



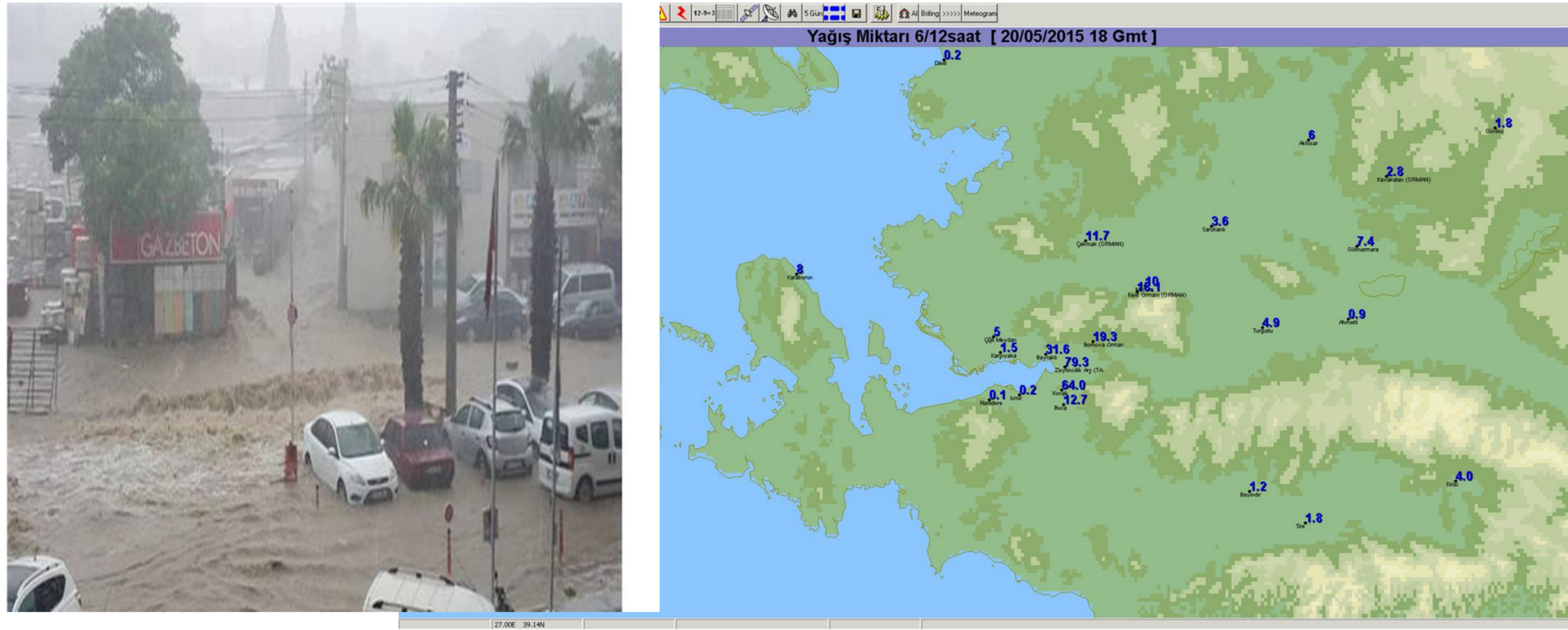
# DETECTION OF EXTREME PRECIPITATION USING REMOTE SENSING PRODUCTS ON 20 MAY 2015 İN İZMİR

## ERAD2016 European Conference on Radar in Meteorology and Hydrology – ORP.P26

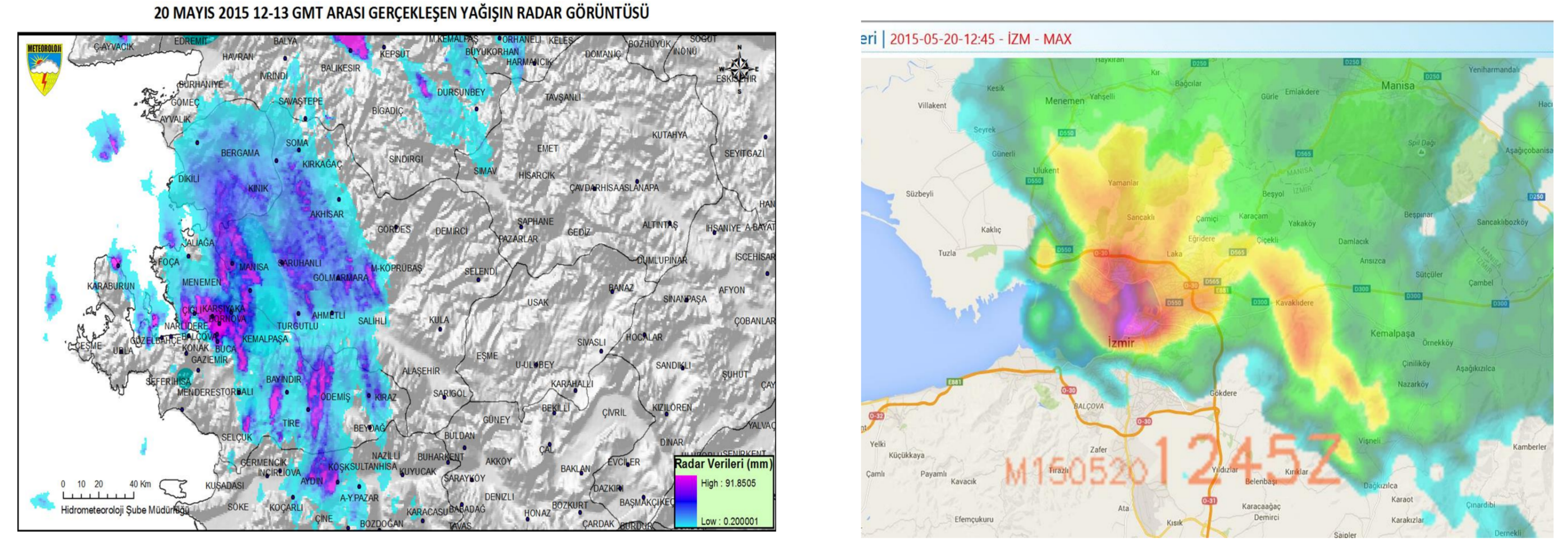
### 10-14 October 2016, Antalya, Turkey

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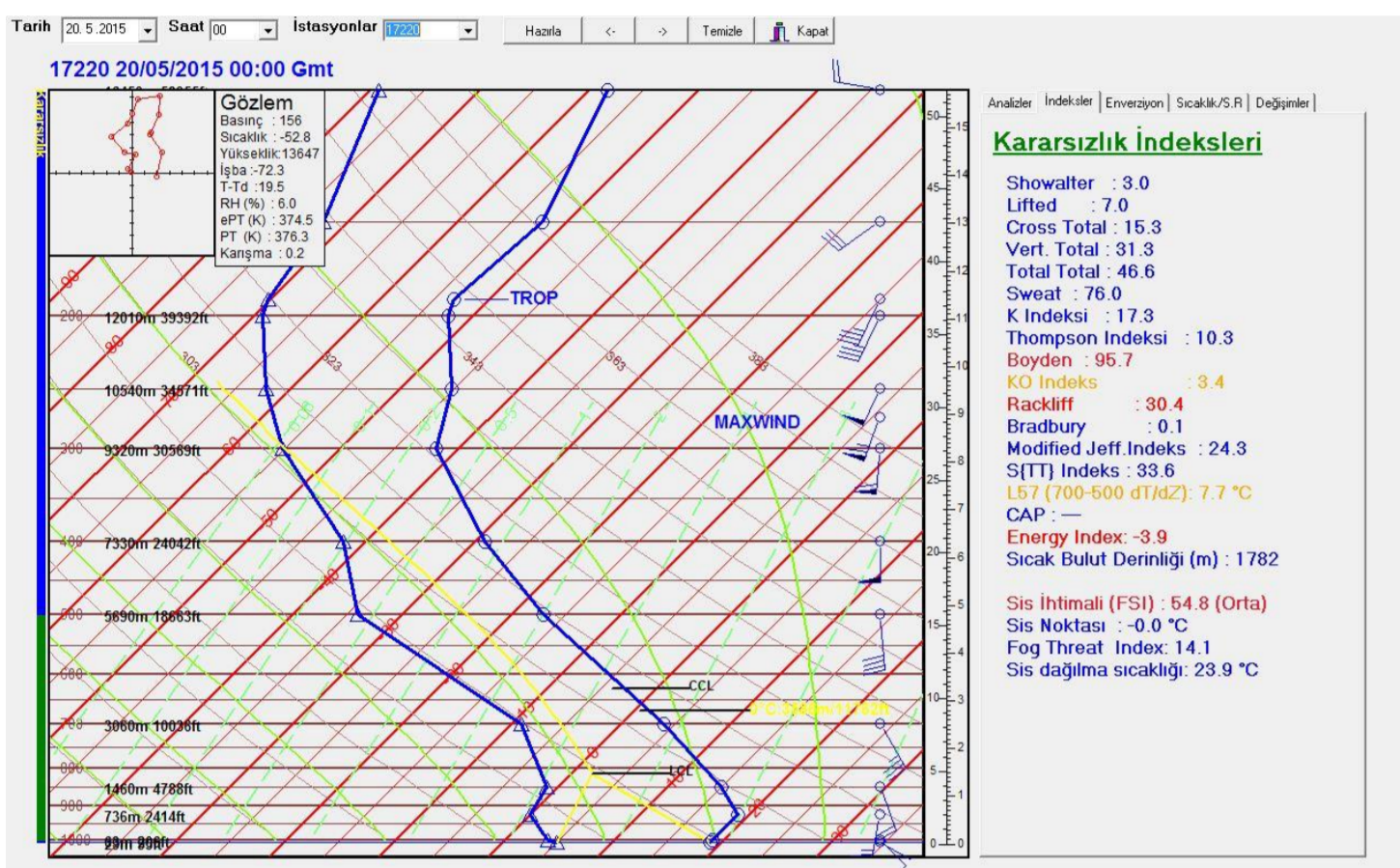
A 57.3 mm of precipitation between 12:00 UTC and 12:30 UTC was measured on 20 May 2015 from Automated Weather Station in Izmir (Station ID:18031). Gust of wind reached 22.4 ( 80 km/h ) at 12:23 UTC. This is called as extreme precipitation which has return period of more than 100 years for Izmir. In particular, Cumulonimbus (Cb) clouds formed over the hottest areas and over the east of the Izmir bay moved southeast and northwest direction.



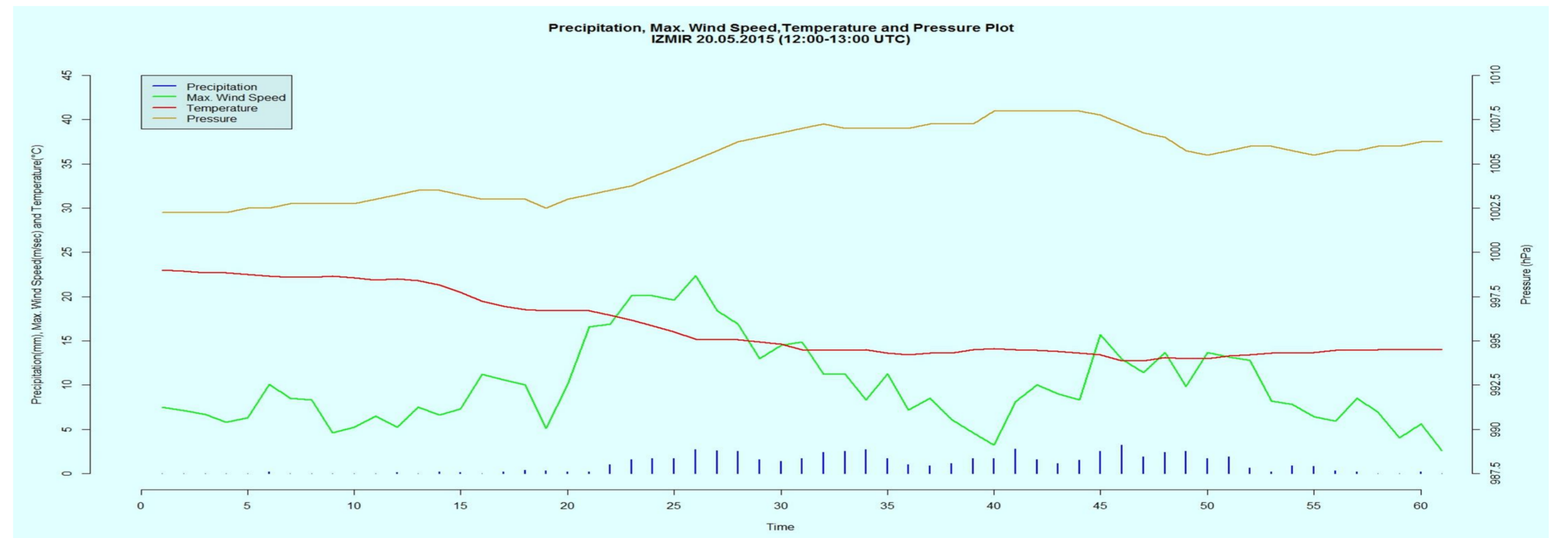
The above picture shows the spatial distribution of 12 hour rainfall total occurred over the east of Izmir bay ending on 20 May 2015 at 18:00UTC.



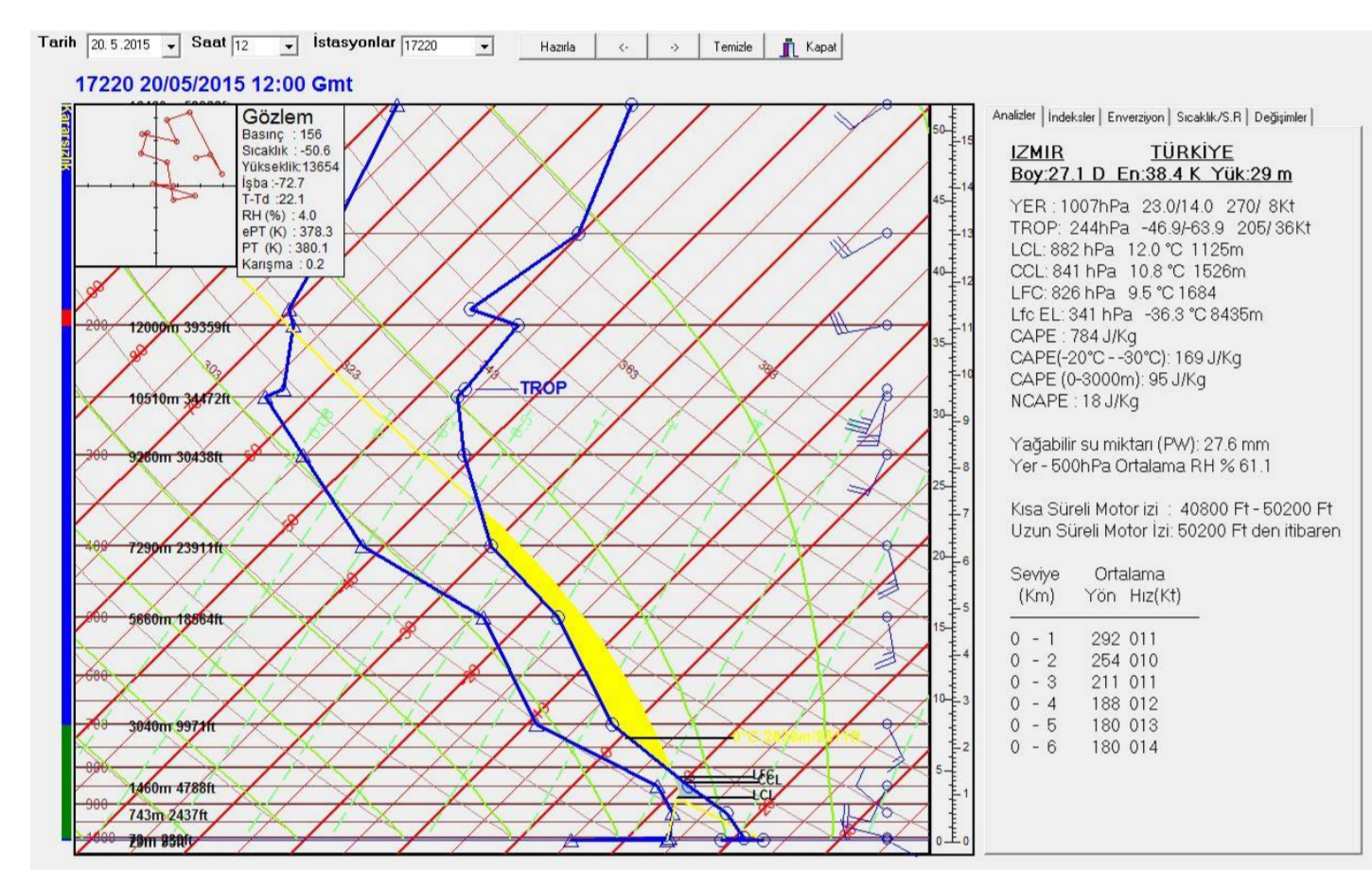
The picture on the left shows total precipitation (mm) over Radar image between 12:00 and 13:00 UTC on 20 May 2015. The picture on the right shows where the storm had highest reflectivity at 12:45 UTC. This display is of maximum echo intensity (reflectivity) measured in dBZ from Izmir radar .



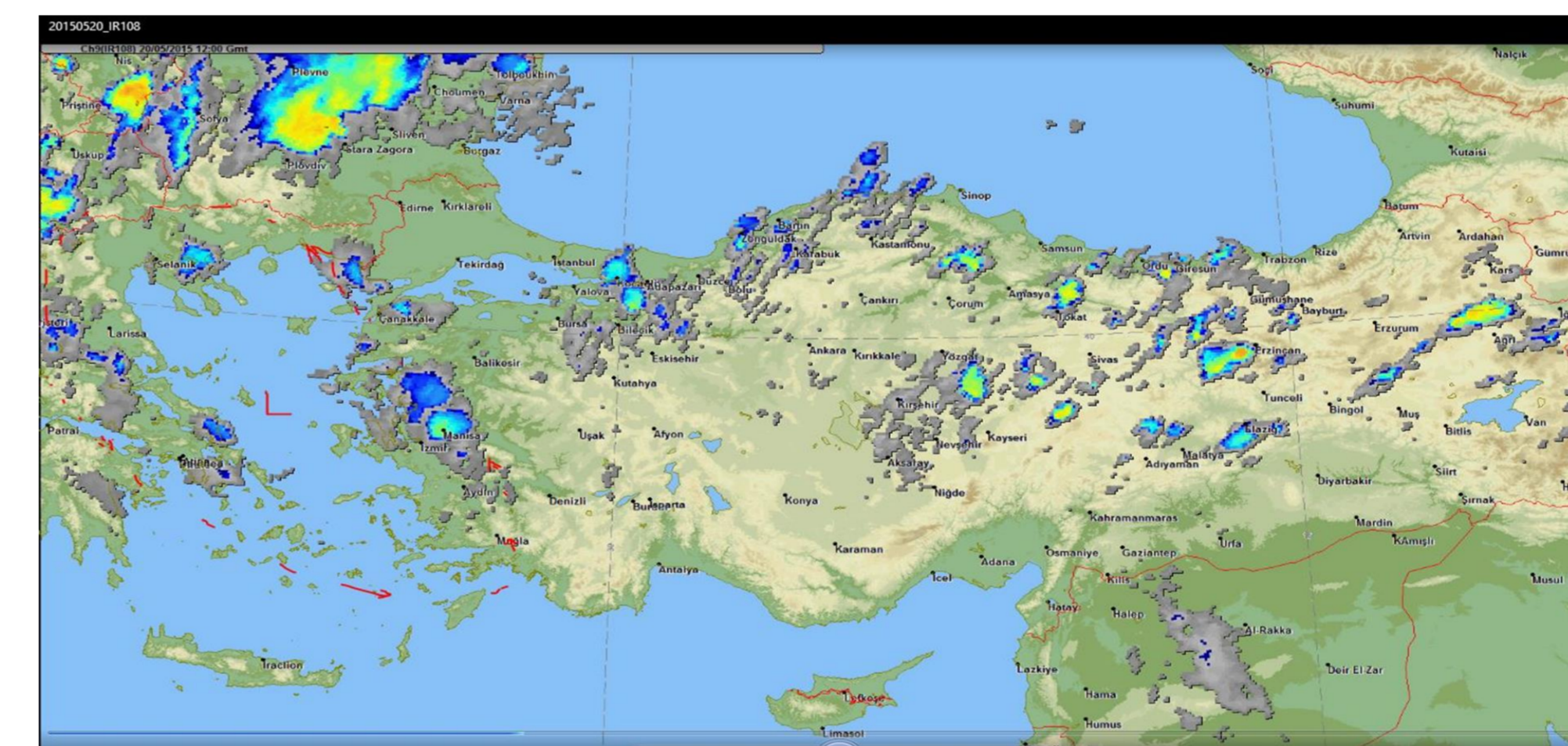
The Skew-T diagram for Izmir (17220) for 00:00 UTC (up) and 12:00 UTC (below) gives a "snapshot" picture of temperature, dewpoint, air pressure, and winds in the atmosphere above a particular point on the Earth's surface.



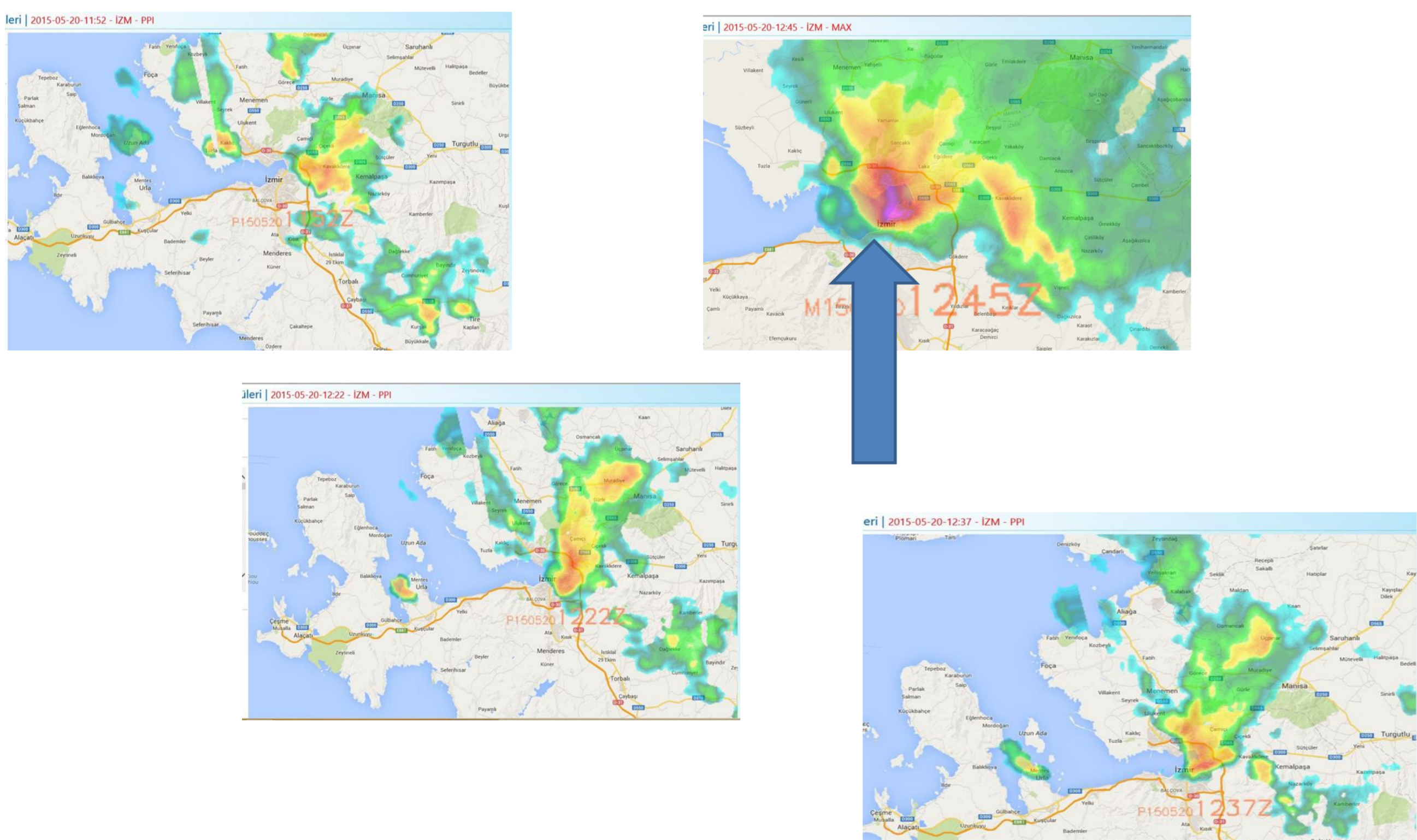
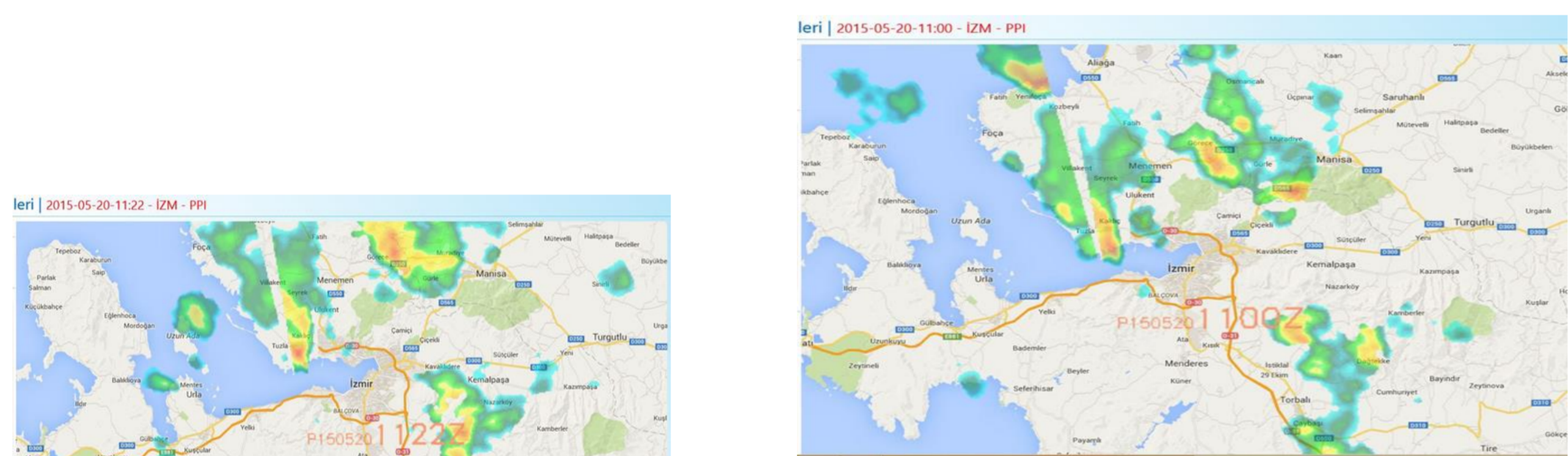
The upper right picture shows the minute to minute variations in temperature, air pressure, maximum wind speed and precipitation between 12:00UTC and 13:00UTC on 20 May 2015 in Izmir. Increase in pressure indicate the presence of mass movement. Reaching the maksimum storm wind speed and decrease in temperature indicate supporting the formation of a strong cumulonimbus.



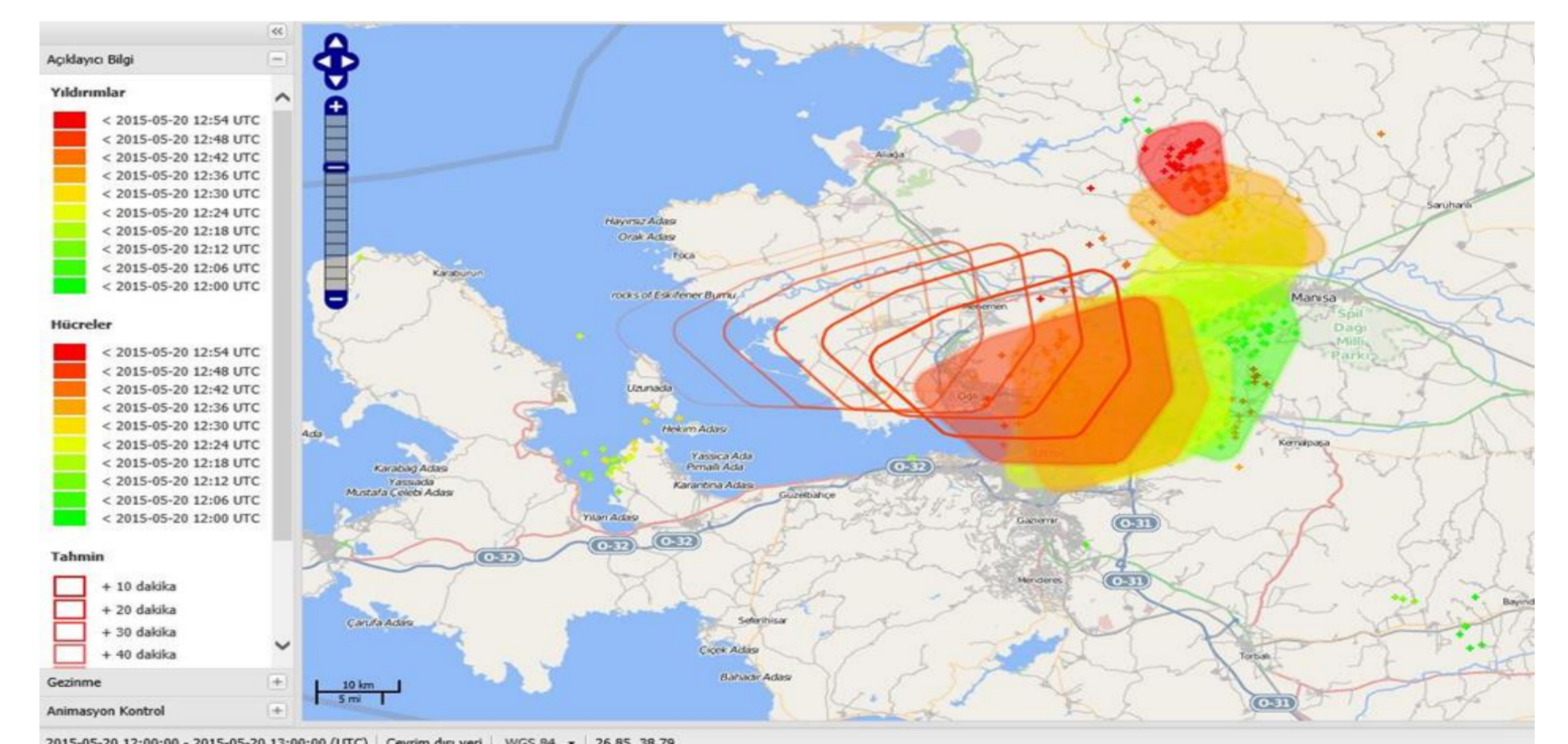
In general, it indicates the formation of instability conditions. The increase in moisture content is observed to be significant. The increase in value of the CAPE is also observed. The wind is blowing from the south and southeast. This shows the characteristics of typical wind field in front of a trough



The animation of satellite images showed that an anticyclonic wave over Aegean Sea supported a strong convective activity and the formation of cumulonimbus in the southern part of Izmir



The uppermost Lightning Detection and Tracking System (LDTs) shows the direction of lightning field and its direction



Izmir Radar PPI images starting from 11:00 UTC indicate how cumulonimbus cloud formation developed over time. The system was moving northwestward direction from the southeast. Radar maximum reflective values, where precipitation is most intense at the time (12:45 UTC) seemed to occur in the eastern part of the Gulf.

#### The intensity of precipitation-Time-Recurrence Analysis for the county of Bornova in the province of İzmir

Starting Date	Starting Hour	End Date	End Hour	Time (min.)	Amount (mm)	Intensity (mm/hr)	Recurrence (Year)
20.05.2015	12:24	20.05.2015	12:48	5	12.5	150.0	15
20.05.2015	12:24	20.05.2015	12:33	10	21.8	130.8	41
20.05.2015	12:21	20.05.2015	12:35	15	28.8	115.2	55
20.05.2015	12:21	20.05.2015	12:50	30	57.3	114.6	More than 100
20.05.2015	12:05	20.05.2015	13:04	60	62.4	62.4	80

#### RESULTS:

A significant increase has been observed in the intensity of rainfall in recent years, in accordance with the predictions of global climate change. Moreover, many events are held locally. It is the fact that high amount of rainfall such as 50-65 mm in a half hour across our country can be measured in different regions. Estimates of small-scale events and monitoring them can only be carried out by remote sensing products. Forecasters should use more advanced satellite , radar and LDTs for short-term forecasting to adapt themselves to these changes.

