



Synoptic analysis and comparison of two cold events in Greece: The cold spells in January 2017 and in January 2019

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In recent years, southeastern Europe and particularly the Balkan Peninsula during winter months appears to be often affected by cold extremes. In addition to disruptions in societal activities and economic impacts, such events pose significant risks to society as they are associated with excess mortality. In January 2017 an exceptionally cold episode occurred in eastern and southeastern Europe and many areas reached record low temperatures. Greece experienced exceptional snowfalls and freezing temperatures. Specifically, in areas of the Greek territory where this research is carried out, many sites revealed frost spells and in some cases sequences of “ice days”. Similarly extreme temperatures were recorded in January 2019, when snowfalls occurred even in coastal parts of the country. This study investigates the extreme intrusion of cold air in the Greek region during January 2017 and January 2019. We determine the synoptic conditions in which the two severe events were occurred and study the effects on the weather conditions at individual sites of the country. Daily temperature and precipitation data were analysed for the two periods of study and compared to their 40-year (1961-2000) averages. Subsequently, a series of circulation maps at 500hPa was produced to visualize the prevailing atmospheric circulation that caused the movement of continental arctic air masses towards southern Europe.