping to contextualise recent hydrological conditions and their implications for national energy security. Between September and November 2025, there was a percentage reduction in storage levels in all subsystems, followed by a slight recovery in December in the Southeast/ Centre-West and Northeast subsystems.

Figure 7 - Reservoir levels between September and December 2025 (Source: ONS)





The Southeast/Midwest subsystem, the country's main energy generation and consumption hub, saw the most significant drop in storage levels, falling from 50.3% in September to 41.58% in November, with a slight increase to 42.14% in December. This trajectory is directly associated with the combination of below-average rainfall in the main river basins and high energy demand. Given its centrality in the system, this subsystem has a direct influence on the formation of the Difference Settlement Price (PLD) and the definition of the tariff flags.

In the south, reservoirs maintained high and relatively stable levels throughout the quarter, remaining above 88 per cent until November, reflecting the frequent occurrence of above-average rainfall. December saw a sharper drop, with storage falling to 71.79 per cent, but still at a comfortable level from an operational point of view.

The Northeast showed a gradual reduction in storage levels over the period, from 54.21% in September to around 45% in November, a behaviour consistent with the irregularity of rainfall during the seasonal transition and the intensification of drought areas in the region.

In the northern subsystem, and despite volumes remaining high in September (82.4 per cent), there was a progressive reduction up until November (58.97 per cent), associated with the seasonal decrease in rainfall in parts of the Amazon basin. Even with this drop, storage levels remained adequate for the period, ensuring the regional contribution to the balance of the electricity system.

In this context, the national water balance at the end of November made it possible for the National Electricity Agency (ANEEL) to announce the transition from the level 1 red tariff flag to the yellow flag from December 2025, reducing the additional cost of energy for consumers. The amount charged for every 100-kWh consumed went from R$ 4.46 to R$ 1.885. Despite this tariff relief, the scenario still requires continuous monitoring, especially in the Southeast/ Centre-West subsystem, where the high dependence on hydroelectric generation, coupled with the variability of rainfall and the recurrence of drought episodes, keeps the system sensitive to hydro-meteorological fluctuations.

During the dry period of 2025, there was a sharp drop in the levels of the main water systems in the São Paulo Metropolitan Region. From autumn and through winter, rivers and reservoirs began to lose volume continuously, including the Cantareira System, the Guarapiranga and the Alto Tietê. Figures 8, 9, and 10 show the evolution of these three systems throughout the year, comparing the observed values with the historical climatology and the forecast for the coming months projected by MeteoIA.

At the start of the rainy season, in the spring of 2025, rainfall was below average, which prevented the expected recovery of the reservoirs. As a result, volumes continued to fall and reached critical levels between November and December, reaching approximately 20 per cent in the Cantareira and Alto Tietê. This pattern reinforces the direct influence of rainfall deficit on water storage. The MIA's projections indicate a gradual recovery in the volumes stored in the three systems from the beginning of 2026. However, the projected levels remain below the historical climatological average, suggesting that water recovery tends to be partial and dependent on the regularity of rainfall throughout the summer.

Figure 8 - Useful volume of the Cantareira system (Source: MeteoIA)

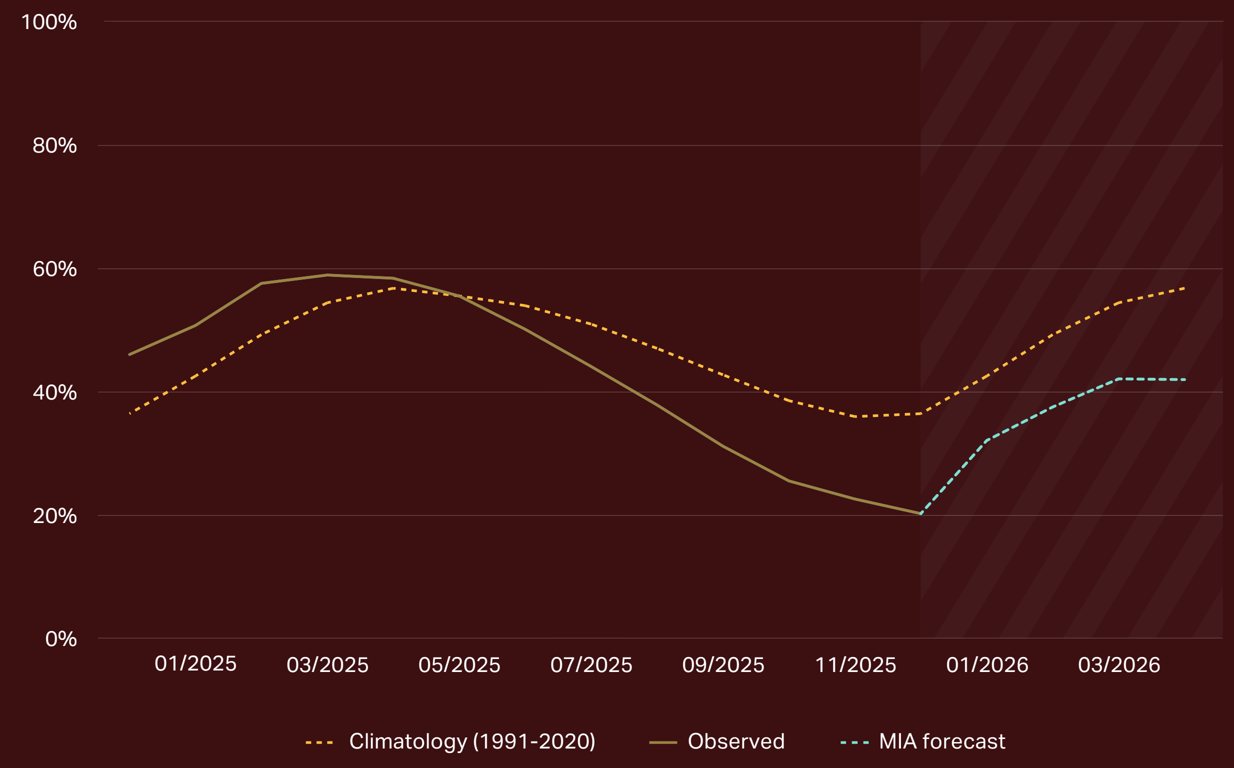


Figure 9 - Useful volume of the Guarapiranga system (Source: MeteoIA)

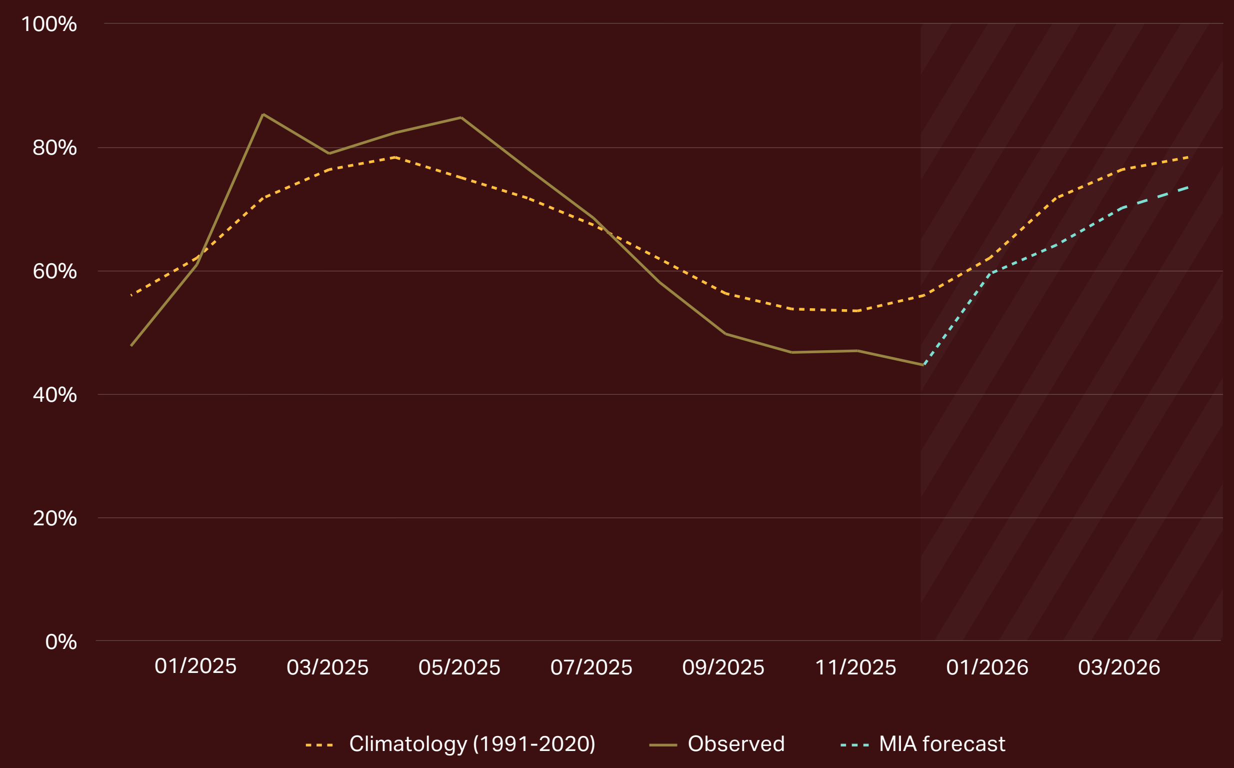
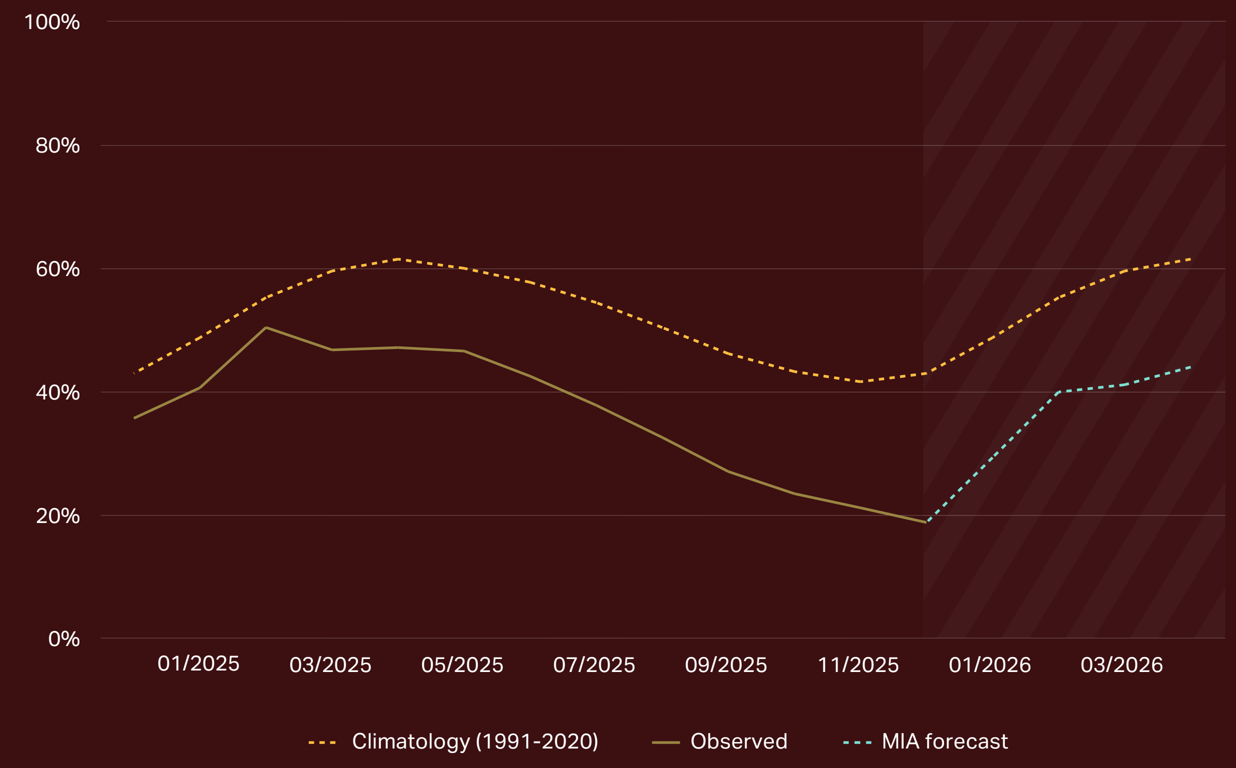


Figure 10 - Useful volume of the Alto Tietê system (Source: MeteoIA)



While the Cantareira and Guarapiranga systems do not have large hydroelectric plants and therefore do not play a significant direct role in electricity generation, their strategic importance for supplying the São Paulo Metropolitan Region is fundamental, directly impacting water security and reflecting regional urban demand. The Alto Tietê system plays a strategic role in supplying and regulating water in the São Paulo Metropolitan Region.

It mainly serves the east of the capital, the municipalities of Alto Tietê and areas of the interior of São Paulo, integrating reservoirs that also have small and medium-sized hydroelectric plants. In addition to human supply, the system participates in flood control and supports various economic activities in the region. The Tietê River, which runs through 62 municipalities until it flows into the Paraná River, is the largest river in the state of São Paulo and is under heavy anthropogenic pressure throughout its basin. This combination of high demand, intense urbanisation and climate variability makes the Alto Tietê especially sensitive to prolonged periods of drought. In years with below-average rainfall, reservoirs recover more slowly, increasing the vulnerability of supply.

This scenario reinforces the need for continued attention, considering the high dependence of the São Paulo capital's urban supply on these reservoirs. Thus, integrated monitoring between climate forecasts, water resource management and operational planning remains essential to mitigate risks associated with the occurrence of extreme events and water security.

Extreme weather events in Brazil and South America

Rainfall and wind extremes

Between September and December 2025, Brazil was affected by a sequence of extreme hydro-meteorological events, including intense rainfall, windstorms, hailstorms, torrential downpours, extratropical cyclones and tornadoes, with impacts concentrated mainly in the South, Southeast, Centre-West and areas of the Western Amazon. These events were associated with the high atmospheric instability typical of the seasonal transition period, enhanced by the greater availability of humidity and the organisation of intense convective systems.

In terms of impacts, the extreme episodes resulted in significant damage to urban and rural infrastructure, with recurrent records of roof collapse, falling trees and poles, prolonged interruptions to electricity supply, urban flooding, road blockages and damage to transport and drainage systems. In events concentrated between November and December, millions of consumers were temporarily affected by power outages, especially in the states of São Paulo, Paraná, Santa Catarina and Rio Grande do Sul.

The extreme rainfall events affected thousands of people, with records of displaced people, homeless people, preventive evacuations and the continuous mobilisation of the Civil Defence and Fire Brigade agencies. Although most of the impacts were of a material nature, there were occasional injuries and deaths, mainly associated with structural collapses, falling trees and localised severe phenomena such as tornadoes. Together, these episodes showcase increasing socioeconomic and infrastructural vulnerability to more frequent and intensified climate extremes in the country.

In September, extreme events were related to the advance of frontal systems and increased atmospheric instability during the transition from winter to spring. In Rio Grande do Sul, accumulations close to 150 mm in the first ten days of the month represented around 70 per cent of the monthly climatological average, with the occurrence of storms accompanied by strong winds and hail.

Between 21 and 22 September, the passage of an intense cold front and the formation of lines of instability resulted in high volumes of rain in a short space of time, with accumulations of more than 90 mm in municipalities of the South and Southeast, as well as wind gusts of more than 100 km/h and urban flooding, including significant episodes in the Metropolitan Region of São Paulo.

In October, high and persistent volumes of precipitation prevailed in areas of Centre-West Paraná, western Santa Catarina and north-western Rio Grande do Sul, as well as portions of Amazonas and Acre. In certain places in the south, monthly accumulations exceeded 300 mm, intensifying soil saturation and increasing the risk of flooding and mass movements.

In November, the frequency and severity of events increased. Between 1 and 2 November, a cold front associated with intense convective nuclei caused heavy rain, hail and severe winds in Paraná, with impacts on dozens of municipalities, agricultural damage and significant structural damage. A few days later, on 7 November, a new episode of severe weather hit Rio Grande do Sul, Santa Catarina and Paraná, with large diameter hail, gusts of over 100 km/h and tornadoes in parts of western Santa Catarina and Paraná. A tornado classified as EF3 in the municipality of Rio Bonito do Iguaçu (PR) is worthy of mention, as it was responsible for severe destruction in urban areas and the most serious impacts recorded in the period.

In summary, the period analysed was marked by intense rainfall concentrated over a short period of time, a high frequency of severe storms and widespread impacts on the population, infrastructure and economic activities. This context reinforces the need to strengthen monitoring, early warning and adaptive planning systems in order to reduce exposure and vulnerability to extreme hydro-meteorological risks in Brazil.

On 22 November 2025, new heavy rains hit the interior of Paraná, with accumulations of more than 70 mm in several places. These high volumes, concentrated in a short period of time, resulted in significant damage to soybean crops, especially in newly planted areas. It is estimated that around 80,000 hectares have suffered severe losses, requiring replanting, which means a direct increase in production costs for the producers affected. In addition, approximately 190,000 hectares showed a reduction in production potential, indicating significant negative impacts on the performance of the 2025/26 soybean crop in the state of Paraná, compared to initial expectations.

In December, the impacts associated with extreme rainfall and intense winds increased in the south and southeast of Brazil. Between 9 and 10 December, the action of a high-intensity extratropical cyclone caused significant effects, characterised by a combination of persistent wind gusts and high volumes of rain.

This event was one of the most severe in recent years, both in terms of its duration and the magnitude of the adverse conditions. At São Paulo's INMET - Mirante de Santana station, maximum gusts reached 82.8 km/h, with eight straight hours above 70 km/h, a record since measurements began in 2006. The intense wind conditions continued for more than 24 hours, significantly aggravating the urban impacts.

There was extensive damage to the electricity grid, falling trees and interruptions to the transport system, with the Fire Brigade dealing with more than 1,600 incidents. It is estimated that around 2.2 million people have been affected by interruptions to the electricity supply in São Paulo.

In Rio Grande do Sul, the hydro-meteorological effects were even more severe in terms of rainfall, with accumulations of between 100 and 190 mm in less than 24 hours in different locations. These high volumes intensified the risks of flooding, flash floods and damage to urban and rural infrastructure, as well as impacts on agricultural and transport activities.

Taken together, the events recorded in November and December 2025 highlight the high vulnerability of the agricultural sector and urban infrastructure to the occurrence of intense rainfall and severe weather systems, especially when associated with the persistence of the events and the prior saturation of the soil. This context reinforces the importance of continuous climate monitoring, adaptive production planning and the adoption of risk management strategies to reduce economic losses and increase resilience in the face of intensified hydro-meteorological extremes (figures 11 and 12).

Figure 11 - Highest rainfall accumulations in 24 hours recorded on 10 December 2025 (Source: INMET)

Municipality	State	Rainfall (mm/day)
Canguçu	Rio Grande do Sul	190,00
Camaquã	Rio Grande do Sul	185,5
Pinheiro Machado	Rio Grande do Sul	136,7
Marília	São Paulo	125,0
Herval	Rio Grande do Sul	122,0
Sertão Santana	Rio Grande do Sul	106,0
Barueri	São Paulo	92,8
Piracicaba	São Paulo	91,8
Barra Bonita	São Paulo	90,6
São Carlos	São Paulo	85,6
Capão da Canoa	Rio Grande do Sul	82,1
Santana da Boa Vista	Rio Grande do Sul	80,4

Figure 12 - Highest wind gusts recorded on 10 December 2025 (Source: INMET)

Municipality	State	Wind gust (km/h)
Pico do Couto	Rio de Janeiro	105,1
Santo Augusto	Rio Grande do Sul	99,0
Arraial do Cabo	Rio de Janeiro	94,0
Bertioga	São Paulo	91,1
Major Vieira	Santa Catarina	91,1
São Paulo - Mirante	São Paulo	82,8
Rio Negrinho	Santa Catarina	81,0
Campos Novos	Santa Catarina	79,9
Curitibanos	Santa Catarina	77,8
Cachoeira Paulista	São Paulo	74,9
São Paulo - Interlagos	São Paulo	74,9
Canguçu	Rio Grande do Sul	73,8

At the end of 2025, several South American countries were affected by episodes of intense precipitation, resulting in significant hydrological impacts that extended beyond Brazilian territory. Between the end of October and December, large areas of Argentina recorded persistently above-average rainfall, leading to soil saturation, extensive flooding and economic damage estimated at US$ 2.4 billion.

Reports from the agricultural sector indicate that there have been four consecutive months of above-average rainfall in central regions of the country, resulting in approximately 1.5 million hectares of flooded agricultural areas or severe operational restrictions, especially in the centre and west of Buenos Aires province, with direct impacts on productive activity.

In Chile, on 6 November 2025, a severe storm hit the centre of the country, including areas of the Santiago Metropolitan Region. The event was associated with the action of a cyclonic vortex at high levels in the atmosphere, intensified by strong north-westerly winds. The interaction of this system with the topography of the Andes favoured the rise of air, increased atmospheric instability and heavy rainfall, even in the absence of a classic frontal system.

The impacts observed in these episodes reinforce the importance of continuous climate monitoring and integrated risk management, especially in regions that are structurally vulnerable to extreme hydro-meteorological events. These events also highlight the need for effective public policies, adjustments to urban and territorial planning and the strengthening of climate resilience as the centrepiece of adaptation strategies.

Recent studies indicate that in the face of extreme events, critical systems - such as energy, transport and supply - tend to show an abrupt reduction in performance, followed by phases of emergency response and gradual recovery. As discussed by Umunnakwe et al. (2021), the climate resilience of energy systems goes beyond initial structural robustness, involving the ability to absorb impacts, maintain essential operations, respond efficiently and recover functionality in less time, reducing economic and social losses.

In this context, the incorporation of structural and operational improvements are key elements for a better response to future occurrences. Climate resilience has thus become a strategic attribute for guaranteeing the continuity of essential services in a scenario of increased frequency and intensity of climate extremes in South America.

Extreme weather events in Brazil and South America

Temperature extremes

The latest data indicate that 2025 will be one of the hottest years on record, reinforcing the trend towards continued warming of the climate system. The rise in average temperatures increases the atmosphere's capacity to retain water vapour, favouring the occurrence of extreme events such as intense rainfall when convective systems become organised, as well as heat waves, severe droughts and greater rainfall irregularity.

Even under the configuration of a weak La Niña, global temperature anomalies remained at historically high levels, with November 2025 recording a global average temperature 1.54 °C above pre-industrial levels, according to the Copernicus Climate Change Service (C3S). This scenario shows that the natural variability associated with ENSO has not been enough to offset the long-term warming induced by anthropogenic forcings.

In Brazil, September to November 2025 was a period marked by strong thermal variability and the recurrence of extremes. In September, high maximum temperatures prevailed in the south of the Amazon, the Centre-West and part of the Southeast, with records exceeding 38 °C and a national record of 42.9 °C in São Miguel do Araguaia (GO). During the same month, occasional cold air masses caused sharp drops in the minimum temperature in the south, with the occurrence of weak frosts.

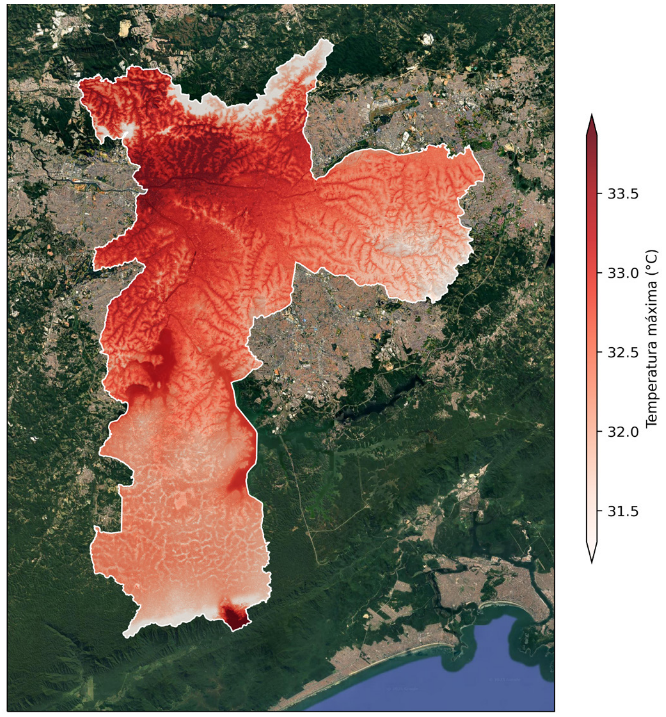
In October, thermal extremes intensified, with temperatures above 38 °C in areas of the North, Northeast and Centre-West regions, with a highlight being the 41.7 °C in Águas Claras (MS). In November, intense heat continued to prevail in these regions, with 41.0 °C recorded in Correntina (BA). Episodes of cooling associated with the passage of cold fronts were observed, resulting in negative anomalies of up to -6 °C in Mato Grosso do Sul, highlighting the high temperature range of the period.

In December, according to CPTEC data, minimum temperatures remained above the climatological average in most of the country, with positive anomalies of more than +1 °C in several states. On the other hand, maximum temperatures showed moderate negative anomalies, especially in the Centre-West and sectors of the North, Northeast, South and Southeast, reflecting greater cloudiness and the influence of more frequent convective systems.

Intense heat events in urban areas were recorded. On 6 October 2025, São Paulo recorded an average maximum temperature of 34.4 °C, with a peak of 36.3 °C at stations in the northern zone, surpassing the previous record. The episode was favoured by pre-frontal conditions, with intensified northerly winds and relative humidity between 23% and 24%, leading to a state of alert being declared for low humidity throughout the capital.

The event recorded on 25 December 2025 is worth highlighting, when the city of São Paulo reached 35.9 °C, the highest temperature ever observed during the month of December, surpassing the previous historical record. This episode highlighted the strengthening of the heat at the end of the period analysed, associated with the reorganisation of the atmospheric circulation typical of early summer (figure 13).

Figure 13 - Maximum temperature recorded in the city of São Paulo on 25 December 2025
(Source: ERA5 reanalysis – ECMWF)



According to the National Meteorological Institute (INMET), January 2026 recorded temperatures above the historical average in several regions of Rio de Janeiro, including metropolitan and inland areas (figure 14). The climatology (1991-2020) indicates an average maximum temperature of 31.2°C for the month, but on 12 January the Seropédica - Ecologia Agrícola station reached 41.0°C, equalling the historical record for January, previously observed in 1969, 1995 and 2015. As a result, 2026 becomes the fourth year in the series that began in 1961 to reach this thermal extreme.

Figura 14 - Maximum temperatures recorded at INMET stations in Rio de Janeiro between 9 and 12 January 2026 (Source: INMET)

Meteorological station	09/jan	10/jan	11/jan	12/jan
Seropédica – Ecologia Agrícola	39,0°C	37,8°C	38,8°C	41,0°C
Vila Militar	37,6°C	38,2°C	39,7°C	40,8°C
Niterói	37,3°C	37,3°C	38,9°C	40,5°C
Duque de Caxias – Xerém	36,6°C	36,5°C	38,2°C	38,8°C
Jacarepaguá	34,1°C	37,1°C	37,4°C	37,0°C
Marambaia	33,7°C	35,8°C	39,5°C	40,0°C

Extreme weather events in Brazil and South America

Wildfires and environmental impacts

The intensification of extreme temperatures, coupled with reduced soil moisture, vegetation stress, and the high availability of fuel, has significantly increased the risk of wildfires at both global and regional scales. Recent studies indicate that heatwaves are becoming more frequent, intense, and persistent due to climate change, creating highly favourable conditions for fire ignition and rapid spread.

In Brazil, 2025 saw a marked increase in burned areas, particularly in the Cerrado and Caatinga biomes. According to data from the Fire Monitoring Programme (Programa Queimadas/INPE), approximately 684,000 km² of vegetation were consumed by fire — the highest value in the historical series, surpassing even the records of 2007 and 2024. Figure 15 illustrates the concentration of the largest burned areas in these two biomes.

The Caatinga reached around 186,000 km² of burned area, representing the highest value since monitoring began in 2002 and indicating a significant increase in the frequency and intensity of fires. This scenario is directly associated with the expansion of areas under severe drought in the Northeast, particularly in October, when approximately 63,000 km² were burned in a single month.

The Cerrado also experienced a critical situation, exceeding 343,000 km² of burned area by November 2025 — a new historical record surpassing the values of 2007. The combination of prolonged water deficit, elevated temperatures, and anthropogenic pressures was decisive in producing this outcome.

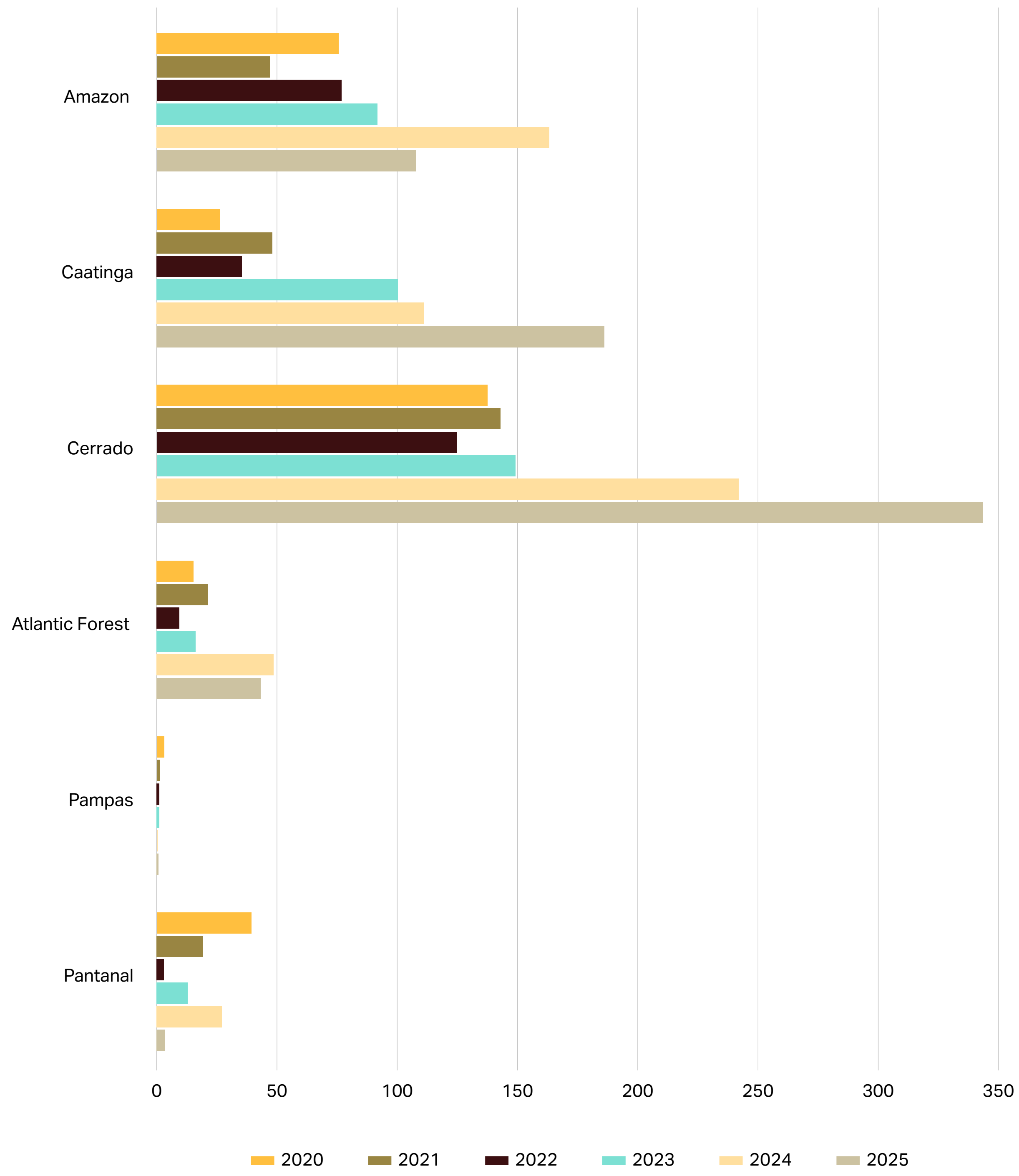
The impacts associated with this increase include ecosystem degradation, biodiversity loss, deterioration of air quality, substantial economic losses, and the emission of large volumes of CO_2, reinforcing the feedback cycle of global warming. In this context, it becomes evident that integrated mitigation and adaptation actions are required to reduce environmental and socio-economic vulnerability in the face of increasing frequency and severity of climatic extremes.

The intensification of extremes — both in temperature and precipitation — also strongly influences fire dynamics in Brazil. Periods of intense rainfall, followed by prolonged droughts, substantially increase the amount of dry biomass available as fuel. This phenomenon, known as the hydrological compensation effect, promotes accelerated vegetation growth during the rainy season, which subsequently becomes highly flammable when exposed to drought and heatwaves. Accordingly, years marked by high rainfall variability tend to register peaks in wildfires, particularly in seasonally dry biomes such as the Cerrado and Caatinga.

Moreover, the combination of warmer nights, reduced relative humidity, and increased vapour pressure deficit — conditions associated with global warming — intensifies evapotranspiration and exacerbates vegetation water stress. Recent studies indicate that these factors not only extend the fire season throughout the year but also increase fire severity, accelerating fire spread and complicating firefighting efforts. Extreme events, such as mega-heatwaves and flash droughts, are becoming more frequent in Brazil and are already recognised as direct catalysts for large-scale wildfires, including in historically less vulnerable areas.

These processes consolidate a worrying trend: fire is no longer merely a consequence of anthropogenic pressures but also reflects profound transformations in the national climate regime.

Figure 15 - Evolution of burned area in Brazilian biomes between 2020 and 2025 - in thousand km²
(Source: TerraBrasilis, LASA/UFRJ, INPE)



Influence of climatic conditions on rainfall in Brazil

Brazil's rainfall regime is shaped by the interaction between large-scale climate forcings and regional atmospheric processes. Teleconnection indices such as the Antarctic Oscillation (AAO, also referred to as the Southern Annular Mode – SAM), the Pacific Decadal Oscillation (PDO), the El Niño–Southern Oscillation (ENSO), and the Indian Ocean Dipole (IOD) act in an integrated manner.

This interaction influences the position and intensity of convergence zones, moisture transport, the frequency of cold fronts, and the organisation of convection across tropical, subtropical, and extratropical scales. The response of these teleconnections varies throughout the year and is particularly relevant during seasonal transition periods, such as spring and early summer.

In the second half of 2025, an atmospheric configuration conducive to the spatial redistribution of rainfall across Brazil was observed. During this period, the AAO shifted from a positive to a negative phase, altering circulation patterns at mid and high latitudes of the Southern Hemisphere.

Studies indicate that, between November and January, the negative phase of the AAO is associated with a weakening of the South Atlantic Convergence Zone (SACZ), reducing the persistence of organised rainfall episodes over central Brazil. This behaviour was consistent with conditions observed during the spring of 2025, when a drier pattern prevailed across the Southeast and Central-West regions.

In addition, the negative phase of the AAO is associated with an increase in the frequency and intensity of cold fronts affecting southern Brazil, Uruguay, and parts of Argentina, as well as enhanced activity over the South Atlantic Ocean. This pattern favoured above-average rainfall in southern Brazil during 2025, in contrast to the drier conditions observed over the interior of the country.

In the tropical Pacific, ENSO remained in a cold-anomalous state during the final quarter of 2025, with sea surface temperature anomalies ranging from approximately −0.5 °C to −0.7 °C, characterising a weak La Niña event.

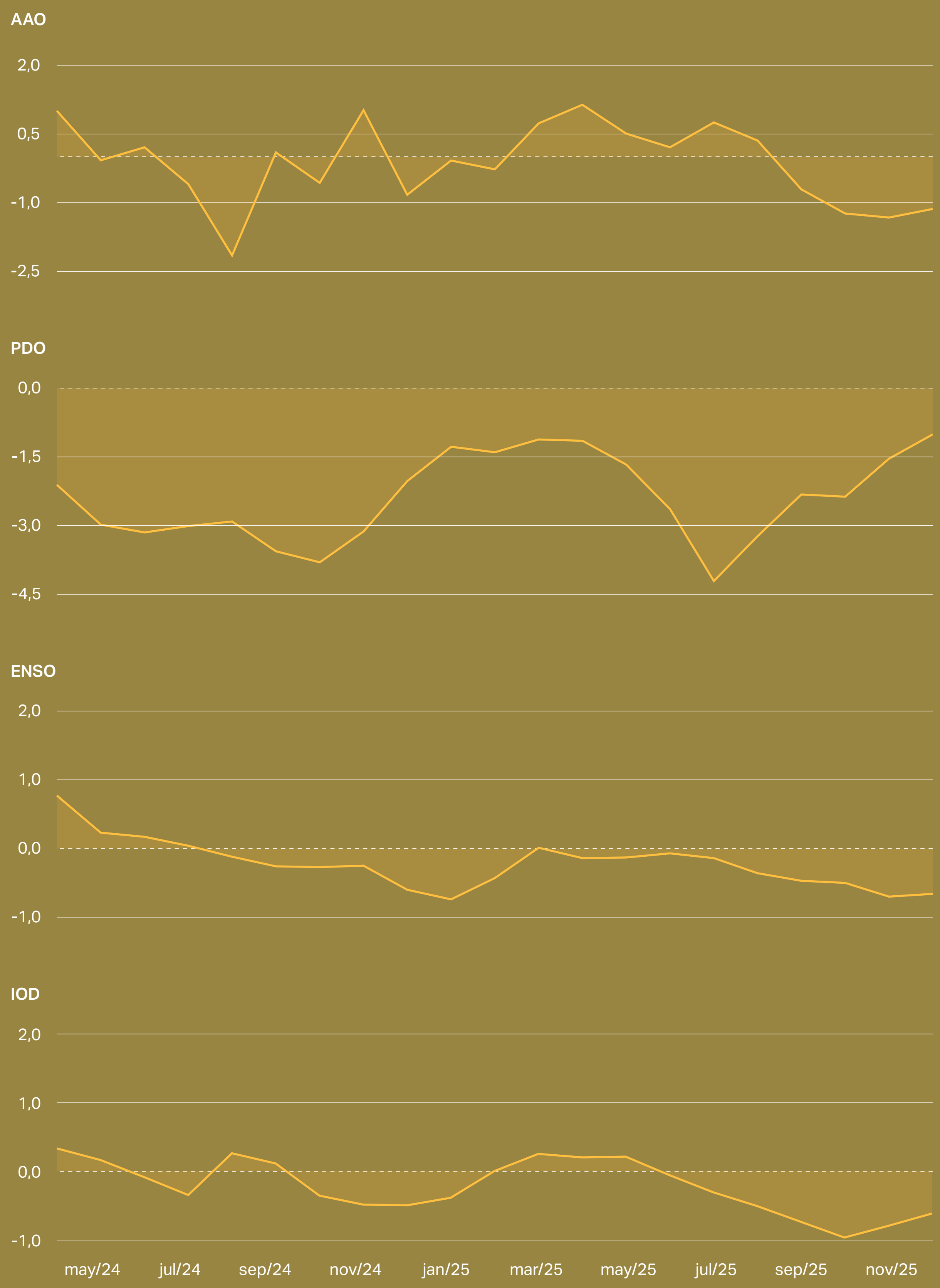
The outlook suggests persistence of the cold signal in the short term, followed by a transition to neutral conditions during the first quarter of 2026. This pattern contributed to the modulation of tropical atmospheric circulation, influencing the distribution of convection and rainfall across South America.

In parallel, the Indian Ocean Dipole (IOD) exhibited a more pronounced negative phase between September and November 2025, characterised by positive sea surface temperature anomalies in the eastern Indian Ocean and negative anomalies in the western sector. The influence of a negative IOD, in phase with La Niña conditions, tends to strengthen the Walker circulation over the Indo-Pacific region, contributing to enhanced convection over parts of the Amazon and reinforcing precipitation totals in this region.

Taken together, the interaction between a negative AAO, a weak La Niña, and a negative IOD created a climatic environment conducive to pronounced regional contrasts in Brazil's rainfall regime, with above-average precipitation in the South and the Amazon, and persistent deficits across central Brazil.

This configuration underscores the importance of continuous monitoring of climate teleconnections for understanding and anticipating seasonal precipitation patterns and their associated impacts (Figure 16).

Figure 16 - Monthly evolution of the main climate indices between April 2024 and December 2025
(Source: NOAA)



Weather forecast for the summer of 2026

Regional climate trends in Brazil: temperature and precipitation for the summer of 2026

Summer represents the period of greatest water demand for agriculture in Brazil, coinciding with critical phases in the vegetative development of strategic crops such as soybean, maize (first and second crops), beans, rice, cotton and sugar cane. In this context, the spatial distribution of rainfall between January and March is a determining factor for agricultural productivity, soil water recharge and the balance of hydrological systems.

Large-scale atmospheric and oceanic conditions play a central role in modulating the climate during the summer. In this scenario, the influence of El Niño-Southern Oscillation (ENSO) and sea surface temperature (SST) anomalies in the Tropical Atlantic are highlighted, which affect the position and intensity of the main convective systems, such as the South Atlantic Convergence Zone (SACZ), and condition the variability of rainfall throughout the country. Thus, the evolution of these climatic forcings over the summer of 2026 will be decisive in defining regional precipitation and temperature patterns, with direct implications for the agricultural sector, water availability and climate risk management in Brazil.

The weather forecast for the summer of 2026 (January to March) indicate a continued strong regional contrast in precipitation and temperature patterns over Brazil. Signs of below-average rainfall combined with above-average temperatures predominate, especially in the northeast, while the north of the country tends to concentrate the highest rainfall volumes for the period.

In the Northeast, the persistence of negative rainfall anomalies, associated with higher temperatures, tends to reduce soil moisture, increase evapotranspiration rates and aggravate the water deficit, especially in areas that already have severe or extreme drought conditions. This scenario increases the risk of impacts on agricultural production, water resources and regional supply.

In the Centre West and Southeast regions, the trend of below or close to average rainfall keeps water replenishment limited, even during the rainy season. This pattern hinders the recovery of reservoir levels and supports a context of attention for water resource management and agricultural production.

Monthly evolution of the weather pattern

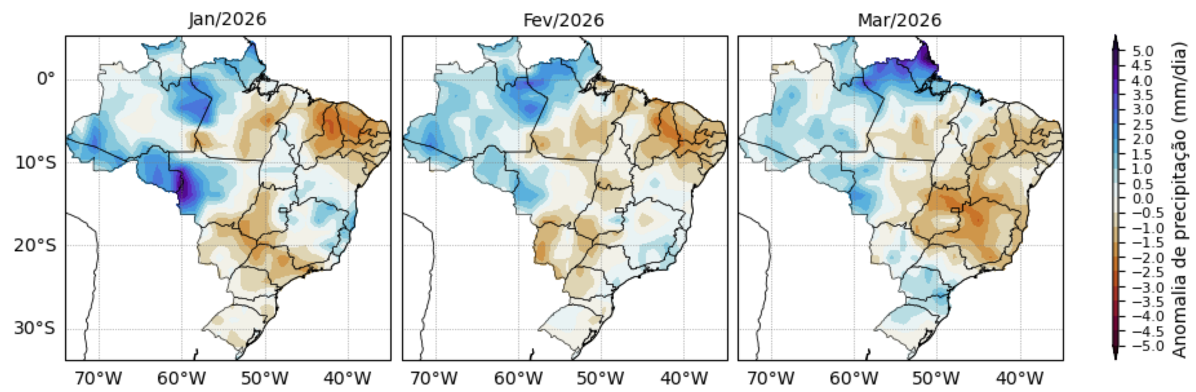
Figures 17, 18 and 19 show the rainfall, maximum temperature and minimum temperature anomalies forecast for the period from January to March 2026 (MIA-MeteoIA).

January 2026: Predominantly below-average rainfall is expected in much of the Centre West, Southeast and Northeast, most notably in areas of Piauí, Mato Grosso do Sul, São Paulo, southern Minas Gerais and Mato Grosso. In contrast, positive rainfall anomalies should occur in parts of Amazonas, Roraima, northern Minas Gerais, Espírito Santo, western Mato Grosso and southern Bahia, reflecting greater action by convective systems associated with the Intertropical Convergence Zone (ITCZ) and the South Atlantic Convergence Zone (SACZ). The start of summer therefore tends to be marked by high spatial heterogeneity of rainfall.

February 2026: The dry signal persists in the Northeast and parts of the Centre West, but with reduced intensity. The northern region continues to see above-average rainfall. In areas of the south and southeast, conditions tend to be close to climatological, with the exception of parts of São Paulo, Minas Gerais, Espírito Santo and Rio de Janeiro, where there is an indication of an occasional increase in rainfall. This behaviour suggests greater intra-seasonal variability, often associated with the action of the Madden-Julian Oscillation (MJO).

March 2026: There is a reorganisation of the rainfall pattern, with a strengthening of the negative anomalies in the interior of the Northeast and in parts of the Southeast, including areas of Bahia, Minas Gerais, Rio de Janeiro, Espírito Santo, São Paulo and Goiás. On the other hand, the continued above-average rainfall in Amazonas, Amapá and the far north of Pará indicates a more persistent ITCZ pattern, typical of late summer and the start of the transition to autumn. This pattern suggests a gradual reduction in convective activity in the centre of the country, compatible with the seasonal weakening of the SACZ. For the southern region, the trend for March indicates above-average rainfall accompanied by higher temperatures, a condition that could increase phytosanitary risks, especially for crops still in the field, requiring greater attention to management practices and monitoring of agricultural diseases.

Figure 17 - Precipitation anomaly forecast for Brazil between January and March 2026, with reference to 1991 to 2020 (Source: MeteoIA)



The maximum temperature anomaly projections indicate a predominance of values above the climatological average in the centre south of Brazil throughout the summer of 2026, with regional and temporal variations throughout the quarter.

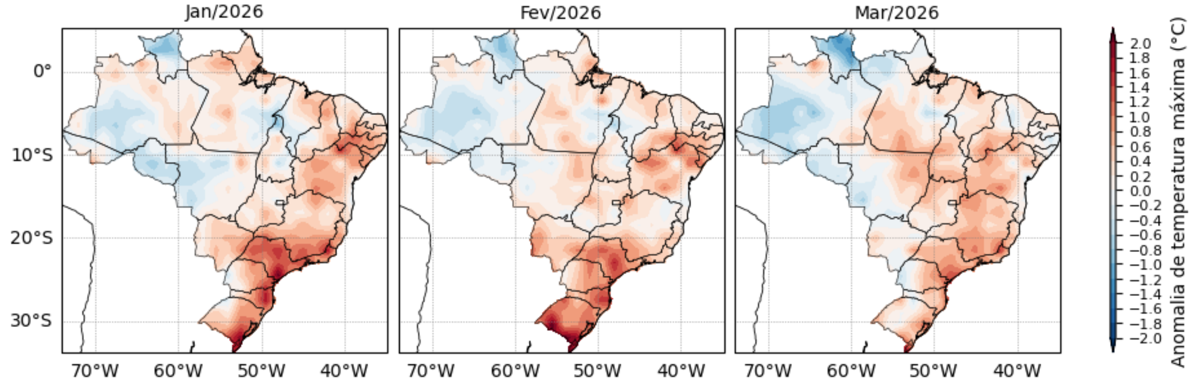
January 2026: The most intense positive anomalies are concentrated in the south and northeast, as well as portions of the southeast, especially the state of São Paulo, where the most consistent sign of warming can be seen. In contrast, areas of Roraima, western Amazonas and isolated sectors of Tocantins tend to record temperatures slightly below the climatological average.

February 2026: Warming intensifies in Rio Grande do Sul, with positive anomalies of up to +2 °C, extending into the eastern strip of Santa Catarina and Paraná and the interior of São Paulo, where deviations remain between +1 °C and +1.6 °C. On the other hand, negative anomalies persist in a large part of Amazonas, the north-east of Minas Gerais and the coast of Bahia, indicating significant thermal contrasts between the country's regions.

March 2026: The warming pattern continues in a more localised way, with positive anomalies concentrated on the southern coast of São Paulo and in central and southern Minas Gerais. On the other hand, more significant negative anomalies remain in Amapá, with deviations that could reach -1.4 °C, and in areas of Amazonas, close to -1.0 °C.

In general, the quarter shows a predominance of maximum temperatures above the climatology in the centre south of Brazil, alternating with warming and cooling cores in the north. This pattern tends to increase evaporative demand, influence the soil water balance and intensify the impacts of precipitation deficits in already vulnerable regions, reinforcing the need for attention to water, agricultural and urban management during the summer of 2026.

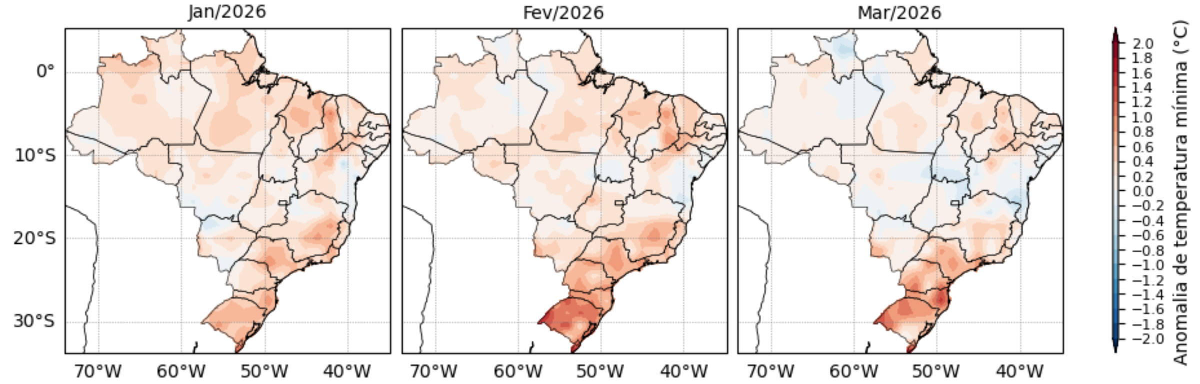
Figure 18 - Maximum temperature anomalies forecast for Brazil between January and March 2026, with reference to 1991 to 2020 (Source: MeteoIA)

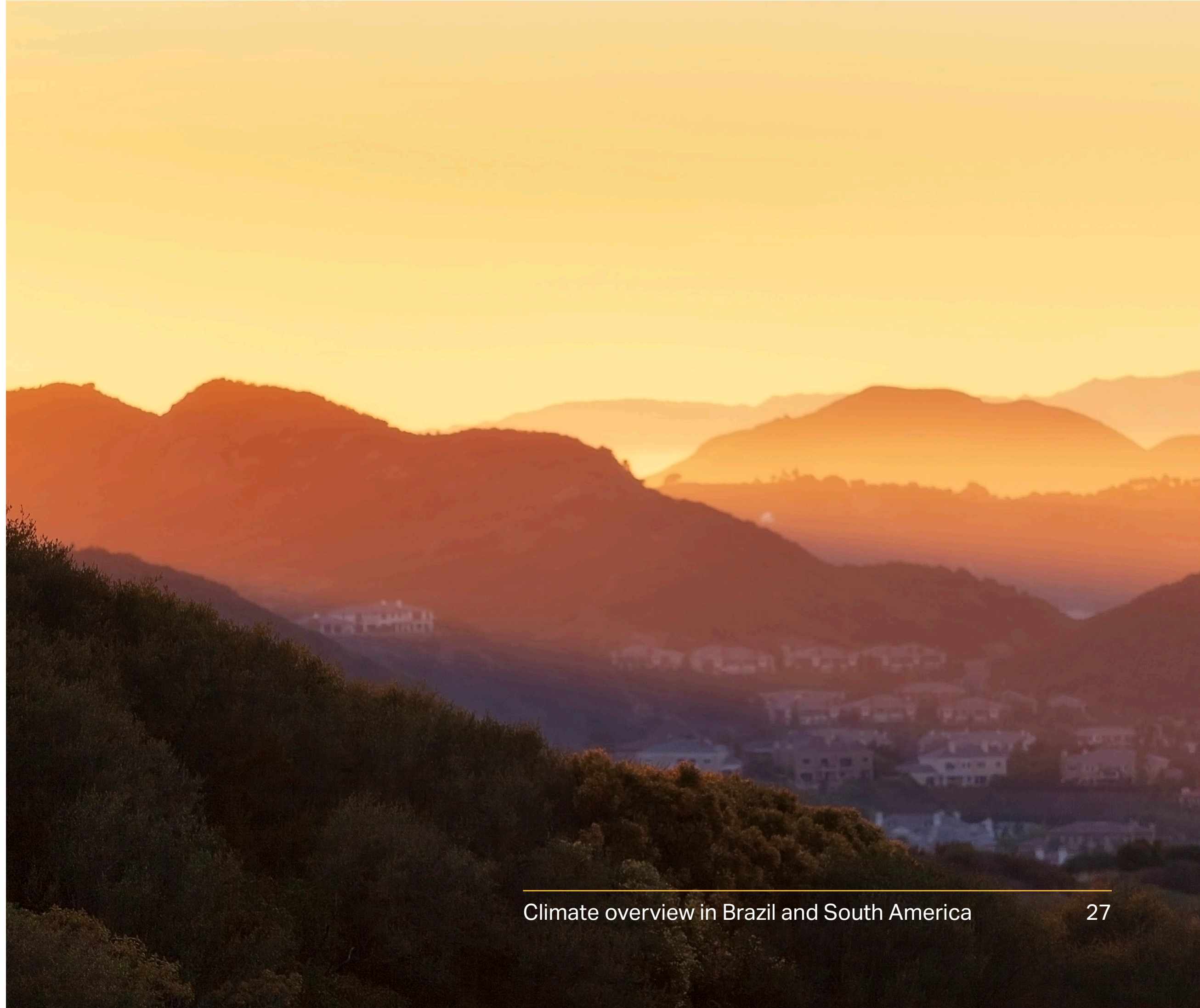


Projections of minimum temperature anomalies indicate a predominance of values slightly above the climatological average in most of Brazil throughout the summer of 2026, reflecting the maintenance of warmer nights in various regions of the country (figure 19). In January, the positive signal is more consistent in the South, Southeast and Northeast regions, especially in areas of Maranhão and Piauí, where minimum temperatures tend to remain above the climatological standard.

Between February and March, the positive anomalies intensify in the south and parts of the southeast, characterising a scenario of less night-time cooling towards the end of the quarter. This behaviour is associated with the persistence of atmospheric patterns favourable to warming during the transition from summer to autumn. In general, higher minimum temperatures contribute to greater heat stress, high soil moisture losses and potential impacts on agriculture, public health and energy consumption, especially in regions that already face water deficits or high daytime temperatures.

Figure 19 - Minimum temperature anomalies forecast for Brazil between January and March 2026, with reference to 1991 to 2020 (Source: MeteoIA)





Prospects for Brazilian agriculture: soybeans and off-season maize in focus

The climatic conditions observed at the end of 2025 played a decisive role in the performance of the main summer crops in Brazil, especially soybeans and first crop maize, directly influencing the window and production potential of 2026 off-season maize. According to Conab and INMET data, by December, the first maize crop had reached around 85% of the sown area, while soybean had reached around 97% of its planted area, albeit with significant regional differences.

In the first-crop maize, there were contrasting climatic impacts, especially in the South. In Rio Grande do Sul, excessive rain prolonged soil moisture, making it difficult to manage areas sown earlier and delaying the start of the harvest.

In Paraná, the combination of high temperatures and reduced rainfall in December began to affect areas in the grain filling stage, increasing water stress and reducing production potential in some municipalities. In Santa Catarina, episodes of intense heat associated with occasional periods of low soil moisture have compromised pollination and grain filling in specific areas, although crops planted later have performed satisfactorily so far.

As for soybean, the climatic scenario also posed regional challenges. In Tocantins, below-average rainfall and high temperatures in October significantly reduced soil moisture, causing delays in planting and putting pressure on the agricultural calendar, with possible repercussions on the 2026 off-season maize window. In November, heavy rain and hailstorms in Paraná affected early-stage crops, resulting in the need for replanting in several municipalities.

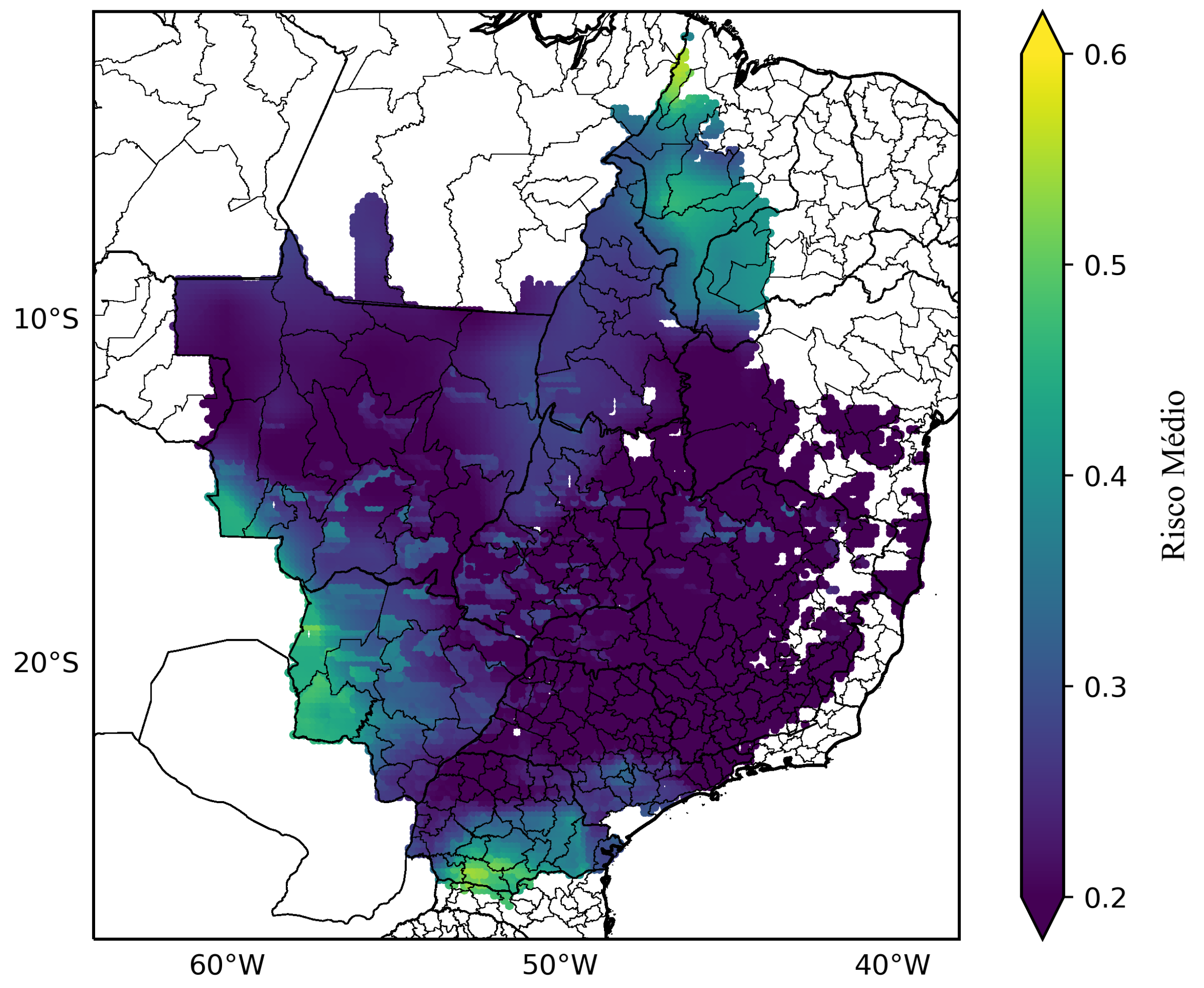
In Mato Grosso do Sul, there was an expansion in the area planted with soybean, and most of the crops showed satisfactory development conditions. Even so, areas in the south of the state concentrated the highest percentages of crops in fair or unfavourable condition, mainly associated with phytosanitary pressures and restrictions on vegetative development.

Recent impacts reinforce the structural vulnerability of the agricultural sector to climate variability. In previous years, losses of more than R$ 12 billion in the Brazilian agricultural sector were associated with events such as droughts, regional droughts, hailstorms, heatwaves, windstorms and cyclones, highlighting the need for production planning based on climate information and continuous risk management.

In the context of off-season maize 2026, there is a high climate risk in specific areas of the country, especially in the centre of southern Paraná, the eastern strip of the interior of São Paulo, western Mato Grosso do Sul, western and southern Mato Grosso, as well as portions of the interior of Maranhão and Piauí. These risk levels stem from the combination of recurring climatic threats, including extreme temperatures, irregular rainfall, episodes of excess water and strong winds throughout the crop cycle.

In short, the performance of soybean and the definition of the production potential of off-season maize in 2026 will be strongly dependent on the regularity of rainfall, the occurrence of thermal extremes and the suitability of the regional agricultural calendar, reinforcing the importance of continuous climate monitoring and the adoption of adaptive management strategies to mitigate risks and reduce production losses (figure 20).

Figure 20 - Climate risk forecast for the next off-season maize crop in Brazil, considering climate threats and the agricultural calendar (Source: MeteoIA)



About our team

Howden Re provides a differentiated and holistic approach to reinsurance, capital markets and strategic advisory.

Howden Re has partnered exclusively with MeteoIA, bridging the gap between weather data and meteorological intelligence.

By combining scalable artificial intelligence (AI) with cuttingedge physics, MeteoIA designs industry-specific weather solutions. Their technology transforms raw weather data into actionable insights for better decision-making. Combined with Howden Re's expert re/insurance insights and analytical expertise, this unique partnership enables powerful risk assessment and strategic decision-making.

For more information on the datasets and methodologies used by MeteoIA in this report, or to learn about our reinsurance brokerage solutions, please contact Howden Re's team at report.brasil@howdenre.com.

Authors

Antônio Jorge Rodrigues
Head of Treaty
antonio.rodrigues@howdenre.com

Arthur Sanches
Contracts Director
arthur.sanches@howdenre.com

Julia Freitas
Contracts Director
julia.freitas@howdenre.com

Mariana Lima
Analytics Director
mariana.lima@howdenre.com

Raidel Báez Prieto
Climate Risk Specialist
raidel.prieto@howdenre.com

Gustavo Ducatti
Reinsurance Analyst
gustavo.ducatti@howdenre.com

Definitions

Negative anomaly: when the variable analysed is lower than the historical average for that period.

Positive anomaly: when the variable analysed is higher than the historical average for that period

SST: sea surface temperature

Anticyclone: high atmospheric pressure zone / Cyclone - low atmospheric pressure system

Climatology: historical average that is used for comparison (30-year periods)

Eastern Wave Disturbance (EWD): systems that impact annual rainfall totals in Northeast Brazil

Teleconnections: Global climate patterns that generate persistent anomalies in atmospheric circulation, connecting distant regions and influencing phenomena such as cold fronts, convergence zones and precipitation regimes on scales of weeks to decades.

ENSO: El Niño Southern Oscillation / ULCV – Upper-Level Cyclonic Vortex

ITCZ: Intertropical Convergence Zone / SACZ - South Atlantic Convergence Zone

Drought criteria

Weak: Entering drought: short-term short dry spell reducing planting, crop growth or grazing. Coming out of drought: some prolonged water deficits, pastures or crops not fully recovered.

Moderate: Some damage to crops, pastures, streams, reservoirs or wells with low levels, some developing or imminent water shortages; voluntary water use restrictions requested.

Severe: Crop or pasture losses likely; water shortages common; water restrictions imposed.

Extreme: Major crop / pasture losses; generalised water shortages or restrictions.

Exceptional: Exceptional and widespread crop / pasture losses; water shortages in reservoirs, streams and water wells, creating emergencies.

Heat wave criteria

When the temperature is 5o C above the monthly climatological average for at least 3 days.

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Contact us at report.brasil@howdenre.com

Av. Luís Carlos Berrini 105 - Ed. Berrini One, 10º andar - São Paulo, Brasil

+55 (11) 3045-4777
contato.brasil@howdengroup.com

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