

## Introduction

Central Mediterranean cyclones are among the cyclones affecting Turkey. Central Mediterranean cyclones begin to affect Turkey starting from the west and southwest. The effect firstly causes west of Turkey to become warmer by southwest wind and cloudiness to increase. Then, at the west and southwest parts of Turkey, strong wind, heavy shower and thunderstorm are induced. The warm front of Central Mediterranean cyclones which are effective in winter time uprise over the cold air being effective in central Turkey leading to overrunning snowfall [1]. In this study, forecasting of overrunning snowfall in Ankara on 14.12.2019 is investigated by utilizing ECMWF EPS predictions..



Figure 1. 13.12.2018, 1200 GMT QNH



Figure 2. 14.12.2018, 0000 GMT QNH

## Data

- ECMWF IFS and Ensemble Products
- TSMS Surface Observations
- TSMS Ankara Radar Products

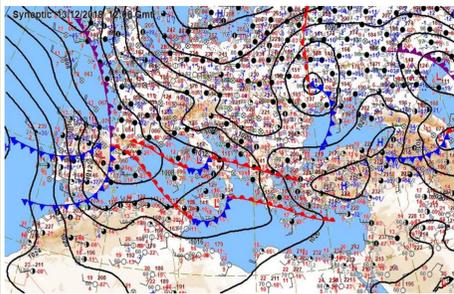


Figure 3. 13.12.2018, 1200 GMT Surface Chart

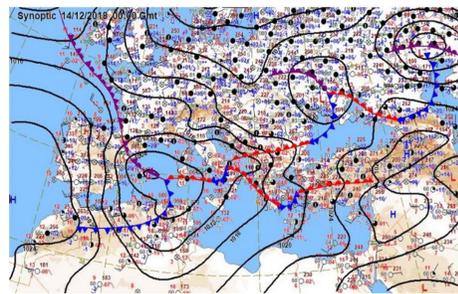


Figure 4. 14.12.2018, 0000 GMT Surface Chart

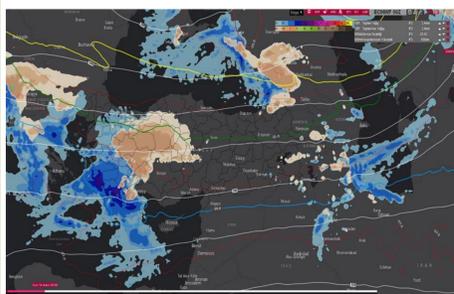


Figure 5. 14.12.2018, 0000 GMT, precipitation, snow, 500 hPa geo and temp

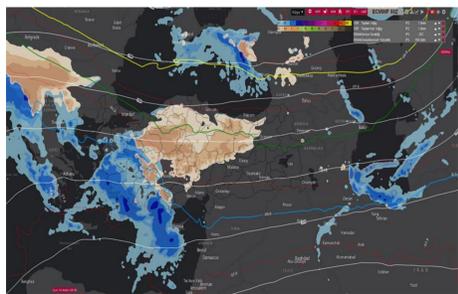


Figure 6. 14.12.2018, 0600 GMT, precipitation, snow, 500 hPa geo and temp

## Methodology

When we look at the synoptic analysis of 13.12.2018, Ankara is under the influence of 1024 hPa high pressure system and -5.0 °C cold air on 850 mb map. In the west of Italy, there is a low pressure system which is not too deep compared to the season of 1004 hPa and the warm front of the system extends to Ankara. The lack of depth means leave system affecting Turkey would not be strong in the rain.

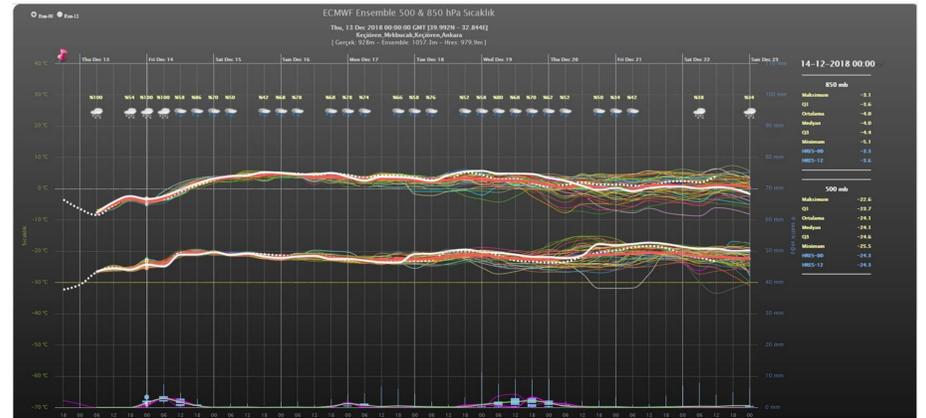


Figure 7. ECMWF 13.12.2018, 0000 GMT ENS Diagram

Prognostic and ensemble maps and graphs to we look at Turkey's internal parts is likely to snowfall, if we look at the Ankara private in ensemble map 1mm from the possibility to leave more precipitation is 100%, 5mm of rainfall leaving in the probability of 30-60%, more than 10mm rainfall it is seen that there is no possibility of quitting. When we look at the Ensemble spaghetti graph, we estimate the probability of 4-5 cm snow thickness. In the measurements, a thickness of 4 cm was measured at the center of Ankara.

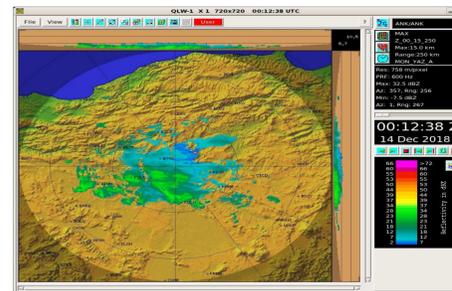


Figure 8. 14.12.2018, 0000 GMT Ankara Max Radar Image

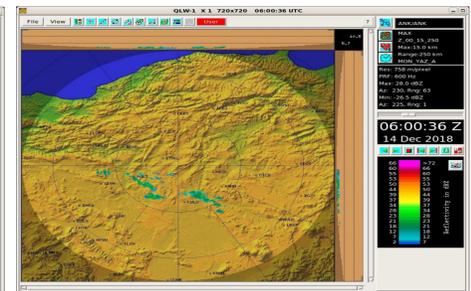


Figure 9. 14.12.2018, 0600 GMT Ankara Max Radar Image



Figure 10. 14.12.2018, precipitation probability map over 1mm



Figure 11. 14.12.2018, 14.02.2018 precipitation probability map over 5mm

## Conclusions

It is known that ECMWF model is really consistent in predicting large scale precipitations. For the kind of cases presented in this study in which EPS and deterministic predictions are consistent, the success rate of predicting the location, precipitation area and precipitation amount of frontal systems affecting Turkey in winter time is satisfactory. It is crucial for forecasters to use EPS along with the deterministic model. This study shows that EPS predictions are successful for forecasting warm front overrunning snowfall.

## Contact

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## References

- [1]: Hava Analiz ve Tahmin Tekniği, Ankara 2007, Sayfa 248-249.
- [2]: Web: [www.ecmwf.int](http://www.ecmwf.int) (Erişim Tarihi: 15.02.2019)