

Early Warning Systems



The UN Climate Change Conference (COP30) will take place in Belém, Brazil, from November 10-21. Key expectations include the presentation of new national climate action plans (NDCs), progress on finance from COP29, and discussions on scaling innovative climate finance mechanisms. The conference will also feature the COP30 Action Agenda, a program to engage businesses, civil society, and various levels of government in practical climate solutions.

Background

Both Article 7 and Article 8 from the 2015 Paris Agreement recognize Early Warning Systems (EWS) as a key adaptation strategy for “averting, minimizing and addressing loss and damage.”

EWS provide timely and effective climate forecasts to alert communities, allowing them to act in advance and reduce the risks from climate-related hazards.

Under the Global Goal on Adaptation framework adopted at COP28, one of the targets states that by 2027 all Parties will have “multi-hazard early warning systems, climate information services for risk reduction, and systematic observation to support improved climate-related data, information and services.”

The [Early Warnings for All initiative \(EW4All\)](#) was launched by the UN Secretary-General in November 2022 at COP27. The Initiative calls for the whole world to be covered by an early warning system by the end of 2027. UNEP is one of the implementing partners under the initiative.

Key messages

Transboundary climate risks can ripple across borders, ecosystems and sectors, impacting distant communities.

EWS are a proven, efficient and cost-effective climate adaptation measure for saving lives and livelihoods.

EWS should be simple and accessible, including for vulnerable and marginalized groups, and must be established as a preventative measure as early as possible instead of waiting until after a climate disaster has occurred.

Progress with EWS is important for the Global South, which faces a disproportionate share of the climate change impacts while having a limited capacity to develop and deliver services.

EWS should be established to detect a range of climate hazards to maximize effectiveness, ranging from floods to extreme heat, droughts and the risk of wildfire. This includes understanding compounding effects of multiple overlapping hazards.

Key data

Countries with ‘substantial’ and ‘comprehensive’ coverage of multi-hazard EWS experience **mortality rates that are 6 times lower** than those with ‘limited’ to ‘moderate’ early warnings (UNDRR & WMO 2024).

Investing in EWS can **save up to US\$15 in reduced disaster impacts** for every dollar spent (WMO 2025).

Just under half of the world’s countries (45%), mainly in least developed countries and small island developing states, are **still not covered by EWS** (UNDRR & WMO 2024).

Based on an analysis of EM-DAT data from 1900 to 2023, a recent study determined that nearly 20% of the disaster records for the period were **classified as multi-hazard events** and that these events had caused 59% of global economic losses (UNDRR & WMO 2024).

What happened at COP29?

Government leaders used a high-level event to **call for renewed urgency**—and greater investment, expertise, and technological support—to accelerate EW4All initiative.

The World Meteorological Organization reported that although coverage of multi-hazard EWS is **at its highest since 2015**, progress remains uneven: many countries, especially in Africa and Latin America, still lack comprehensive systems

A key **Solutions Dialogue** was held prior to the summit to identify high-impact solutions, mobilize political will, and gather momentum for accelerating EWS implementation.

What to expect at COP30

The COP30 negotiations will prioritize integrating and **scaling up the EW4All initiative**, which aims for every person on Earth to be protected by early warning systems by 2027.

As EWS has been included in the GGA framework, COP30 may **establish indicators for EWS coverage**, reliability, timeliness, or community reach.

What is UNEP doing?

Increasing Access and Coverage: In line with its Medium-Term Strategy, UNEP works all over the world to increase access to high-quality weather and climate information, forecasting and EWS to strengthen disaster preparedness and improve local adaptation efforts. These EWS in turn underpin evidence-based policy and action. Core components of our initiatives include strengthening institutional frameworks for climate information and multi-hazard EWS, developing capacity for country ownership of EWS, and enhancing capacity for monitoring, analysis and forecasting of climate and its impacts. For example, a transformative programme was initiated by UNEP and partners in 2020 to establish integrated climate and ocean information services and EWS in five Pacific Island countries, supported by US\$49.9 million of funding from the Green Climate Fund.

Partnerships and networks: UNEP is one of the implementing partners under the EW4All initiative and is actively taking part in the world of technical groups under Pillar 1 (risk knowledge and management) and Pillar 2 (observations and forecasting). In addition, UNEP plays a key role in the following global EWS initiatives:

- [Systematic Observations Financing Facility](#)
- [Alliance for Hydromet Development](#)
- [Risk-informed Early Action Partnership](#)

Further reading

Adaptation Gap Report 2025

UNEP's work on Early Warning Systems

Story: An early warning system for disasters takes shape in Timor-Leste

RESILIENCE: The Global Adaptation Podcast
(Episode 1: Saving Lives)

Global Status of Multi-Hazard Early Warning Systems
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