

**VERIFICATION of the SEECOF-30 WINTER 2023/2024**  
**CLIMATE OUTLOOK FOR GREECE**

DIVISION of CLIMATOLOGY – APPLICATIONS  
HELLENIC NATIONAL METEOROLOGICAL SERVICE (HNMS)

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## Introduction

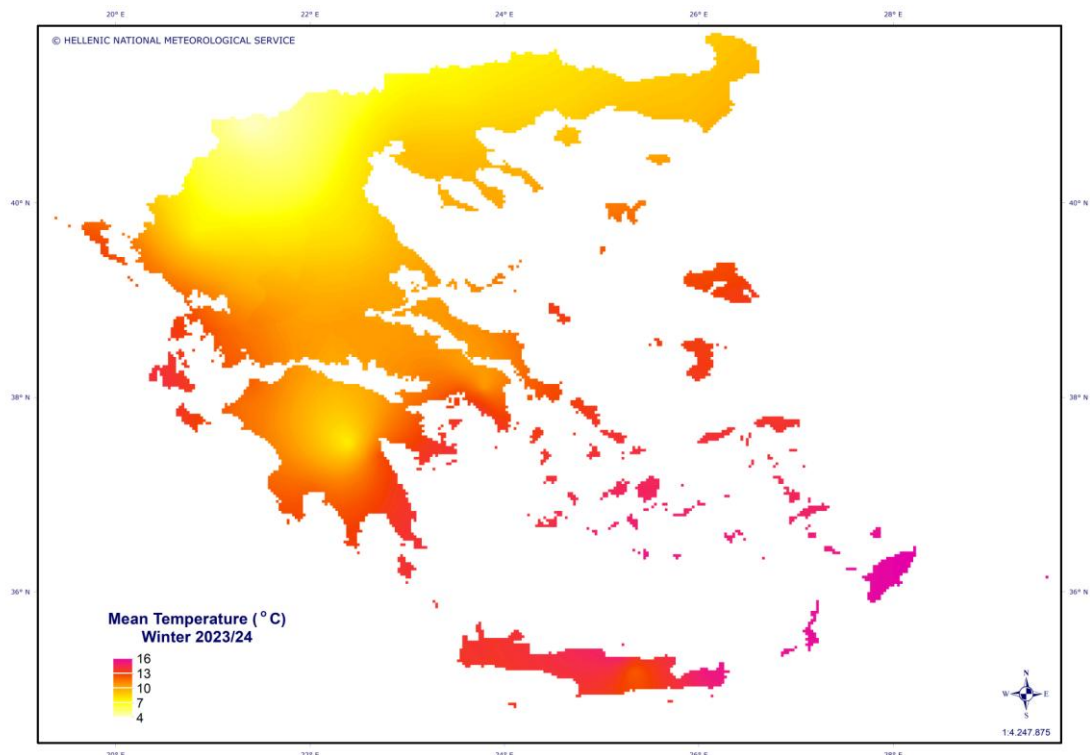
This report consists of two parts. In part A, an analysis of the observed mean temperature for Winter 2023/24 as well as an assessment - verification of SEECOF-30 temperature outlook for Winter 2023/24 was performed. The reference period for comparison/ verification was the base period of 1981-2010.

In part B, an analysis of the observed precipitation for Winter 2023/24 as well as an assessment - verification of SEECOF-30 precipitation outlook for Winter 2023/24 was performed. The reference period for comparison/verification was the base period of 1981-2010.

## Part A

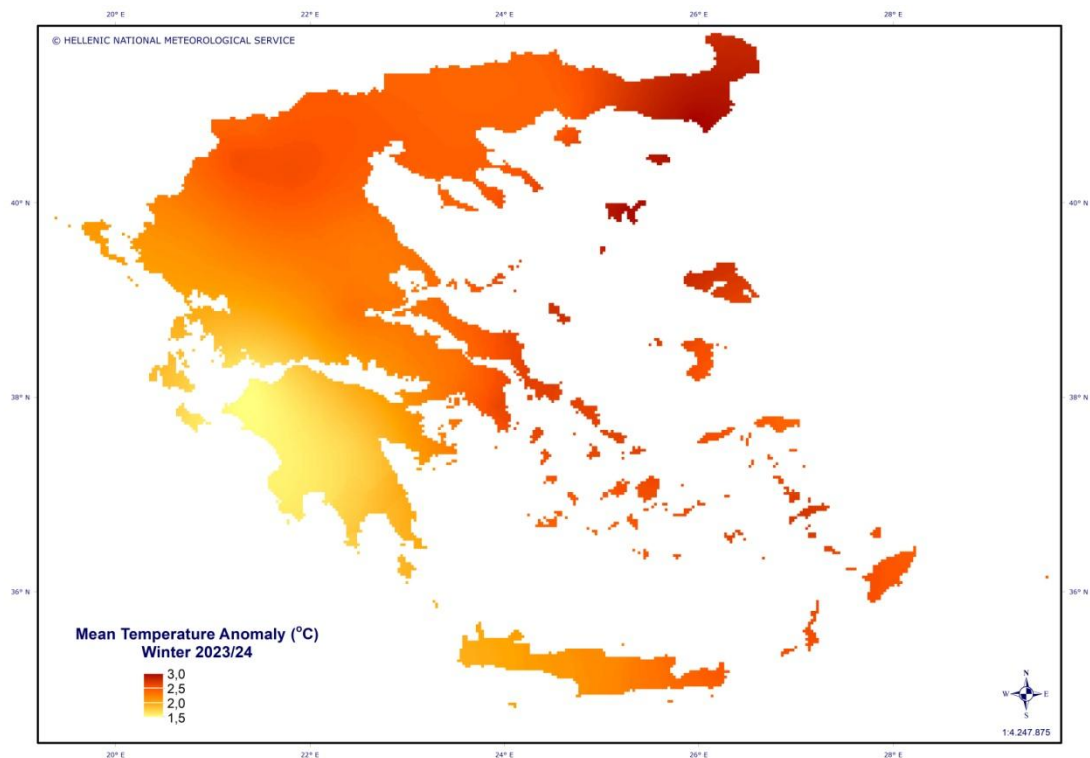
### 1. Temperature: Seasonal analysis of the Winter 2023/24 air temperatures anomalies in Greece

Winter 2023/24 was the warmest winter since 1960. The mean temperature in winter ranged from 4 to 16 °C. The greatest temperature values were recorded over Dodecanese islands and Crete (Figure 1). The average temperature was 2.3°C higher than the 1981-2010 normal value and 0.2°C higher than the previous warmest winter of 2020/21.



**Figure 1.** Mean temperature (°C) in Winter 2023/24

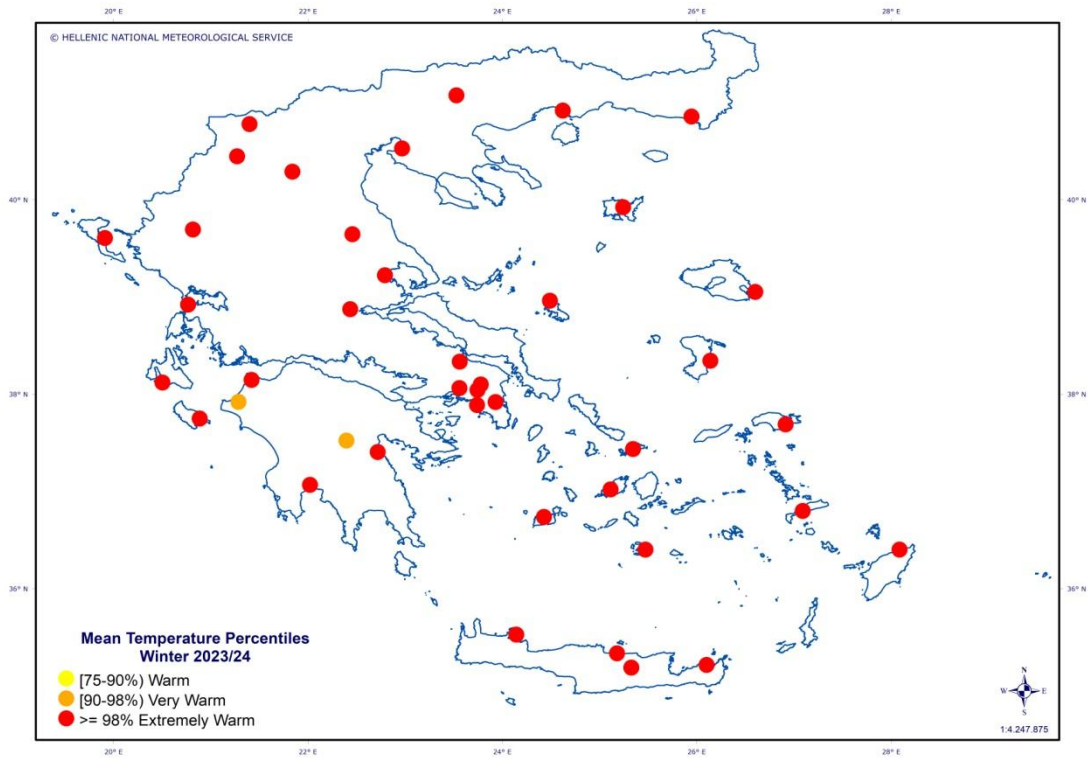
Mean winter temperature over northeastern Greece (the regions of eastern Macedonia-Thrace and the islands of the northern Aegean) were even 3 °C above 1981-2010 normal values (Figure 2).



**Figure 2.** Mean temperature anomalies (°C) for Winter 2023/24 in Greece according to the 1981-2010 climatology.

In order to quantify the observed seasonal temperatures in winter 2023/24 in terms of cold, warm and normal, the percentile method was applied. The percentiles were calculated for each station and are based on homogenized mean temperature series for the period 1960-2010.

According to percentile ranks (Figure 3), all stations (100% of the examined stations) experienced extremely warm or very warm conditions.

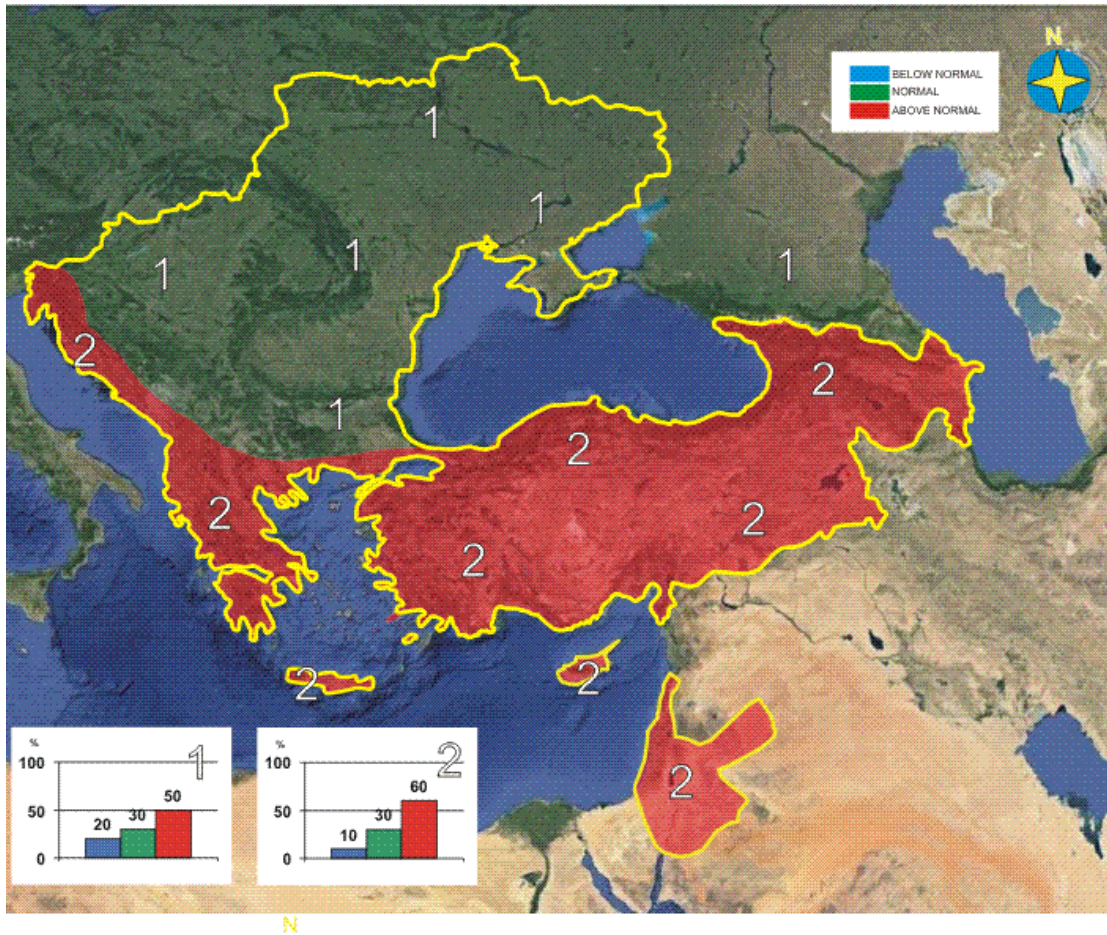


**Figure 3.** Mean temperature percentiles for Winter 2023/24.

## 2. Verification of the SEECOF-30 Winter 2023/24 temperature outlook for Greece

The consensus statement of SEECOF-30 Winter 2023/24 temperature outlook mentioned that winter temperature was likely to be near or above-normal in most of the SEECOF region (zone 1 in Figure 6) and above-normal in Jordan, Israel, southern parts of Turkey, along the coasts of the Ionian, Aegean, Central and Eastern Mediterranean Seas with belonging hinterland (zone 2 in Figure 6).

The distribution probabilities for temperature in most parts of Greece were 10% below normal, 30% around normal and 60% above normal (zone 1), while in the northern Greece were 20% below normal, 30% around normal and 50% above normal (zone 2) (Figure 6).



**Figure 6.** Graphical presentation of the 2023/24 winter temperature outlook.

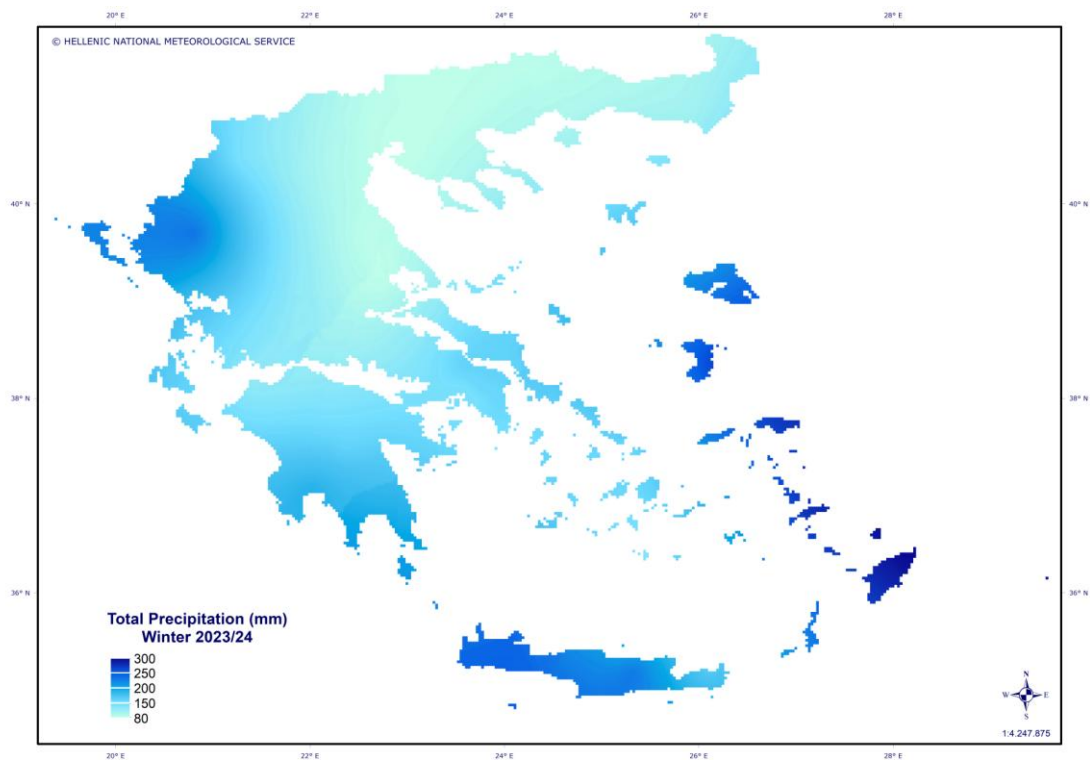
Verifying the SEECOF’s temperature outlook: the SEECOF’s prediction is successful since winter temperatures in the whole Greek territory were above normal values.



## Part B

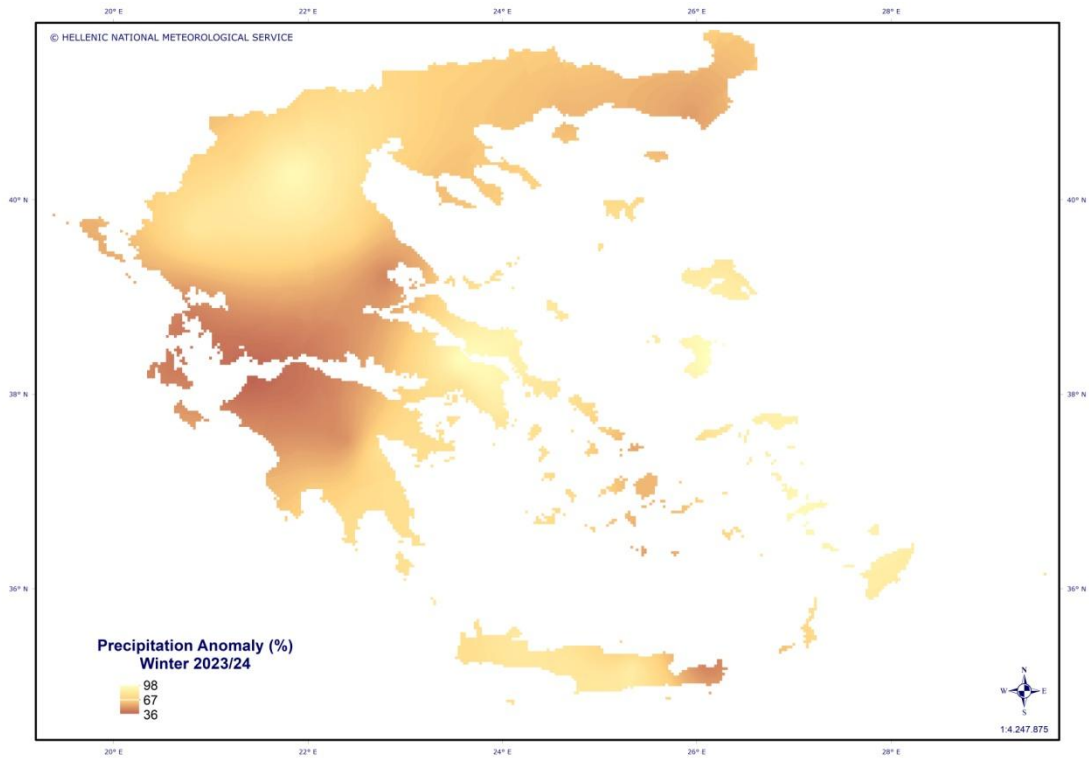
### 1. Precipitation : Seasonal analysis of the Winter 2023/24 precipitation anomalies in Greece

Winter precipitation totals ranged from 80 mm up to 320 mm. The lower rainfall heights were recorded in north-central mainland, while the higher ones in Dodecanese and the north Ionian islands (Figure 7).

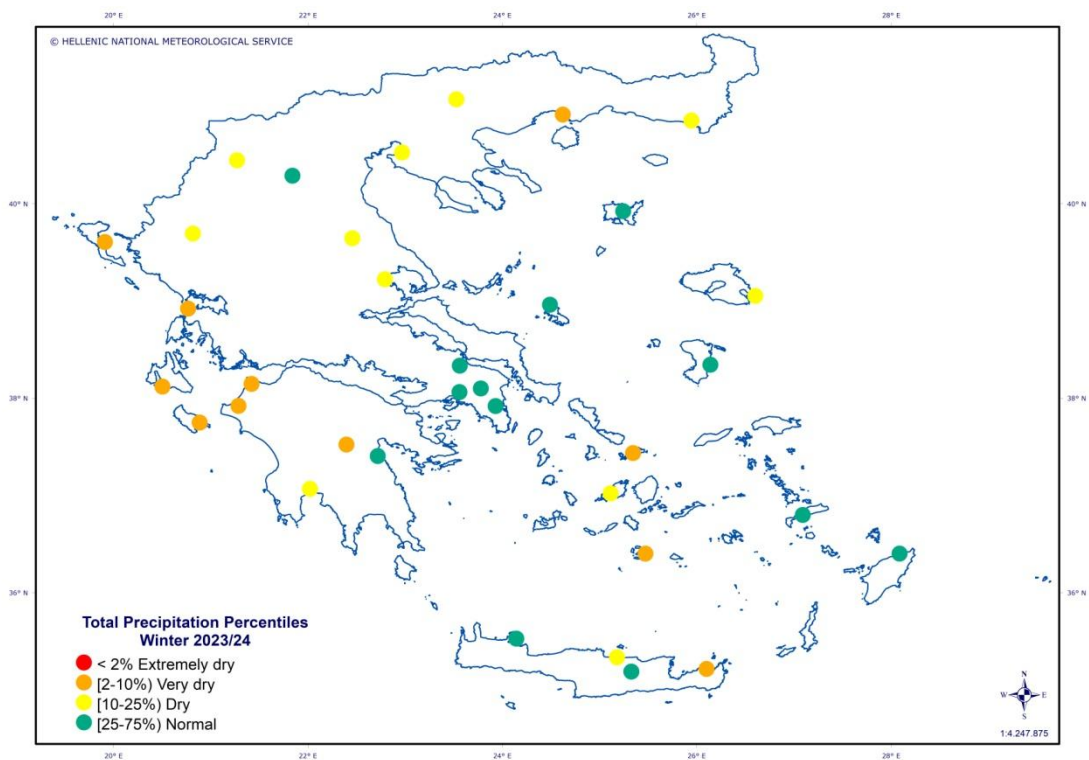


**Figure 7.** Spatial distribution of Winter 2023/24 precipitation totals expressed in mm.

Winter 2023/24 precipitation ratios to the normal values (1981-2010) (the normal values are based on homogenized data series) were computed and are given in percentages in Figure 8. The analysis showed that winter 2023/24 was drier than normal in most of the country. Total winter precipitation accounted for less than 60% of 1981-2010 normal value in Ionian islands and west coastal areas, north Peloponnese, southeast Crete and Cyclades islands and a few parts over central mainland and east Macedonia and Thrace. Near to normal conditions prevailed in the Attica region, eastern Aegean islands and in a few scattered places in northern Greece.



**Figure 8.** Winter 2023/24 precipitation anomalies (compared to 1981-2010 climatology) given in percentages.

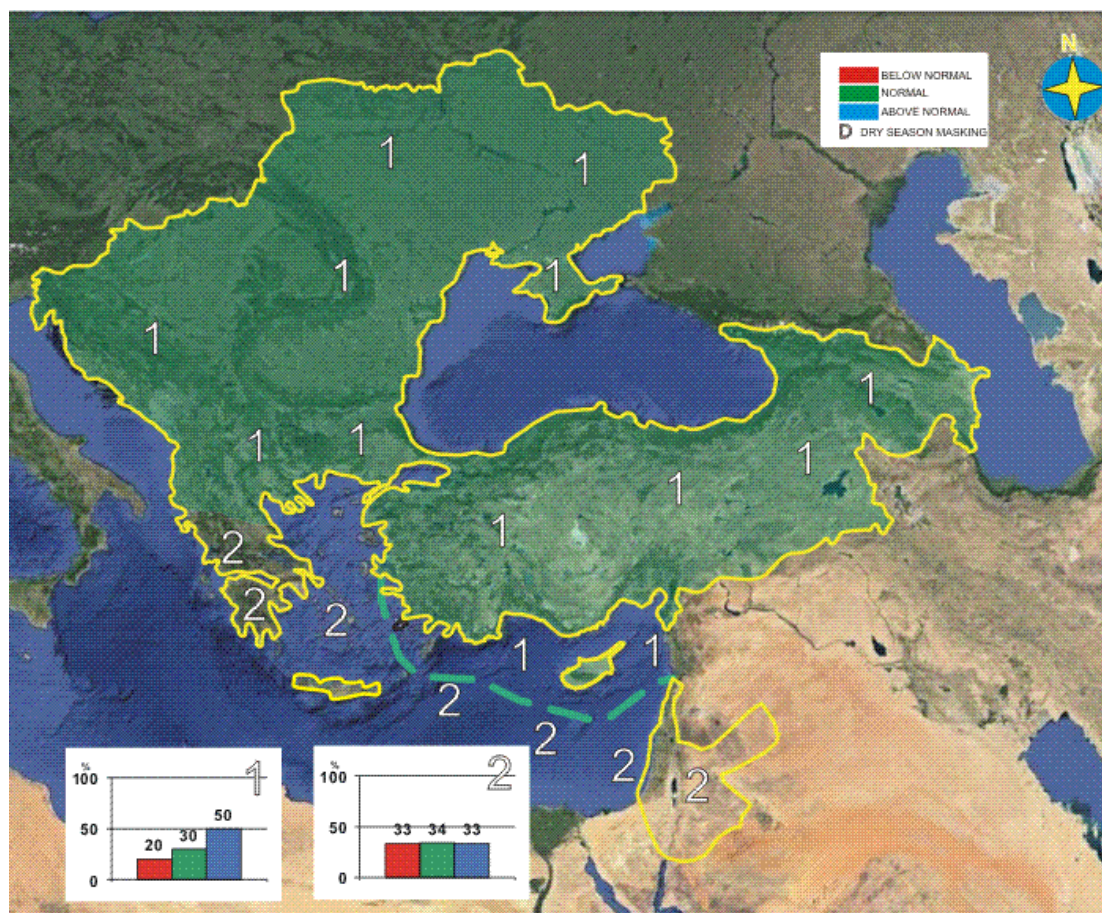


**Figure 9.** Precipitation percentiles for Winter 2023/24.

In order to quantify the observed precipitation height in terms of wet, dry and normal the percentile method was applied. The percentiles were calculated for each station and are based on homogenized precipitation series for the period 1960-2010. According to percentile ranks 31,4 % of the examined stations experienced very dry conditions, 31,4 % experienced dry conditions and 37,2 % had normal conditions (most of them located in the east and south Greece) (Figure 9).

## 2. Verification of the SEECOF-30 Winter 2023/24 precipitation outlook for Greece

The consensus statement of SEECOF-30 Winter 2023/24 precipitation outlook mentioned that winter precipitation totals are likely to be above-normal, while in the south of Greece, Turkey, Israel, Jordan, along the coasts of Ionian, southern coasts of the Aegean, southern and eastern coasts of the Black Sea (zone 2 in Figure 2) the uncertainty is high: probabilities for below, near- or above-average conditions are approximately equal.



**Figure 11.** Graphical presentation of the 2023/24 winter precipitation outlook.



Verifying the SEECOF-30 Winter 2023/24 precipitation outlook: the SEECOF's prediction was not successful since the area of Greece did not experience above normal conditions.

**Table 1. Seasonal mean temperature and precipitation sums – Ranks**

Winter 2023/24		Seasonal mean temperature (°C)					Seasonal precipitation sums (mm)			
Station	Rank *	33%	50%	67%	Observed value	Rank **	33%	50%	67%	Observed value
Thessaloniki	3	6.1	6.7	7.5	9.2	50	93	112	140	83
Eleusis	1	9.6	10.2	10.6	12.4	48	126	164	187	103
Souda	1	11.4	11.8	12.0	13.6	46	292	348	383	269
Zakynthos	2	11.0	11.3	11.6	12.7	59	357	403	453	167

\*Rank – 1960/61-2023/24 period (warmest season)

\*\*Rank – 1960/61-2023/24 period (highest seasonal precipitation)

**Table 2. Brief assessment of SEECOF-30 climate outlook**

Seasonal temperature		Seasonal precipitation		High Impact Events *
Observed	SEECOF-30 climate outlook for temperature	Observed	SEECOF-30 climate outlook for precipitation	
Above normal	Above normal	Below normal mainly in west, central and north parts. Near-to-normal in Attica region and eastern Aegean islands	Above normal in the central and south parts of Greece	

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