

**VERIFICATION of the SEECOF-26 WINTER 2021/2022**  
**CLIMATE OUTLOOK FOR GREECE**

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## Introduction

This report consists of two parts. In part A, an analysis of the observed mean temperature for Winter 2021/22 as well as an assessment - verification of SEECOF-26 temperature outlook for Winter 2021/22 were performed, first on monthly basis and then for the whole Winter 2021/22 season. The reference period for comparison/verification was the base period of 1971-2000.

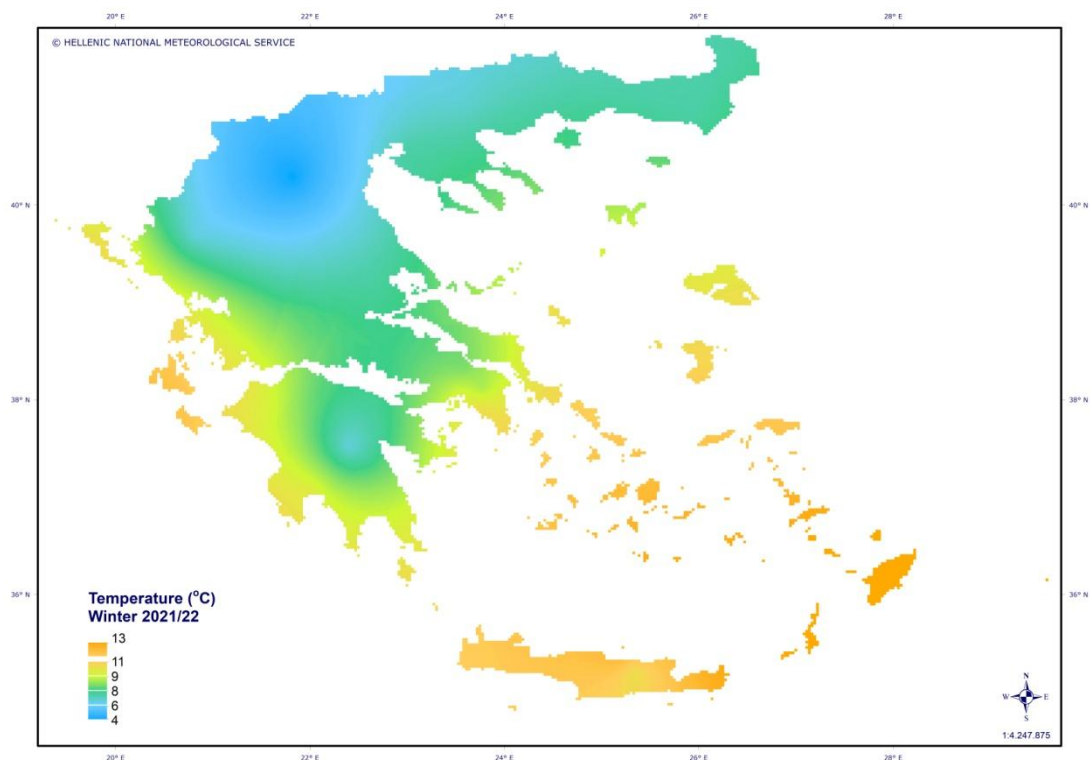
In part B, an analysis of the observed precipitation for Winter 2021/22 as well as an assessment - verification of SEECOF-26 precipitation outlook for Winter 2021/22 were performed, first on monthly basis and then for the whole Winter 2021/22 season. The reference period for comparison/verification was the base period of 1971-2000.

## Part A

### 1. Temperature

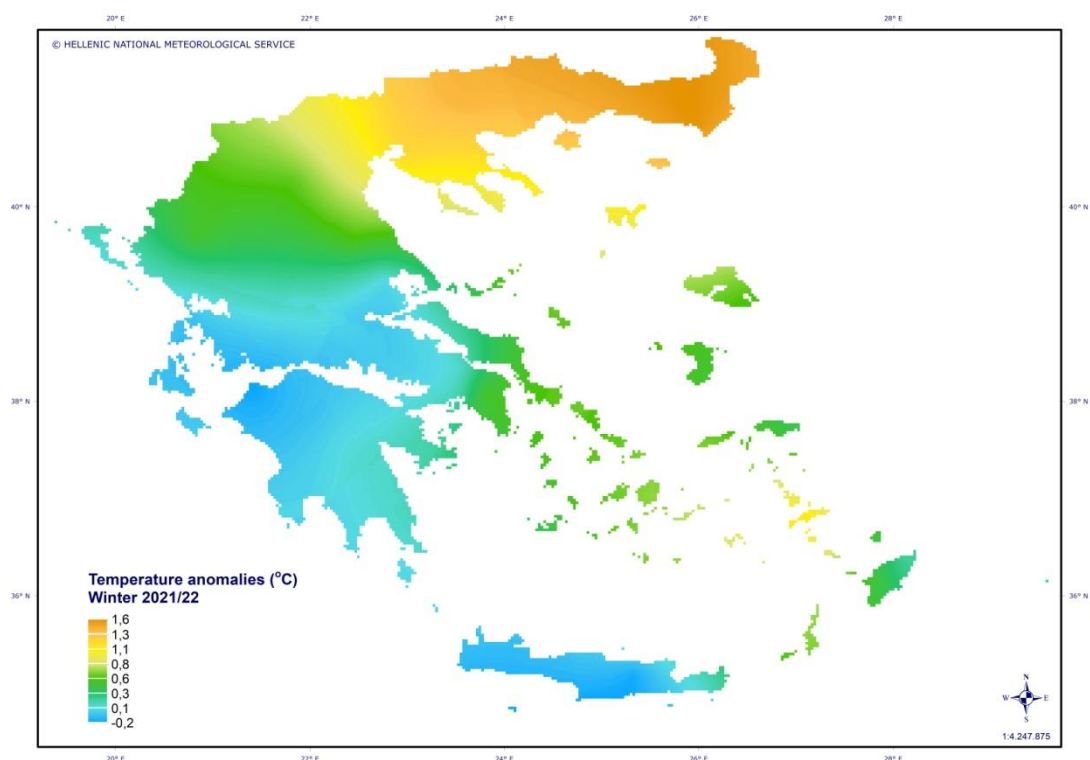
#### 1.1. Seasonal analysis of the Winter 2021/22 air temperatures anomalies in Greece

The seasonal air temperature in winter ranged from +4 °C to +13 °C. The greatest mean temperature values were recorded over southeast areas (east Crete, Dodecanese islands) and the lowest ones over northwest mainland (Figure 1).



**Figure 1.** Mean temperature (°C) in Winter 2021/22

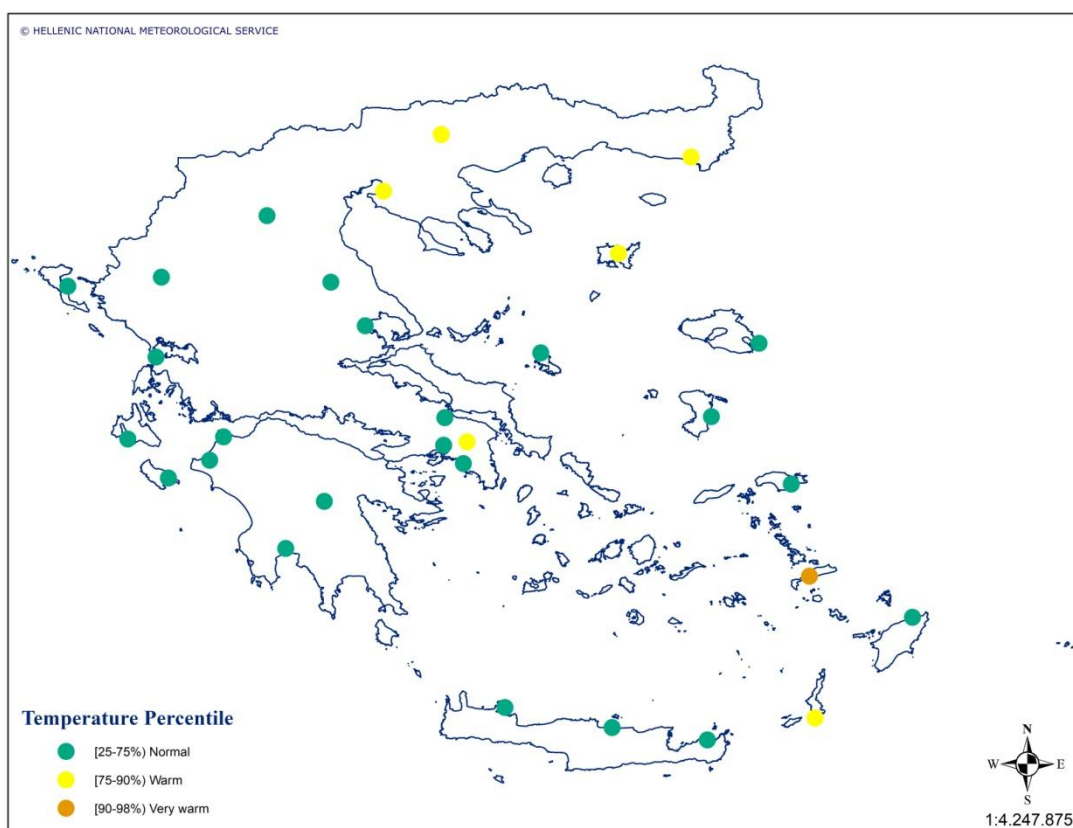
Temperature in winter 2021/22 in Greece was near or slightly below normal values over central and south parts. Temperatures of 1.0-1.5 °C above 1971-2000 normal values occurred only over northeastern areas (Figure 2).



**Figure 2.** Mean temperature anomalies (°C) for Winter 2021/22 in Greece according to the 1971-2000 climatology.

In order to quantify the observed seasonal temperatures in winter 2021/22 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 1960-2004.

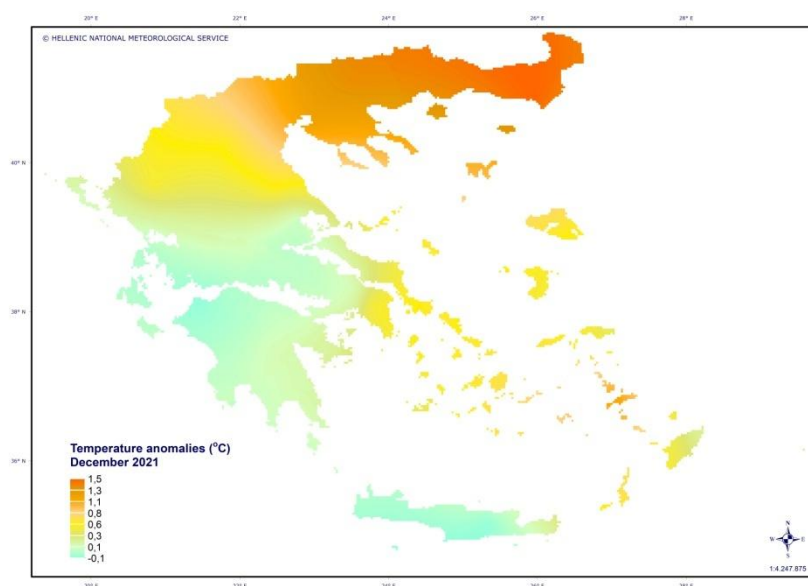
According to percentile ranks (Figure 3), the majority of stations presented normal conditions, six stations - mainly over the northeast areas - experienced warm conditions and only one station in Dodecanese islands experienced very warm ones.



**Figure 3.** Mean temperature percentiles for Winter 2021/22.

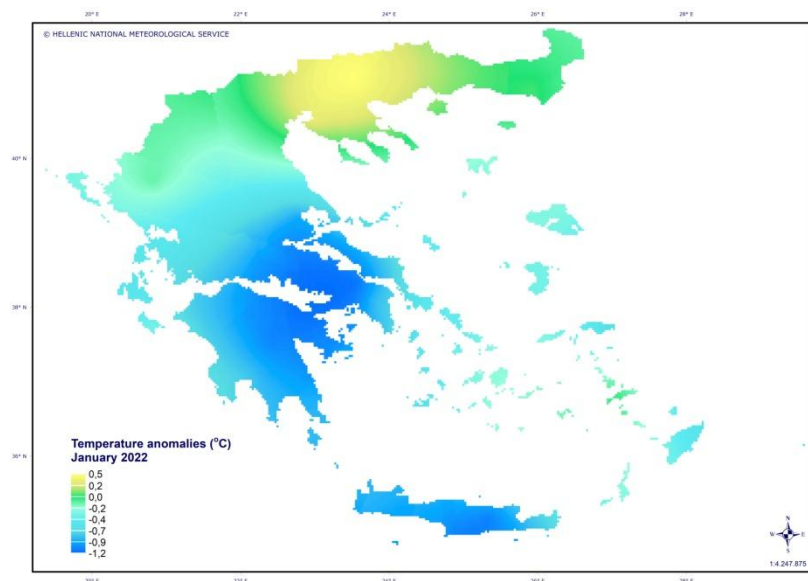
### 1.2. Monthly analysis of the air temperatures anomalies in Greece

In **December 2021**, mean temperatures were near to normal values for most of Greece and only across northeast areas the anomalies were of at least 1.0 °C above 1971-2000 average (Figure 4).



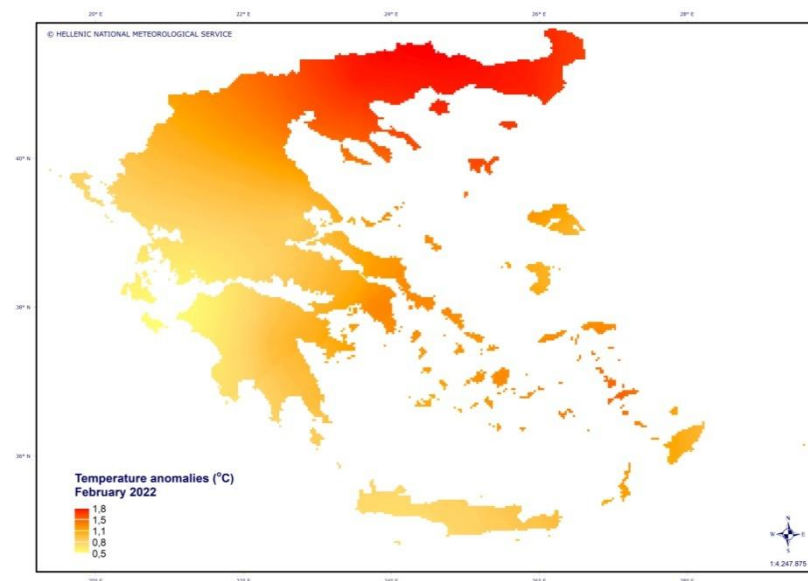
**Figure 4.** Mean temperature anomalies (°C) in December 2021 according to the 1971-2000 climatology.

Temperature anomalies in **January 2022** were near or below 1971-2000 normal



values for most of Greece, and only over north Greece, mainly central Macedonia, were slightly above normal values. (Figure 5).

Temperatures in **February 2022** were above the 1971-2000 average over the whole country. The mean temperature departures from normal values ranged from 0.5 °C to

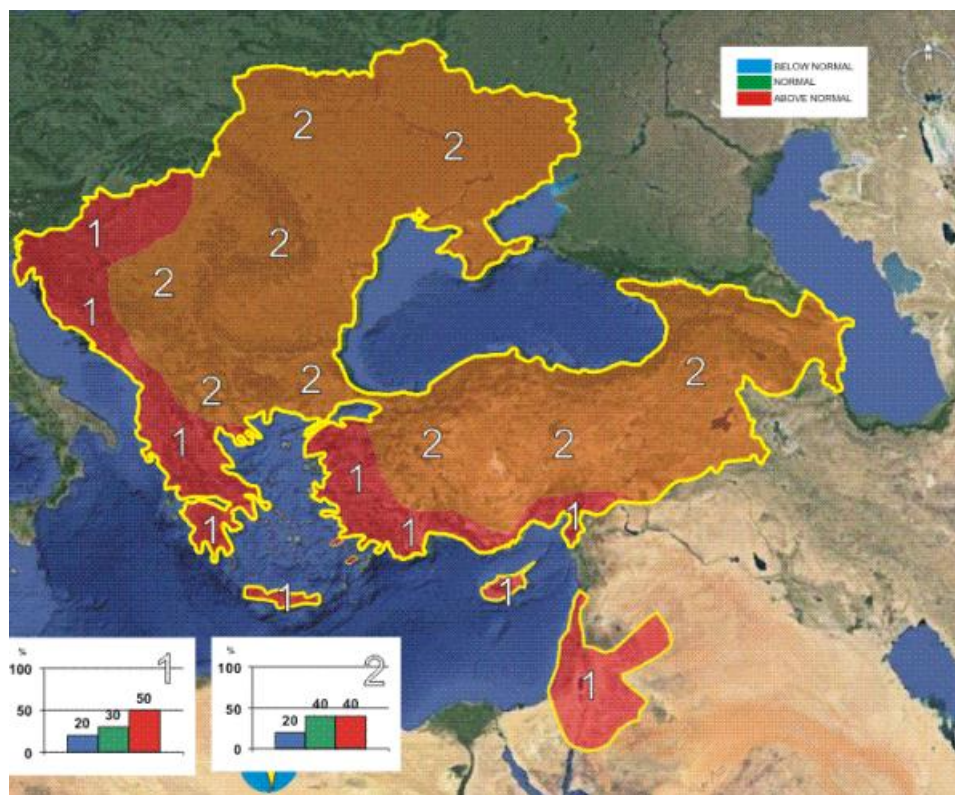


1.8 °C and the greatest positive anomalies were recorded in the northeastern mainland.

**Figure 5.** Mean temperature anomalies (°C) in January (above) and February 2022 (bottom) according to the 1971-2000 climatology.

### 1.3. Verification of the SEECOF-26 Winter 2021/22 temperature outlook for Greece

The consensus statement of SEECOF-26 Winter 2021/22 temperature outlook mentioned that winter temperature was likely to be near or above normal in most of the SEECOF region (zone 2 in Figure 6), whereas Pannonia Plain, western Balkans, western parts of Turkey, Israel, Jordan, along the coasts of the Adriatic, Ionian, Aegean and Mediterranean Seas with belonging hinterland are forecasted to observe above-normal winter temperature (zone 1 in Figure 6). The distribution probabilities for temperature in most of Greece were 20% below normal, 30% around normal and 50% above normal (zone 1), while in the rest of Greece (central and northeast Macedonia and Thrace), were 20% below normal, 40% around normal and 40% above normal (zone 2) (Figure 6).



**Figure 6.** Graphical presentation of the 2021/22 winter temperature outlook.

Verifying the SEECOF's temperature outlook (although this is relative to the 1981-2010 normal values): the SEECOF's prediction cannot be considered successful, since winter temperatures in Greece were near or slightly below normal values in most of Greece and only over central and east Macedonia and Thrace were above normal values.

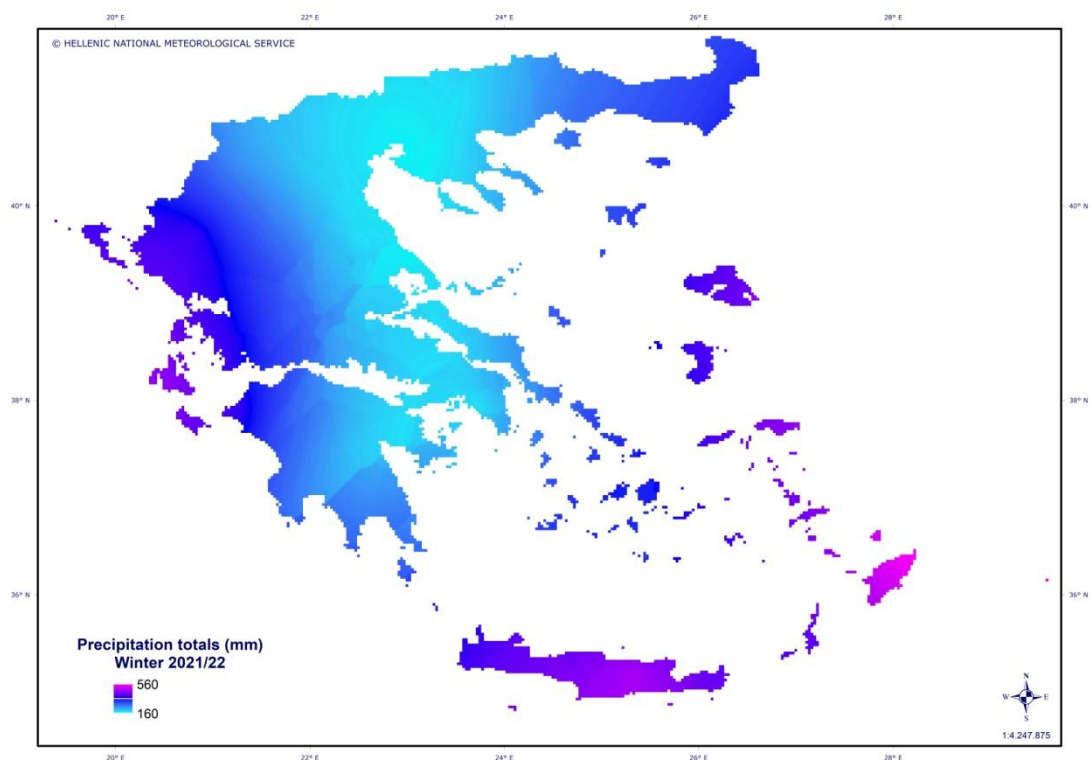


## Part B

### 2. Precipitation

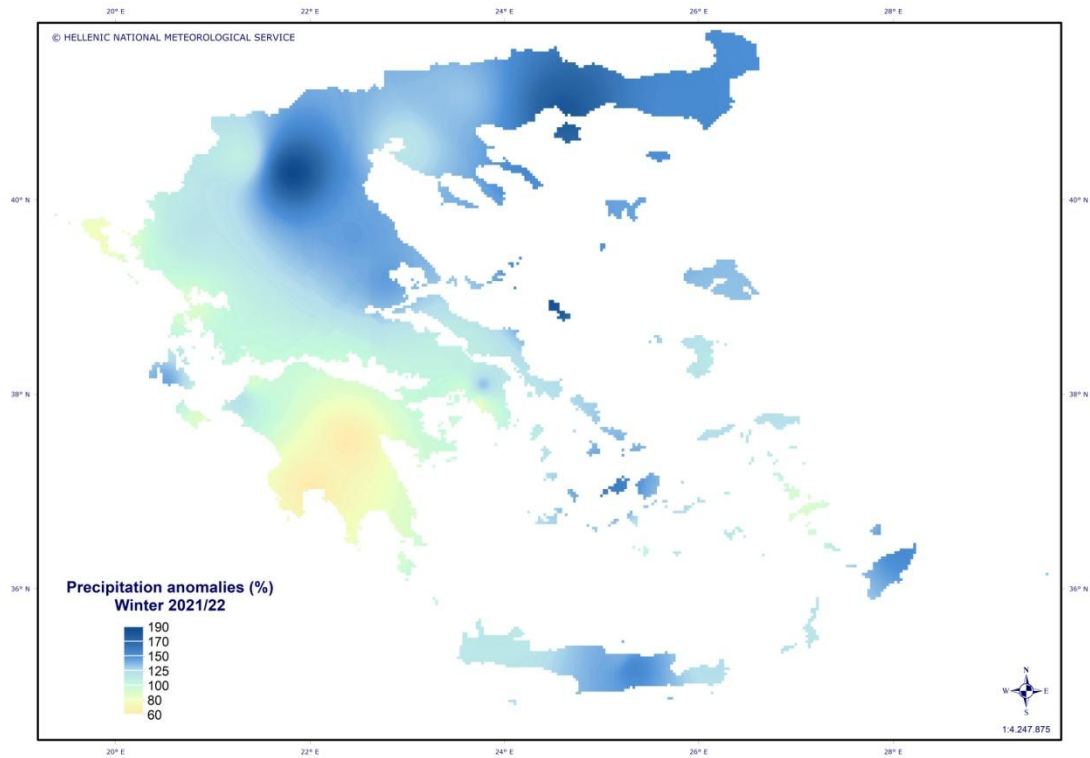
#### 2.1. Seasonal analysis of the Winter 2021/22 precipitation anomalies in Greece

Winter precipitation totals ranged from 160 mm up to above 560 mm. The lower rainfall heights were recorded in east-central mainland, while the higher ones in the southeast parts of the country (Figure 7).



**Figure 7.** Spatial distribution of Winter 2021/22 precipitation totals expressed in mm.

The winter 2021/22 precipitation ratios to the normal values (1971-2000) (the normal values are based on homogenized data series) were computed and are given in percentages in Figure 8. The analysis showed that in winter 2021/22 precipitation was near or above average over most of Greece. Drier-than-average conditions in terms of precipitation were dominating only in few regions, mainly in Peloponnese. The winter 2021/22 precipitation anomalies ranged from 60% to 190 %.

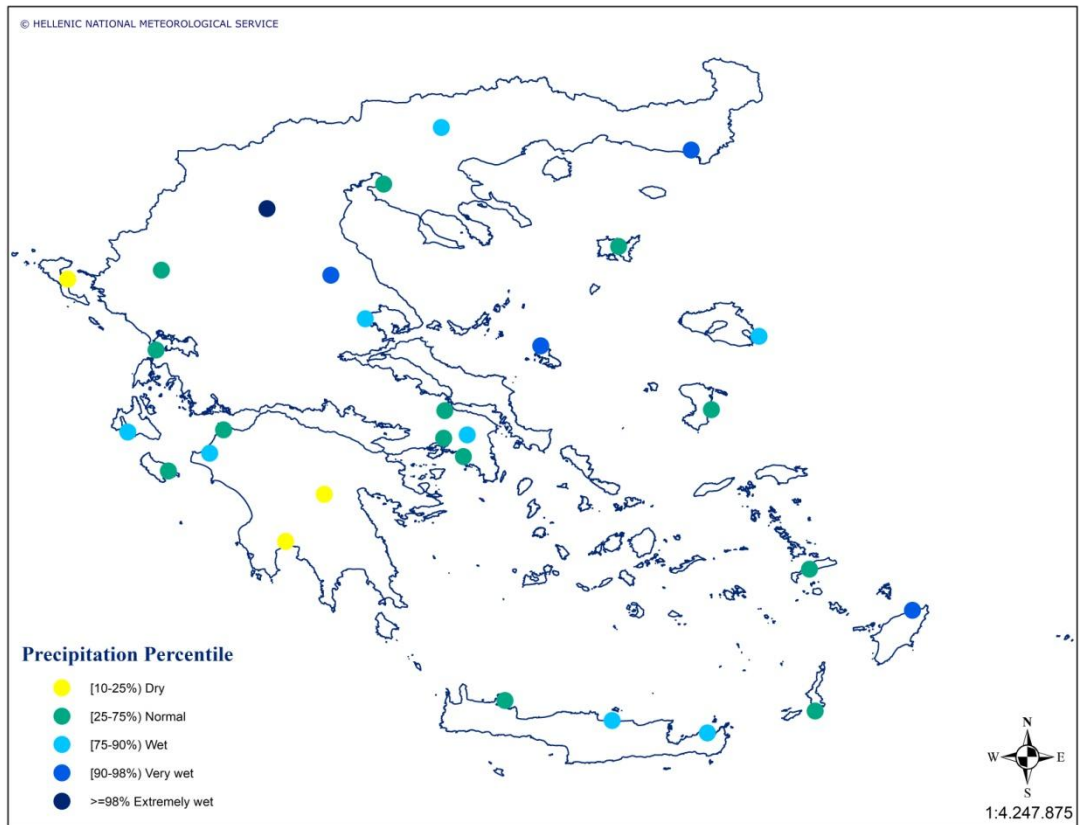


**Figure 8.** Winter 2021/22 precipitation anomalies (compared to 1971-2000 climatology) given in percentages.

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 1970-2004. According to percentile ranks (Figure 9) accumulated precipitation for winter 2021/22 has been described by the following categories in the whole country:

- Dry conditions were found only in 3 stations (10 % of the examined stations).
- Normal conditions prevailed in 13 stations (45 % of the examined stations).
- Wet conditions were found in 8 stations (28 % of the examined stations).
- Very wet were observed in 5 stations mainly (17 % of the examined stations).

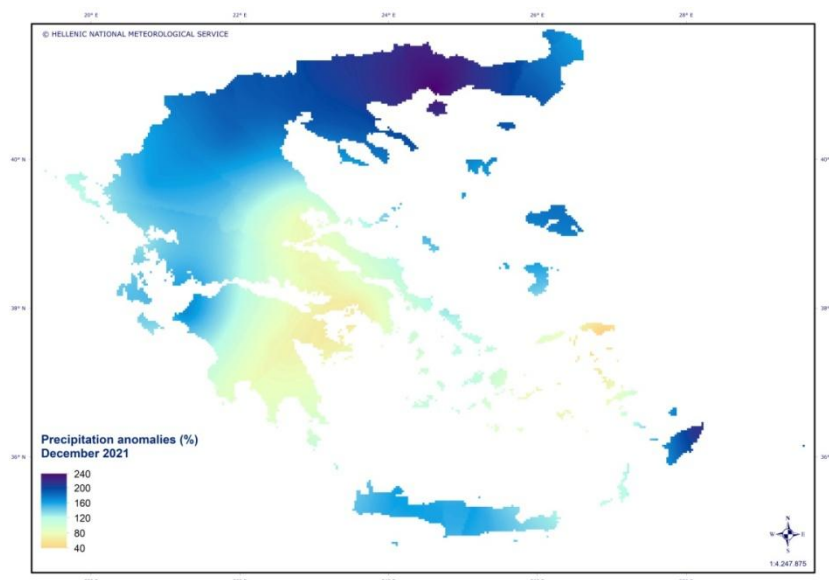




**Figure 9.** Precipitation percentiles for Winter 2021/22.

## 2.2. Monthly analysis of precipitation anomalies in Greece

**December 2021** in terms of precipitation, was wetter than 1971-2000 average over most of Greece. The greatest anomalies of at least 1.5 times the normal values are found over north and west Greece, Crete and few east Aegean islands. In contrast, drier than average conditions established in some regions: parts of east-southeast mainland.



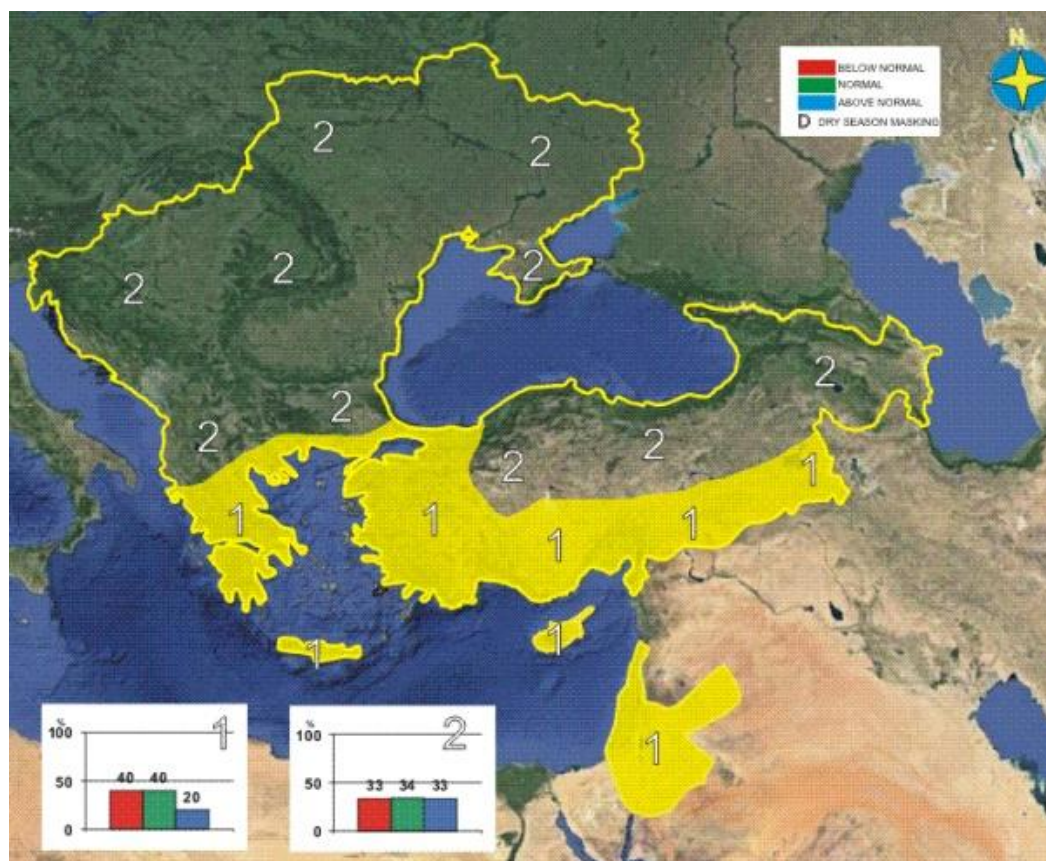
**Figure 10.**  
Precipitation anomalies (%) in December 2020 according to the 1971-2000 climatology.

In **January 2022** most of the north and west Greek areas experienced drier than normal conditions in terms of precipitation, while wetter than normal conditions dominated in much of the east-central mainland, including Attica region and Aegean islands.

In **February 2022** precipitation was below or near 1971-2000 normal values in most parts of Greece. Conversely, precipitation was well above average over northeast parts and Crete.

## 2.3. Verification of the SEECOF-26 Winter 2021/22 precipitation outlook for Greece

The consensus statement of SEECOF-26 Winter 2021/2022 precipitation outlook mentioned that winter precipitation totals are likely to be below - or near-normal in Greece (40% below normal, 40% around normal and 20% above-normal), southern and western parts of Turkey, Israel and Jordan, along the coasts of Ionian, southern coasts of the Aegean Sea and Eastern Mediterranean (zone 1 in Figure 11), while in rest of the SEECOF region (zone 2 in Figure 11) uncertainty is high: probabilities for below, near- or above-average conditions are approximately equal.



**Figure 11.** Graphical presentation of the 2021/22 winter precipitation outlook.

Verifying the SEECOF-26 Winter 2020/2021 precipitation outlook (although this is relative to the 1981-2010 normal values): the SEECOF's prediction cannot be considered successful since near or above normal conditions dominated in most of Greece and only few regions, mainly Peloponnese experienced drier than normal conditions.

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

Winter 2021/22		Seasonal mean temperature (°C)					Seasonal precipitation sums (mm)			
Station	Rank*	33%	50%	66%	Observed value	Rank**	33%	50%	66%	Observed value
Thessaloniki	5	5.7	6.0	6.8	7.5	8	90.8	116.1	136.8	141
Helliniko	5	10.3	10.8	11.0	11.2	20	121.9	151.6	177.1	127
Souda	12	11.3	11.5	11.8	11.3	10	274.2	341.6	372.2	381
Zakynthos	9	10.9	11.2	11.5	11.1	19	323.1	378.5	406.1	330

\* Rank – 1971-2000 period (warmest season)

\*\* Rank – 1971-2000 period (highest seasonal precipitation)

**Table 2. Brief assessment of SEECOF-26 climate outlook**

Seasonal temperature		Seasonal precipitation		High Impact Events *
Observed	SEECOF-26 climate outlook for temperature	Observed	SEECOF-26 climate outlook for precipitation	
Near or slightly below normal values; Above normal only in central and east Macedonia and Thrace	Above-normal in most of Greece and near normal only in central and northeast Macedonia and Thrace	Above or near normal conditions dominated in most of Greece and only few regions, mainly Peloponnese experienced drier than normal conditions	below - or near-normal (40% below normal, 40% around normal and 20% above-normal)	From 22 to 25 February 2025 a severe weather system named ELPIS hit eastern parts of Greece and brought heavy snowfall and snowsquall across Aegean islands, Evia and Attiki. Heavy snowfall disrupted most transportation in Attiki, schools were closed, public services were suspended and thousands of households were left without electricity due to downed trees.

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