



Significant tornado and strong waterspout climatology of Greece

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Tornadoes and strong waterspouts are extreme weather events, associated with deep convection and severe thunderstorm activity, representing extremely dangerous phenomena. Significant tornadoes are defined those of an F2/EF2 of the Fujita/Enhanced Fujita tornado intensity scale or T4 of the TORRO scale or greater. Strong waterspouts are considered those associated with severe thunderstorms occasionally moving to land becoming damaging tornadoes equivalent of an EF2 intensity or greater.

A total of about 55 significant tornado and strong waterspout events have been recorded in the last 19 years, a period of systematic tornado recording and developing of the Greek tornado database (2000-18). In this study, an analysis of climatological features of significant tornado and strong waterspouts of Greece is presented, in term of spatiotemporal patterns of frequency of occurrence and intensity levels. The annual cycle of significant tornado and strong tornado occurrence is different for the various parts of Greece, with northern Greece appearing maximum during summer and southern Greece during winter and vice versa. Western Greece exhibits a longer seasonality in significant tornado and strong waterspout occurrence, lasting from autumn up to spring.

Considering significant tornado and strong waterspout days, the maximum is located in Iliia prefecture in northwest Peloponnese, followed by Kerkyra island in the northern Ionian Sea and then Rhodes in the south-eastern Aegean Sea. Considering strong waterspout occurrence, the maximum activity was located north off shore of Crete in the southern Aegean sea with western Greece followed as indicating also high frequency.

A principal component analysis (PCA) was applied on significant tornado and strong waterspout frequency distributions for the various regions of Greece. The results indicated the first component (PC1) grouping regions of western Greece, the Ionian Islands and the southern Aegean, and the second component (PC2) regions of north-central Greece and the south-eastern Aegean Sea.