State of the Climate in Latin America and the Caribbean 2022

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Third in an annual series since 2020.

Collaborative effort of:

- **30+** National Meteorological and Hydrological Services and Regional Climate Centres
- **4** UN partners (FAO, UNEP, UNDRR, WMO)
- **15+** International and regional organisations, and research centres
- **60+** Scientists and experts
Key Regional Climate Indicators in 2022

- Temperature
- Precipitation
- Glaciers
- Sea level rise
Compared to previous decades since 1900, the 1991–2022 period shows the highest warming trend (≥ 0.2°C per decade).

Regional temperature trends for the Caribbean, Mexico, Central America and South America, for 30-year periods.
Temperature

2022 anomalies were not uniform across the LAC region

1) Largest above average anomalies > 1 °C occurred in:
   - Mexico
   - Northern Central America
   - The Caribbean
   - Eastern central South America

2) Below average temperature anomalies occurred mainly in:
   - Southern Central America
   - The extreme north of South America
   - Western central South America
Precipitation anomalies relative to 1991–2020 baseline

Overall, consistent with the typical rainfall patterns associated with La Niña conditions:

**Largest deficits**
- Paraná–La Plata Basin,
- Central and eastern Mexico,
- Parts of the Caribbean,
- Central and southern regions of Chile,
- Central and south-western Andes of Peru and in Bolivia

**Above-normal precipitation**
- Most of Central America,
- Northern South America,
- North-eastern Brazil.
Glaciers

Glaciers across the region continued losing mass and loss rates over the past decades are among the highest globally.

Rate of ice mass loss in metre water equivalent per year:

- **Tropical Andes**: 0.96 m w.e / year
- **Dry Andes**: 0.79 m w.e / year
- **Southern Andes**: 0.69 m w.e / year

(Note: 1 m w.e is 1 metre of water of net melted ice per square metre of surface)
Sea level rise

The sea level in the LAC region has increased at a higher rate than globally over 1993-2022 Satellite measurement period:

- South Atlantic reaching **3.66 mm / year**
- Subtropical North Atlantic **3.60 mm/ year**

→ IPCC:

*Sea level rise will continue in the oceans around Central and South America, contributing to increased coastal flooding in low-lying areas and shoreline retreat along most sandy coasts.*
Extreme events and their impacts

78 high impact events reported in 2022
(Source: CRED EM-DAT database)

- 63% related with flood
- 23% related with storms

1,153 reported fatalities
- 75% associated with floods
- 17% associated with landslides

US$ 9 billion economic damages:
- 48% associated with storms and floods
- 44% associated with droughts

Weather-, climate- and water-related disasters in Latin America and the Caribbean in 2022

Note: The actual figures related to the impacts of extreme events are likely to be worse because of under-reporting.
Tropical cyclones

Hurricane Fiona ranks as the third costliest hurricane on record (since 1980) in Puerto Rico, leading to US$ 2.5 billion in damages.

Hurricane Ian affected severely Cuba

→ Destruction affected housing and infrastructures
→ 20,000 hectares of land destroyed affecting food production

Hurricane Julia was the second tropical storm in 2022 to cross over between the Atlantic and Pacific Basins

→ Several Central American countries affected.
→ 35 direct deaths related to flash flooding and destruction

Hurricane Lisa

→ 39% of Belize population affected (around 172,000 people)
Floods and landslides triggered by heavy rainfall led to hundreds of fatalities and billions of US dollars in economic losses across the region.

Two consecutive heavy rain-related disasters devastated Petropolis, Rio de Janeiro state, Brazil, leading to more than 230 deaths. On 15 February 258 mm of rain occurred in 3 hours and on 20 March 415 mm in 10 hours.

In Colombia floods and landslides resulted in 266 reported fatalities and impacted more than 600,000 people. Almost 300 cities were declared to be in a state of public calamity.

Red contours correspond to areas of risk for landslides at Petrópolis.
Drought

South America

Chile ➔ Megadrought.

Parana/La Plata ➔ Worst drought since 1944. Partially attributed to dry conditions related to the La Niña event.

Grand Chaco ➔ Most severe drought in the last 80 years.

Southern Andes of Peru ➔ Most severe drought since instrumental measurements first began in 1965.

Central America and the Caribbean

Mexico ➔ 30% of territory experienced moderate to extreme drought.

Costa Rica ➔ Dry conditions impacted the availability of potable water supply in the North Pacific and Central country regions.

Puerto Rico ➔ 68% of the Puerto Rico experienced moderate to severe drought.
In January, November and December 2022, southern South America suffered from long and intense heatwaves. The prolonged dry conditions associated with high temperatures led to record wildfires.

From January to March 2022, wildfire emissions were the highest in the last 20 years in Paraguay and northern Argentina. Brazilian state of Amazonas had the highest July–October total fire emissions of the last 20 years at just over 22 megatons.
Agriculture and food security

Drought conditions in 2022 led to damages to agriculture and reduced crop yields, affecting global crop markets.

Argentina, The Paraná river, on which Argentina relies to export 80% of its agricultural products, was affected by low water flow.

Chile declared an “agricultural emergency” in December 2022 in the Magallanes region and in the Chilean Antarctic due to the water deficits.

Gran Chaco, 80% of families in this area have suffered losses of over 75% with respect to their agricultural production for self-consumption due to drought.

Brazil’s agricultural production index decreased 5.2% in first quarter of 2022 compared to the first quarter of 2021. Coffee yields expected to be the lowest since 2014.
Climate services for agriculture and energy

Climate services improved in the region. About 60% of countries are providing climate data services for Agriculture and Energy sectors.

However, fewer percentage of Members reported providing climate projections and tailored products: < 50% for Agriculture and < 35% for Energy

Percentage of LAC meteorological services providing climate services

Agriculture and food security

Energy sector
Multi-hazard risk-information systems

LAC region experiences considerable early warning challenges.

For example, in South America only 60% of people are covered by MHEWS according to 2020 data.

Population in the LAC must be made more aware of climate-related risks, and early warning system.

Improved multidisciplinary mechanisms for providing warning services to the population are an urgent priority in the LAC.
WMO in support of climate adaptation (SDG-13)

- Global Greenhouse Gas Watch
  - WMO coordinated global Greenhouse Gas Monitoring Infrastructure

- Systematic Observations Financing Facility (SOFF)
  - Financing LDCs and SIDS to better predict extreme weather events

- Early Warnings for All Initiative
  - Ensuring every person on Earth is protected by early warning systems within five years
2022 was less warm than previous years in Latin America and the Caribbean, however, the long-term warming continued with an **average trend of about 0.2 °C/decade over 1991-2022 period**.

**Sea levels continued to rise** threatening the continental coastal areas of several Latin American and Caribbean countries and small island developing States (SIDS).

**Floods and landslides** triggered by heavy rainfall led to hundreds of fatalities and billions of US dollars in economic losses across the region.

**Prolonged drought conditions** contributed to negative impacts on several economic sectors in the region, including agriculture, energy, transportation and water supply.

**Climate Services for Agriculture and Energy** have improved in the LAC, However climate projection services are still lagging with less than 50 % of WMO Members providing these services for the agriculture and food security, and energy sectors. There is untapped potential for NMHSs to assist with energy transition.

More efforts are needed to help decision-making by demonstrating the costs and benefits of strengthening multi-hazard early warning systems and climate services for climate adaptation.
Thank you
Muchas gracias

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