Turkish State Meteorological Service

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Advantages and disadvantages of ECMWF products for Istanbul and Black Sea

Introduction

The numerical weather prediction models have a great role in making weather forecasting. The accuracy and the resolution of these models directly effect the quality of the forecasts. In paralel with the developments in computer software technology, they have also been developing rapidly. The developments in this field pave the way for some changes in the display of the model outputs and the use of them by forecasts. Ec Chart, for example, is a web-based application, which is developed recently by ECMWF for displaying the model outputs. In contrast to usual displays of NWP models, this application enables forecasters to use the program more flexibly and interactively. In this respect, it can fairly be said that it is better than the other display programs.

We, as the Turkish forecasters, working in General Directorate of Meteorology, have been using Ec Chart program for a while. The fact is that different regions of our country have different topographic characteristics. Forecasting is difficult especially in the Black Sea Region of our country, which has chain of higher mountains running parallel to coastline. We have benefitted much from Ec Chart in making micro forecasts for this region. Especially with the zooming facility, It allows us to make more accurate precipitation and wind forecasts. For instance, thanks to it, we predict precipitation only for the coastal line or for the sea side even though the model predicts the precipitation for both of them. So, we can easily say that Ec Chart help us to increase the accuracy rate of our micro level forecasts.

The Marmara Region which has the highest population density in our country, including the city of İstanbul, Turkey's most populous city, is among the regions in which we have difficulty in making forecasts. Sea-induced snow showers and gales or high winds, which is observed in the region from time to time, are among the hardly foreseeable weather events. In addition to that, the dense housing in the region creates urbanization effect, which effects the accuracy of the model products negatively. Likewise, not only the precipitation forecasting but also the prediction of the starting time of the event in critical temperature thresholds is important for forecasters. This is because dense housing effects negatively the temperature that rains turn into snow, and also because snowfall causes big problems in the city. In our study, NWP model outputs predict the starting time of the event for İstanbul as 09:00 GMT, whereas Ec Chart displays that only the western parts of the city receive precipitation at 09:00 GMT, and that the whole of the city will not receive precipitation before 12:00 GMT. The observations too reveal that the starting time of the precipitation is 07:50 GMT.

Such kind of case studies show that the improvements in NWP models pretty facilitate the forecasters' work. There is no doubt that we, as forecasters, need NWP model outputs to make accurate forecasts. However, it should be remembered that the 'human factor' or forecasters' experience is another important factor especially for making accurate forecasts for the regions that have highly different geographical characteristics.

Example 1 — 26 Jan 2016 Istanbul / TUR

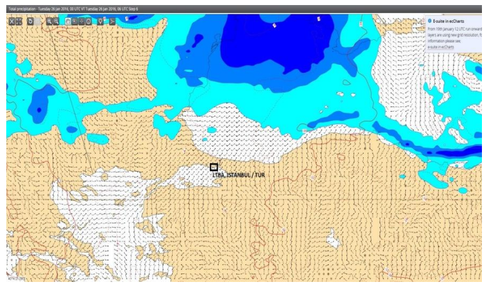

Figure 1 : ECMWF porduct total precipitation 26 Jan 2016 06:00 GMT

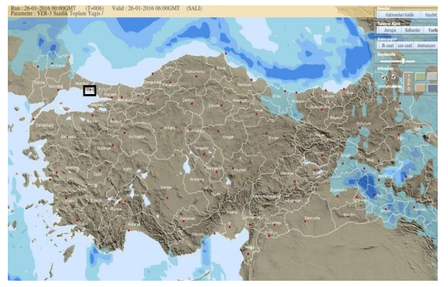

Figure 2 : TSMS porduct total precipitation 26 Jan 2016 06:00 GMT

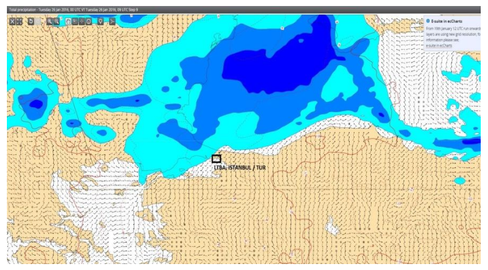

Figure 3 : ECMWF porduct total precipitation 26 Jan 2016 09:00 GMT

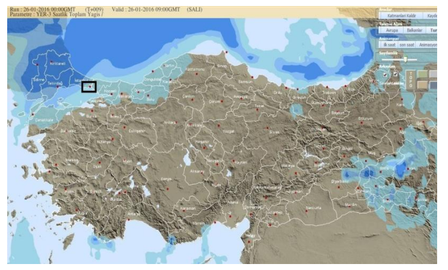

Figure 4 : TSMS porduct total precipitation 26 Jan 2016 09:00 GMT

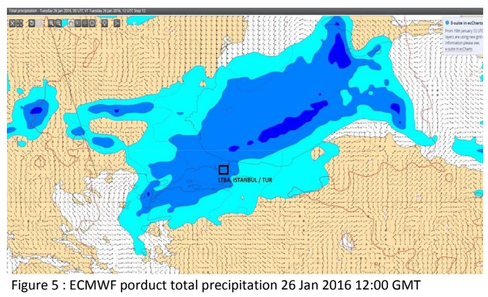

Figure 5 : ECMWF porduct total precipitation 26 Jan 2016 12:00 GMT

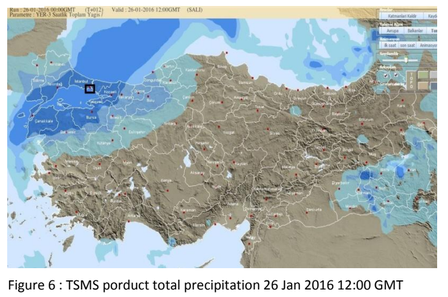

Figure 6 : TSMS porduct total precipitation 26 Jan 2016 12:00 GMT

Taf	2057	17060	1601260455	1601260440	FTTT70 LTBA 260440 LTBA 260440Z 2606/2712 23012KT 9999 SCT030 BKN100 BECMG 2606/2609 4000 -SHSN SCT008 BKN020 TEMPO 2609/2613 1200 +SHSN BECMG 2613/2617 36013KT 7000 -SHSNRA SCT030 BKN090 =

Figure 7 : TSMS, LTBA, Istanbul, meteorological terminal area forecast 26 Jan 2016 04:40 GMT

Metar	2866	17060	1601260753	1601260750	SATT70 LTBA 260750 LTBA 260750Z 20017KT 8000 -SHSN FEW018 BKN033 BKN070 02/M04 Q1024 NOSIG RMK RWY17L 21016KT RWY05 21015KT RWY23 21016KT =

Figure 8 : TSMS, LTBA, Istanbul, meteorological terminal air report 26 Jan 2016 07:50 GMT

Metar	3305	17060	1601260857	1601260850	SATT70 LTBA 260850 LTBA 260850Z 21014KT 1100 R35R/1400N R17L/1200N R05/0700N R23/P1500N +SHSN BKN007 BKN020 00/M01 Q1024 BECMG 4000 NSW RMK RWY17L 22014KT RWY05 22016KT RWY23 22014KT =

Figure 9 : TSMS, LTBA, Istanbul, meteorological terminal air report 26 Jan 2016 08:50 GMT

Metar	3305	17060	1601261153	1601261150	SATT70 LTBA 261150 LTBA 261150Z 23010KT 200V260 3900 1300NW R35R/P1500D R17L/P1500U R05/P1500U R23/P1500D -SHSN SCT006 BKN020 01/01 Q1025 RESHSN R17L/2///95 R17R/2///95 R05/2///95 NOSIG RMK RWY17L 24008KT 190V270 RWY05 23010KT 200V260 RWY23 23011KT =

Figure 10 : TSMS, LTBA, Istanbul, meteorological terminal air report 26 Jan 2016 11:50 GMT

Example 2 — 26 Jan 2016 Black Sea / TUR

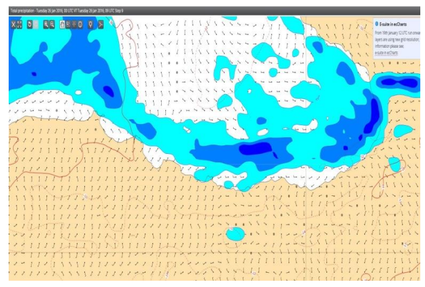

Figure11 : ECMWF porduct total precipitation 26 Jan 2016 09:00 GMT

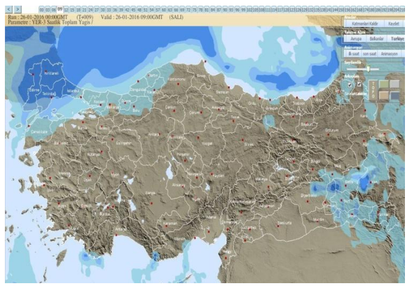

Figure12 : TSMS porduct total precipitation 26 Jan 2016 09:00 GMT

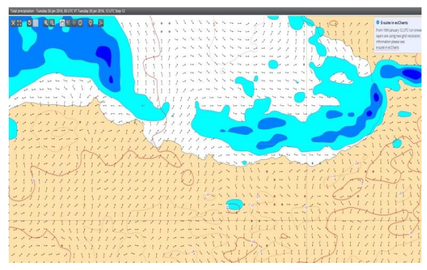

Figure13 : ECMWF porduct total precipitation 26 Jan 2016 12:00 GMT

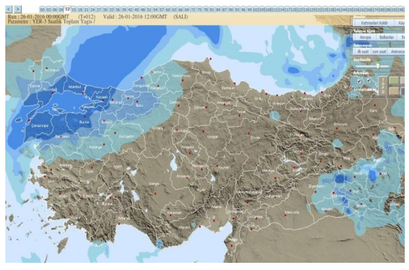

Figure14 : TSMS porduct total precipitation 26 Jan 2016 12:00 GMT

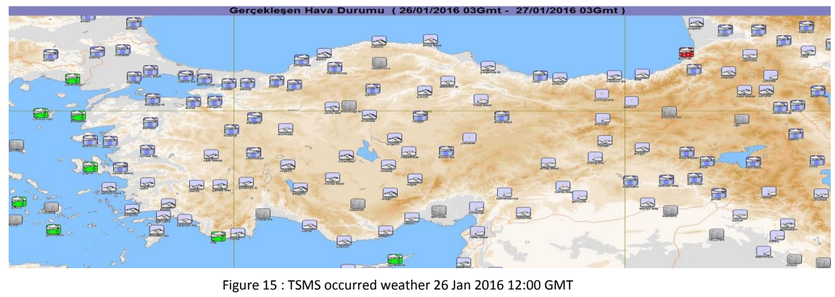

Figure 15 : TSMS occurred weather 26 Jan 2016 12:00 GMT

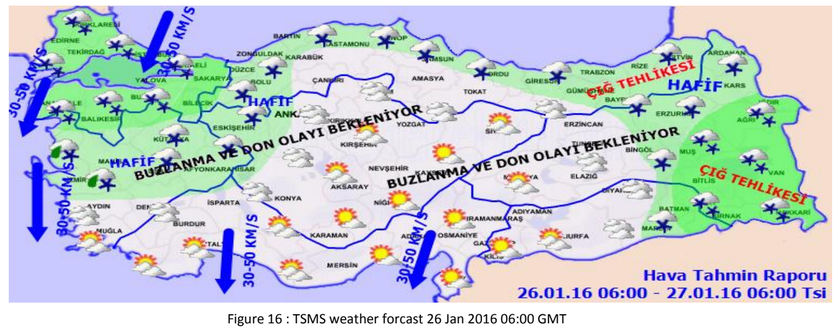

Figure 16 : TSMS weather forcast 26 Jan 2016 06:00 GMT

Referance

1. ECMWF Products
2. TSMS Products
3. Istanbul Ataturk Airport meteorological office forecast and observations