



Hurricane Debby: extra-tropical transition, characteristics and impacts in Finland in 1982

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Although a significant number of tropical cyclones move into the mid-latitudes and transition to extra-tropical cyclones, it is very rare that such cyclones affect North-Eastern Europe and Finland in particular. As the climate changes, the likelihood of such storms reaching North-Eastern Europe and Finland may increase. Hence, it is important to identify characteristics of such cyclones and the large-scale circulation patterns which are conducive for storms with tropical origins to impact North-Eastern Europe. Here we present a case study of storm Mauri that originated from hurricane Debby and hit Lapland, Finland in September 1982, resulting in 2 fatalities and 3 Mm³ of forest damage. The extra-tropical transition of Debby, synoptic evolution of Mauri and the large-scale circulation patterns of September 1982 are investigated using ERA-Interim reanalysis data. September 1982 was characterised by a positive North Atlantic Oscillation which resulted in the jet stream being stronger and further North compared to the climatological mean. Furthermore, central Europe was dominated by high pressure. Debby transitioned from a warm-cored symmetric tropical cyclone to a cold-cored asymmetric system before rapidly crossing the North Atlantic. However, near the UK ex-Debby started to lose its cold core and asymmetric structure. As ex-Debby approached Lapland, it merged with a pre-existing low pressure centre. An occluded bent-back front wrapped around the storm, now named Mauri, leading the formation of a warm seclusion. Due to the warm seclusion, Mauri regained a warm-cored symmetric structure before reaching the Barents Sea. Hence, unlike a typical extratropical cyclone, storm Mauri had a warm core and symmetric features.