Center for Disaster Management and Risk Reduction Technology

Karlsruhe Institute of Technology

CEDIM Forensic Disaster Analysis (FDA) Group

Wildfires January 2026 | South-Central Chile

Information as of: 02 February 2026

DOI: 10.5445/IR/1000190174

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Summary

Naturereignis	Start	End	Duration
Wildfires	**16.01.2026**	**-**	**15 Days (on-going)**

Notable happenings:

Burnt Area:	> 45,000 ha
Casualties:	21
Destroyed homes:	> 2,300

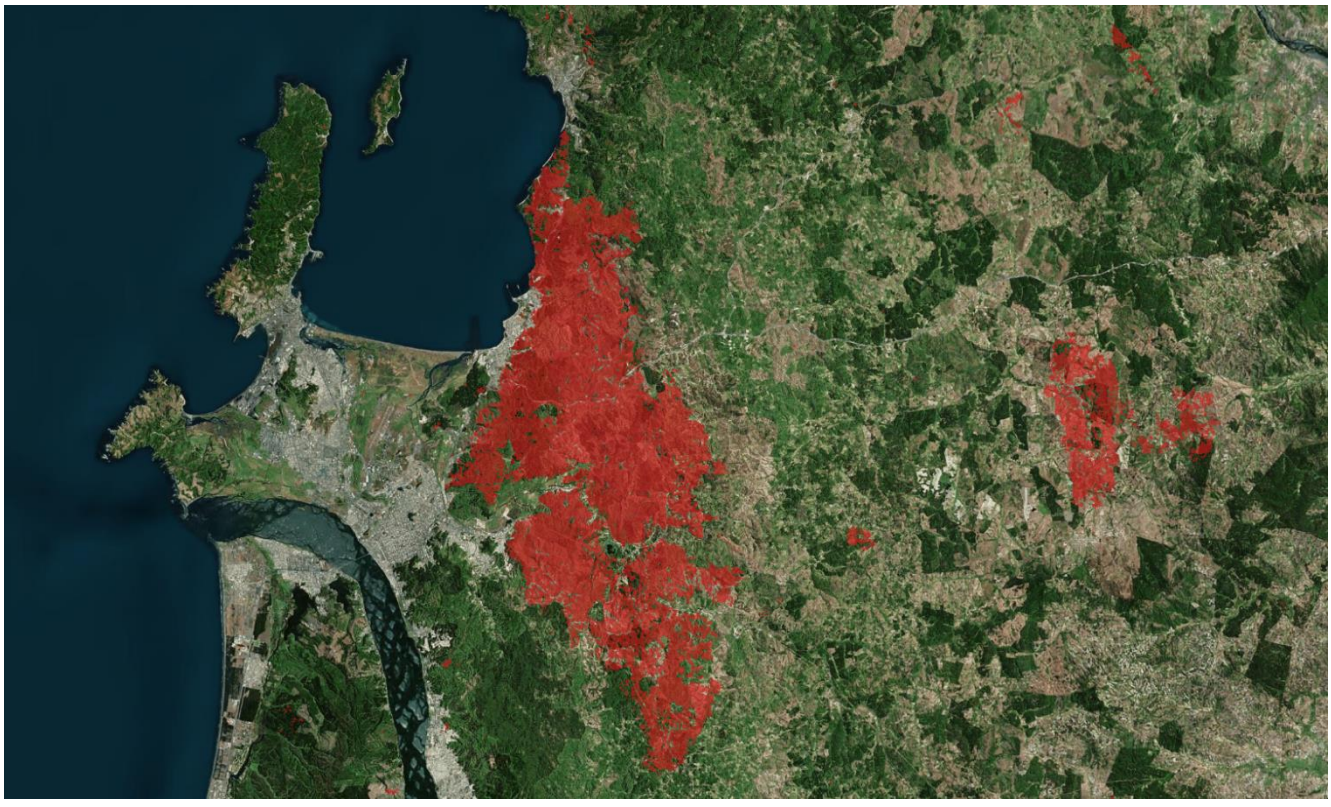


Figure 1: Automatic detection of burnt vegetation area around the Concepción Metropolitan Area between 17 and 21 January based on Sentinel-2 imagery.

1 Summary

During the summer months, wildfires are common in Chile's Mediterranean climate zones, varying considerably in size, speed of spread and impact. In January 2026, despite prior warnings from national authorities about exceptionally high temperatures between 16 and 18 January and the associated elevated wildfire risk, multiple fires broke out in the regions of *Biobío*, *Ñuble* and *La Araucanía* during and after this period.

According to official provisional figures from the National Disaster Prevention and Response Service (as of 22.01.2026, 23:00), between 17 and 21 January a total area of approximately 40,000 hectares was affected, with 2,098 homes destroyed, 20,471 people displaced and 21 persons killed (SENAPRED, 2026). The largest contiguous fires occurred east of the Concepción Metropolitan Area and mainly affected the municipality of Penco, namely the *Trinitarias* fire (15,541 ha) and *Rancho Chico* fire (7,231 ha) (CONAF, 2026).

The wildfires under consideration warrant closer analysis in that, despite not being the most extensive in terms of area, they resulted in comparatively high levels of damage to the population due to their occurrence at the wildland-urban interface (see Fig. 2a & b). In Chile's recent history, comparable events include the Valparaíso hills wildfire of February 2024 (135 fatalities, approx. 11,000 ha burned) (Gobierno de Chile, 2024) and the large-scale fires in the south-central Chile in 2017 (12 fatalities, approx. 518,000 ha burned) (Pliscoff et al., 2020).

Figure 2a: Before and after imagery of burnt neighborhoods in Penco (Source: Ministerio de Obras Públicas, Departamento de Territorio, Dirección de Planeamiento, 2026).

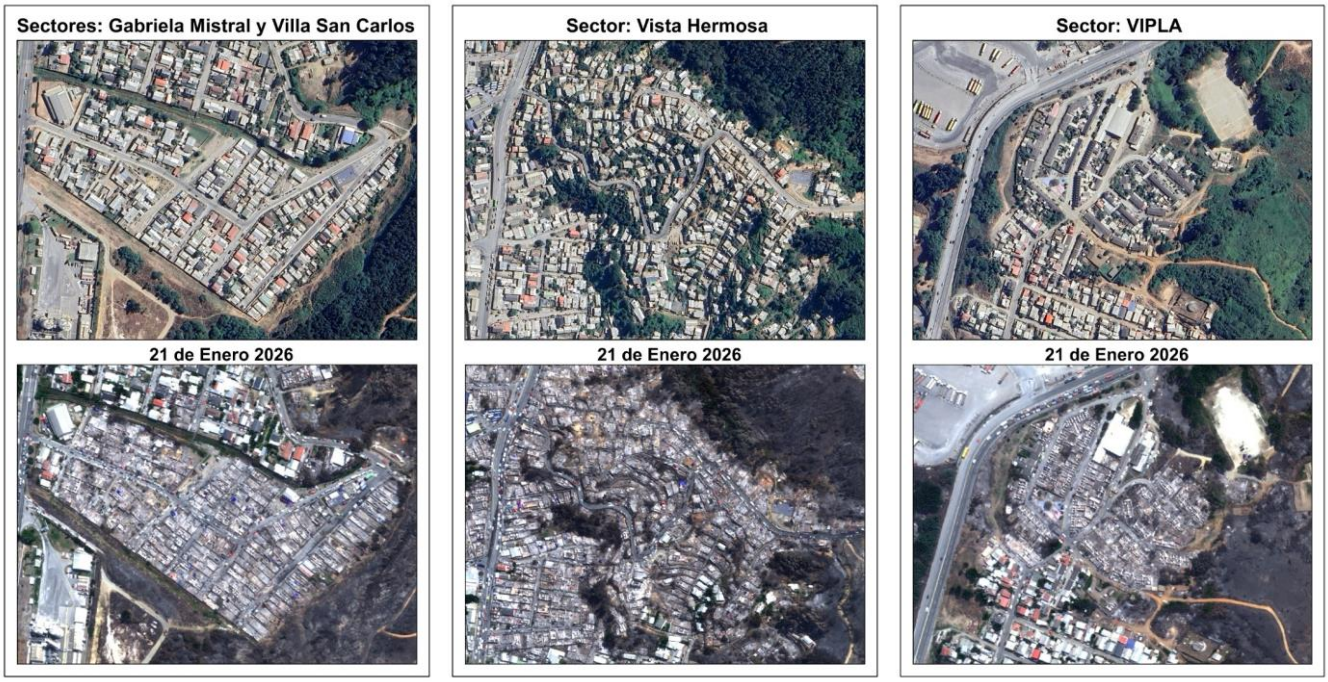


Figure 2b: Before and after imagery of burnt neighborhoods in Penco (Source: Ministerio de Obras Públicas, Departamento de Territorio, Dirección de Planeamiento).

2 Meteorological Information

2.1 Average monthly rainfall (November to January)

The south-central region of Chile, spanning from the capital city of Santiago de Chile to Puerto Montt, has a Mediterranean climate. This climate type is characterized by alternating wet and dry seasons. Most of the annual rainfall occurs during the mild winter months, while rain is sporadic during the warm summer. Occasional convective rains develop only near and above the Andes Mountains during the summer. Additionally, processes that enhance precipitation can occur in and around the Andes when frontal systems from low-pressure areas in the South Pacific reach south-central Chile.

In Concepción, where forest fires caused the most damage, rainfall is generally low from November to January (Fig. 3). The long-term average rainfall in Concepción from the beginning of November to the end of January is just 58 mm. Concepción's total annual rainfall averages 984.3 mm, while Chillán's, located about 80 km further east, averages 936.2 mm.

2.2 Rainfall in 2025 and 2026

The year 2025 was characterized by a rainfall deficit in the areas around Concepción and Chillán, which increased significantly, especially from August onward. From 1 January 2025, until the outbreak of the forest fires in mid-January 2026, Concepción received 273 mm less than the long-term average rainfall, totaling only 72% of the usual amount.

The rainfall deficit increased with every kilometer inland. Chillán, located approximately 80 kilometers east of Concepción , recorded only 522 mm of total rainfall between January 1, 2025, and January 20, 2026. The long-term average for the same period is 940 mm. At 56%, Chillán's rainfall was barely half the normal amount. In both Concepción and Chillán, no rain was recorded in January 2026 until the 20th. The last significant rainfall occurred on 20 December 2025.

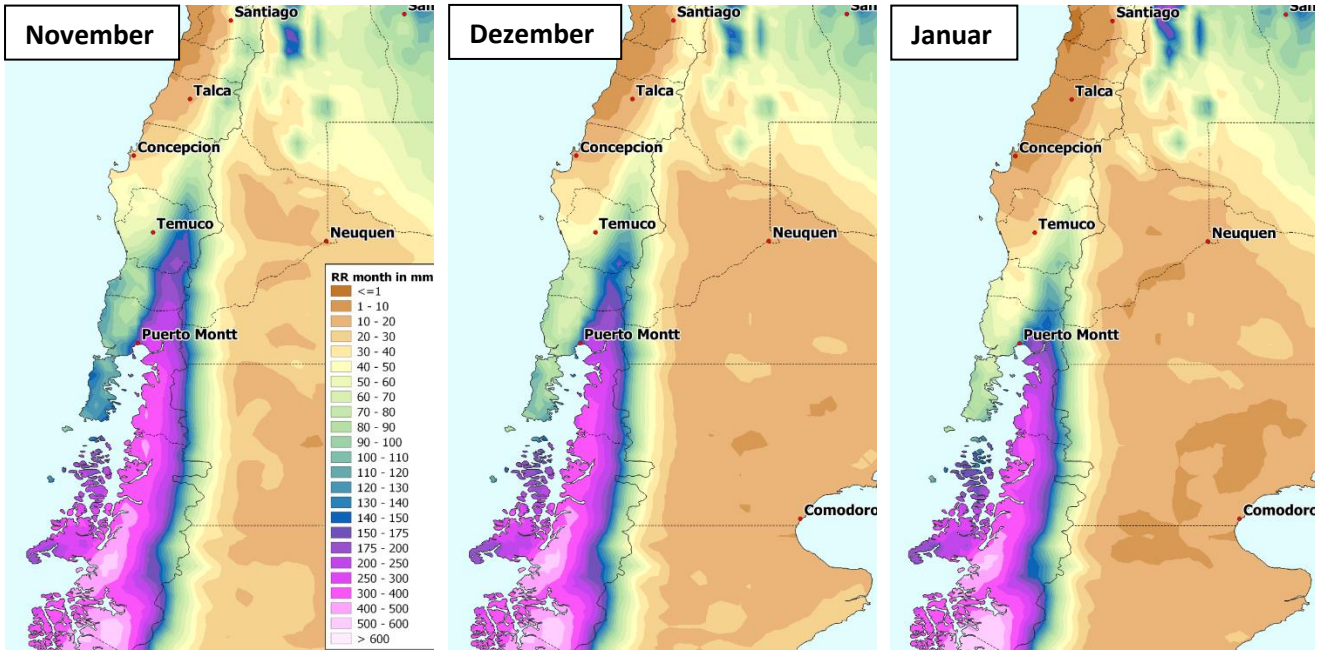


Figure 3: Mean monthly rainfall in mm in southern and central Chile. November on the left, December in the middle, January on the right (Period: 1991–2020, data source: ERA5 reanalysis).

Figure 4 illustrates the daily rainfall activity at the Concepción and Chillán stations from 1 January 2025, to 20 January 2026. The brown areas represent the difference between the actual rainfall and the long-term average and indicate an increasing deficit. In Concepción, the deficit is about one-third of the annual rainfall; in Chillán, it is nearly half. From October 2025 onward, the three months prior to the outbreak of the forest fires in mid-January 2026, the affected areas received barely 20 mm of rain.

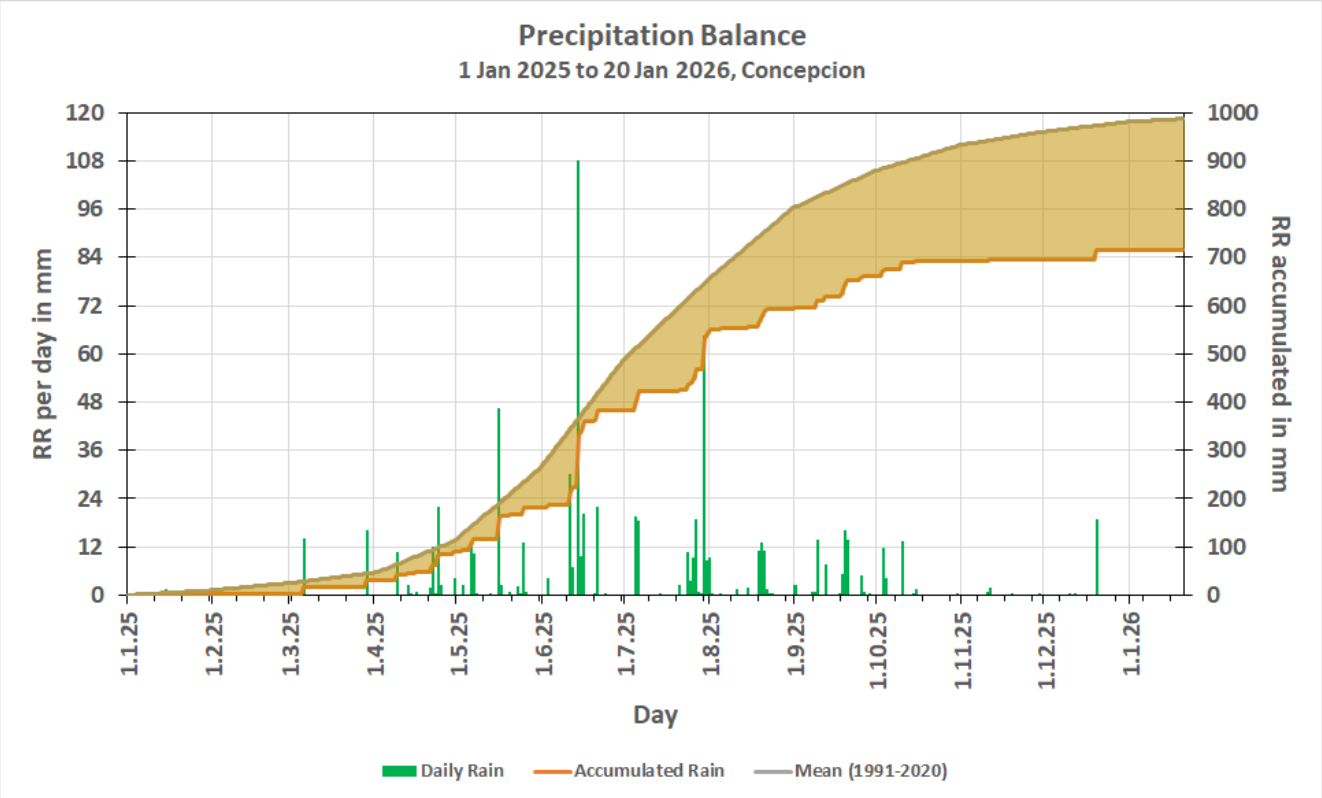
2.3 Air Temperature history since 1 December 2025

The air temperature in Concepción rarely exceeds 25°C. This is due to its coastal location on the Pacific Ocean and the influence of the cold Humboldt Current. However, the influence of the cold water diminishes rapidly inland. East of the coastal hill ranges, which rise to between 200 and 600 meters above sea level, and before the Andes Mountains dominate the landscape further east, temperatures in the central valley frequently climb above 30 °C in summer.

Figure 5 shows the daily maximum temperature in Concepción on the Pacific coast and in Chillán, which is located inland, from 1 December 2025, to 29 January 2026. The 90th percentile of the respective daily maximum temperature (long-term mean) is also shown for both stations. In particular, the thermometer often showed more than 35 °C in the central valley of Chillán in January 2026. It was especially hot on 18 and 19 January with temperatures reaching 37.2 and 37.3 °C, respectively.

2.4 Wind history since 1 January 2025

Figure 6 shows the course of the daily maximum mean wind speeds at Concepción and Chillán from 1 January to 29 January 2026. The highest mean wind speeds were recorded in the days leading up to and during the outbreak of the forest fires. From 11 to 18 January, the maximum average wind speed in Concepción was between 18 and 20 knots (33 and 37 km/h). For wind gusts, for which no measurements are available, speeds of around 50 km/h can be estimated.



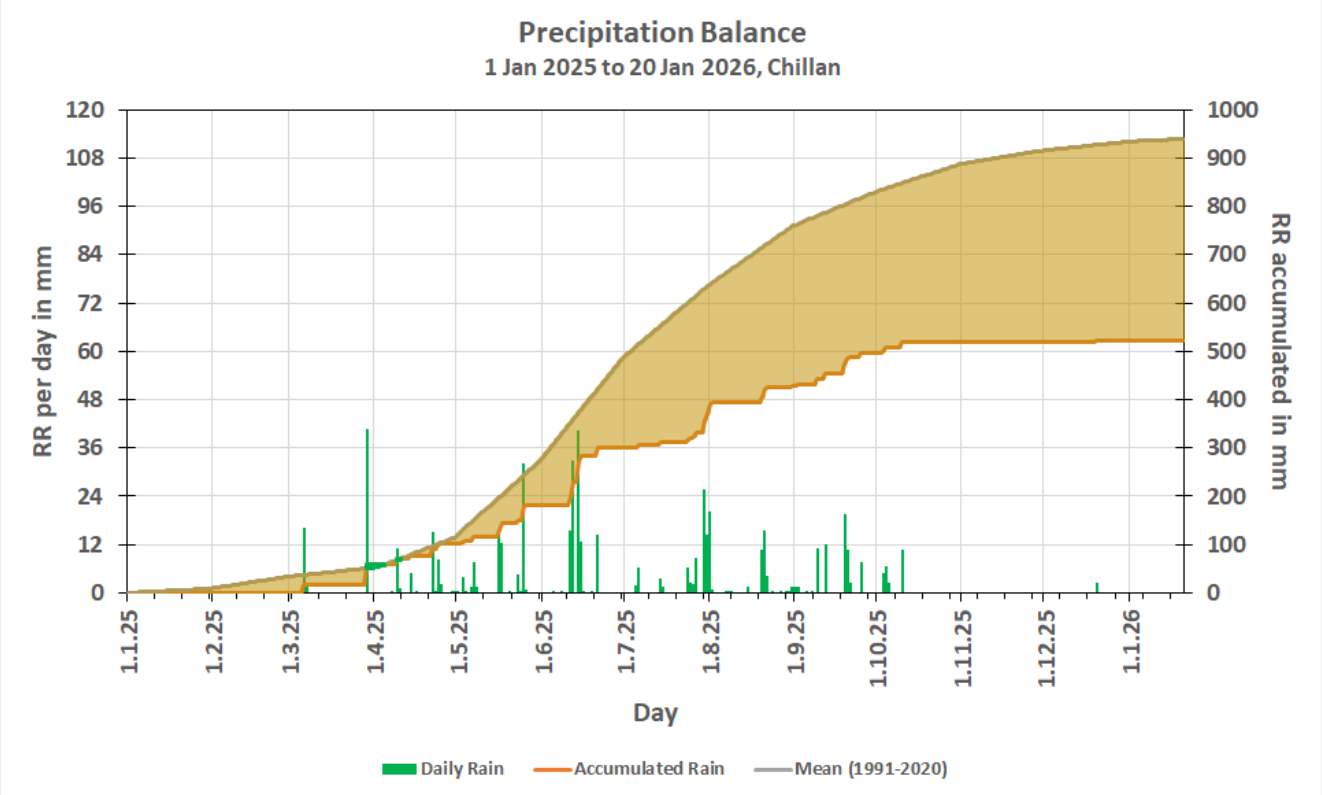


Figure 4: Daily precipitation values (green bars) from 1 January 2025 to 20 January 2026, the accumulated daily rainfall (red line), and the rainfall surplus or deficit relative to the long-term daily total rainfall at Concepción (top) and Chillán (bottom). The long-term mean is shown by the brown curve (period: 1991–2020).

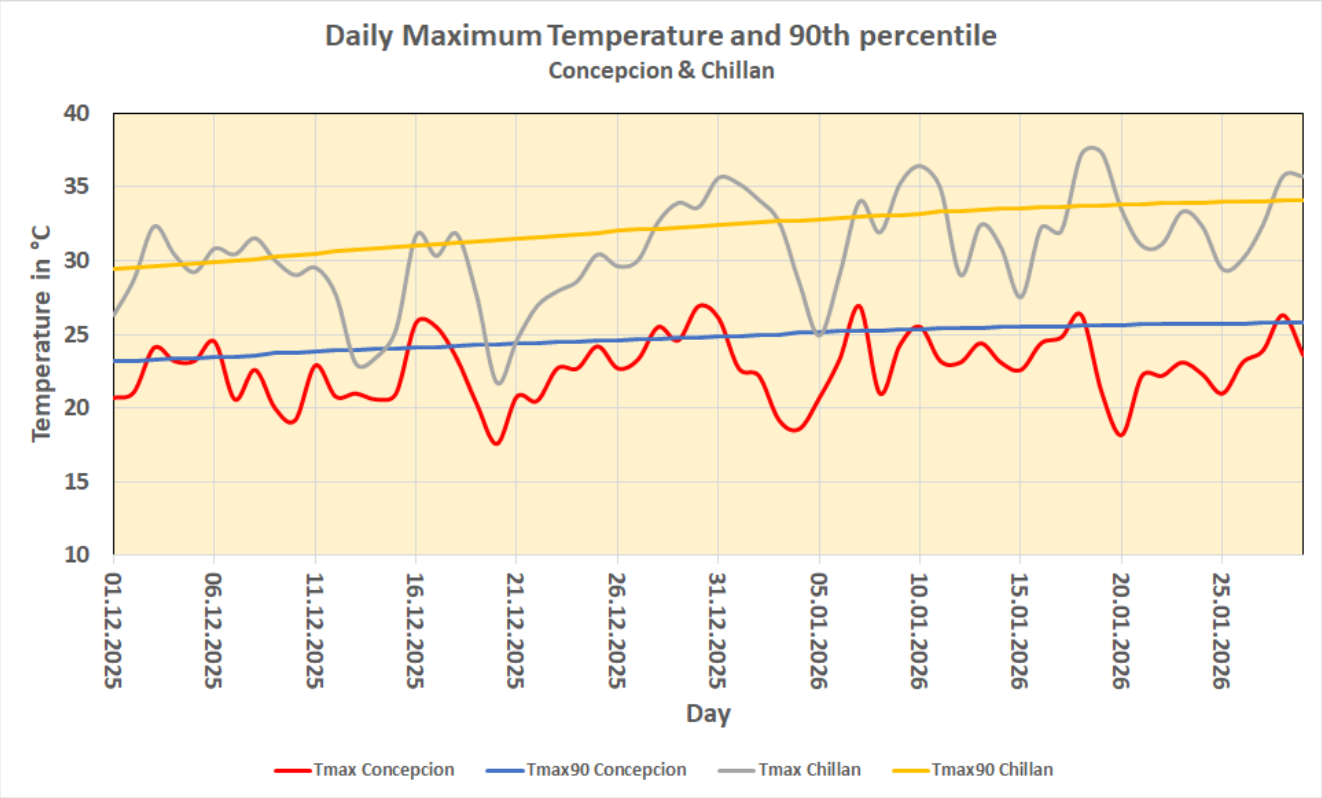


Figure 5: Daily maximum temperature at Concepción (red) and Chillán (grey) from 1 December 2025 to 29 January 2026, including the 90th percentile of the daily maximum temperature in Concepción (blue) and Chillán (orange; Data source: https://climatologia.meteochile.gob.cl).

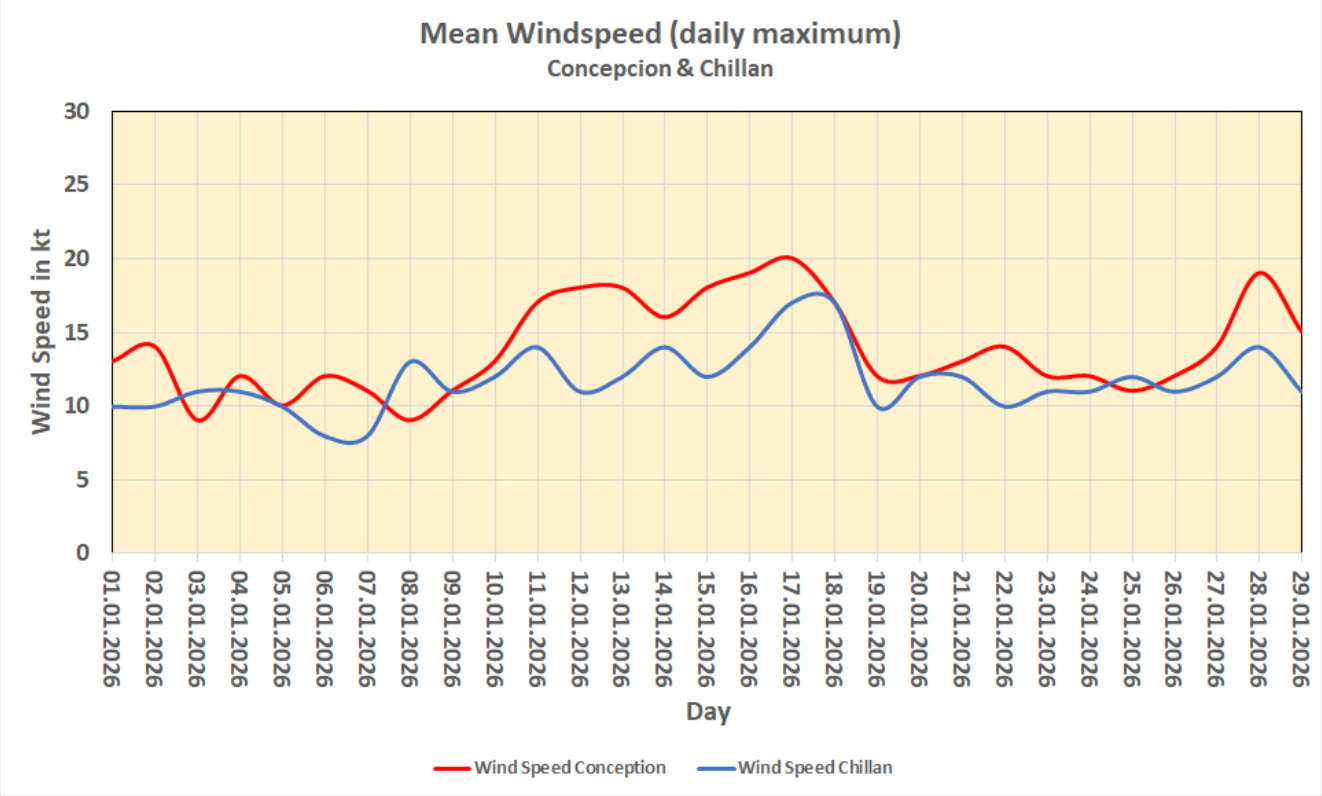


Figure 6: Trend of the daily maximum mean wind speeds at Concepción (red) and Chillán (blue) in kt during the period from 1 January 2026 to 29 January 2026 (Data source: https://climatologia.meteochile.gob.cl).

2.5 Satellite images

Assuming clear skies, satellite images often provide a good, high-resolution view of the Earth's surface. This allows for the rapid identification and assessment of affected areas in the event of a natural disaster. Figure 7 uses an orange color code to show the areas affected and destroyed by the devastating Trinitarias forest fire a few kilometers east of the Chilean port city of Concepción. The fire broke out on 17 January 2026, engulfing densely populated areas and towns, particularly Penco, a town northeast of Concepción. The burned areas identified in Figure 7 on 25 January 2026, cover 12,781 hectares. Figure 8 shows total fire activity between 17 and 19 January.

Figure 7: Overview of the areas affected by the wildfire Trinitarias. Satellite image from 25 January 2026, 14:46 UTC (Source: https://www.copernicus.eu/en/media/image-day-gallery/wildfires-biobio-and-nuble-regions-chile).

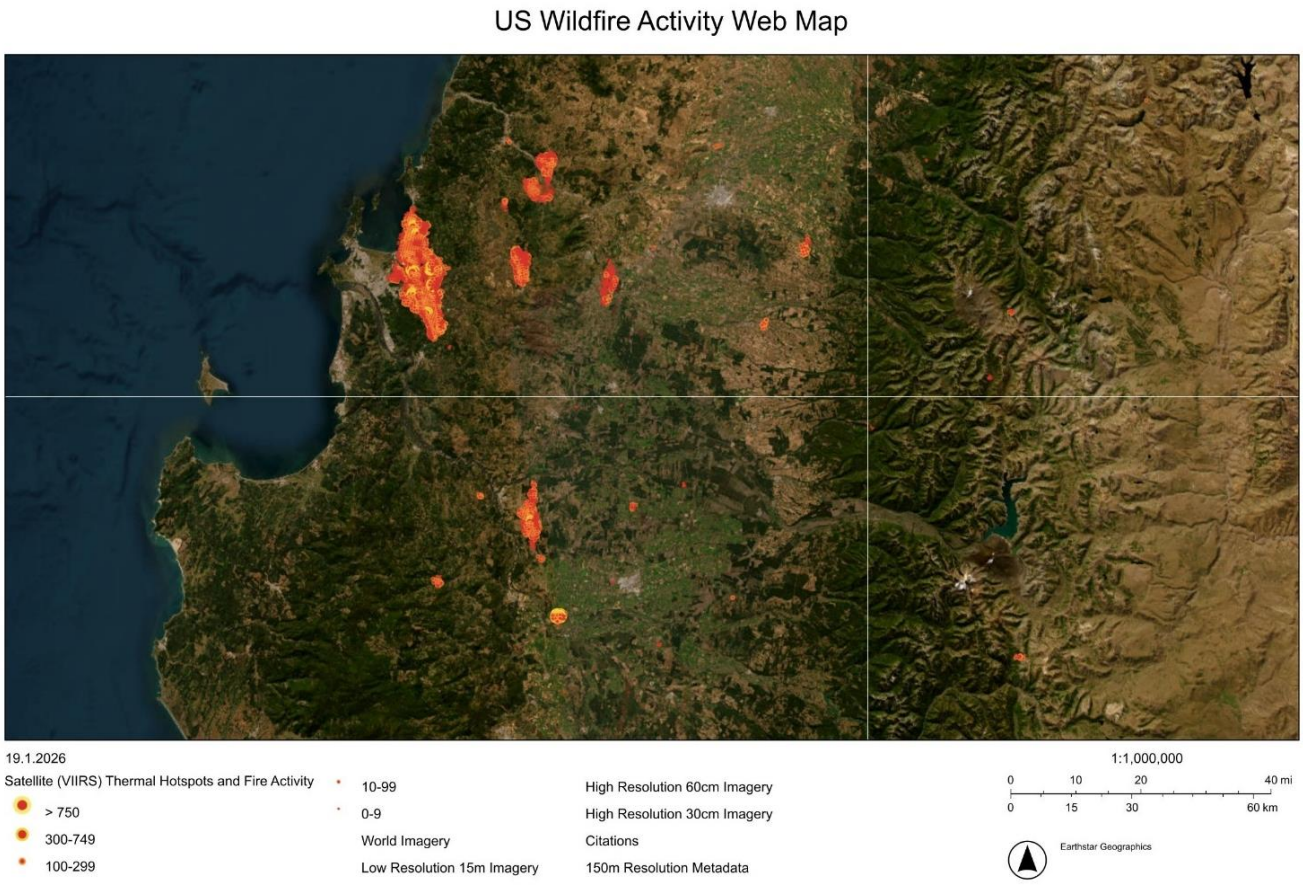


Figure 8: Overview of the areas affected by all the wildfires between 17 and 19 January (US Wildfire Activity Web Map, as of 19 January 2026. Source: https://www.arcgis.com/apps/mapviewer/index.html?webmap=df8bcc10430f48878b01c96e907a1fc3).

Satellite images can also help to track the spread of smoke and soot particles from forest fires. In large and prolonged forest and bushfires, the combustion residues are propelled several kilometers into the atmosphere, where they can remain for long periods and are often transported thousands of kilometers. In extreme cases, they can even circle the entire hemisphere. Figure 9 impressively shows the plume of smoke from the Chilean forest fires near Concepción, as it is transported hundreds of kilometers northwest across the Pacific Ocean.

Figure 9: Satellite image from 18 January 2026 indicating smoke (Source: https://science.nasa.gov/earth/earth-observatory/fires-erupt-in-south-central-chile).

3 The socio-spatial construction of wildfire risk in central-southern Chile

Disasters are defined as a "complex mix of natural hazards and human action" (Wisner et al., 2004, p. 5). Consequently, it is imperative to consider the role of social influences in addition to natural circumstances when assessing the potential for future fire events. The scientific community has widely identified several factors that make central-southern Chile a wildfire hotspot: The spread of exotic forest monocultures consisting of highly flammable trees (*Pinus radiata* and *Eucalyptus globulus*), periods of drought and human activities in the wildland-urban interface lead to a particularly high risk of forest fires (Carmona et al., 2012; Ciocca et al., 2023; Jaque-Castillo et al., 2025).

3.1 Forestry Land Use

Chile's prevailing economic model is based on extracting and exporting raw materials from the mining, forestry, and fishing industries. Tree plantations are "one of the cornerstones of the Chilean export-oriented resource-based development strategy" (Mora-Motta, 2024, p. 1), and are primarily located in central-southern Chile. According to the Chilean Forestry Institute (INFOR), the privately owned forest plantations cover approximately 632,000 ha in Biobío (26 % of the regional territory), 278,000 ha in Ñuble (21 %), and 464,000 ha in La Araucanía (14.5 %) (INFOR, 2024), as shown in Figures 10, 11 and 12. These plantations increase the risk of wildfires because they consist mainly of species such as pine and eucalyptus that generate large amounts of fine fuels, lower the landscape moisture and exhibit high calorific values, thereby increasing the potential for fast-spreading, high-intensity wildfires (Jaque-Castillo et al., 2025). Many people in Chile live near the plantations, often with limited protective measures, such as establishing and maintaining firebreaks. Consequently, a significant proportion of the population is directly at risk of wildfires (Aguirre et al., 2024).

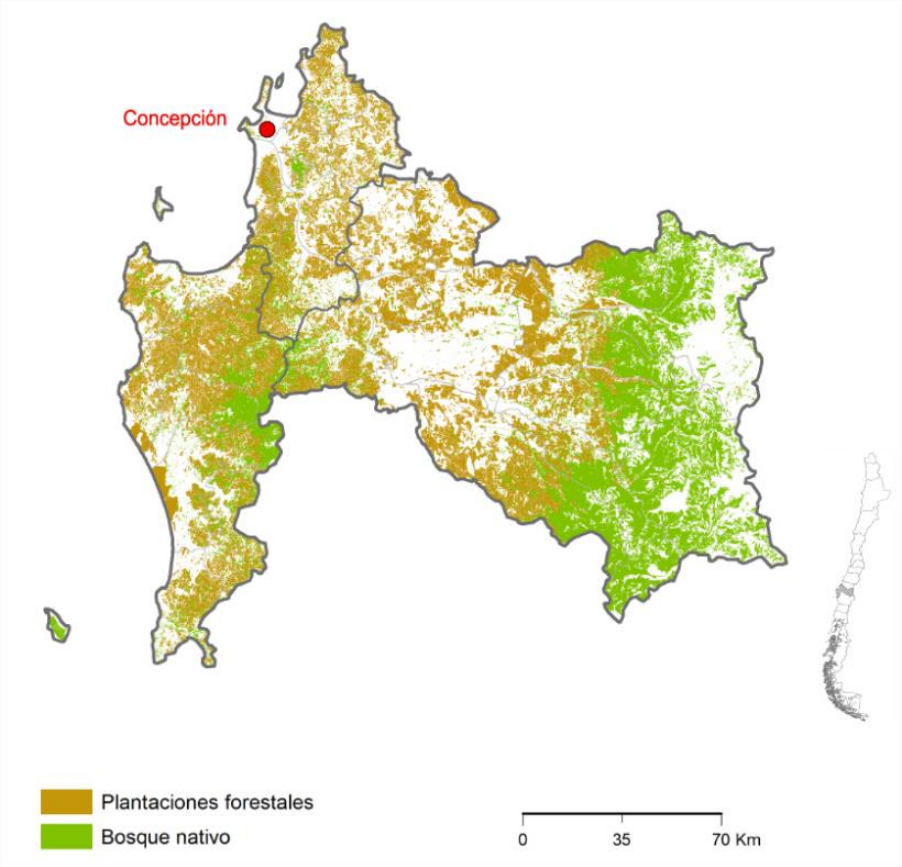


Figure 10: Distribution of forest plantations and native forests in Biobío region (Source: https://www.infor.gob.cl/index.php/sector-forestal/estadisticas-regionales/region-del-biobio).

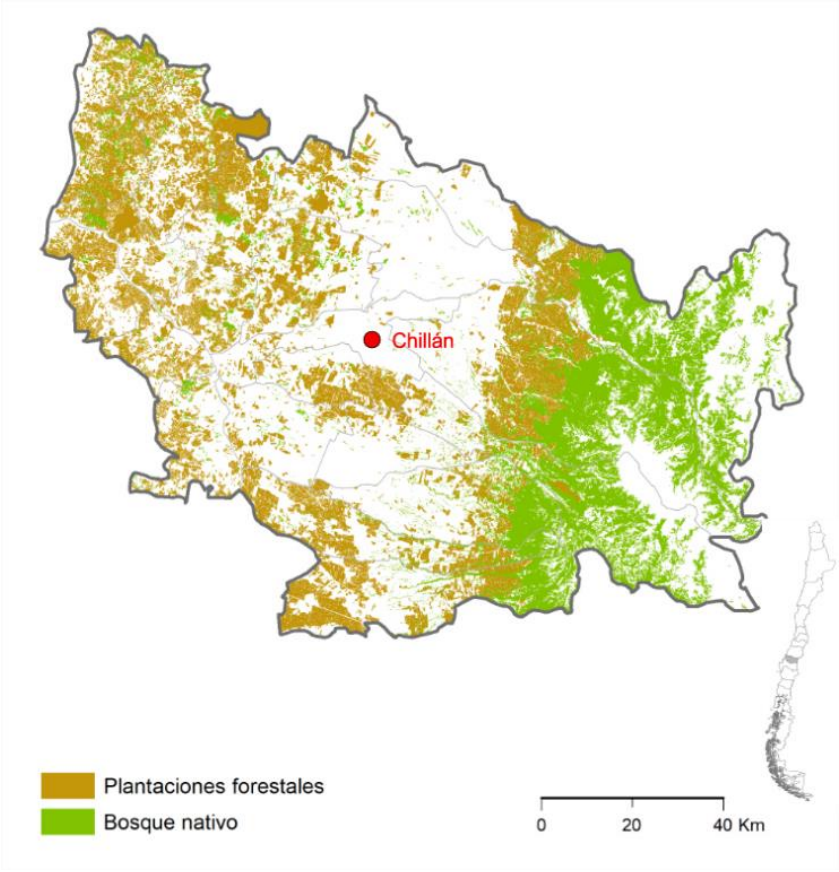


Figure 11: Distribution of forest plantations and native forests in Ñuble region (Source: https://www.infor.gob.cl/index.php/sector-forestal/estadisticas-regionales/region-de-nuble).

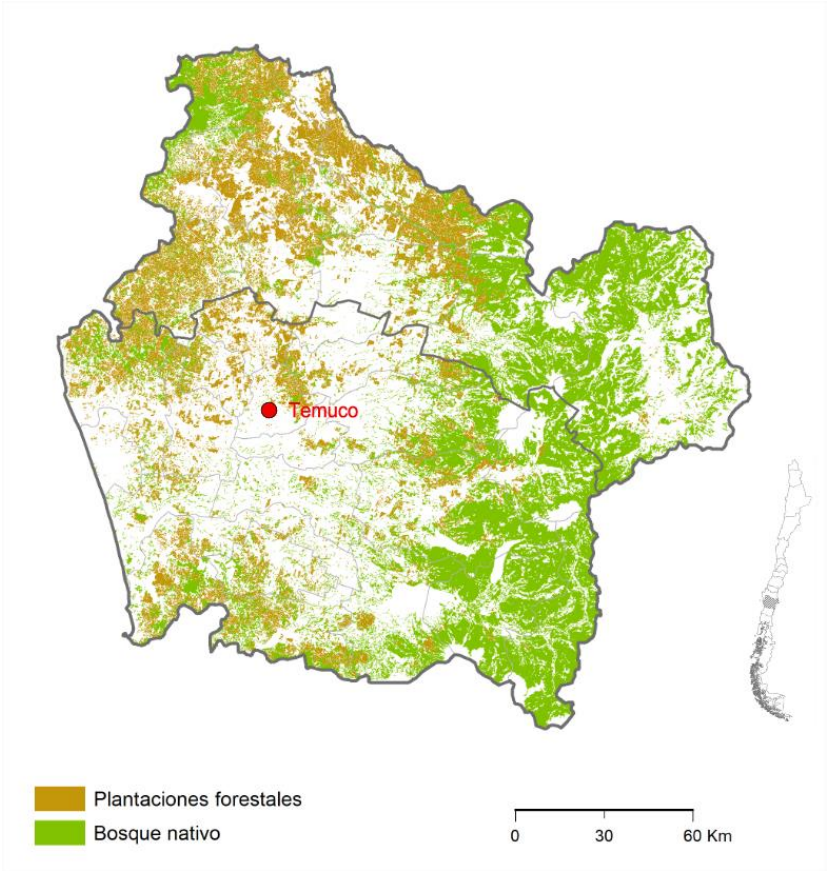


Figure 12: Distribution of forest plantations and native forests in La Araucanía region (Source: https://www.infor.gob.cl/index.php/sector-forestal/estadisticas-regionales/region-de-la-araucania).

3.2 Socio-Spatial Drivers of Wildfire Vulnerability

A growing body of literature indicates that spatial regulation in Chile has often failed to prevent or mitigate disasters (Lara et al., 2021; Romero, 2015; Wyndham et al., 2021). Jaque-Castillo et al. summarize that the "regulatory absence generates a condition that can be assimilated to a 'no man's land', where no public entity assumes responsibility for regulating or mitigating risk" (2025, p. 61). Although municipalities are formally responsible for wildfire prevention and disaster risk management, they lack binding and effective spatial planning instruments to regulate land use in rural areas within their municipal boundaries (Peterson et al., 2023).

Besides, real estate companies exert significant influence on urban growth patterns, particularly since the liberalization of land markets in the 1970s, which has promoted both vertical densification and horizontal urban sprawl in Chilean peripheral cities (Prada-Trigo et al., 2022). Rising land prices in consolidated urban areas have driven urbanization towards peri-urban zones, increasingly transforming these areas into a highly exposed wildland-urban interface (Peterson et al., 2023), where settlements and flammable vegetation are spatially interwoven. Informal urban development processes further exacerbate the risk, particularly with regard to the most vulnerable social groups (Hofflinger et al., 2025; Romero, 2015)

These factors jointly shape spatial patterns of wildfire risk in central–southern Chile, which, mostly triggered by human negligence, can lead to damaging fire events, such as those in January 2026. The negative effects are not limited to the loss of human lives, livelihoods and infrastructure, but also include "changes in the structure of forests, loss of fertile soil, loss of ecosystem services, desertification, changes in microclimate and atmospheric pollution" (Ciocca et al., 2023, p. 2).

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