

Global Drought Mosaic – A Globally Harmonized Drought Map

Description of the Methodological Approach

IDMP Technical Support Unit

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1. Background:

The Global Drought Mosaic is an initiative developed under the Integrated Drought Management Programme (IDMP). The initiative was launched in response to requests from the WMO Coordination Mechanism (WCM) and the need for an overview of drought monitoring efforts and drought conditions worldwide, including information on the status and coverage of national and regional drought monitoring systems.

The Global Drought Mosaic aims to provide a coherent global overview of drought conditions while building on drought information generated and used at national and regional levels. The concept was first developed in 2024, when an initial series of prototype products was produced. During 2025, the concept and methodology were further refined and expanded. Until 2026, the work has been supported by a WMO intern, Gideon Simiyu.

The initiative follows a bottom-up approach, integrating drought information produced by national and regional monitoring systems. This approach preserves the relevance of regional assessments while improving the consistency and accessibility of drought information at the global level.

Over time, the concept evolved into a framework consisting of three complementary products, collectively referred to as the Global Drought Monitors:

1. Global Drought Mosaic
2. Status Map of National Drought Monitors
3. Status Map of Regional Drought Monitors

The latter two status maps provide an overview of existing drought monitoring systems at national and regional levels. They highlight the availability and geographic coverage of drought monitors and provide links to the respective monitoring platforms. The maps are regularly updated and available on the IDMP website.

The present description focuses on Product 1 – the Global Drought Mosaic, which aims to provide an integrated global overview of drought conditions based on information from national and regional drought monitoring systems (See Figure 1)

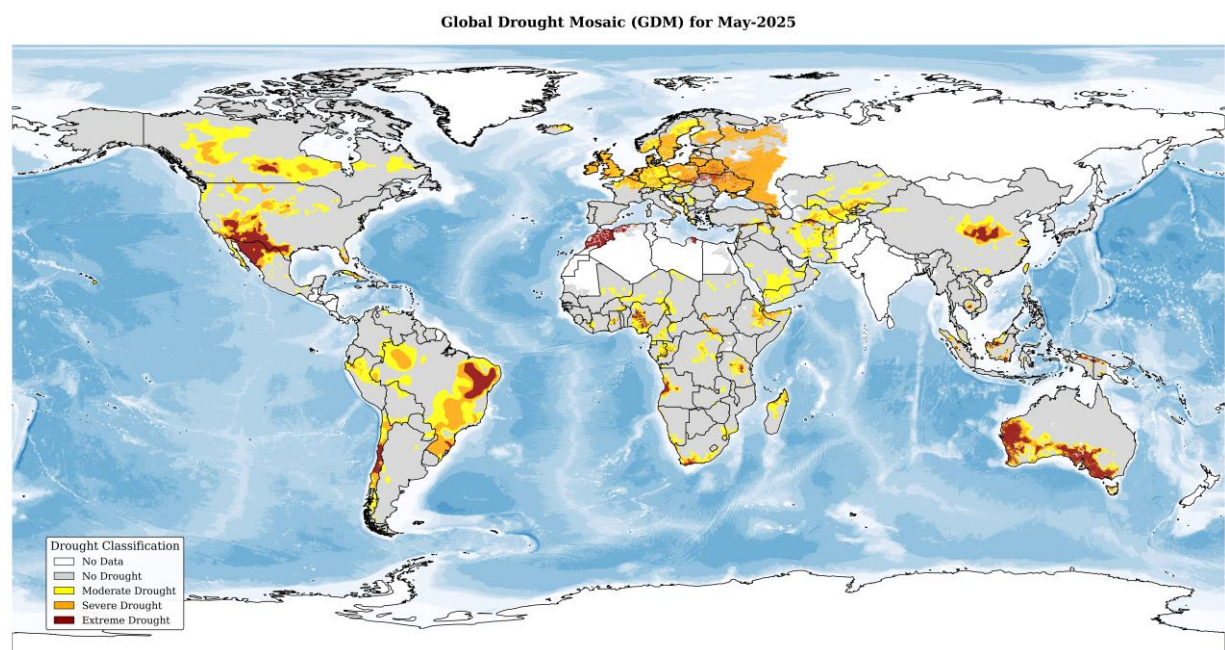


Figure 1: Harmonized Global Drought Map for May 2025 (Pilot product).

2. General approach for the Global Drought Mosaic:

The current harmonized global drought map of the Global Drought Mosaic is a prototype. This product provides an integrated global overview of drought conditions based on the qualitative harmonization of regional drought information. The map applies four standardized drought categories: no drought, moderate drought, severe drought, and extreme drought. Initial development has focused on integrating regional drought

monitors for an example period of May 2025, reflecting the maturity and availability of regional products. The basic steps are:

1. Requesting drought monitoring data from regional drought monitors (see list in Annex 1) for May 2025. Requesting no specific product, but whatever the operating organization deemed most useful for that region on what is most appropriate from your perspective.
2. Integrating the Data in a global Map
3. Qualitative Reclassification of original scale into 4 drought classes (no drought, moderate drought, severe drought, and extreme drought)
4. Asking with Regional Drought monitor operators to review re-classification for the pilot makes sense

3. Qualitative Reclassification Methodology

Drought monitoring systems around the world rely on a wide range of indicators and methodologies. These include indices such as the Standardized Precipitation Index (SPI), the Standardized Precipitation Evapotranspiration Index (SPEI), the Combined Drought Index (CDI), soil moisture indicators, and others. In addition, drought indicators are often calculated at different time scales (e.g., SPI-3, SPI-6, or SPI-12), which reflect different aspects of drought conditions. As a result, drought products from different regions are not directly comparable.

Due to this diversity of indicators, methodologies, and temporal scales, a quantitative harmonization of existing drought monitors is currently not feasible. One alternative would be to request data providers to generate specific standardized products for the Global Drought Mosaic. However, such an approach would require additional resources from data providers and could ultimately resemble the development of a separate global drought monitoring product. Instead, the Global Drought Mosaic follows a pragmatic and lightweight approach based on qualitative harmonization of existing products.

The qualitative reclassification approach is based on two main steps:

1. Standardization to four drought classes

A review of existing drought monitors showed that the smallest number of drought classes commonly used across systems is four. Therefore, the Global Drought Mosaic adopts the following four standardized categories:

- 0 – No drought
- 1 – Moderate drought
- 2 – Severe drought
- 3 – Extreme drought

The reason to choose this number is because drought monitoring systems that use a greater number of classes can be reclassified into these four categories without major difficulties. However, systems with fewer categories cannot easily be subdivided into a larger number of classes without introducing additional assumptions. The four-class framework therefore represents a practical compromise that allows harmonization while preserving the integrity of the original products.

2. Qualitative interpretation of original legends

For each contributing drought monitor, the legend and class descriptions were reviewed and mapped to the standardized four-class system. For example, categories such as “extremely dry” or “exceptionally dry” in the original products are classified under the standardized category “3 – Extreme drought”, while categories ranging from “extremely wet” to “near normal” are classified as “0 – No drought”.

In cases where an original category lies conceptually between two standardized classes (for example, “slightly dry” between “0 – No drought” and “1 – Moderate drought”, the lower severity class is assigned to maintain a conservative interpretation and avoid overestimating drought intensity.

This qualitative reclassification approach allows the Global Drought Mosaic to integrate diverse regional and national drought monitoring products into a consistent global overview while maintaining the original information and interpretation provided by the respective monitoring systems.

4. Next planned steps

To ensure that the methodology is robust and to further refine the approach, several steps are envisaged to move towards the operationalization of the Global Drought Mosaic.

1. Technical review through WMO ET-Drought

The methodology will be reviewed by the WMO Expert Team on Drought (ET-Drought) to assess the soundness of the approach and identify potential improvements. This review is planned by the end of March.

2. Consultation with data providers

Regional drought monitoring providers will be invited to review the methodology, with particular attention to the proposed qualitative reclassification of their drought categories. Their feedback will help ensure that the harmonization remains consistent with the interpretation of the original monitoring products.

3. Agreement on data sharing arrangements

Discussions will be held with regional drought monitor operators to agree on the frequency, format, and mechanisms for sharing drought monitoring information for inclusion in the Global Drought Mosaic.

4. Operationalization of the map production process

A streamlined workflow will be developed for the regular production and updating of the harmonized global drought map, including procedures for data collection, reclassification, and map generation.

5. Potential extension to national drought monitors

In the longer term, the approach may be expanded to include national drought monitoring systems, where appropriate, to further enhance the coverage and detail of the Global Drought Mosaic.

Annex 1: List of included regional and national drought monitors

Nº	Name	Operator	Regional coverage	Drought Indicator	Number of classes	List of original classes and in bracket new class
1.	European Drought Observatory	Joint Research Centre of European Commission	Europe	Combined Drought Indicator	4	1. Watch (1) 2. Warning (2) 3. Alert (3) 4. No Drought (0)
2.	National Water and Basic Sanitation Agency (ANA)	Monitor de Secas	Brazil	Drought Monitor	6	1. Without Relative Drought (0) 2. Slight Drought (0) 3. Moderate Drought (1) 4. Severe Drought (2) 5. Extreme Drought (3) 6. Exceptional Drought (3)
3.	Aral Sea Basin	Green Central Asia, GIZ, GFS, Martin Luther University (MLU) Halle, Germany	Central Asia (ASB)	SPI	8	1. Extremely Wet (0) 2. Severely Wet (0) 3. Moderately Wet (0) 4. Near Normal (0) 5. Mildly Dry (0) 6. Moderately Dry (1) 7. Severely Dry (2) 8. Extremely Dry (3)
4.	North Australia Climate Program	The University of Southern Queensland (UniSQ), Bureau of Meteorology (BoM), the UK Met Office, State Departments of Agriculture in Queensland (DAF), Northern Territory (DITT), and Western Australia (DPIRD) and four Natural Resource Management groups.	Australia	Combined Drought Indicator	11	1. Exceptional Wet (0) 2. Extreme Wet (0) 3. Severe Wet (0) 4. Moderate Wet (0) 5. Slightly Wet (0) 6. Near Normal (0) 7. Slightly Dry (0) 8. Moderate Drought (1) 9. Severe Drought (2) 10. Extreme Drought (3) 11. Exceptional Drought (3)
5.	National climate centre	State Council, CMA	China	Global Drought and Flood Index	5	1. Extreme drought (3) 2. Severe drought (2) 3. Moderate drought (1) 4. Light drought (0) 5. No drought (0)
6.	CIIFEN	Regional Climate Center for Western South America	Western South America	Combined Drought Indicator	5	1. Sequía – Excepcional (3) 2. Sequía – Extrema (3) 3. Sequía – Severa (2) 4. Sequía – Moderada (1) 5. Anormalmente Seco (0)
7.	Drought Management Centre for Southeaster	Clim4Cast, Southeastern Europe Drought Centre	South-eastern Europe	2-monthly surface water balance percentiles	7	1. Exceptional (3) 2. Extreme (3) 3. Severe (2) 4. Significant 5. Moderate (1)

	n Europe (DMCSEE)					6.Minor (0) 7.No drought (0)
8.	North American Drought Monitor (NADM)	National Centers for Environmental Information	North America	Standardized Precipitation Index	6	1.Exceptional Drought (3) 2.Extreme Drought (3) 3.Severe Drought (2) 4.Moderate Drought (1) 5.Abnormally Dry (0) 6.None (0)
9.	The Caribbean Regional Climate Centre	Caribbean Institute for Meteorology & Hydrology (CIMH)	The Caribbean	Standardized Precipitation Index	11	1.Exceptionally wet (0) 2.Extremely wet (0) 3.Very wet (0) 4.Moderately wet (0) 5.Slightly wet (0) 6.Normal (0) 7.Slightly dry (0) 8.Moderately dry (1) 9.Severely dry (2) 10.Extremely dry (3) 11.Exceptionally dry (3)
10.	East Africa Drought Watch	IGAD Climate Prediction & Applications Centre (ICPAC)	Eastern Africa	Combined drought Indicator	5	1.Alert – Vegetation Stress (3) 2.Warning – Soil Moisture Deficit (2) 3.Watch – Rainfall Deficit (1) 4.No Drought Conditions (0) 5.No Data
11.	Africa Centre of Metrological Applications for Development	Africa Centre of Metrological Applications for Development (ACMAD)	Africa	COMBINED DROUGHT INDICATOR (CDI)	4	1.Alert: Vegetation stress following rainfall/ soil moisture deficit (3) 2.Warning: Soil moisture deficit (2) 3.Watch: Rainfall deficit (1) 4.No Drought Conditions (0)
12.	Climate Monitoring in Southeast Asia	Philippine Atmospheric, Geophysical And Astronomical Services Administration	South East Asia	SPI-3 (CMORPH-based)	9	1.Exceptionally Wet (0) 2.Extremely Wet (0) 3.Very Wet (0) 4.Moderately Wet (0) 5.Near Normal (0) 6.Moderately Dry (1) 7.Severely Dry (2) 8.Extremely Dry (3) 9.Exceptionally Dry (3)
13.	SADC Climate Services Centre	ClimSA, Southern African Development Community Climate Services Centre	Southern Africa	Standardized Precipitation Index (SPI-3)	7	1.extremely wet (0) 2.very wet (0) 3.moderately wet (0) 4.near normal (0) 5.moderately dry (1) 6.very dry (2) 7.extremely dry
14.	SISTEMA DE INFORMACIÓN SOBRE	Regional Climate Centre for Southern South America.	South America	SPEI-3	8	1.Extremadamente húmedo (0)

	SEQUÍAS PARA EL SUR DE SUDAMÉRICA					2.Severamente húmedo (0) 3.Moderadamente húmedo (0) 4.Normal (0) 5.Sequía moderada (1) 6.Sequía severa (2) 7.Sequía extrema (3) 8.Sin datos en este periodo
15.	Crop Monitoring and Early Warning in North-Africa	Saraha and Sahel Observatory	Northern Africa	SPI-3	8	1.Extremely Wet (0) 2.Severely Wet (0) 3.Moderately Wet (0) 4.Near Normal (0) 5.Mildly Dry (0) 6.Moderately Dry (1) 7.Severely Dry (2) 8.Extremely Dry (3)
16.	Alpine Drought Observatory	EURAC Research with Slovenian Environment Agency & Central Institution for Meteorology and Geodynamics	Alpine Region	SPEI-6	7	1.Extremely wet 2.Very wet 3.Moderately wet 4.Normal 5.Moderately dry 6.Very dry 7.Extremely dry
17.	Island Climate Update	Climate, Freshwater and Marine Science	NIWA	Standardized Precipitation Index (SPI)	7	1.Extremely wet 2.Severely wet 3.Moderately wet 4.Near normal 5.Moderately dry 6.Severely dry 7.Extremely dry

Note: Should you notice a monitor missing or see any error, please do not hesitate to contact us at droughtmanagement@wmo.int