

La Niña phenomenon in Colombia

Evolution and monitoring: January – February 2023

With the support of

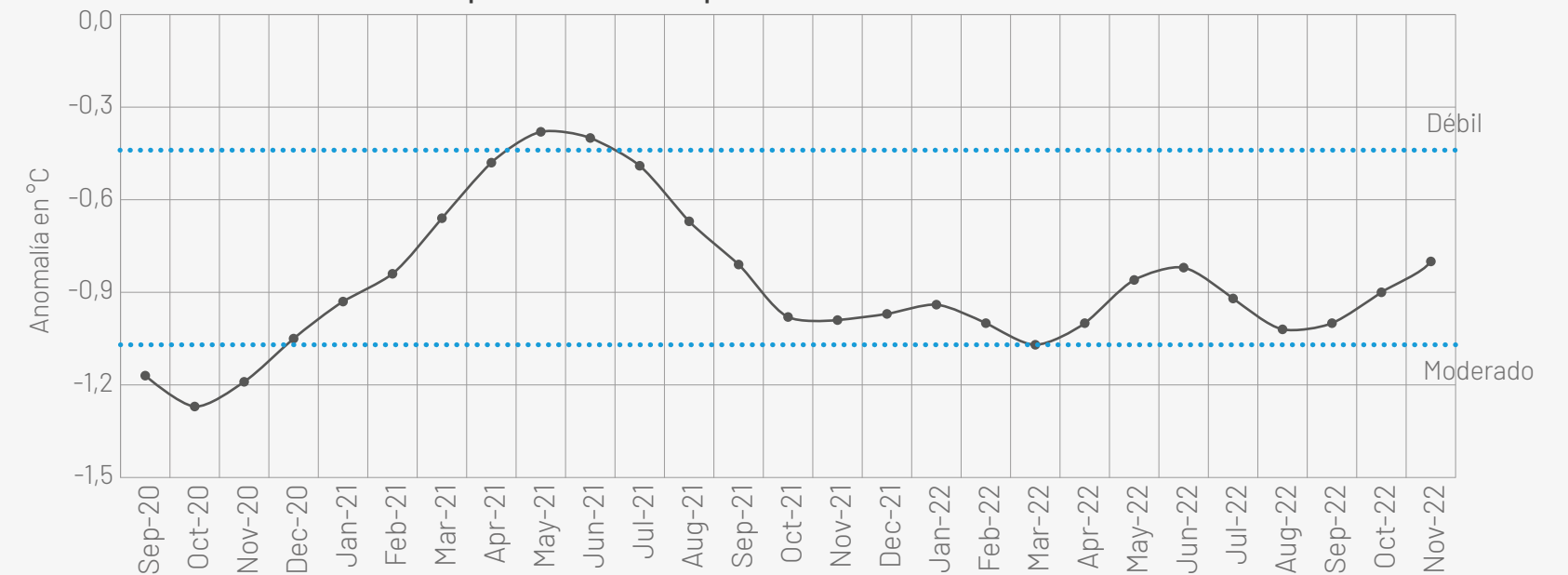


February 2023

According to the World Meteorological Organization, since September 2020 there has been signs of a La Niña episode in the tropical Pacific, with a brief lull occurred between June and August 2021. As of September 2021, the phenomenon resumed, and by mid-November 2022 the episode had remained in effect due to persistent cooling anomalies.

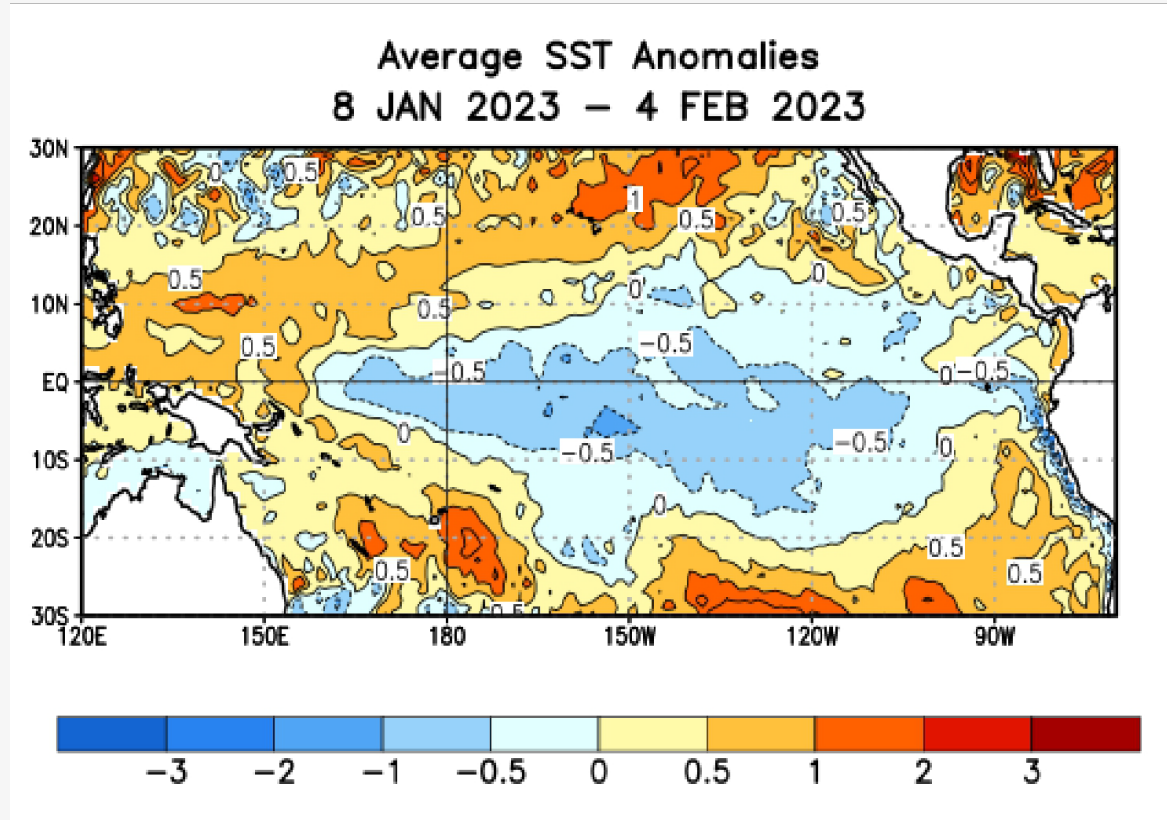
By January 2023, according to the NOAA (National Oceanic and Atmospheric Administration) the surface temperature anomalies of the equatorial Pacific Ocean continues to be below average, maintaining the conditions associated with the La Niña Phenomenon. Despite the continuous occurrence of these cold temperature anomalies, they were weakened in the month of January 2023, with a forecast of a transition towards neutral conditions for the February - April 2023 season. Between March and May 2023, the likelihood of neutral conditions stands at 85% (NOAA, 2023).

Chart 1: Anomaly patterns in the average surface temperature of the equatorial Pacific Ocean linked to the La Niña phenomenon, Sep. 2021 – Nov. 2022



Source: ENSO: Recent Evolution, Current Status and Predictions, February 6, 2023.

Image 1: Average SST anomalies in the Pacific Ocean in January 2023



Fuente: ENSO: Recent Evolution, Current Status and Predictions, 6 de febrero 2023.

Impacts of La Niña phenomenon on Colombian territory

In December 2022, La Niña phenomenon persisted, and according to World Meteorological Organization models, a 75% likelihood that this situation would continue until February 2023. The current La Niña phenomenon would be entering its third consecutive year, making it the first "triple" cycle of this phenomenon in the 21st century. (WMO, 2022).

Typically, December is known for being a month of transition between the second rainy season (which ends in November) and that of less rainfall (January and February) in the Andean, Caribbean, and parts of the eastern plains regions. However, given the extended duration of La Niña phenomenon, heavy rainfall is expected to continue in most of the country, which coincides with the season of heavy rainfall in January and February over the Amazonian Trapezoid, along the foothills of the Putumayo region as well as in some western areas of the Cauca and Nariño regions (IDEAM, 2023).

Impacts related to extreme hydro-meteorological phenomena (torrential floods, flash floods, hailstorms, floods, landslides, and landmass movements) between December 2022 and January 2023*.



267

Number of incidents

Cundinamarca (70 incidents), Norte de Santander (26 incidents) and Antioquia (25 incidents) are the departments with highest number of reported incidents.



27,905

Affected persons

Antioquia (44%), Bolívar (16%), Bogotá D.C. (10%) and Risaralda (7%) are the departments most affected. The municipalities of Dabeiba (Antioquia), Murindó (Antioquia) and Cicuco (Bolívar) represent 53% of the population affected.



8.097

Affected households

Antioquia (39%), Bolívar (27%), Bogotá D.C. (7%) and Risaralda (5%) are the departments with the highest number of affected households. The municipalities of Cicuco (Bolívar), Dabeiba (Antioquia) and Murindó (Antioquia) represent 59% of the total number of affected households.



33

Casualties



48

Deaths



1

Missing person



3.973

Damaged homes



168

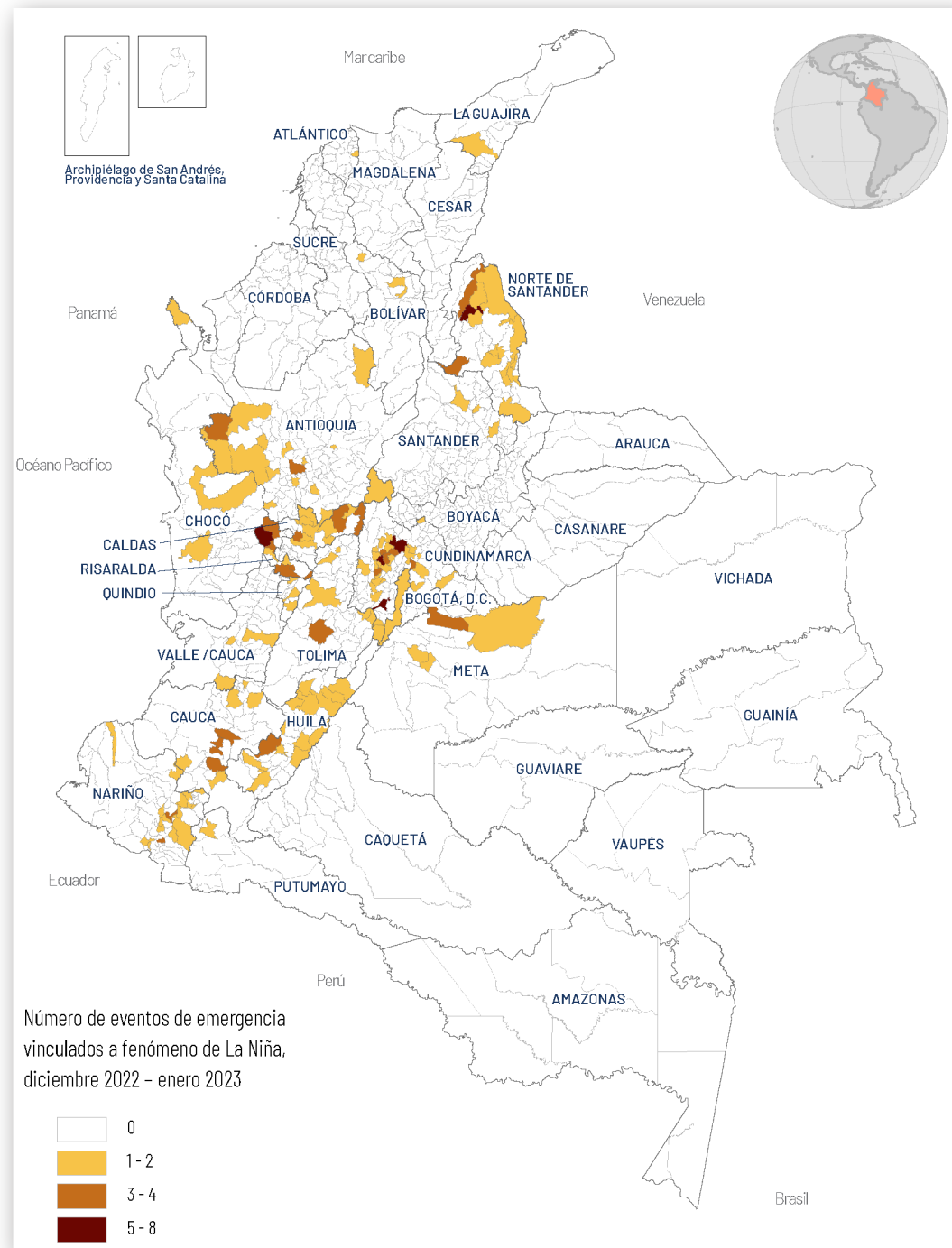
Destroyed homes



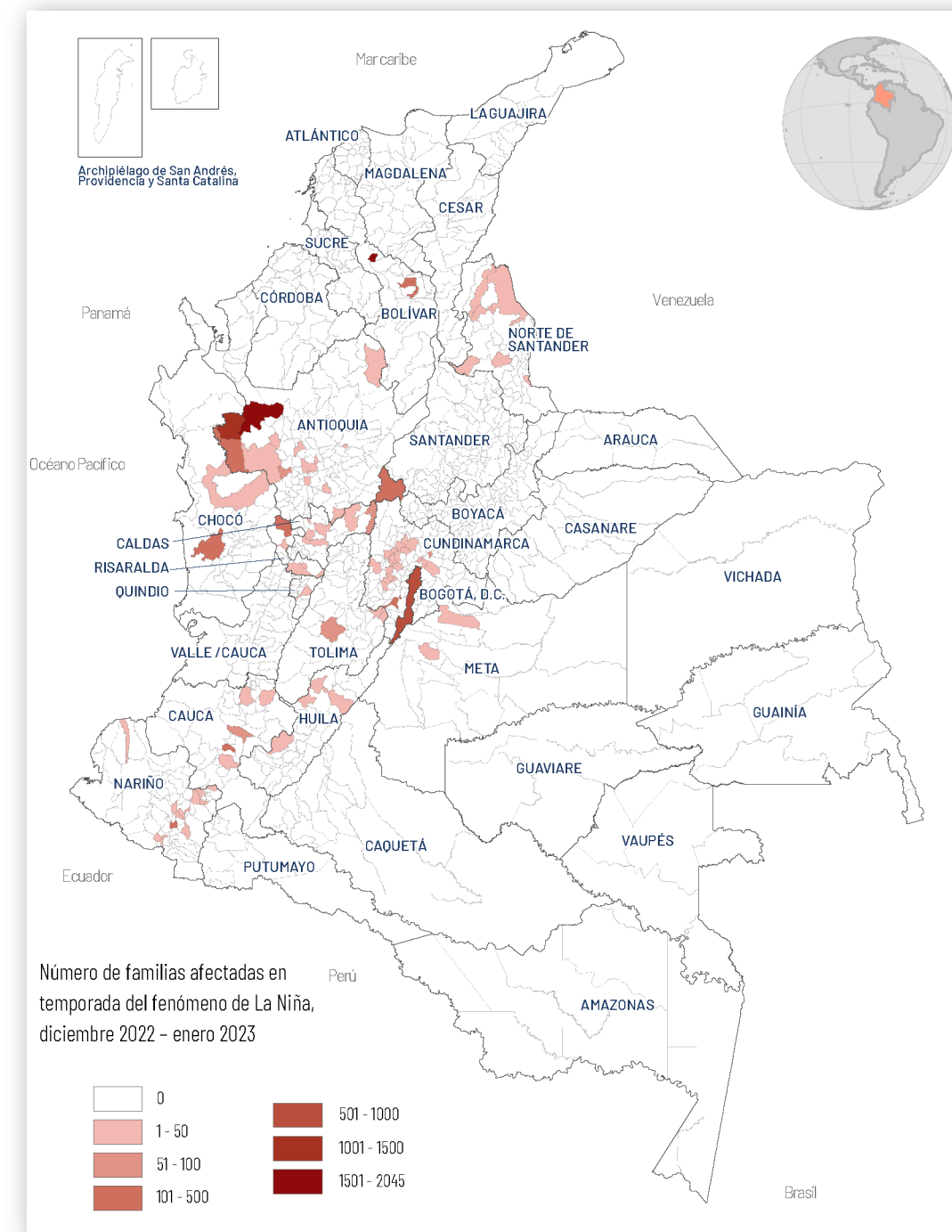
245

Affected roads

Map 1: Number of emergencies related to extreme hydrometeorological phenomena during the La Niña season, December 2022 - January 2023



Map 2: Number of households affected by severe hydrometeorological events during La Niña, December 2022-January 2023



*Source: UNGRD. (2022,2023). Consolidated annual emergencies. Based on the number of events and affected households.

Zones with landslide tendency per February 2023

Given the ongoing conditions of La Niña phenomenon and based on the record of landslide and landmass movements by the Colombian Geological Service (SGC), the rainfall prediction models built by the IDEAM and the record of incidents and events of the UNGRD over the past 10 years, four possible zones were identified as prone to landslides and landmass movements in the month of February 2023.

These zones were determined based on a 4 step process; The first step was to identify areas where landslides and landmass movement phenomena occur from the SGC consolidated record, the next step was to identify the municipalities where such phenomena have been occurring for the month of February based on the UNGRD data over the past 10 years, Identifying areas with higher rainfall expected for the month of February 2023 based on IDEAM prediction data, and lastly, identifying areas with steeper slopes using a digital elevation model (DEM).

Sources

IDEAM. (12 February 2023). *Boletín de predicción climática y recomendación sectorial*. Retrieved on 12/02/2023

OMM. (12 February 2023). *El Niño/La Niña hoy. Boletín El Niño/La Niña Hoy* by the World Meteorological Organization. Retrieved on 21/12/2022

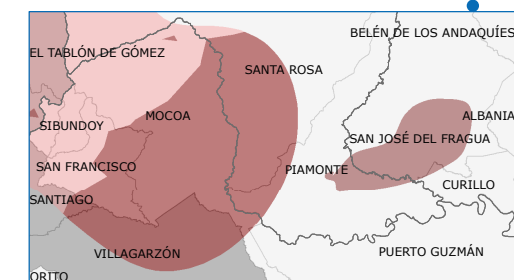
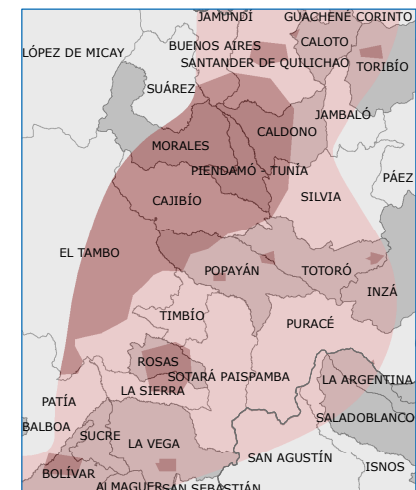
NOAA. (12 DE FEBRERO 2023). *ENSO: Recent Evolution, Current Status and Predictions*. Retrieved on 12/02/2023

UNGRD. (2022,2023). *Consolidated annual emergencies*.

Map 3 : Map of areas prone to landslides and mass movement phenomena, February 2023

Central Cauca*

Possible landslides and mass movement phenomena in areas such as Tambo, Cajibío, Morales, Piendamó, Caldono, and Rosas municipalities that are located within the Romeral Geological Fault. In this latter area, it is important to point out that there was a mass movement disaster in early January 2023 that affected Chontaduro, Parraga Viejo and Soledad villages and rendered the department of Nariño isolated.

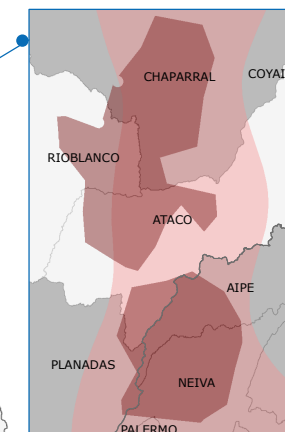
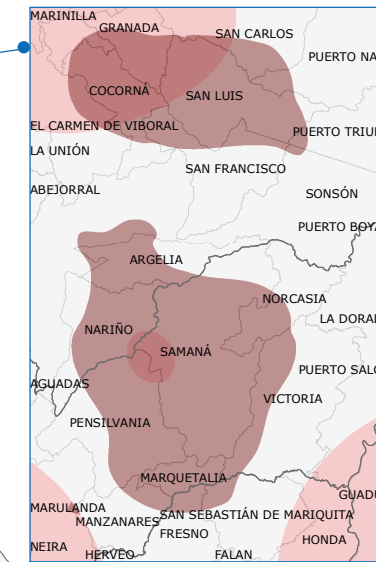


Putumayo and piedemonte*

Potential landslides and landmass movements in parts of the Villa Garzón, Mocoa, San Francisco and Santiago municipalities in the Department of Putumayo, as well as in parts of the Piamonte municipalities in Cauca, and San José de Fragua municipalities in Caquetá.

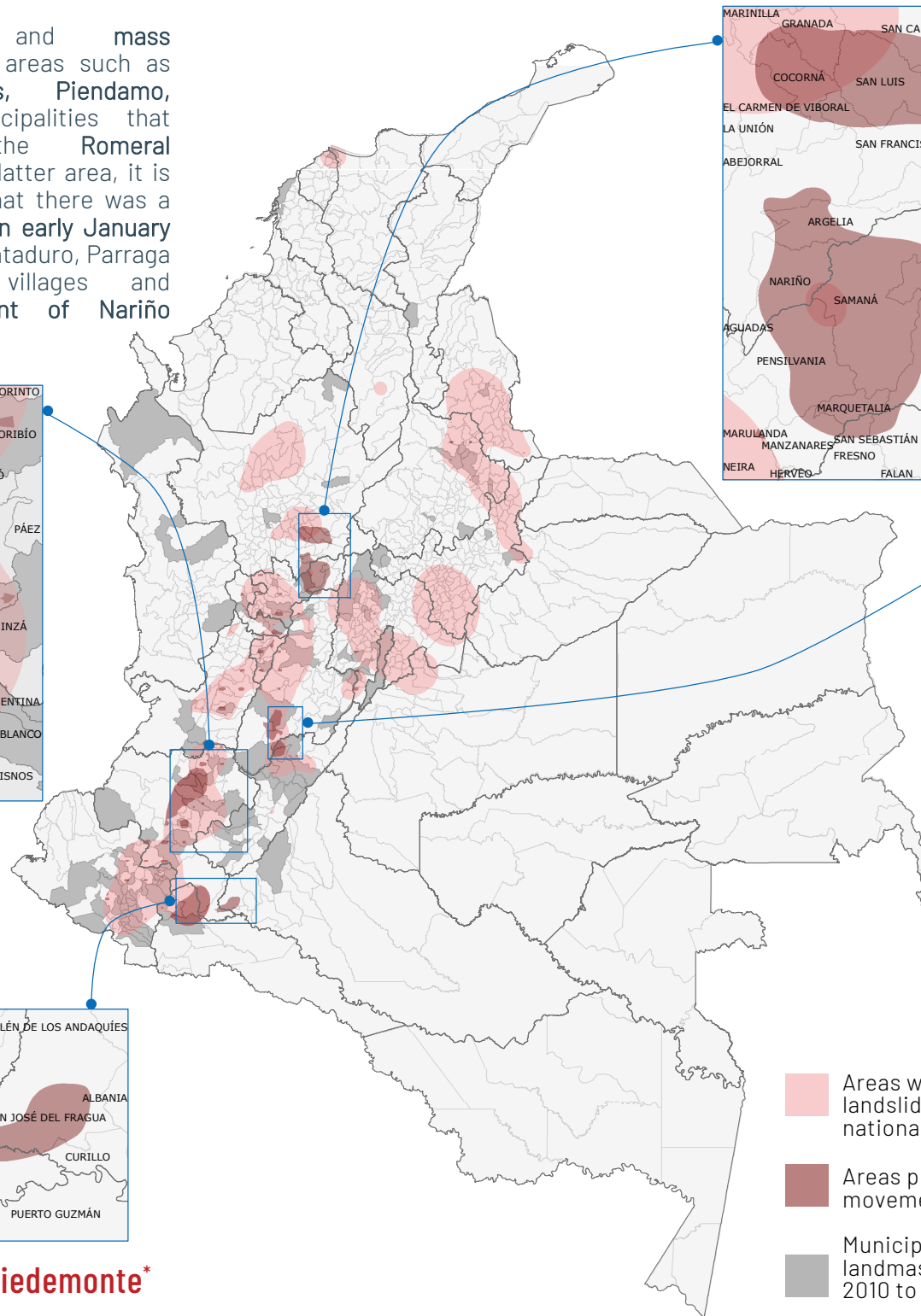
Antioquia and Northeast Caldas*

Potential landslides and landmass movements in some areas of Samaná, Pensilvania, Norcasia and Marquetalia municipalities in the Department of Caldas, as well as in Cocorná, San Luis, Argelia and Nariño municipalities in the south of Antioquia.



South of Tolima and northwest of Huila*

Potential landslides and landmass movements in some areas of Chaparral, Rioblanco, Ataco and Planadas municipalities in the Department of Tolima, as well as in Aipe and Neiva municipalities in the Department of Huila.



- Areas with the highest concentration of landslide and landmass movements on a national level
- Areas prone to landslide and landmass movements in the month of February 2023
- Municipalities with reported landslide and landmass movements occurred in February 2010 to 2022



*Sources: DEAM enero 2023, UNGRD datos año 2010 - 2022, SGC datos año 2020.