

# EFI (instructor led activity) Southern Africa

**EFI**

**Extremely Fantastic Intuition**

# **Extreme Forecast Index**

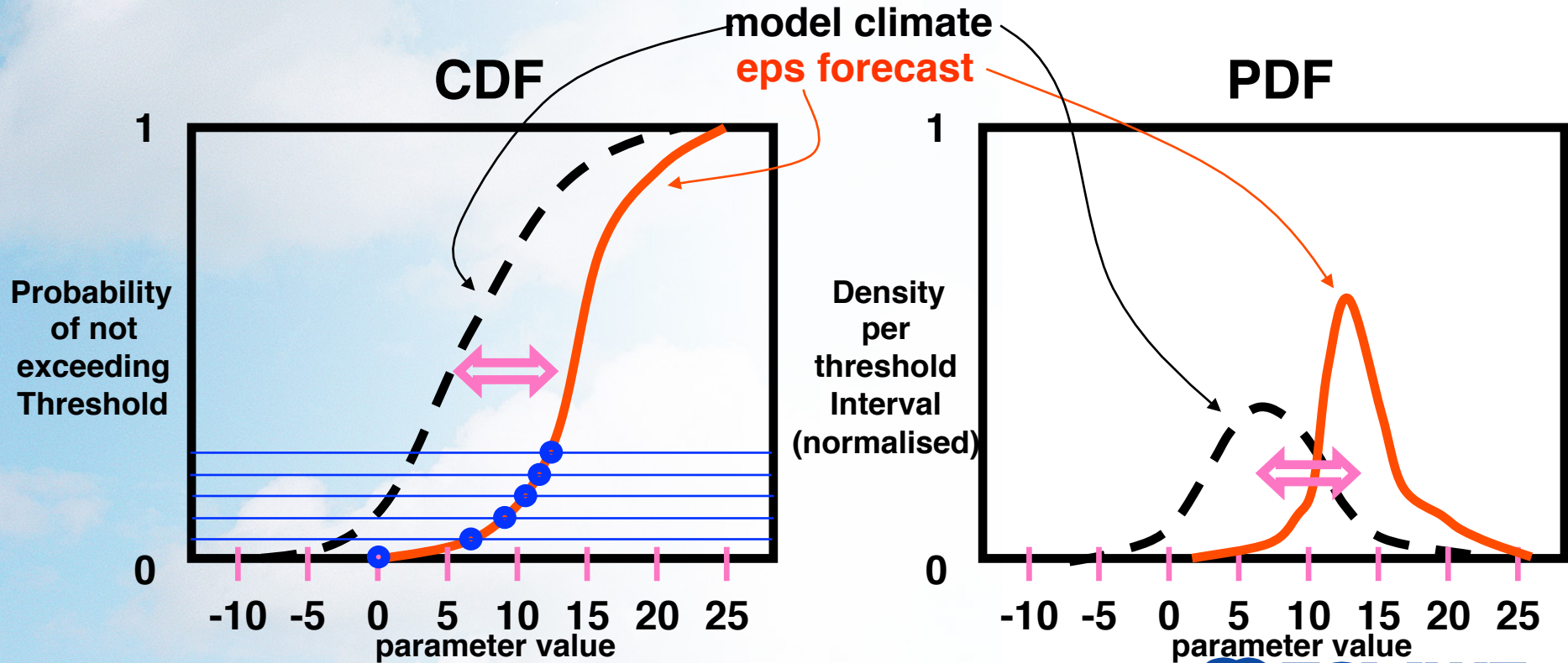
***EFI is a measure of the difference between the ENS distribution and a model climate (M-climate) distribution.***

Ordering



12 0 9 7 13 11...

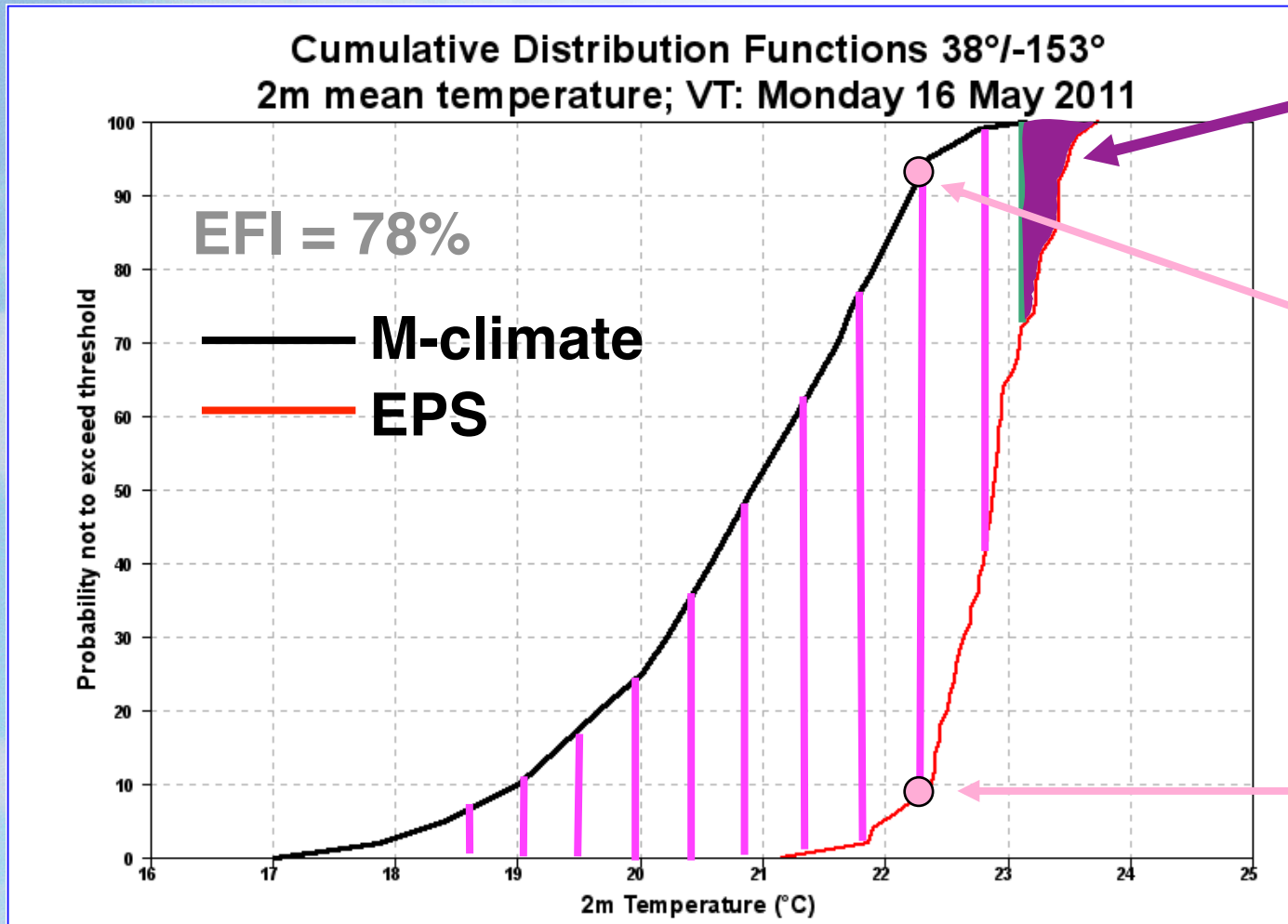
0 7 9 11 12 13...



$$EFI = \frac{2}{\pi} \int_0^1 \left( \frac{p - F_f(p)}{\sqrt{p(1-p)}} \right) dp$$

Represented by pink lines below

More weight to extremes of M-climate



EFI takes no direct account of any EPS members beyond the M-climate extremes

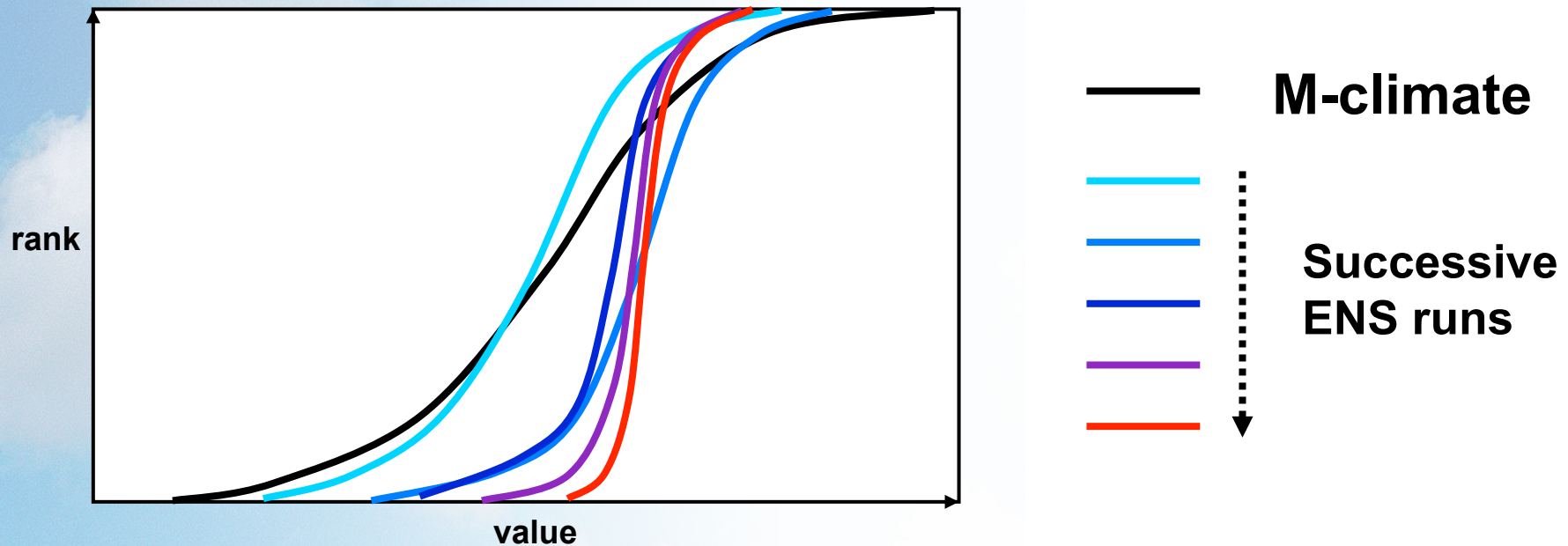
$p$

$-1 \leq EFI \leq 1$

$-100\% \leq EFI \leq 100\%$

$F_f(p)$

# What can we say about CDFs of successive ENS runs?

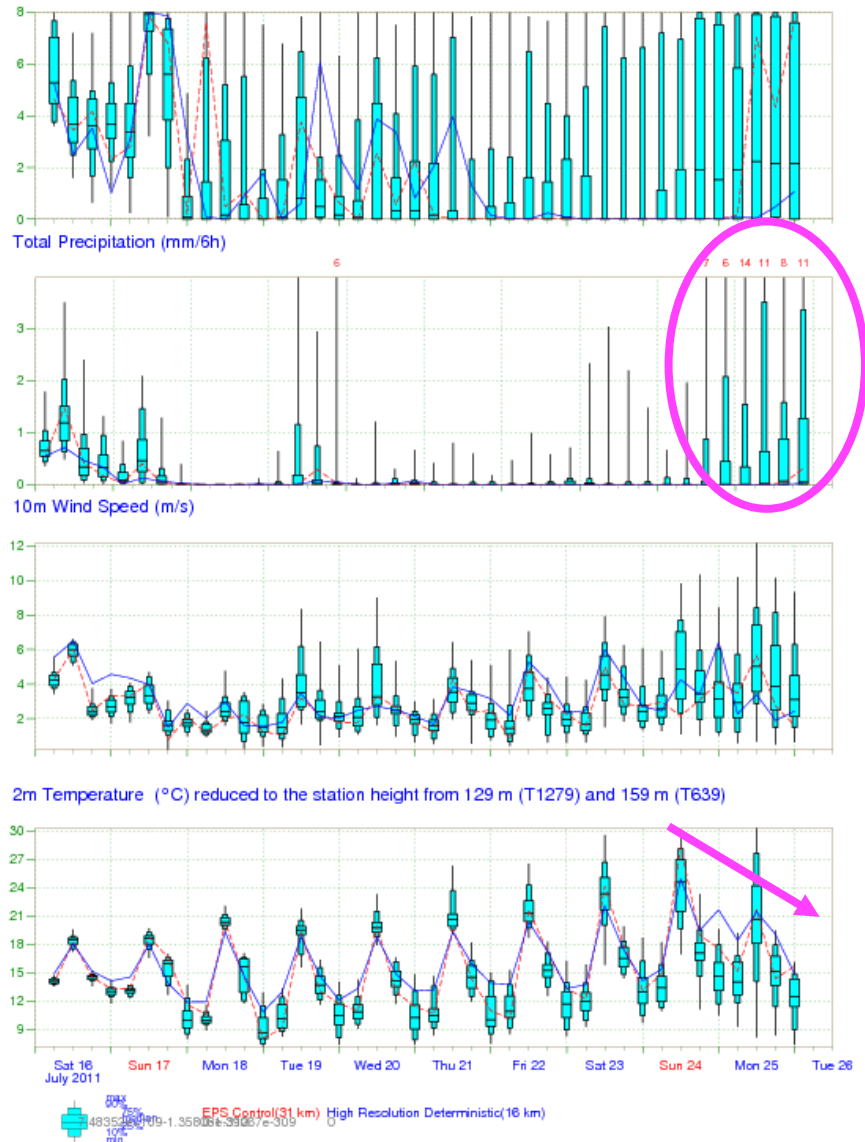


- Lateral variations in CDF position between successive runs are due to the model/flow uncertainty
- A steeper CDF implies higher confidence.

# EPSgrams – D+9

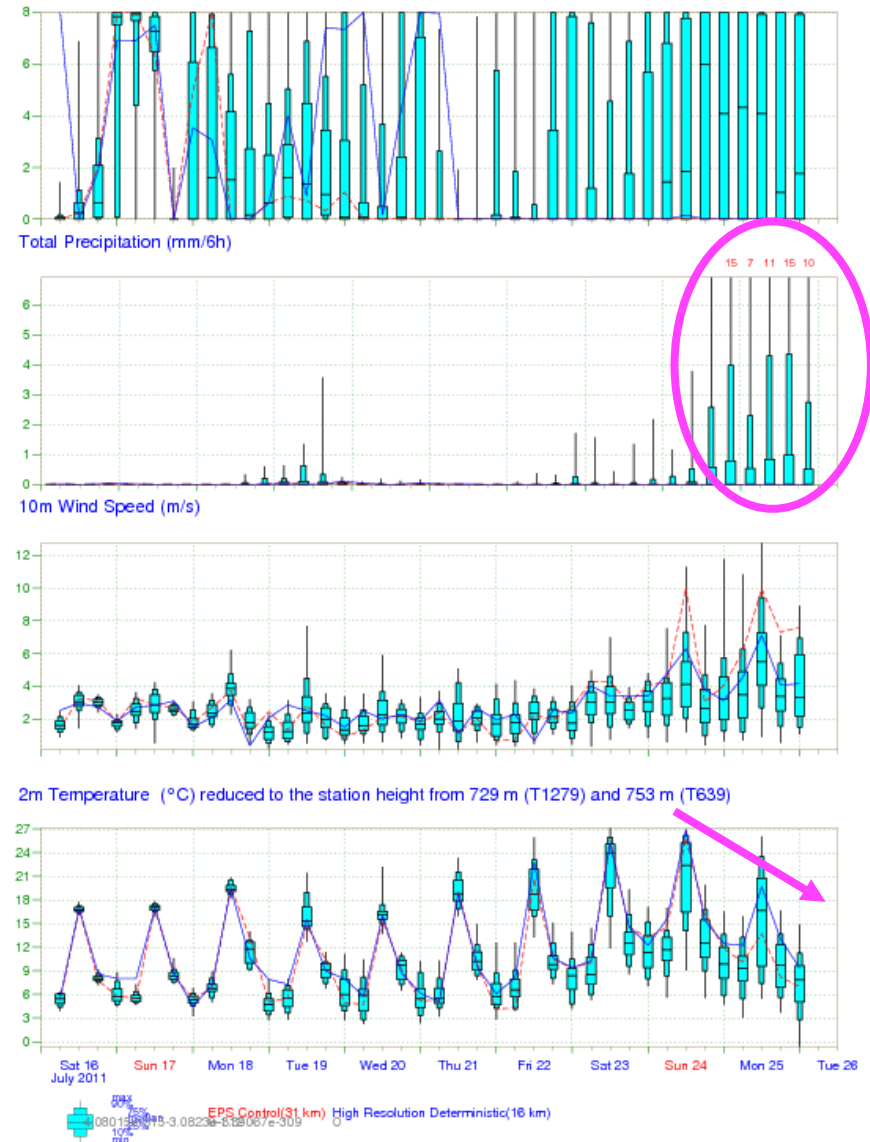
## EPS Meteogram

Durban 29.93°S 30.94°E (EPS land point) 129 m (T1279)  
 Deterministic Forecast and EPS Distribution Saturday 16 July 2011 00 UTC  
 Total Cloud Cover (okta)



## EPS Meteogram

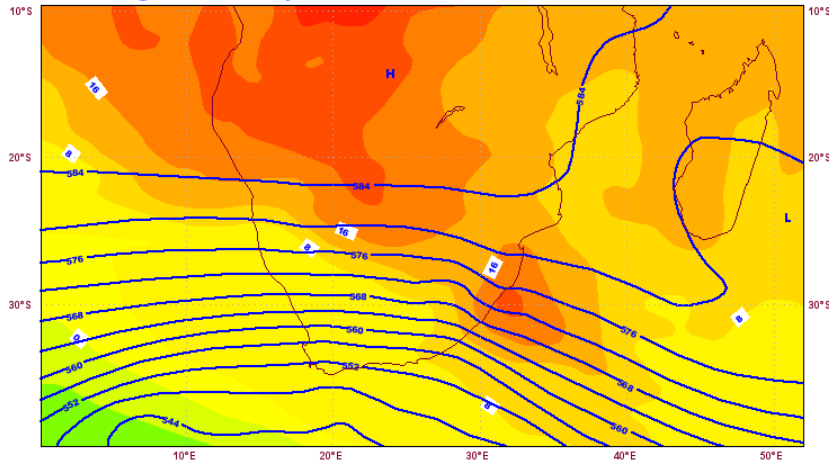
Umtata 31.62°S 28.8°E (EPS land point) 729 m (T1279)  
 Deterministic Forecast and EPS Distribution Saturday 16 July 2011 00 UTC  
 Total Cloud Cover (okta)



# HRES & ENS

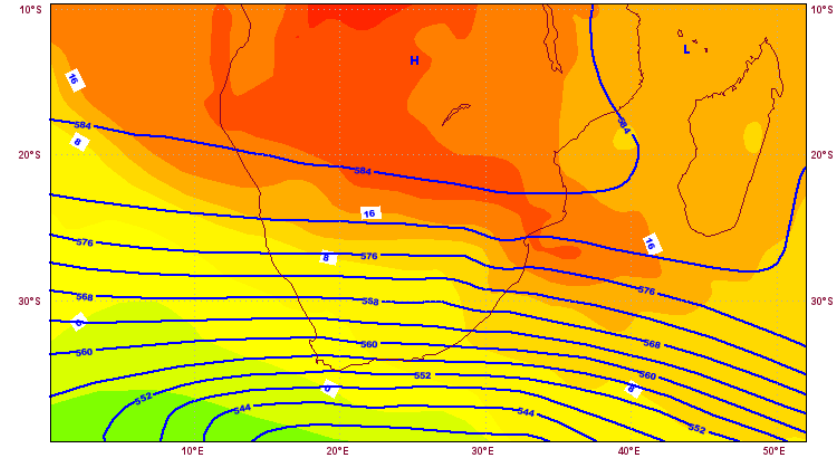
## D+9

Saturday 16 July 2011 00UTC ECMWF Forecast t+216 VT: Monday 25 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature

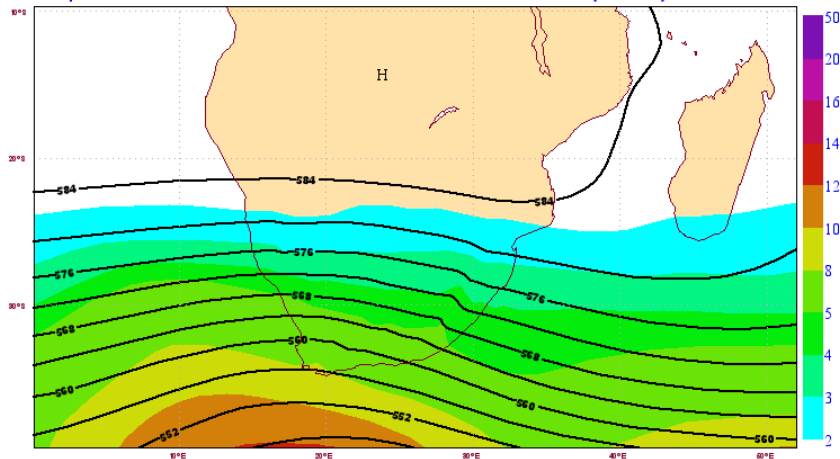


## D+10

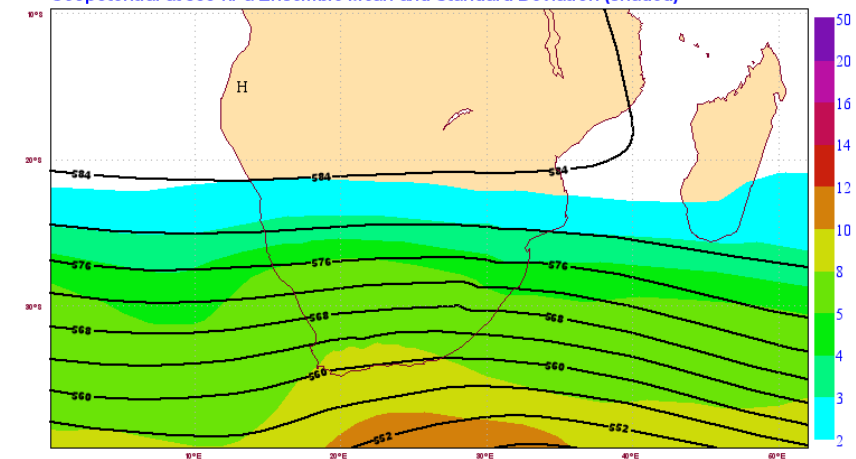
Saturday 16 July 2011 00UTC ECMWF Forecast t+240 VT: Tuesday 26 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature



Saturday 16 July 2011 00UTC @ECMWF Forecast T+216 VT: Monday 25 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



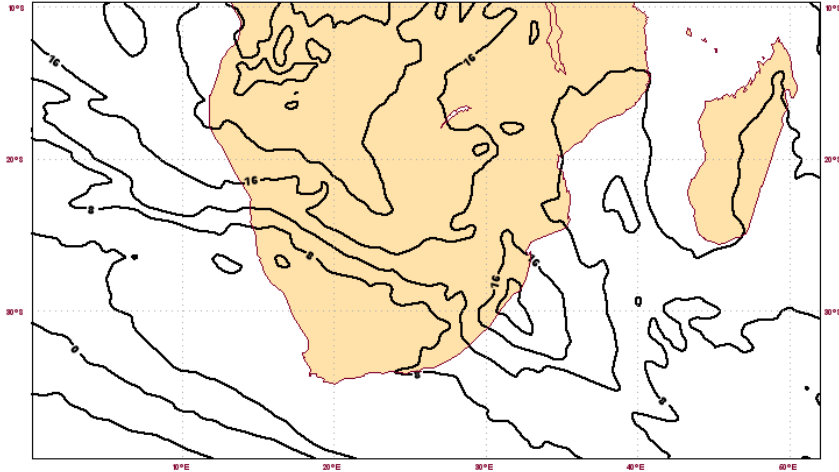
Saturday 16 July 2011 00UTC @ECMWF Forecast T+240 VT: Tuesday 26 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



# HRES & ENS

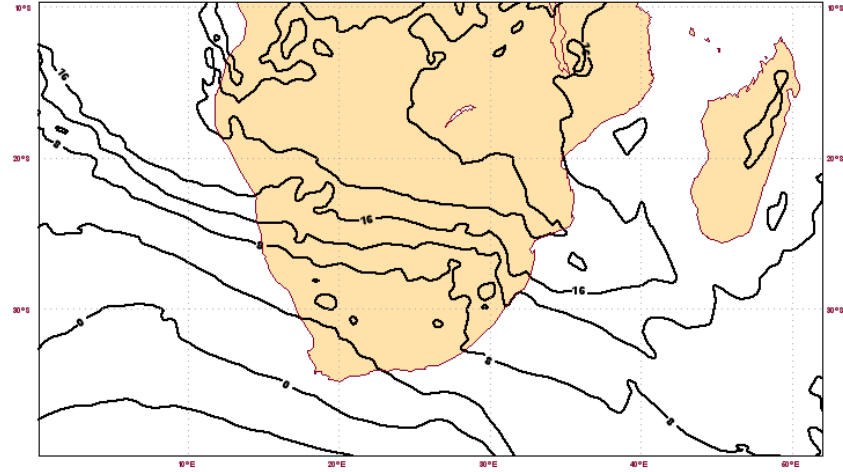
## D+9

Saturday 16 July 2011 00UTC @ECMWF Forecast T+216 VT: Monday 25 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast

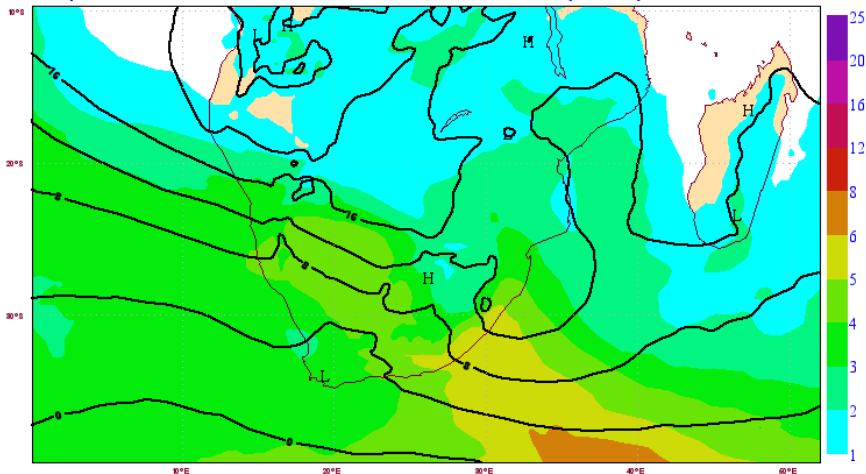


## D+10

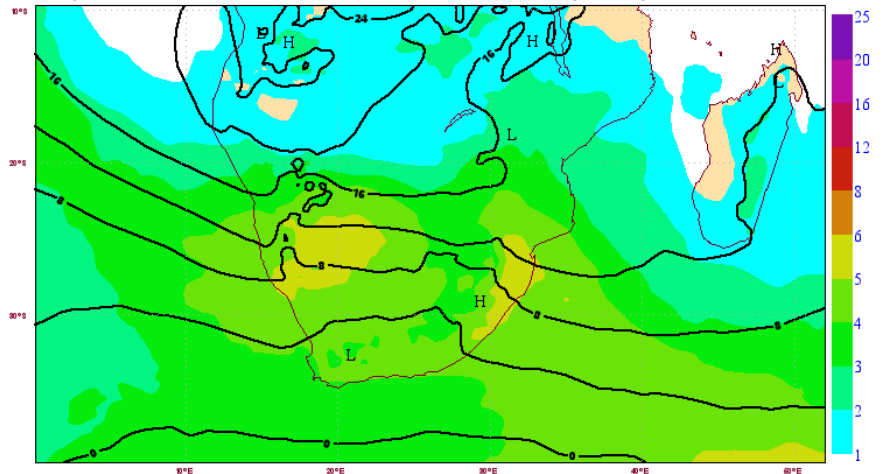
Saturday 16 July 2011 00UTC @ECMWF Forecast T+240 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast



Saturday 16 July 2011 00UTC @ECMWF Forecast T+216 VT: Monday 25 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)



Saturday 16 July 2011 00UTC @ECMWF Forecast T+240 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)

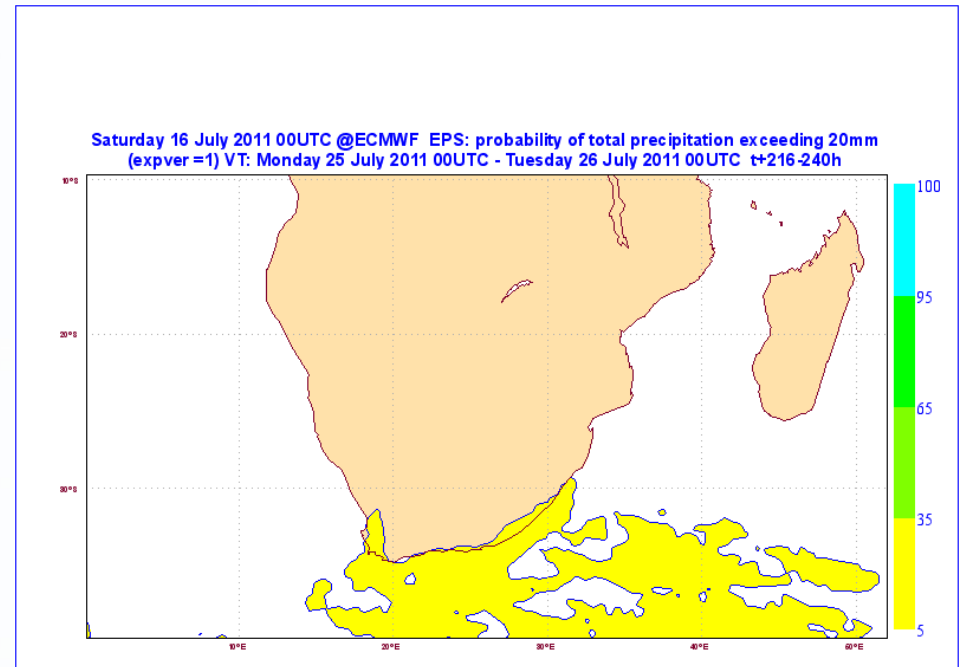
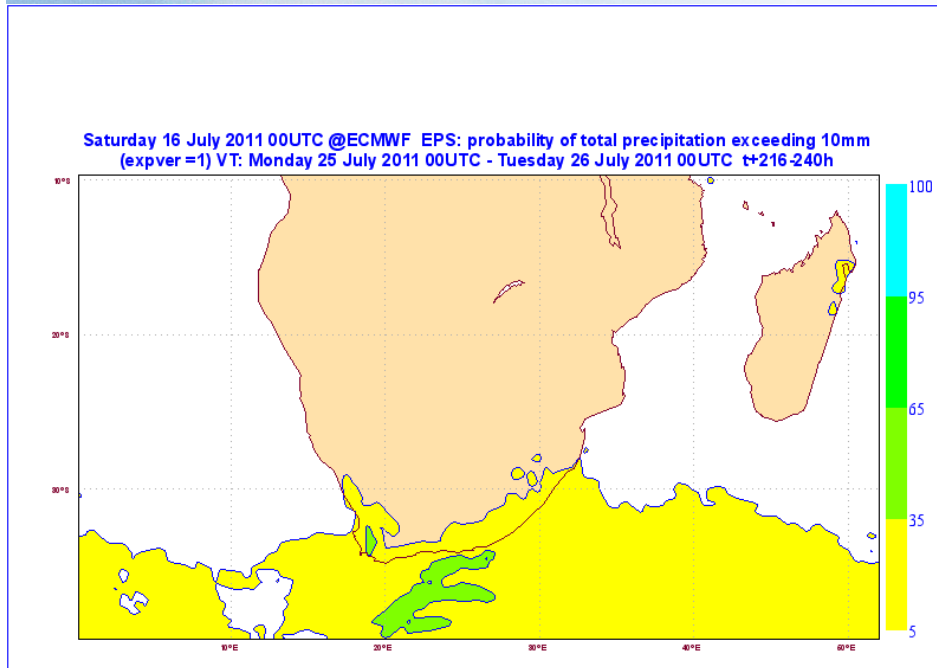




# ENS Probabilities T+216-240

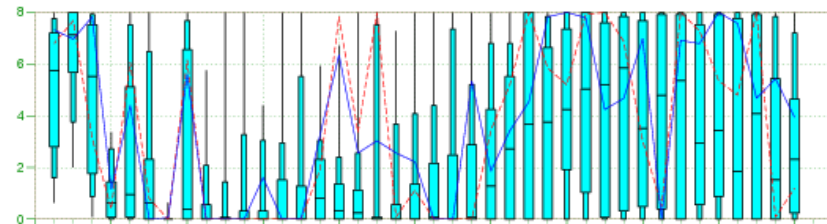
## >10 mm

## >20 mm

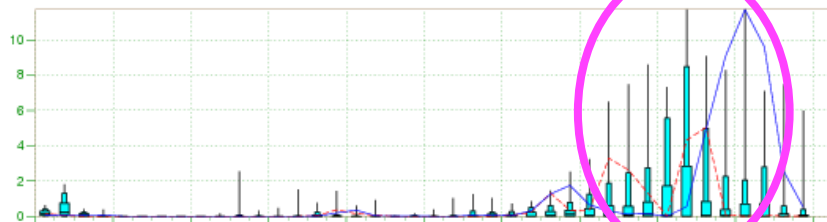


# EPSgrams – D+8

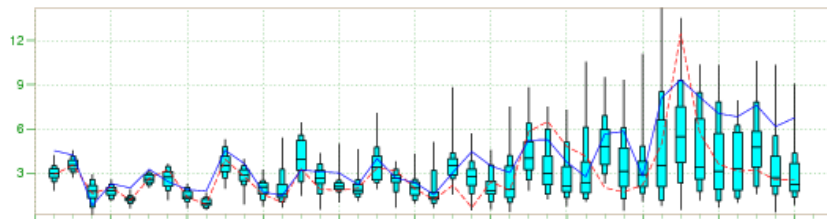
EPS Meteogram  
 Durban 29.93°S 30.94°E (EPS land point) 129 m (T1279)  
 Deterministic Forecast and EPS Distribution Sunday 17 July 2011 00 UTC  
 Total Cloud Cover (okta)



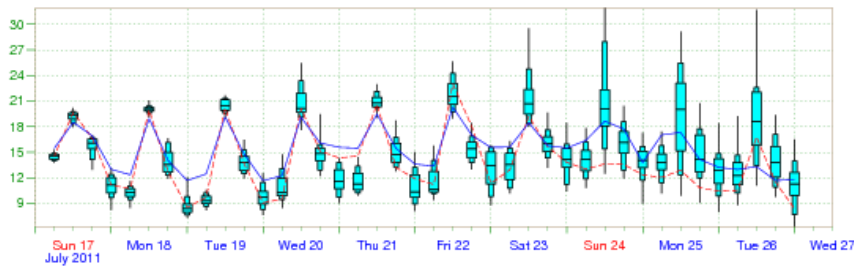
Total Precipitation (mm/6h)



10m Wind Speed (m/s)

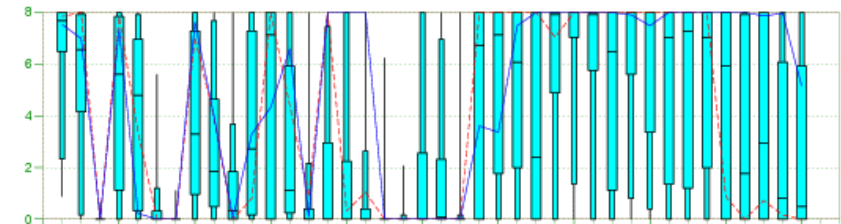


2m Temperature (°C) reduced to the station height from 129 m (T1279) and 159 m (T639)



EPS Control(31 km) High Resolution Deterministic(16 km)

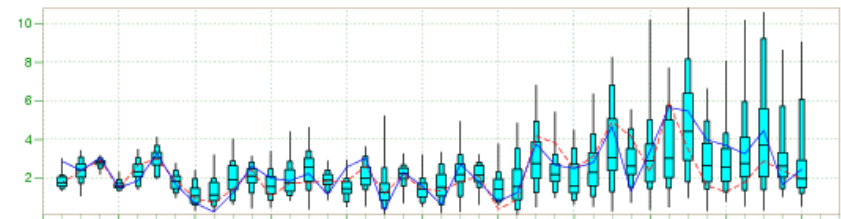
EPS Meteogram  
 Umtata 31.62°S 28.8°E (EPS land point) 729 m (T1279)  
 Deterministic Forecast and EPS Distribution Sunday 17 July 2011 00 UTC  
 Total Cloud Cover (okta)



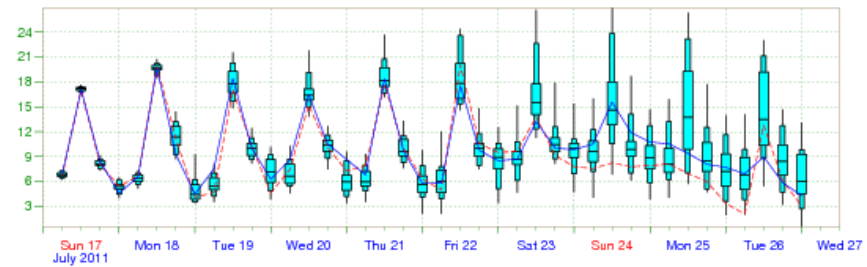
Total Precipitation (mm/6h)



10m Wind Speed (m/s)



2m Temperature (°C) reduced to the station height from 729 m (T1279) and 753 m (T639)

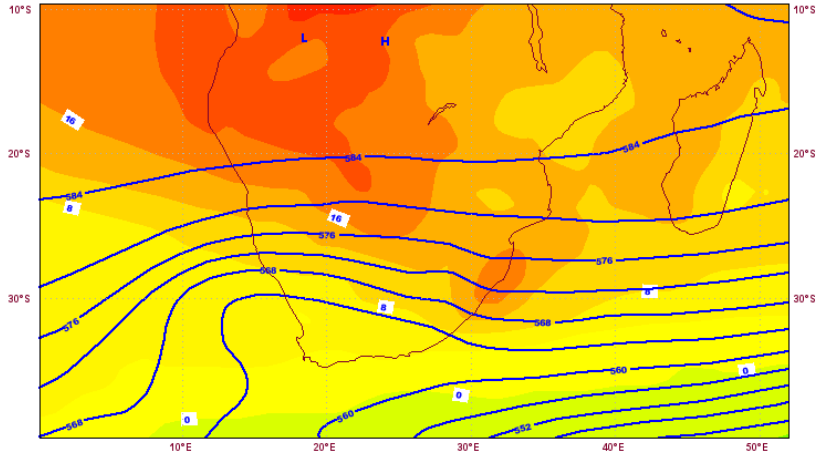


EPS Control(31 km) High Resolution Deterministic(16 km)

# HRES & ENS

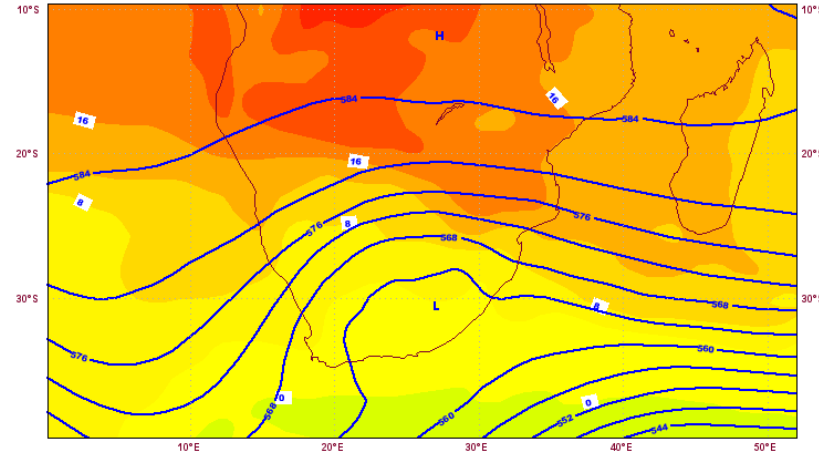
## D+8

Sunday 17 July 2011 00UTC ECMWF Forecast t+192 VT: Monday 25 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature

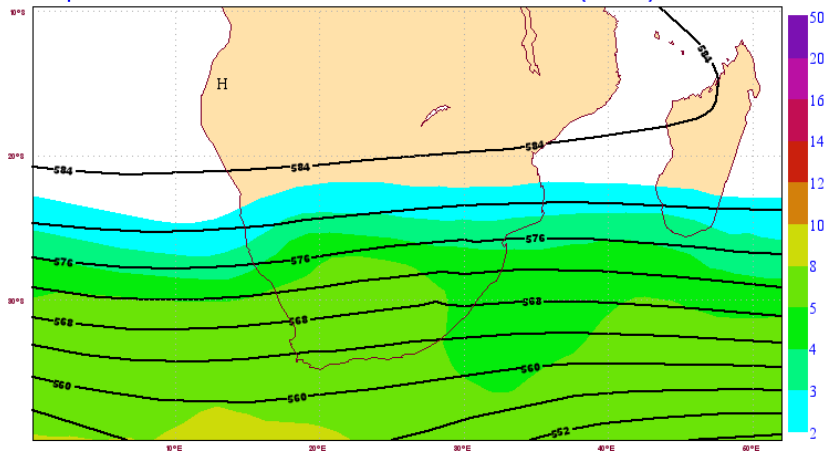


## D+9

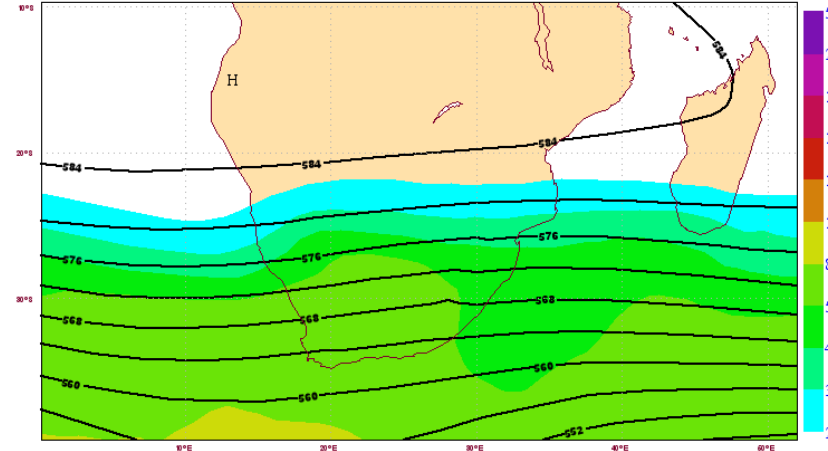
Sunday 17 July 2011 00UTC ECMWF Forecast t+216 VT: Tuesday 26 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature



Sunday 17 July 2011 00UTC @ECMWF Forecast T+216 VT: Tuesday 26 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



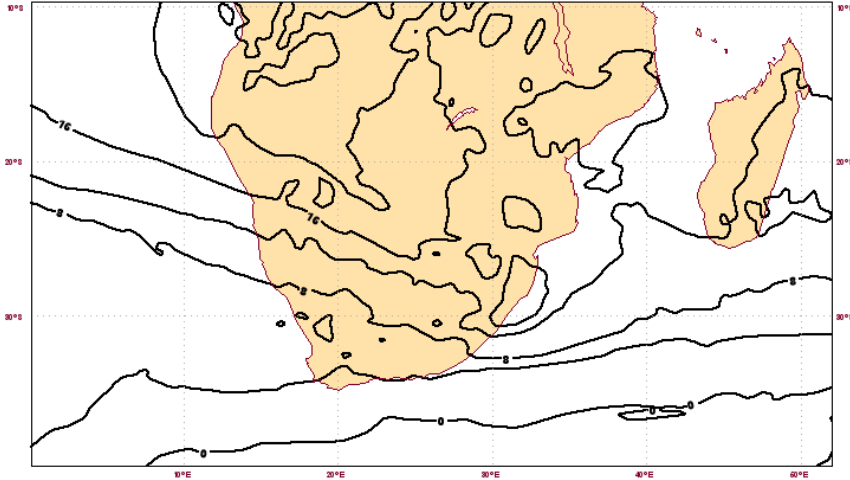
Sunday 17 July 2011 00UTC @ECMWF Forecast T+216 VT: Tuesday 26 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



# HRES & ENS

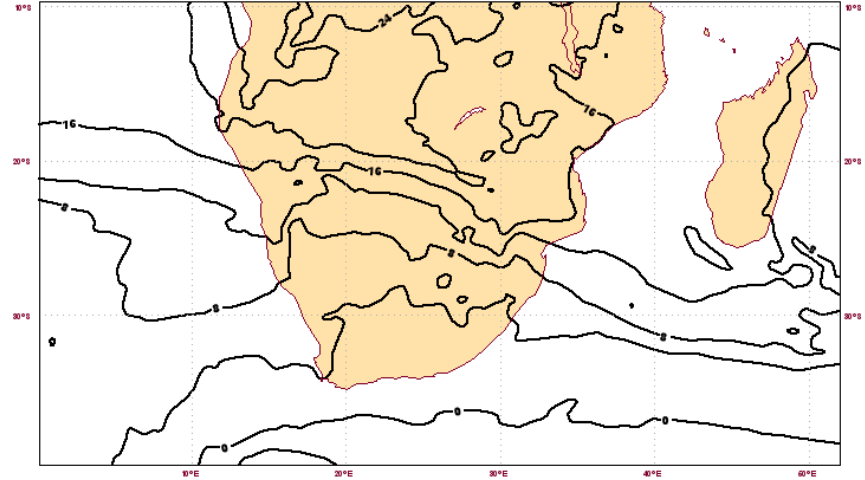
## D+8

Sunday 17 July 2011 00UTC @ECMWF Forecast T+192 VT: Monday 25 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast

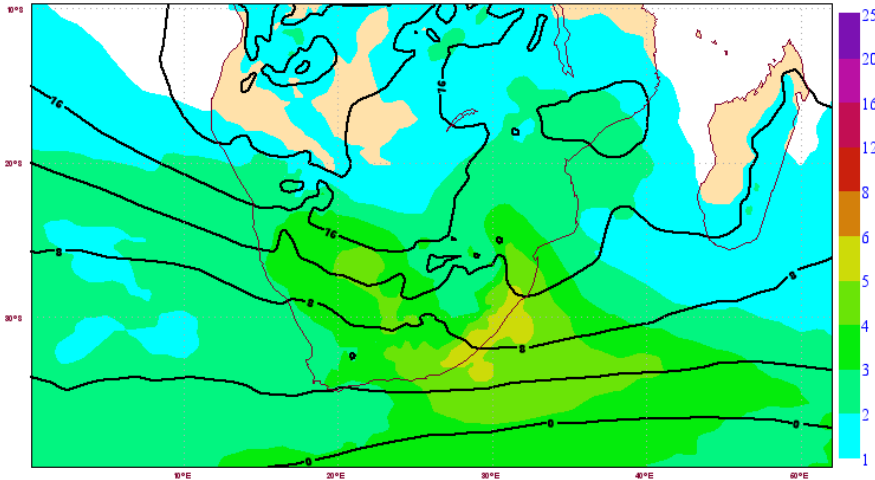


## D+9

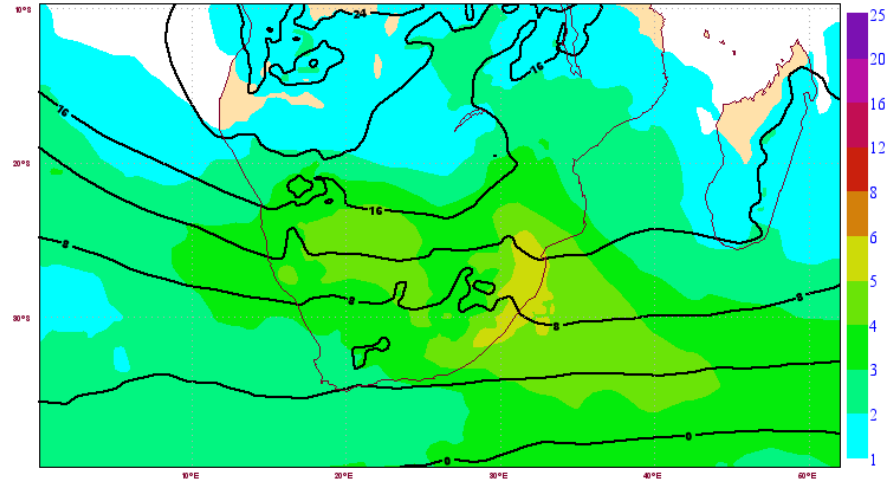
Sunday 17 July 2011 00UTC @ECMWF Forecast T+216 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast



Sunday 17 July 2011 00UTC @ECMWF Forecast T+192 VT: Monday 25 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)



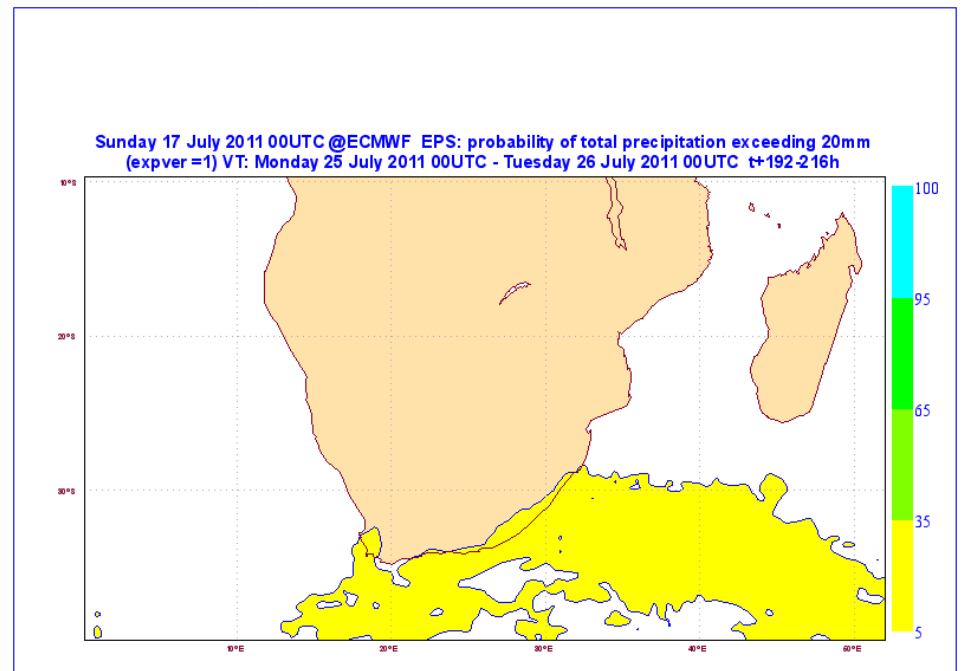
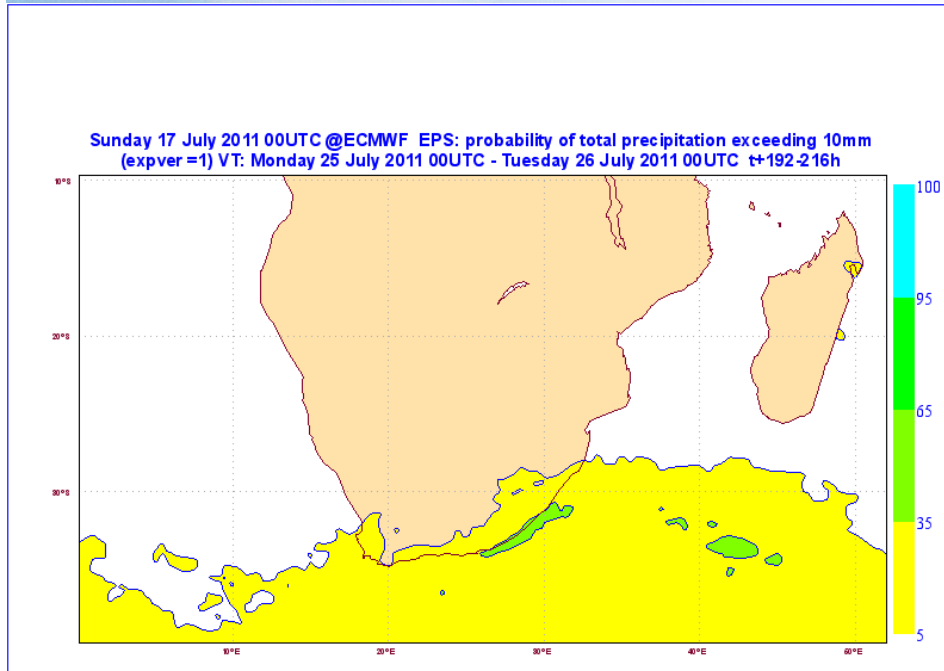
Sunday 17 July 2011 00UTC @ECMWF Forecast T+216 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)



# ENS Probabilities T+192-216

## >10mm

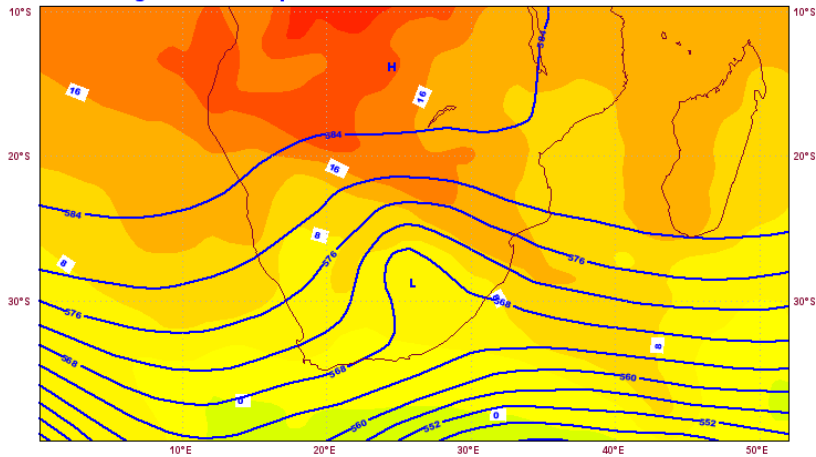
## >20mm



# HRES & ENS

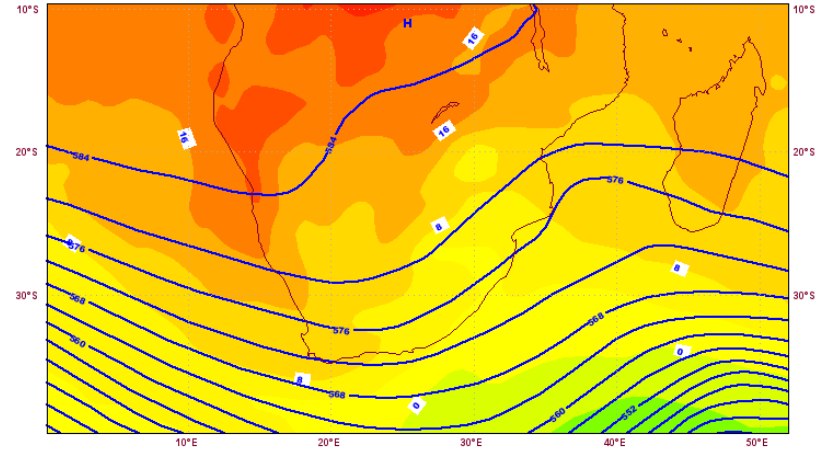
## D+7

Monday 18 July 2011 00UTC ECMWF Forecast t+168 VT: Monday 25 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature

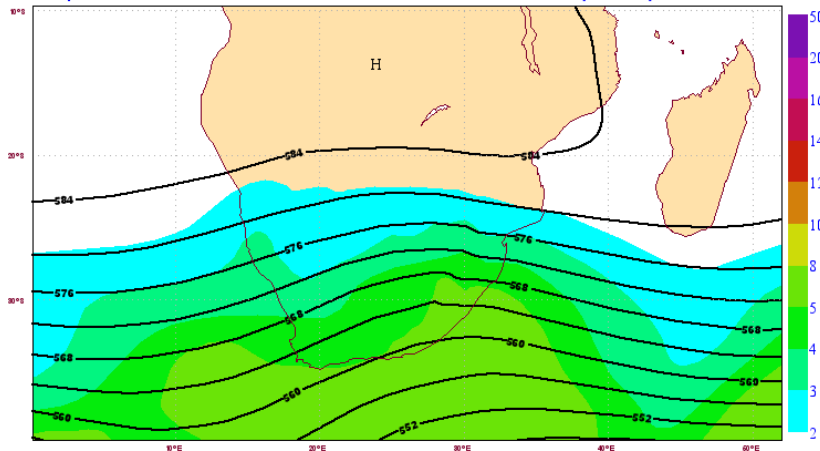


## D+8

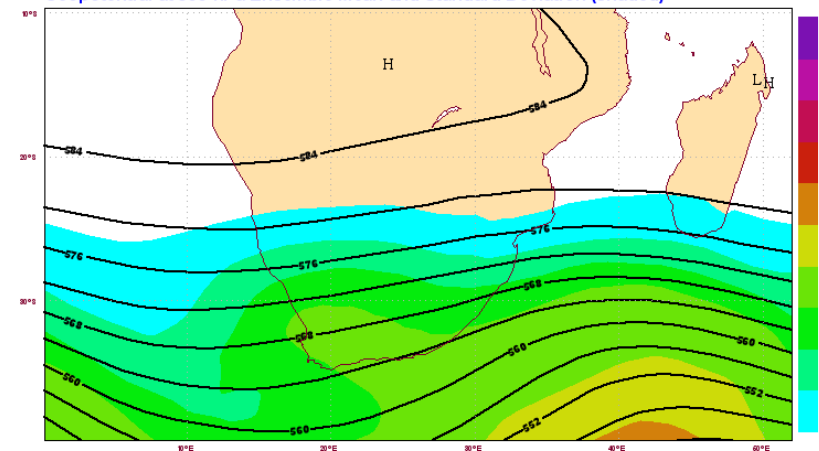
Monday 18 July 2011 00UTC ECMWF Forecast t+192 VT: Tuesday 26 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature



Monday 18 July 2011 00UTC @ECMWF Forecast T+168 VT: Monday 25 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



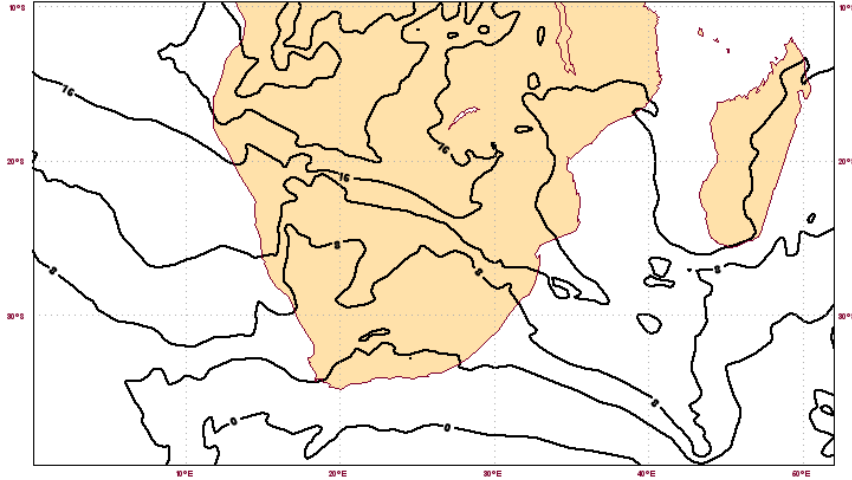
Monday 18 July 2011 00UTC @ECMWF Forecast T+192 VT: Tuesday 26 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



# HRES & ENS

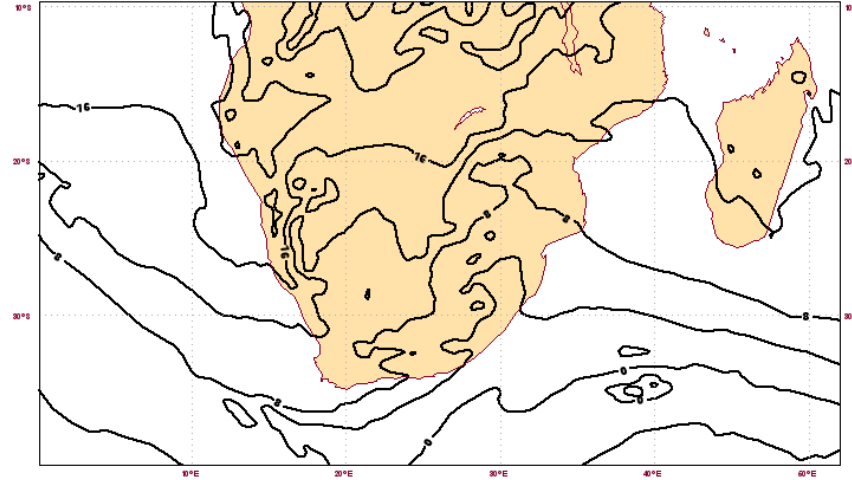
## D+7

Monday 18 July 2011 00UTC @ECMWF Forecast T+168 VT: Monday 25 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast

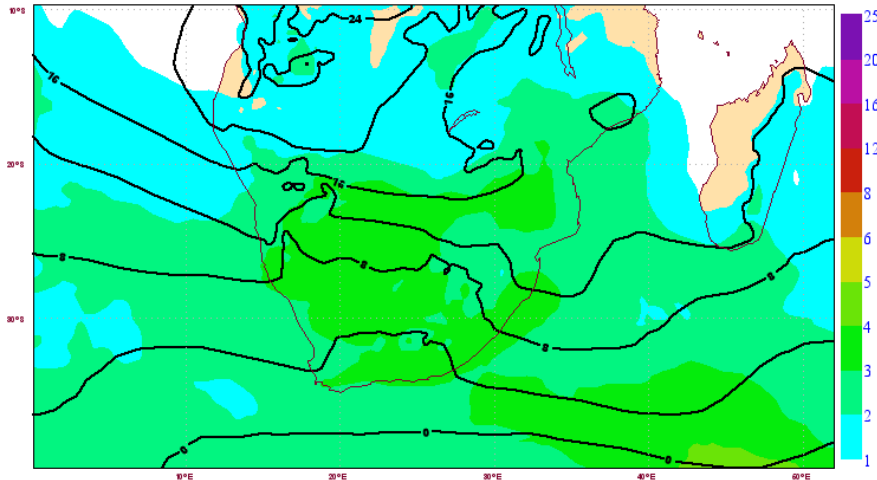


## D+8

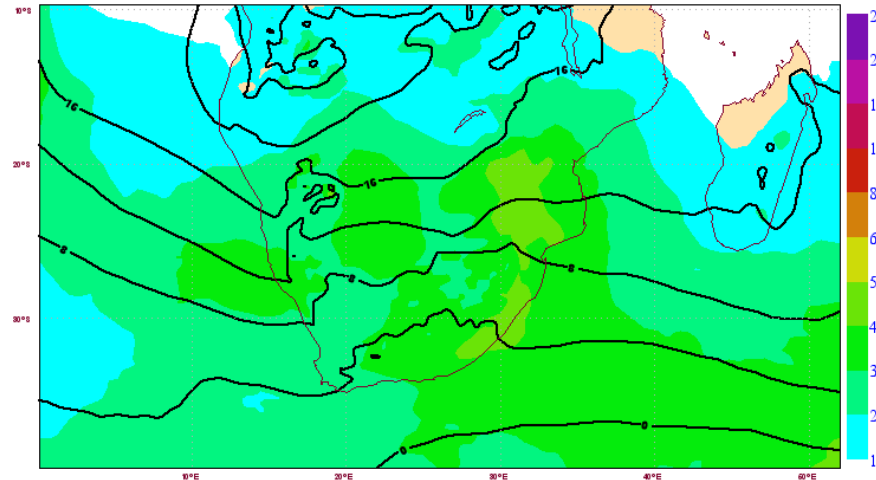
Monday 18 July 2011 00UTC @ECMWF Forecast T+192 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast



Monday 18 July 2011 00UTC @ECMWF Forecast T+168 VT: Monday 25 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)

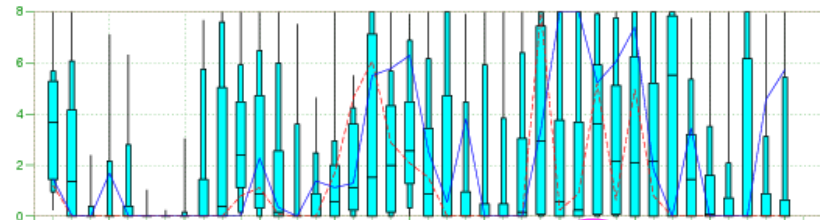


Monday 18 July 2011 00UTC @ECMWF Forecast T+192 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)

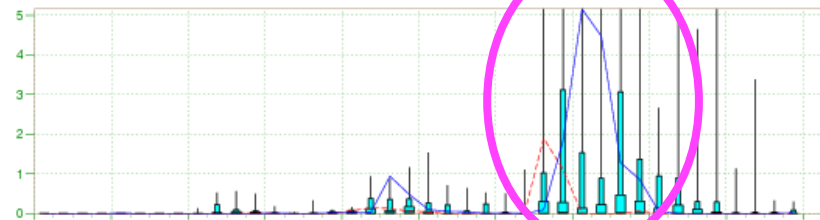


# EPSgrams – D+7

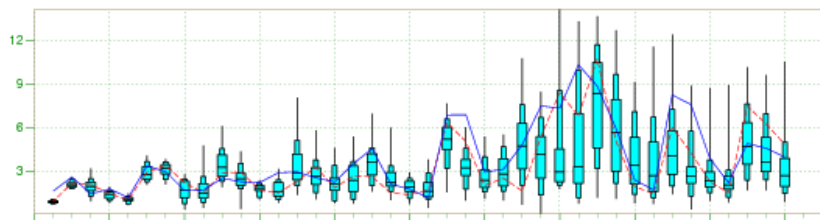
EPS Meteogram  
 Durban 29.93°S 30.94°E (EPS land point) 129 m (T1279)  
 Deterministic Forecast and EPS Distribution Monday 18 July 2011 00 UTC  
 Total Cloud Cover (okta)



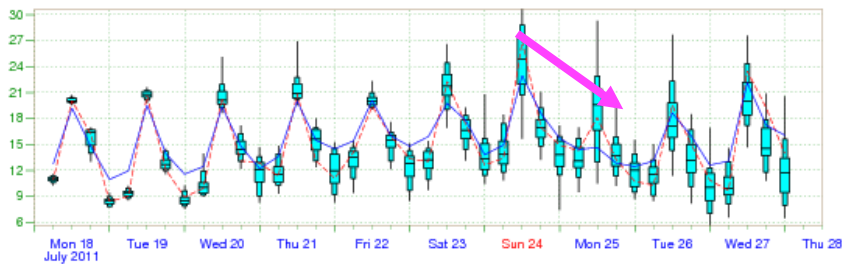
Total Precipitation (mm/6h)



10m Wind Speed (m/s)

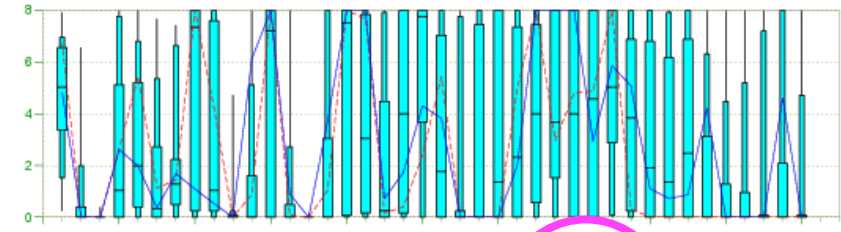


2m Temperature (°C) reduced to the station height from 129 m (T1279) and 159 m (T639)

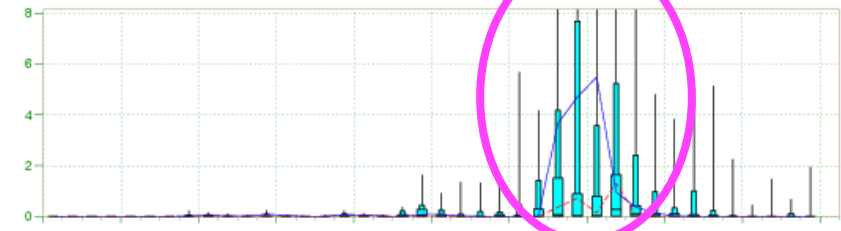


■ EPS Control(31 km) High Resolution Deterministic(16 km)  
--- 0927380915-1.345084e-309 C-1.39087e-309  
--- 10%  
--- 10%  
--- 10%

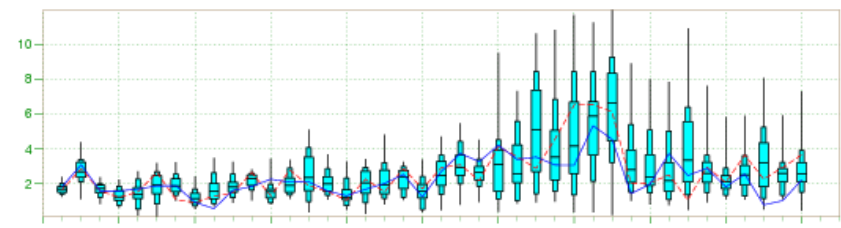
EPS Meteogram  
 Umtata 31.62°S 28.8°E (EPS land point) 729 m (T1279)  
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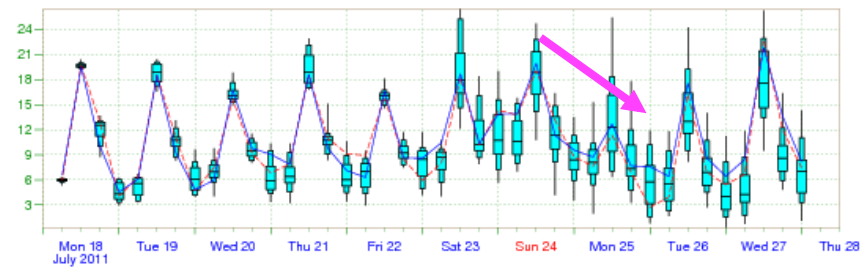
Total Precipitation (mm/6h)



10m Wind Speed (m/s)



2m Temperature (°C) reduced to the station height from 729 m (T1279) and 753 m (T639)



■ EPS Control(31 km) High Resolution Deterministic(16 km)  
--- 1.39087e-309 1.4822e-322 C-1.39087e-309  
--- 10%  
--- 10%  
--- 10%

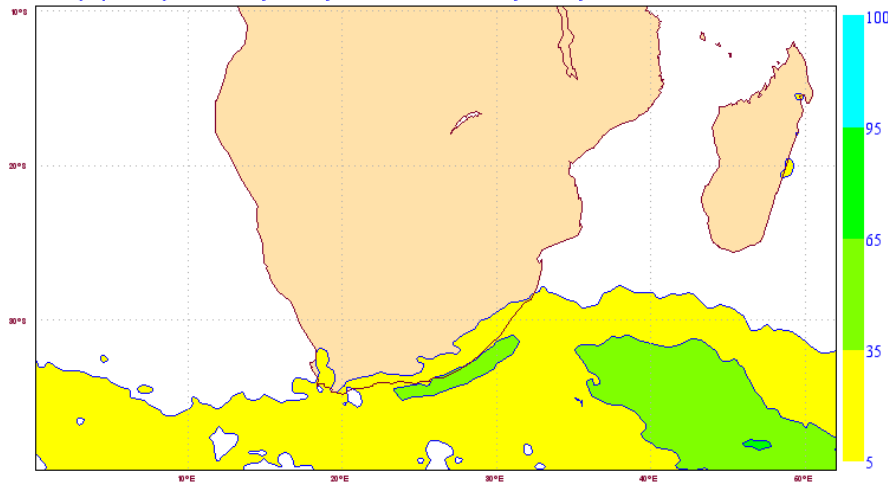


# ENS Probabilities T+168-192

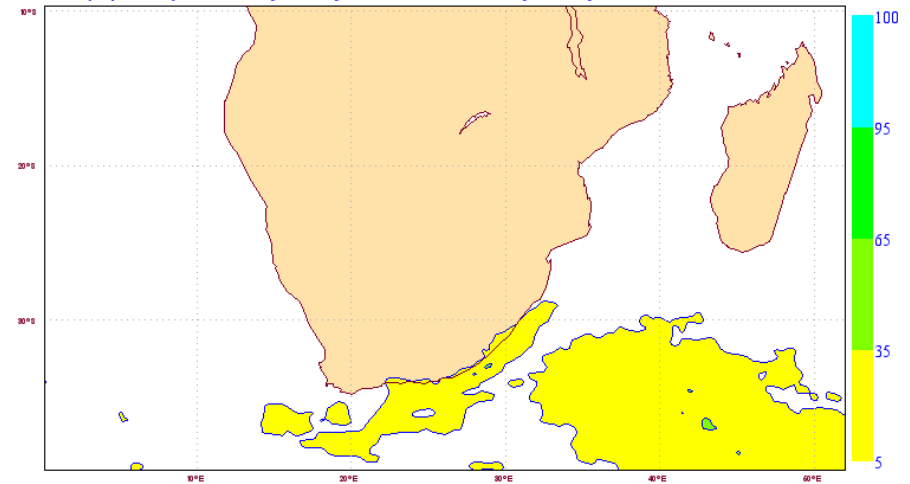
## >10mm

## >20mm

Monday 18 July 2011 00UTC @ECMWF EPS: probability of total precipitation exceeding 10mm (expver =1) VT: Monday 25 July 2011 00UTC - Tuesday 26 July 2011 00UTC t+168-192h



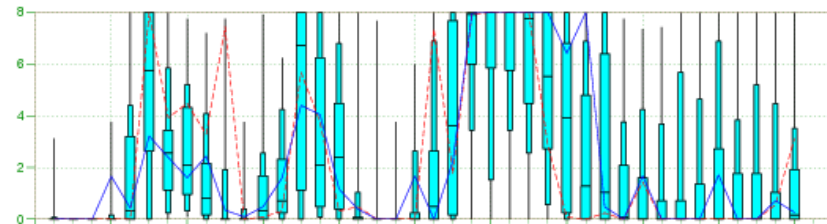
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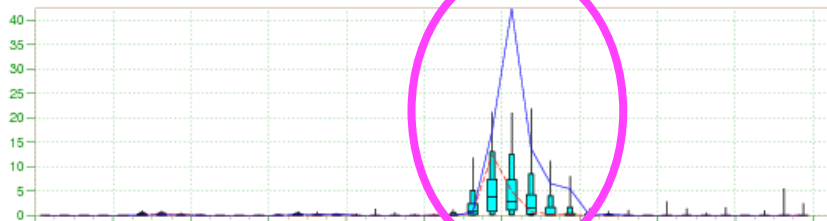
# EPSgrams – D+6

## EPS Meteogram

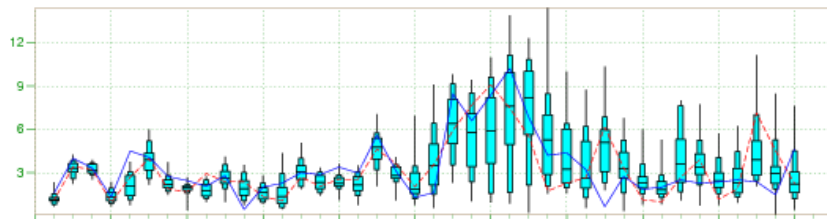
Durban 29.93°S 30.94°E (EPS land point) 129 m (T1279)  
 Deterministic Forecast and EPS Distribution Tuesday 19 July 2011 00 UTC  
 Total Cloud Cover (okta)



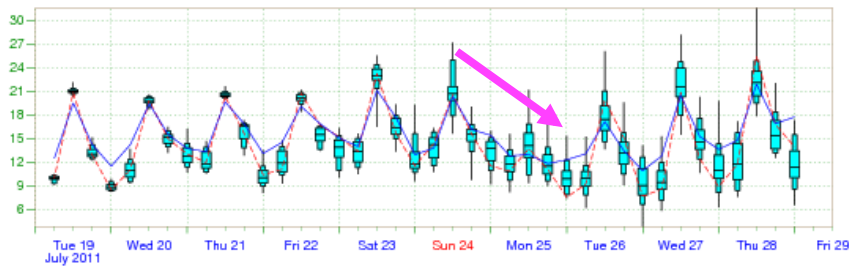
Total Precipitation (mm/6h)



10m Wind Speed (m/s)



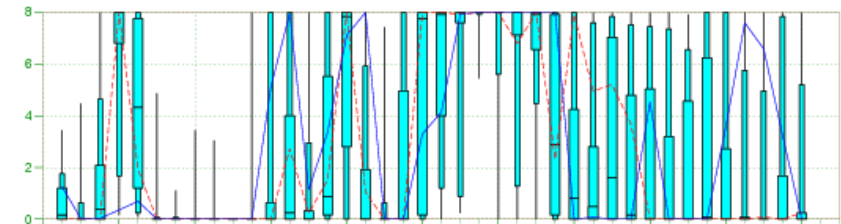
2m Temperature (°C) reduced to the station height from 129 m (T1279) and 159 m (T639)



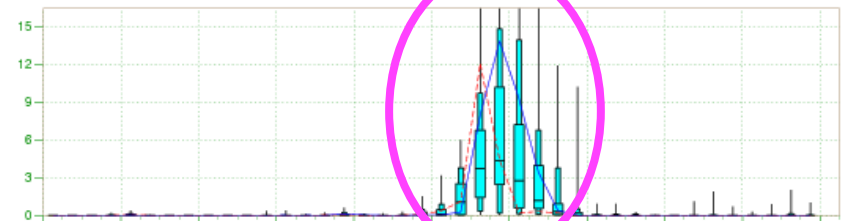
EPS Control(31 km) High Resolution Deterministic(16 km)

## EPS Meteogram

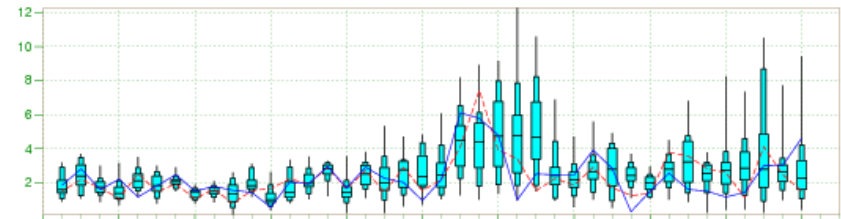
Umtata 31.62°S 28.8°E (EPS land point) 729 m (T1279)  
 Deterministic Forecast and EPS Distribution Tuesday 19 July 2011 00 UTC  
 Total Cloud Cover (okta)



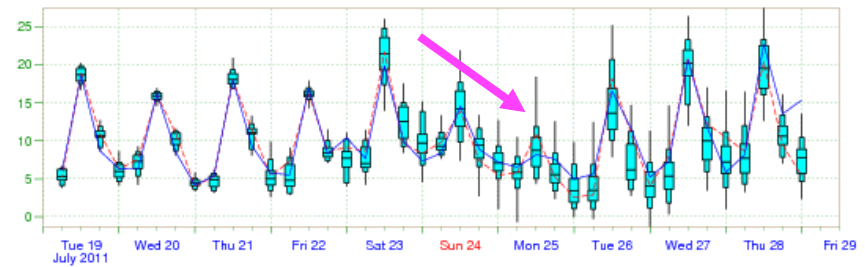
Total Precipitation (mm/6h)



10m Wind Speed (m/s)



2m Temperature (°C) reduced to the station height from 729 m (T1279) and 753 m (T639)

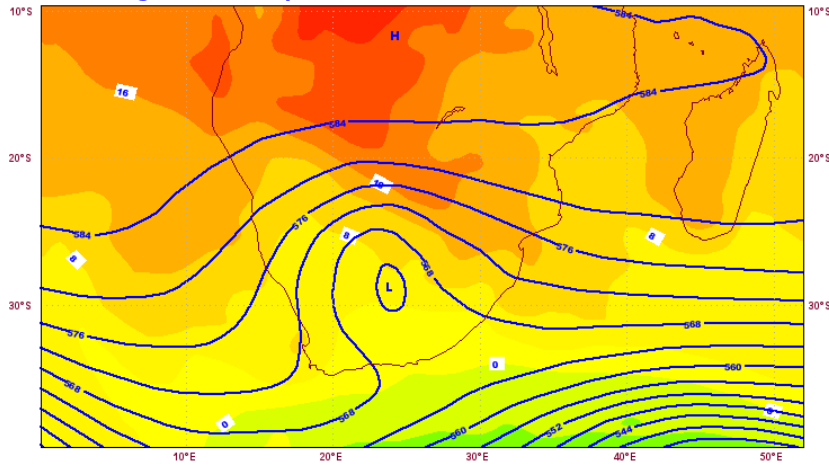


EPS Control(31 km) High Resolution Deterministic(16 km)

# HRES & ENS

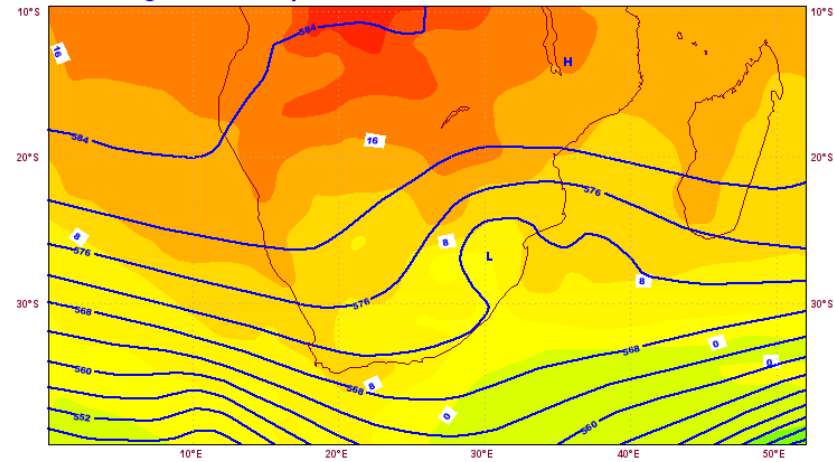
## D+6

Tuesday 19 July 2011 00UTC ECMWF Forecast t+144 VT: Monday 25 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature

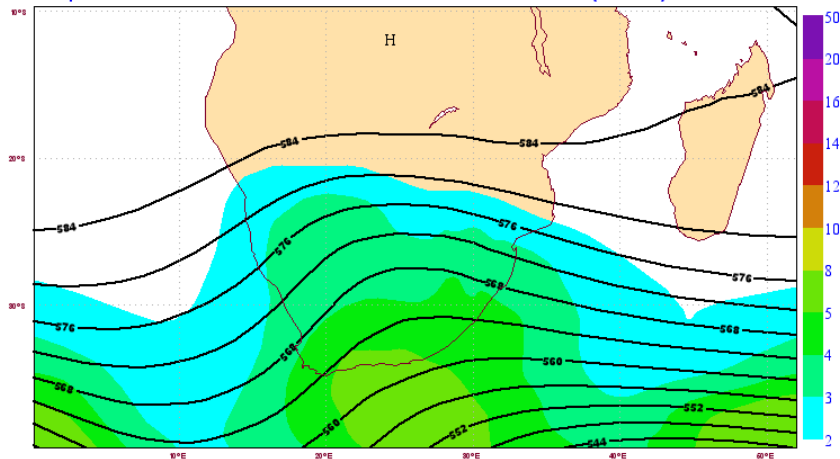


## D+7

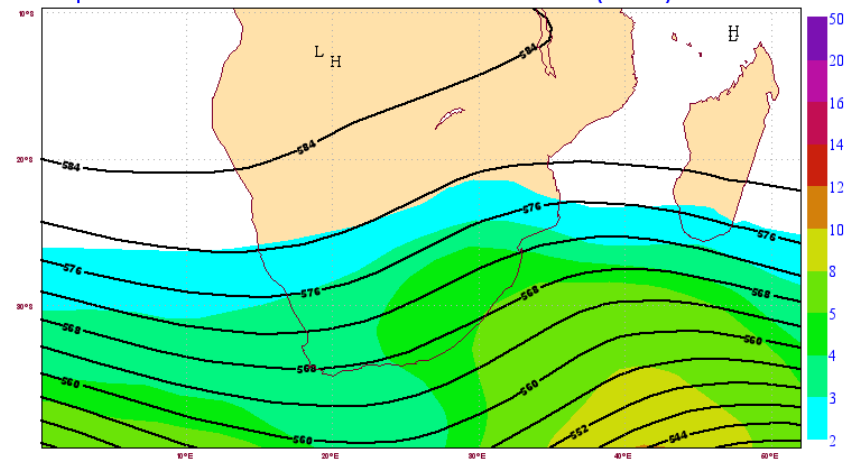
Tuesday 19 July 2011 00UTC ECMWF Forecast t+168 VT: Tuesday 26 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature



Tuesday 19 July 2011 00UTC @ECMWF Forecast T+144 VT: Monday 25 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



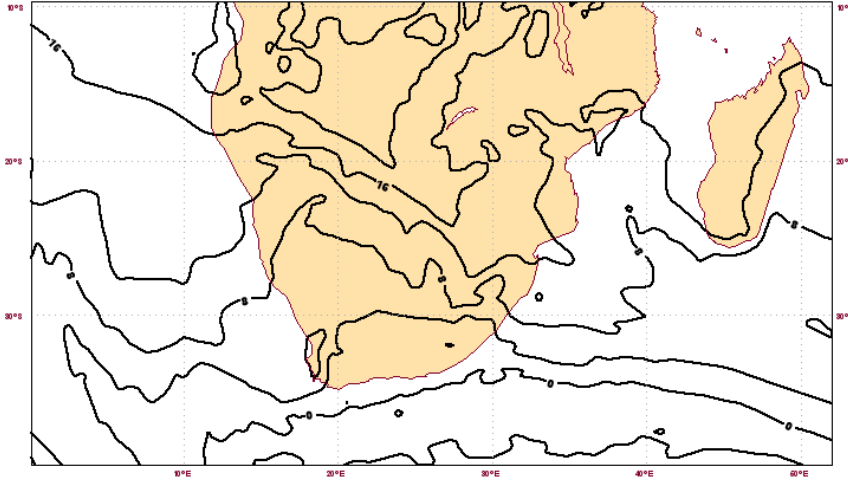
Tuesday 19 July 2011 00UTC @ECMWF Forecast T+168 VT: Tuesday 26 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



# HRES & ENS

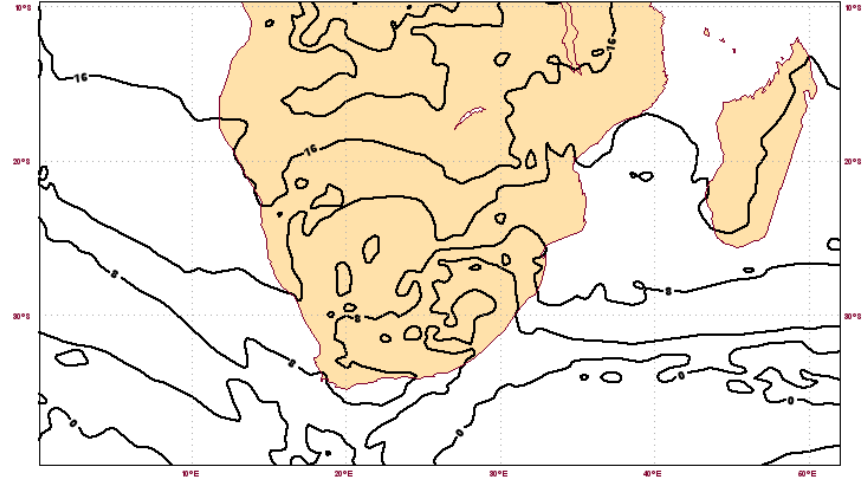
## D+6

Tuesday 19 July 2011 00UTC @ECMWF Forecast T+144 VT: Monday 25 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast

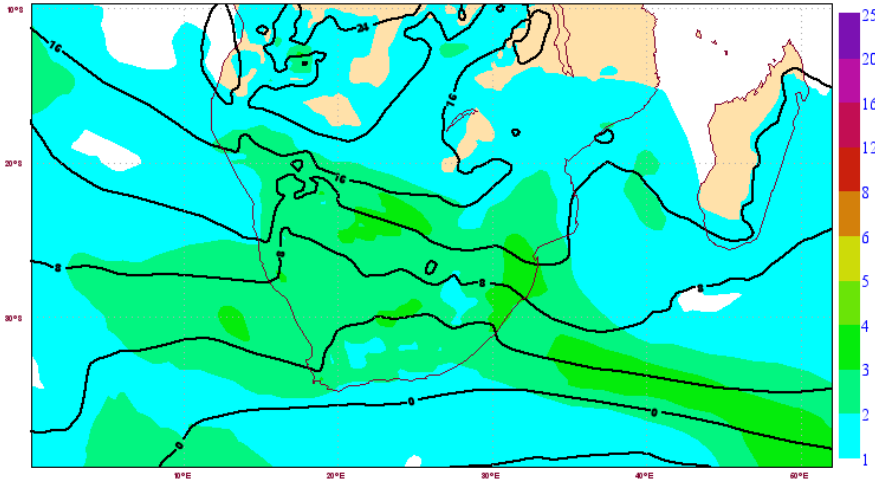


## D+7

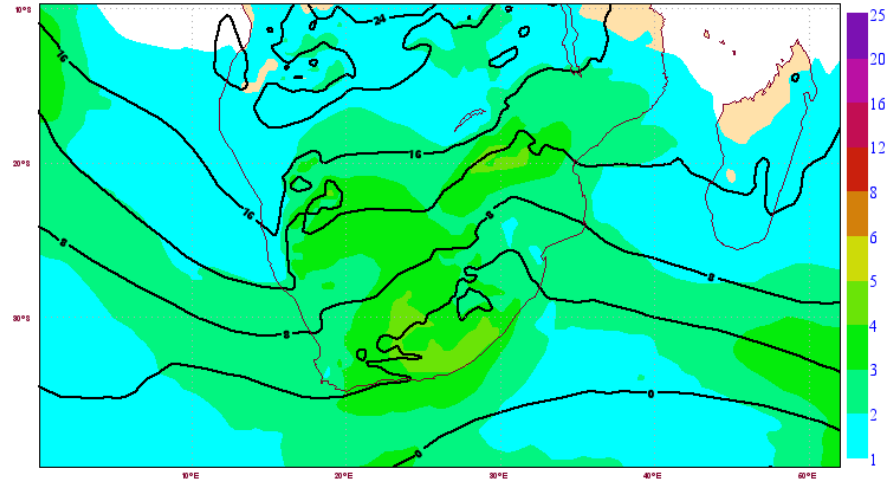
Tuesday 19 July 2011 00UTC @ECMWF Forecast T+168 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast



Tuesday 19 July 2011 00UTC @ECMWF Forecast T+144 VT: Monday 25 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)



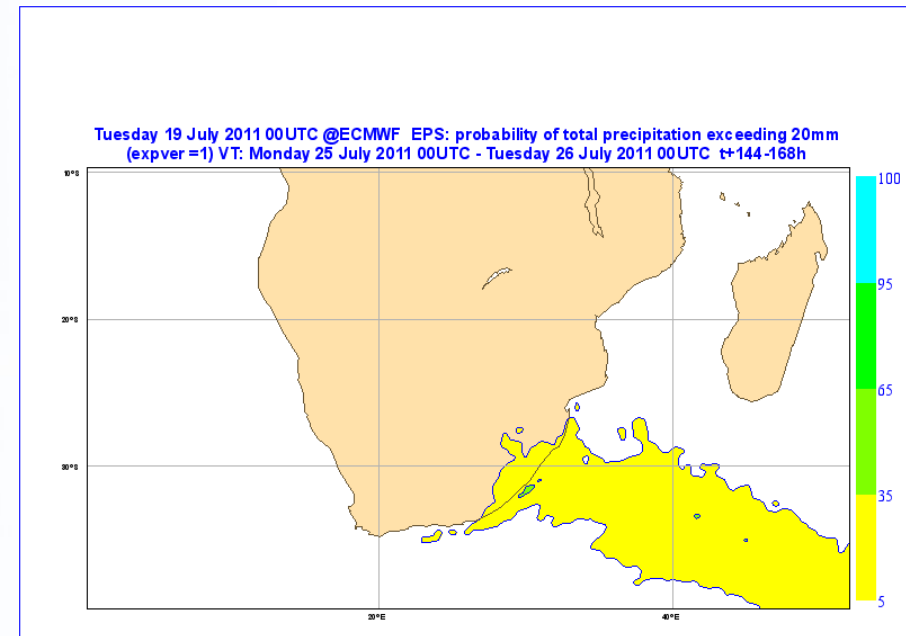
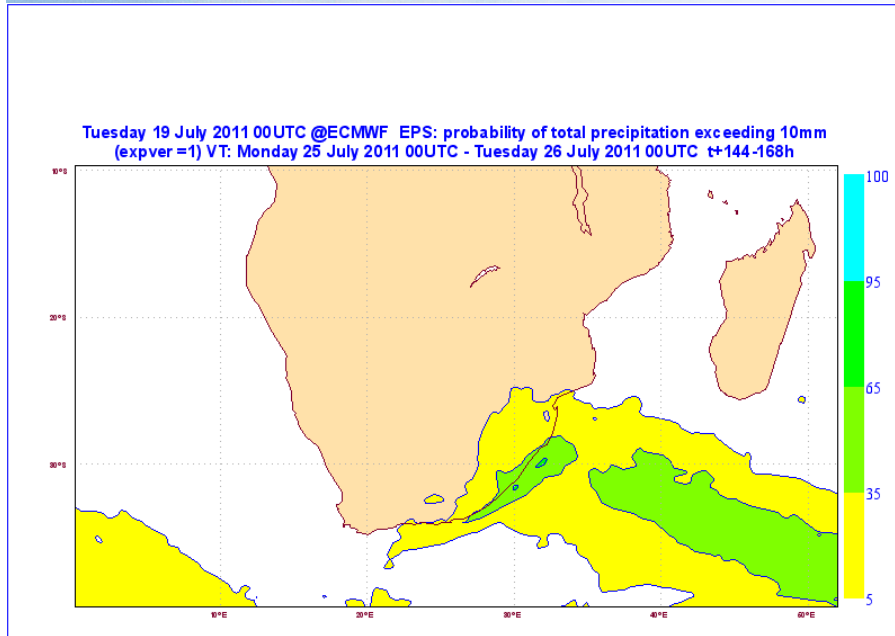
Tuesday 19 July 2011 00UTC @ECMWF Forecast T+168 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)



# ENS Probabilities T+144-168

## >10mm

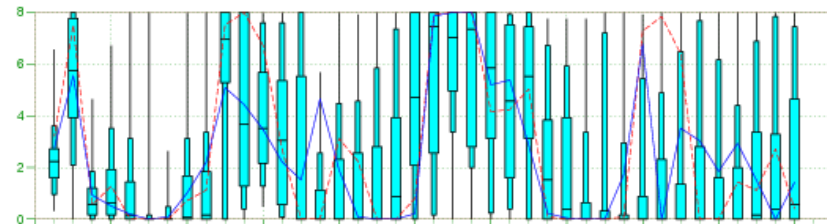
## >20mm



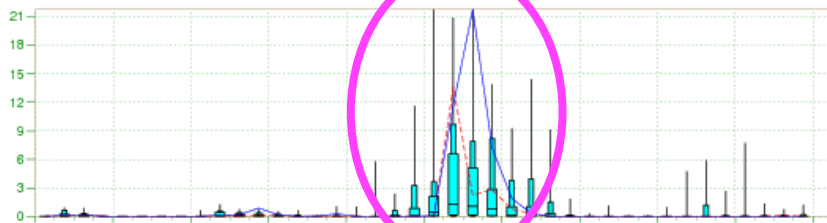
# EPSgrams – D+5

## EPS Meteogram

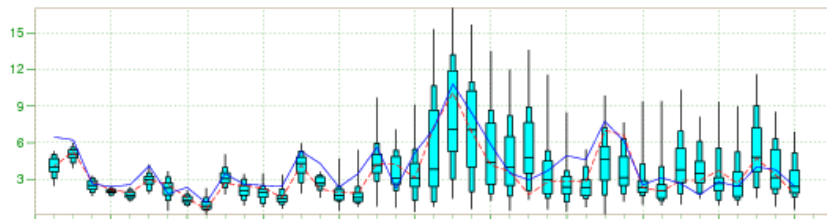
Durban 29.93°S 30.94°E (EPS land point) 129 m (T1279)  
 Deterministic Forecast and EPS Distribution Wednesday 20 July 2011 00 UTC  
 Total Cloud Cover (okta)



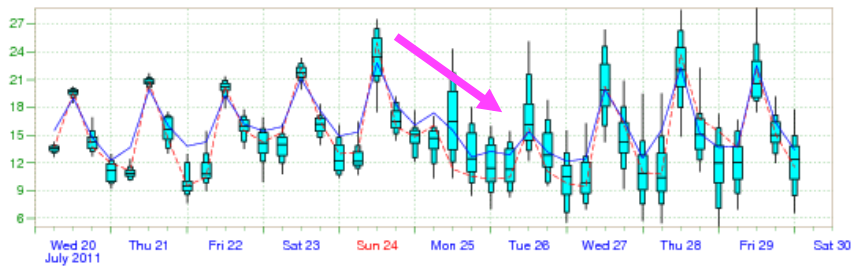
Total Cloud Cover (okta)



10m Wind Speed (m/s)



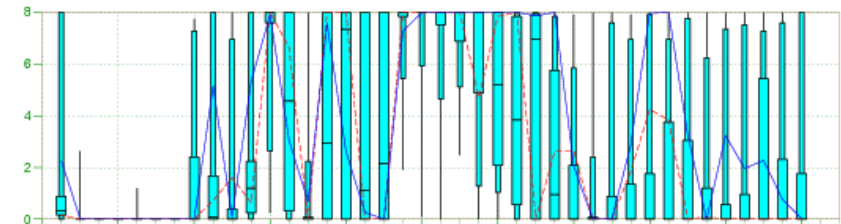
2m Temperature (°C) reduced to the station height from 129 m (T1279) and 159 m (T639)



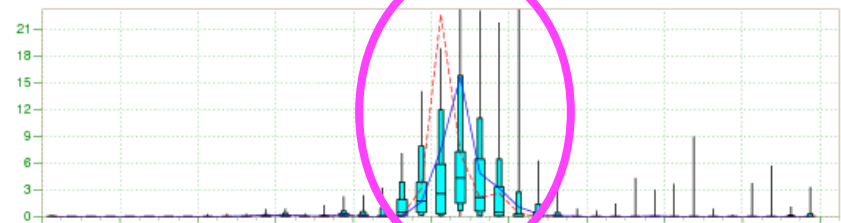
EPS Control(31 km) High Resolution Deterministic(16 km)

## EPS Meteogram

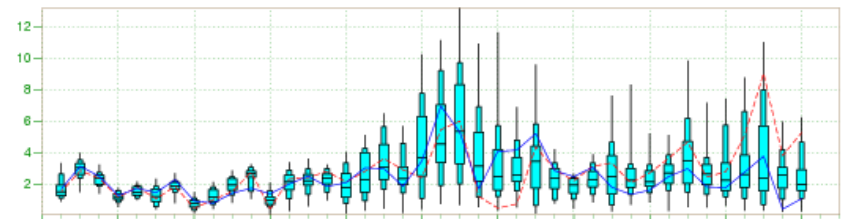
Umtata 31.62°S 28.8°E (EPS land point) 729 m (T1279)  
 Deterministic Forecast and EPS Distribution Wednesday 20 July 2011 00 UTC  
 Total Cloud Cover (okta)



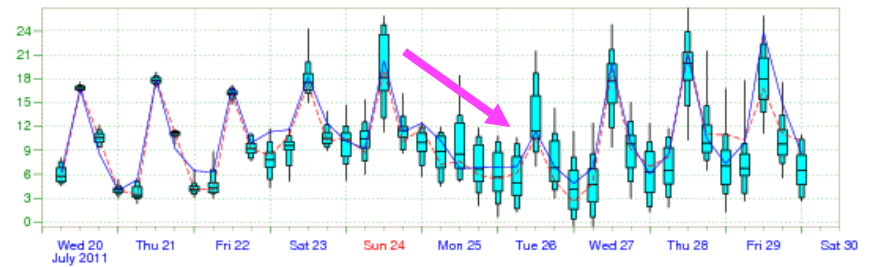
Total Cloud Cover (okta)



10m Wind Speed (m/s)



2m Temperature (°C) reduced to the station height from 729 m (T1279) and 753 m (T639)

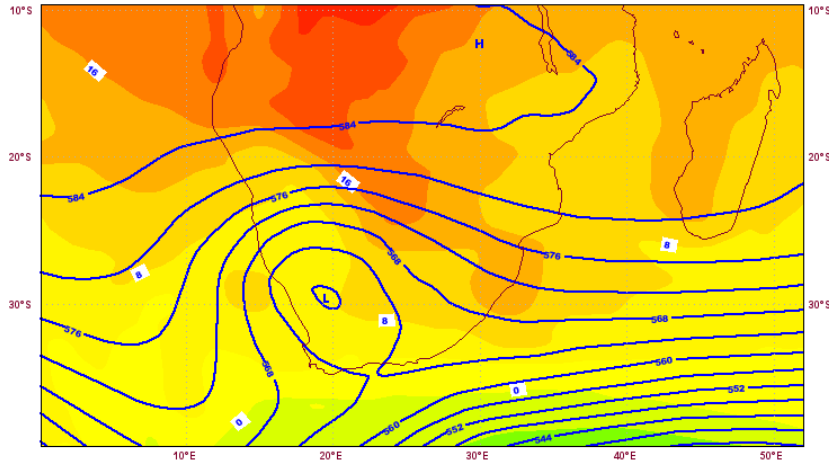


EPS Control(31 km) High Resolution Deterministic(16 km)

# HRES & ENS

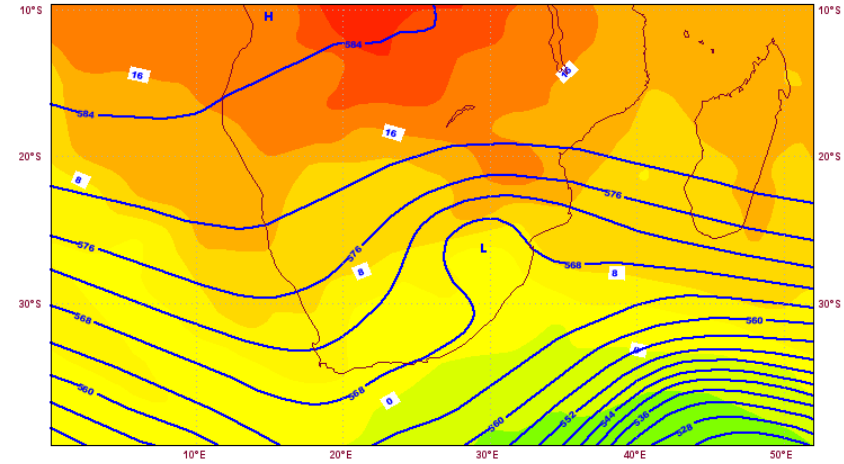
## D+5

Wednesday 20 July 2011 00UTC ECMWF Forecast t+120 VT: Monday 25 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature

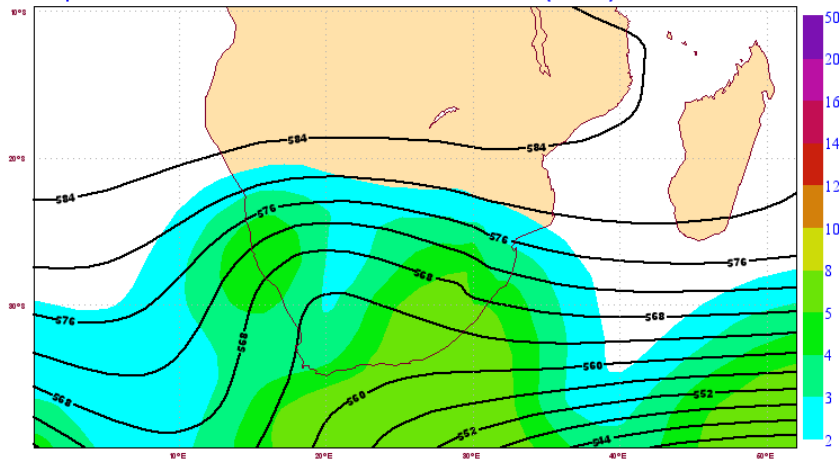


## D+6

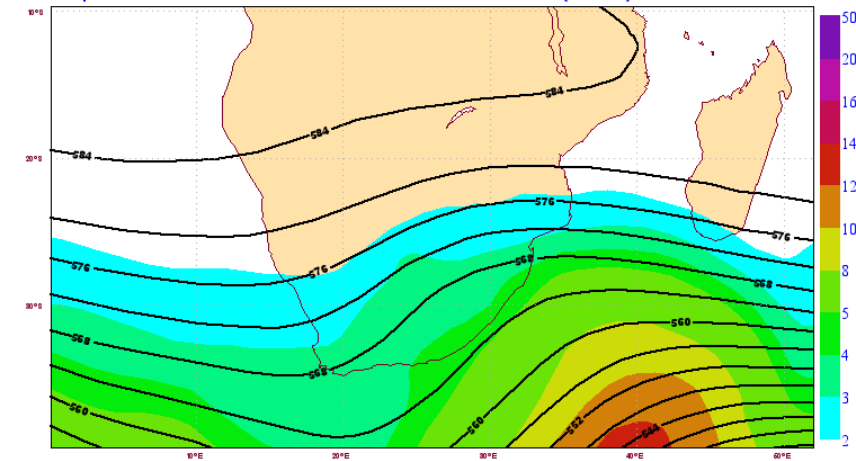
Wednesday 20 July 2011 00UTC ECMWF Forecast t+144 VT: Tuesday 26 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature



Wednesday 20 July 2011 00UTC @ECMWF Forecast T+120 VT: Monday 25 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



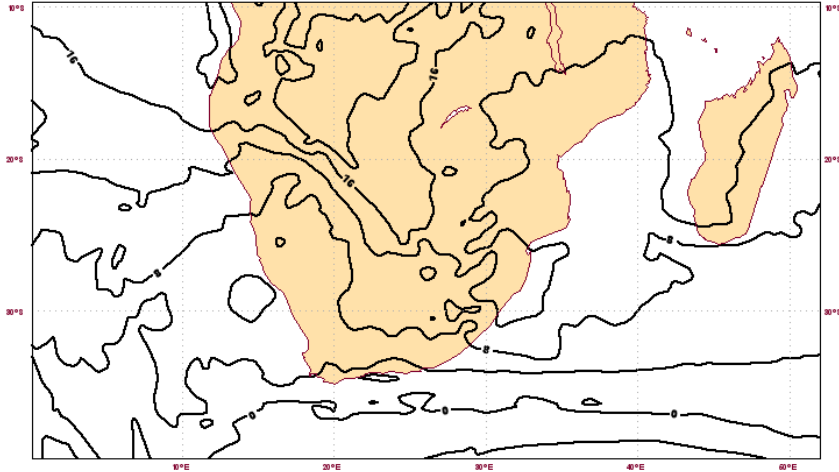
Wednesday 20 July 2011 00UTC @ECMWF Forecast T+144 VT: Tuesday 26 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



# HRES & ENS

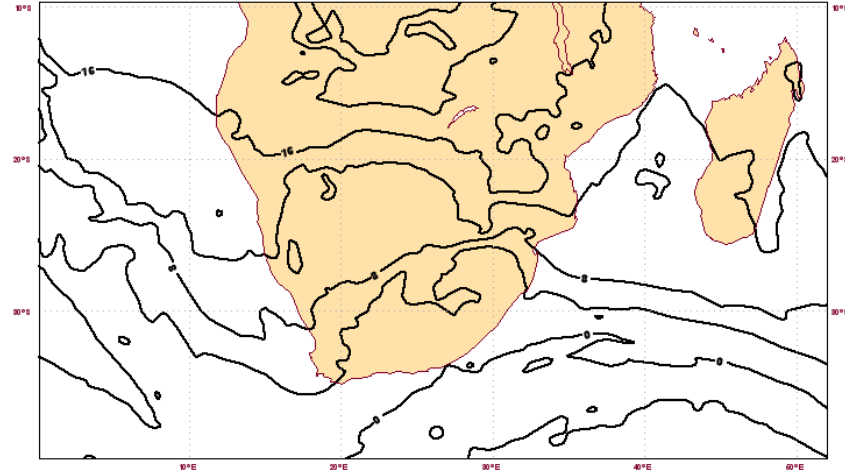
## D+5

Wednesday 20 July 2011 00UTC @ECMWF Forecast T+120 VT: Monday 25 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast

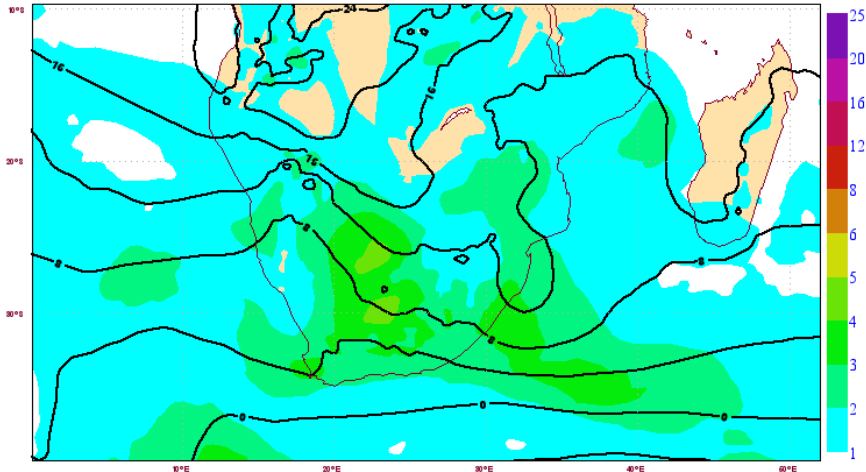


## D+6

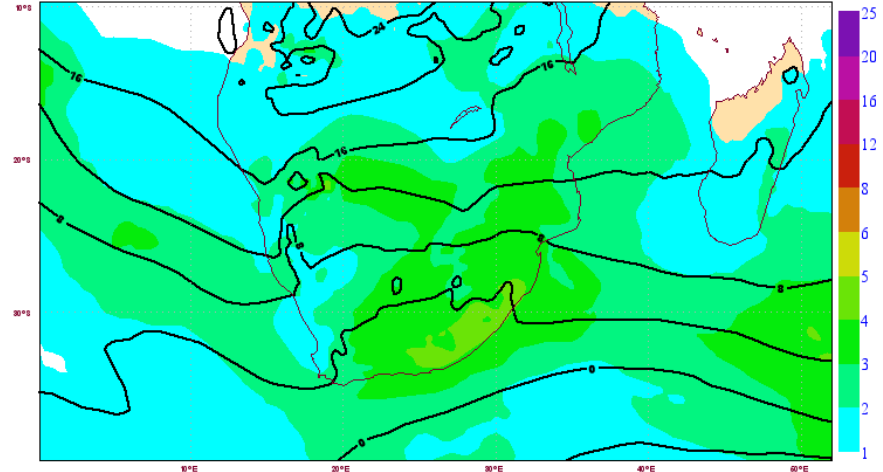
Wednesday 20 July 2011 00UTC @ECMWF Forecast T+144 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast



Wednesday 20 July 2011 00UTC @ECMWF Forecast T+120 VT: Monday 25 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)



Wednesday 20 July 2011 00UTC @ECMWF Forecast T+144 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)

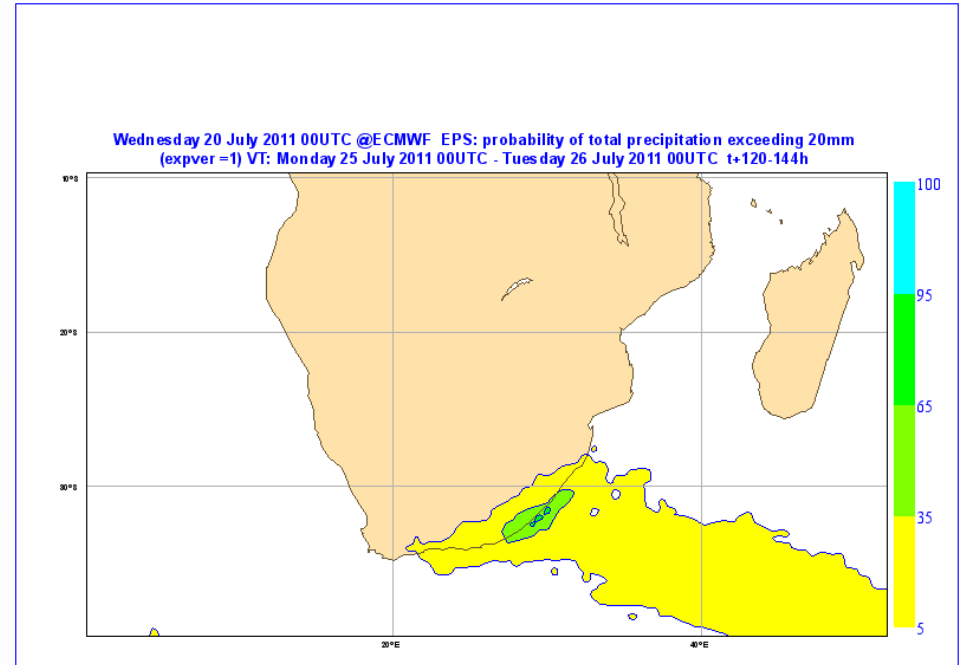
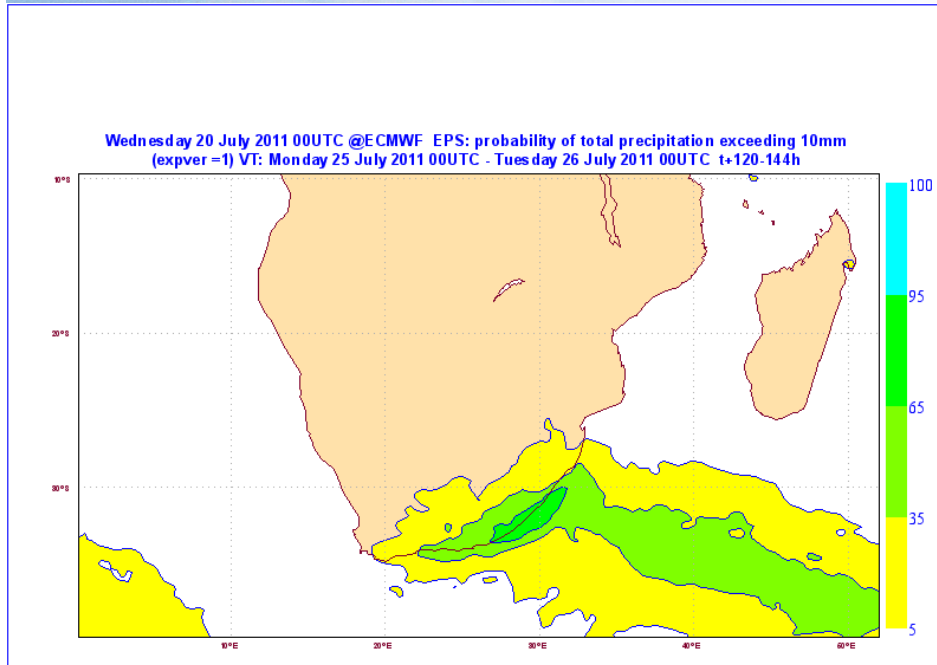




# ENS Probabilities T+120-144

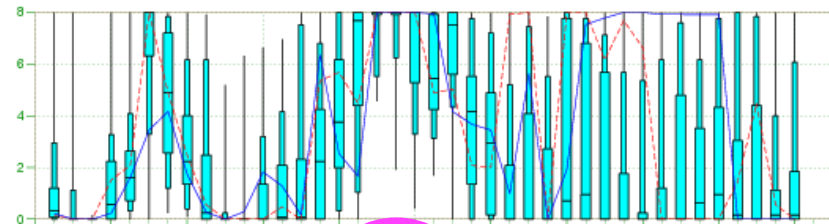
## >10mm

## >20mm

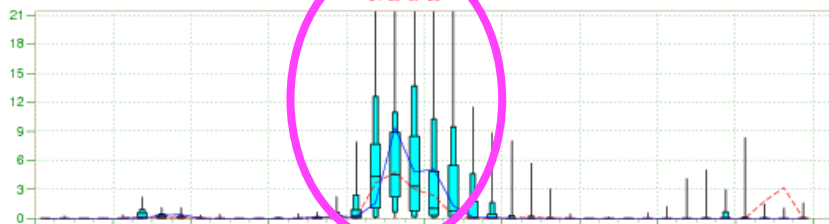


# EPSgrams – D+4

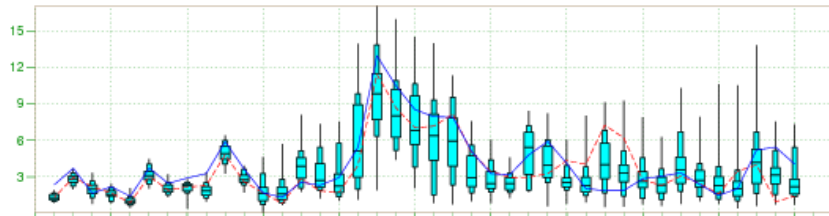
EPS Meteogram  
 Durban 29.93°S 30.94°E (EPS land point) 129 m (T1279)  
 Deterministic Forecast and EPS Distribution Thursday 21 July 2011 00 UTC  
 Total Cloud Cover (okta)



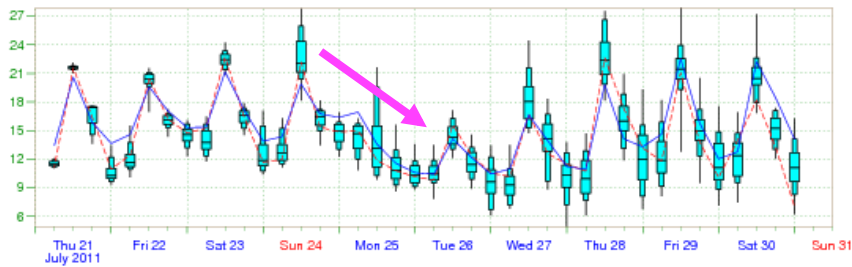
Total Precipitation (mm/6h)



10m Wind Speed (m/s)

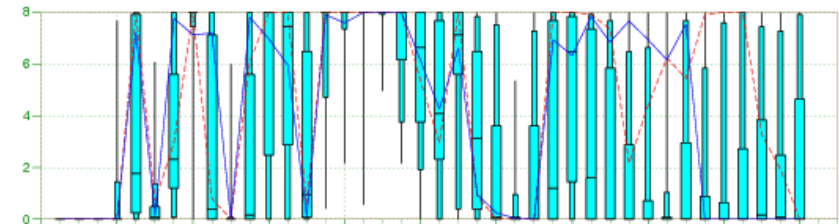


2m Temperature (°C) reduced to the station height from 129 m (T1279) and 159 m (T639)

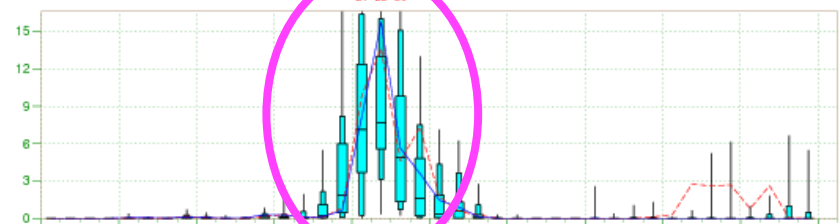


50%  
 5032 1500 19-1.35804-39067-309  
 EPS Control(31 km) High Resolution Deterministic(16 km)

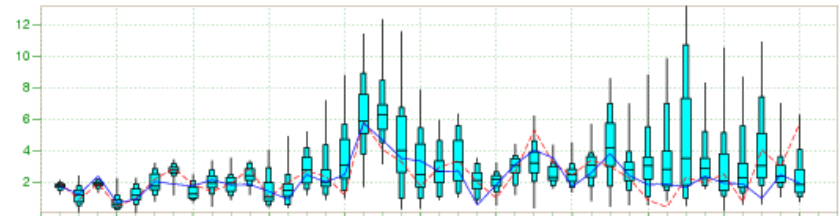
EPS Meteogram  
 Umtata 31.62°S 28.8°E (EPS land point) 729 m (T1279)  
 Deterministic Forecast and EPS Distribution Thursday 21 July 2011 00 UTC  
 Total Cloud Cover (okta)



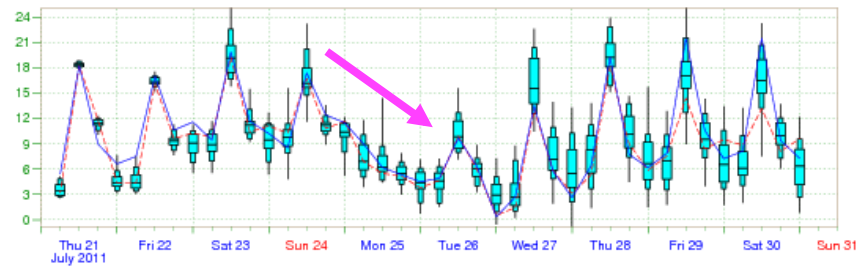
Total Precipitation (mm/6h)



10m Wind Speed (m/s)



2m Temperature (°C) reduced to the station height from 729 m (T1279) and 753 m (T639)

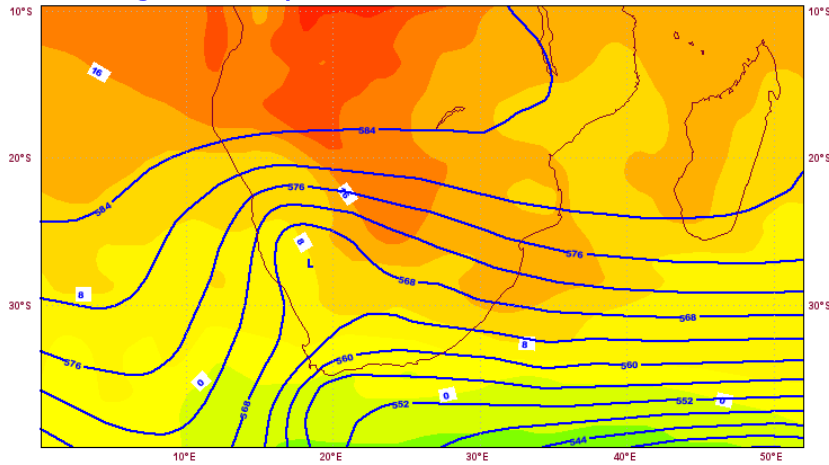


50%  
 4936 1500 19-1.36521-39067-309  
 EPS Control(31 km) High Resolution Deterministic(16 km)

# HRES & ENS

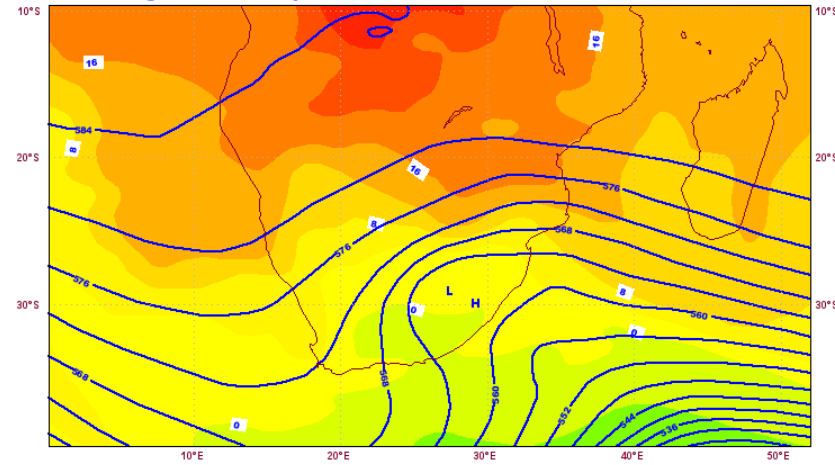
## D+4

Thursday 21 July 2011 00UTC ECMWF Forecast t+ 96 VT: Monday 25 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature

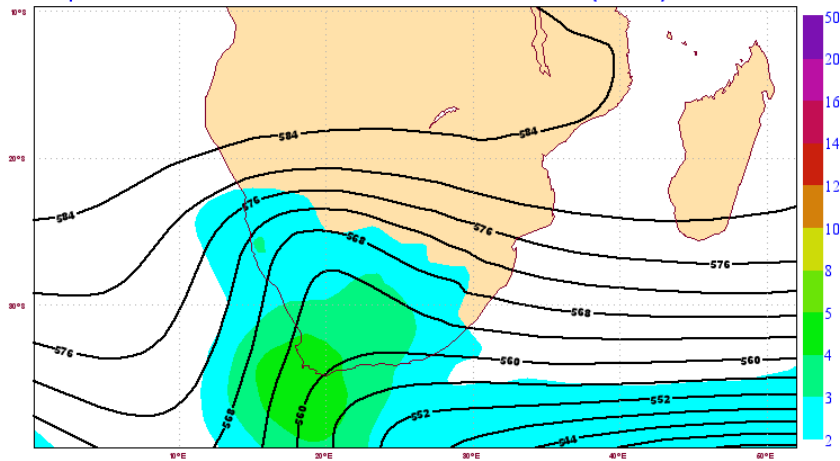


## D+5

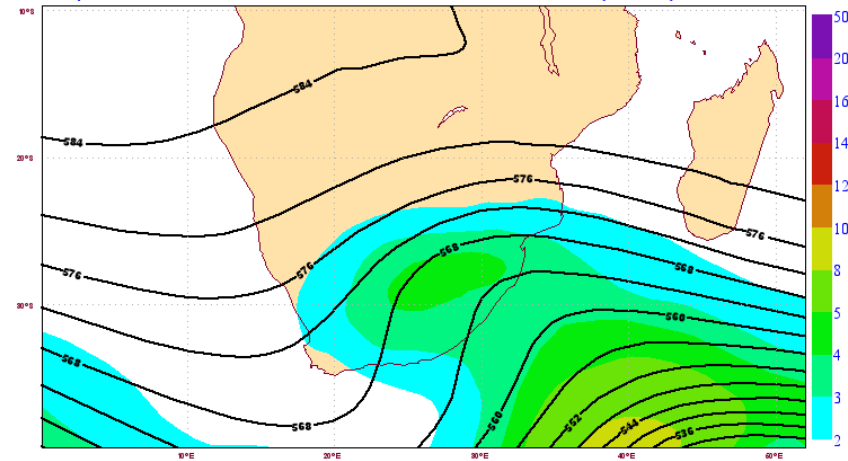
Thursday 21 July 2011 00UTC ECMWF Forecast t+120 VT: Tuesday 26 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature



Thursday 21 July 2011 00UTC @ECMWF Forecast T+96 VT: Monday 25 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



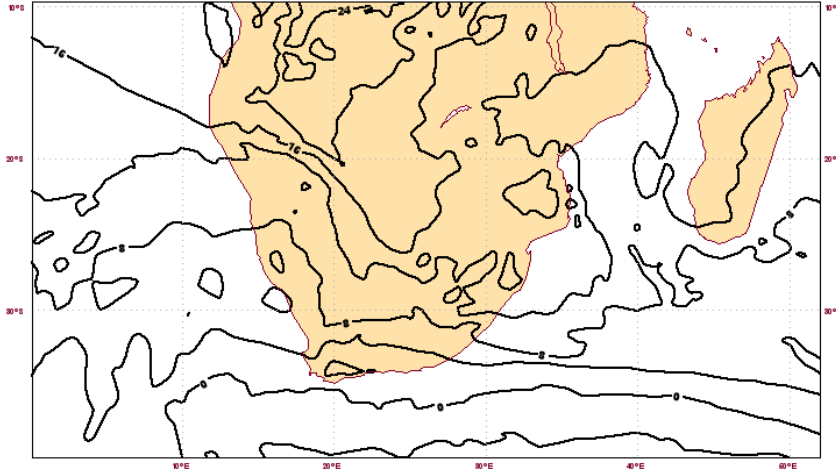
Thursday 21 July 2011 00UTC @ECMWF Forecast T+120 VT: Tuesday 26 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



# HRES & ENS

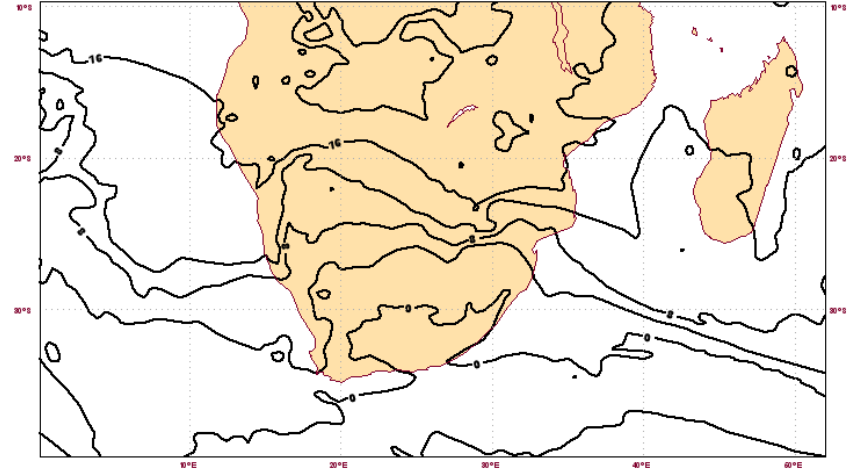
## D+4

Thursday 21 July 2011 00UTC @ECMWF Forecast T+96 VT: Monday 25 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast

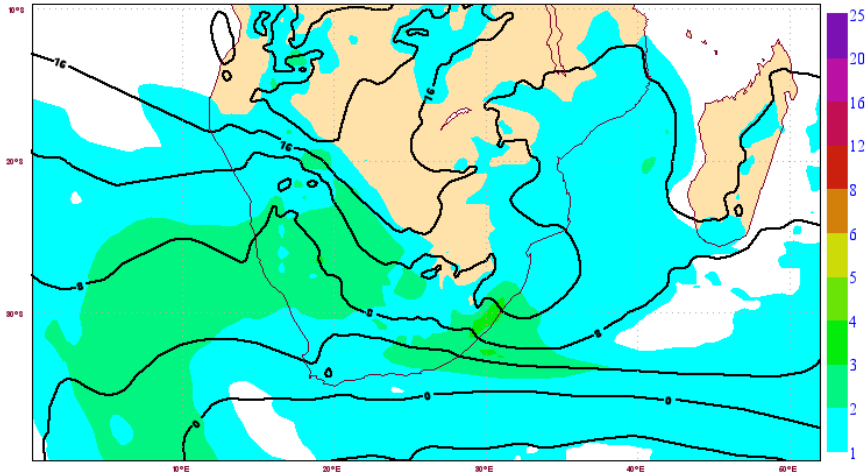


## D+5

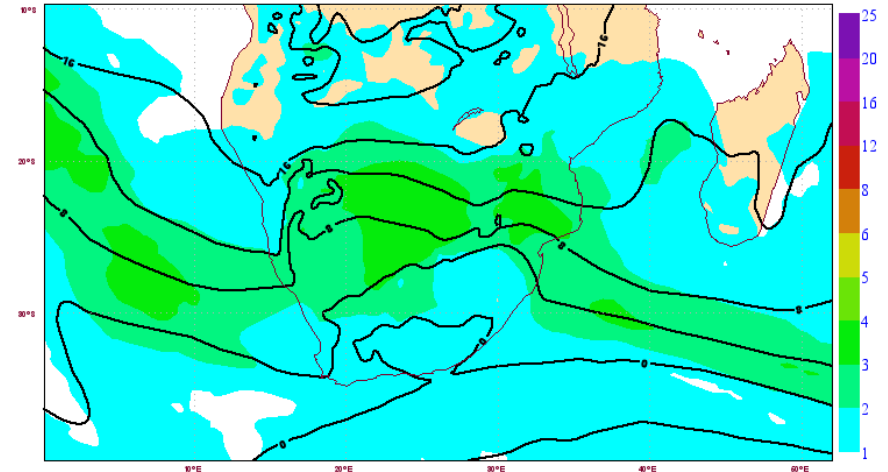
Thursday 21 July 2011 00UTC @ECMWF Forecast T+120 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast



Thursday 21 July 2011 00UTC @ECMWF Forecast T+96 VT: Monday 25 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)



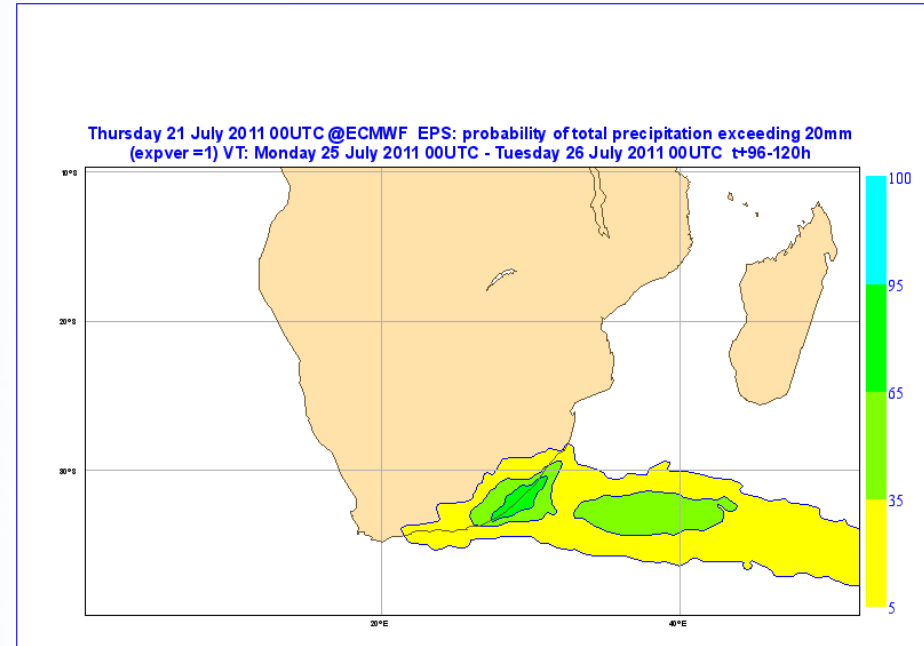
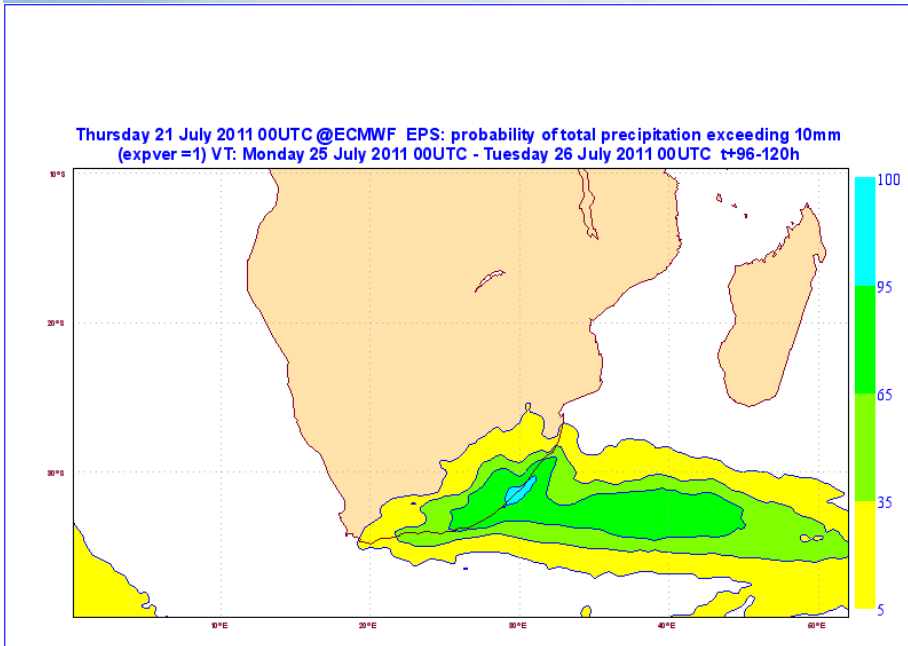
Thursday 21 July 2011 00UTC @ECMWF Forecast T+120 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)



# ENS Probabilities T+96-120

## >10mm

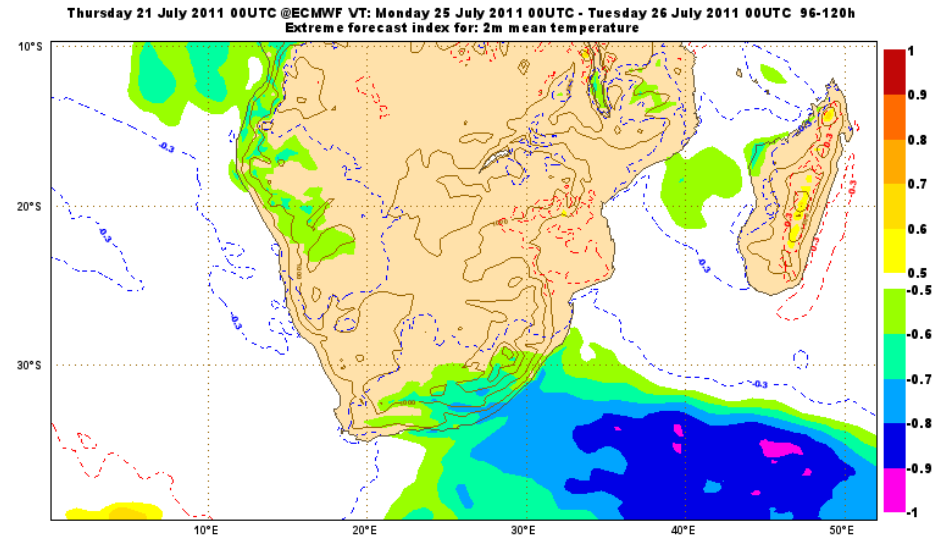
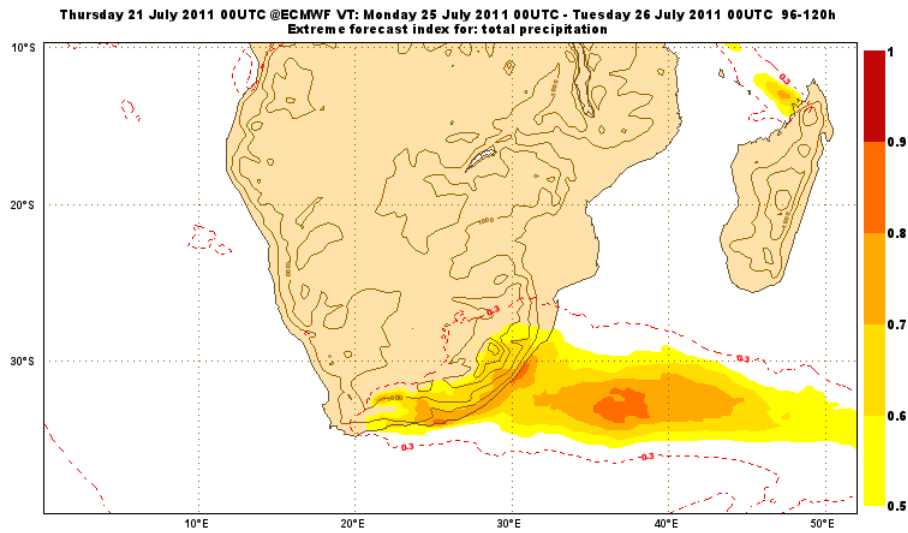
## >20mm



# EFI T+96-120

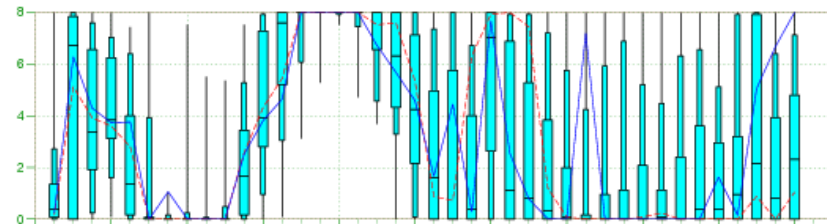
## Precipitation

## Temperature

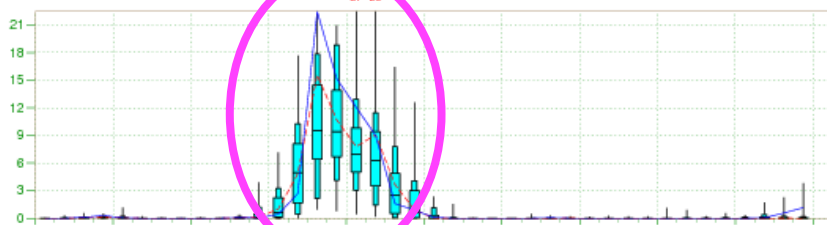


# EPSgrams – D+3

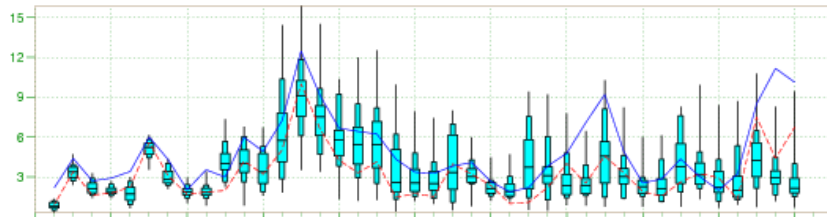
EPS Meteogram  
 Durban 29.93°S 30.94°E (EPS land point) 129 m (T1279)  
 Deterministic Forecast and EPS Distribution Friday 22 July 2011 00 UTC  
 Total Cloud Cover (okta)



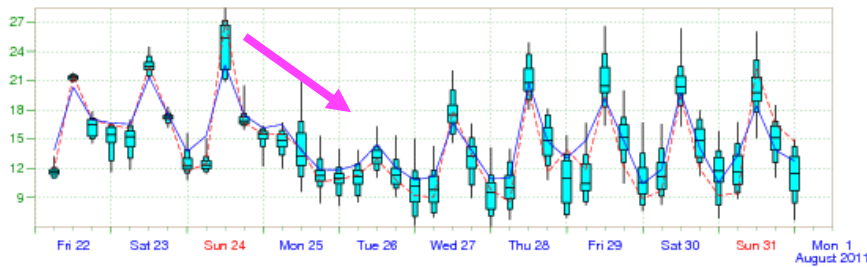
Total Precipitation (mm/6h)



10m Wind Speed (m/s)

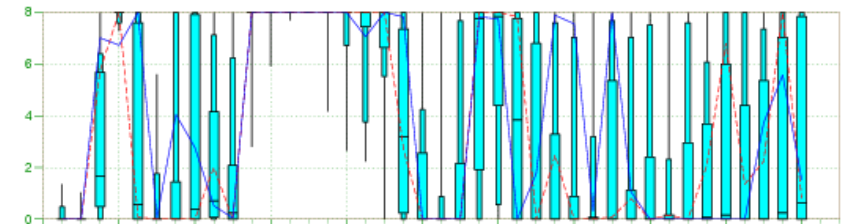


2m Temperature (°C) reduced to the station height from 129 m (T1279) and 159 m (T639)

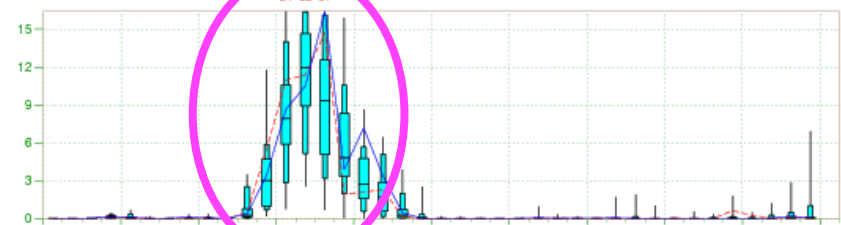


50% 10% 10%  
 EPS Control(31 km) High Resolution Deterministic(16 km)  
 5038 1207 19 -2.3534e+1 695-10.7521 0-1.95067e-309

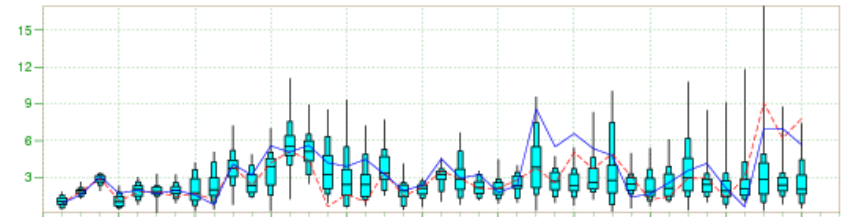
EPS Meteogram  
 Umtata 31.62°S 28.8°E (EPS land point) 729 m (T1279)  
 Deterministic Forecast and EPS Distribution Friday 22 July 2011 00 UTC  
 Total Cloud Cover (okta)



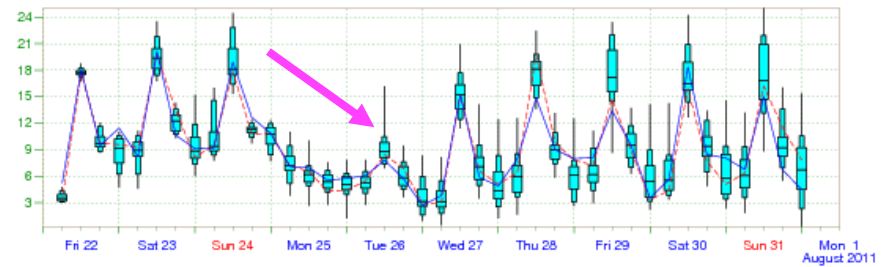
Total Precipitation (mm/6h)



10m Wind Speed (m/s)



2m Temperature (°C) reduced to the station height from 729 m (T1279) and 753 m (T639)

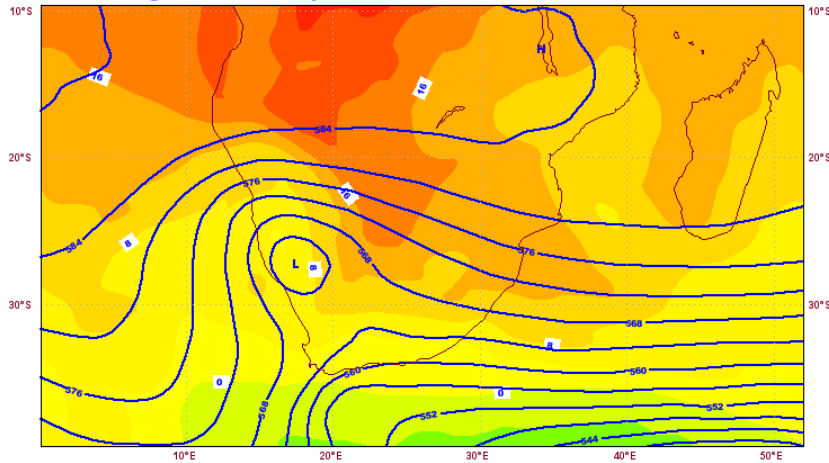


50% 10% 10%  
 EPS Control(31 km) High Resolution Deterministic(16 km)  
 6578 1207 19 6.79039e-03 205e-315-2.91350e-309 67e-309

# HRES & ENS

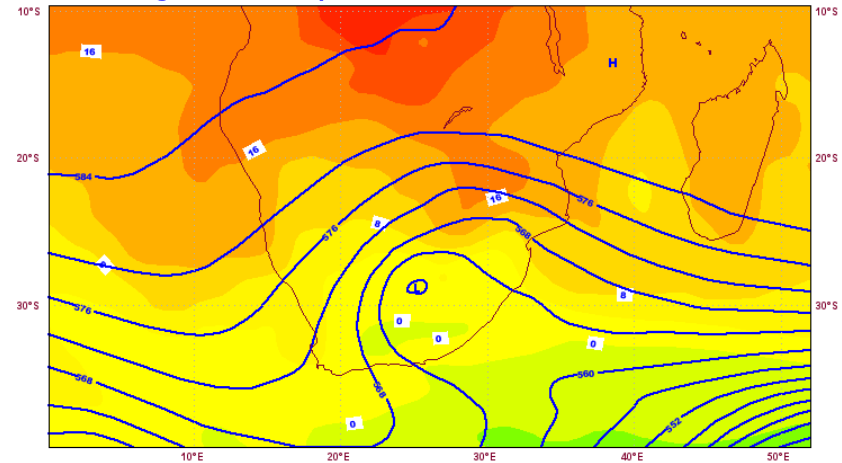
## D+3

Friday 22 July 2011 00UTC ECMWF Forecast t+ 72 VT: Monday 25 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature

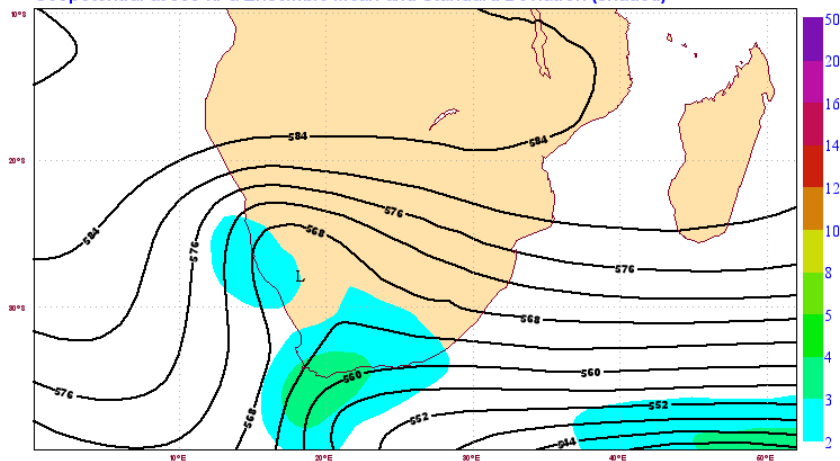


## D+4

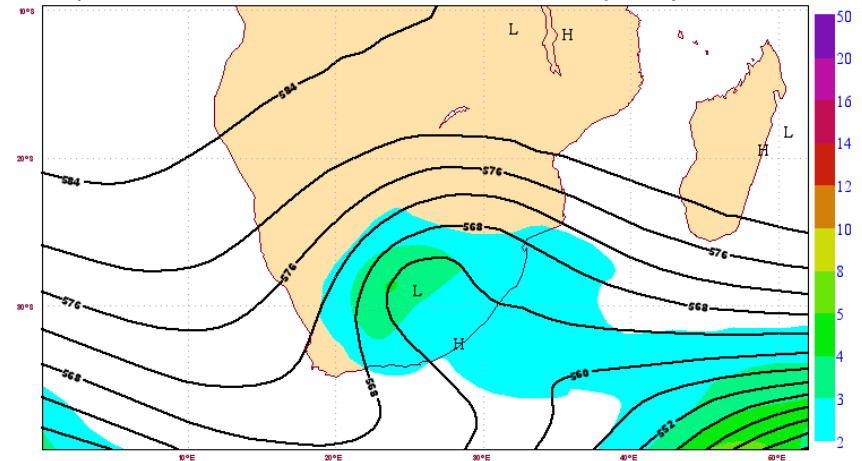
Friday 22 July 2011 00UTC ECMWF Forecast t+ 96 VT: Tuesday 26 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature



Friday 22 July 2011 00UTC @ECMWF Forecast T+72 VT: Monday 25 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



Friday 22 July 2011 00UTC @ECMWF Forecast T+96 VT: Tuesday 26 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



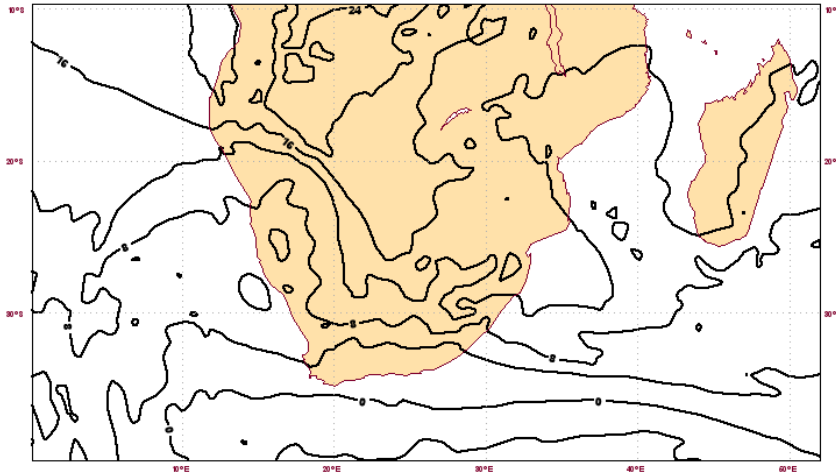


# D+3

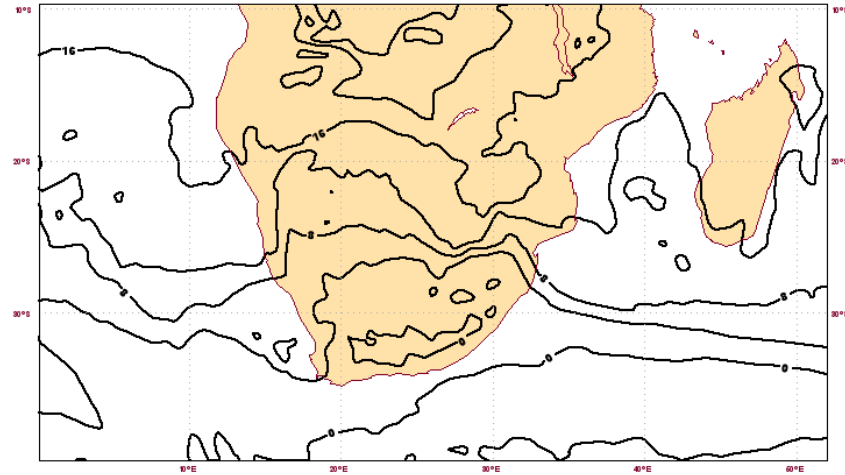
# HRES & ENS

# D+4

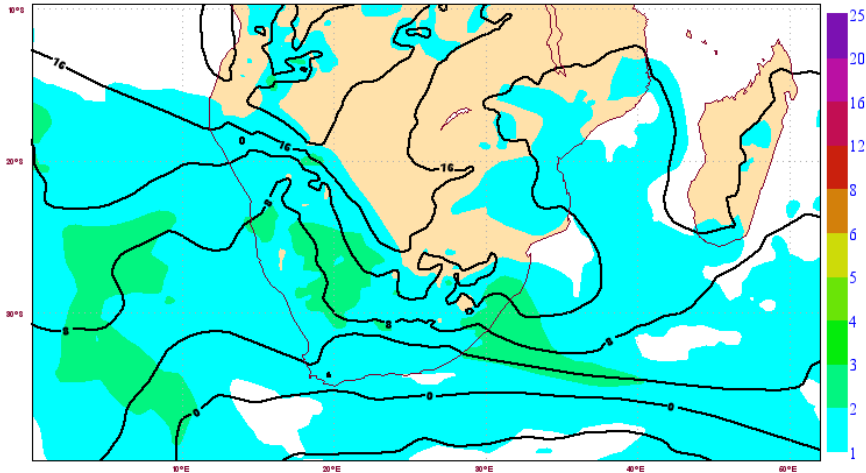
Friday 22 July 2011 00UTC @ECMWF Forecast T+72 VT: Monday 25 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast



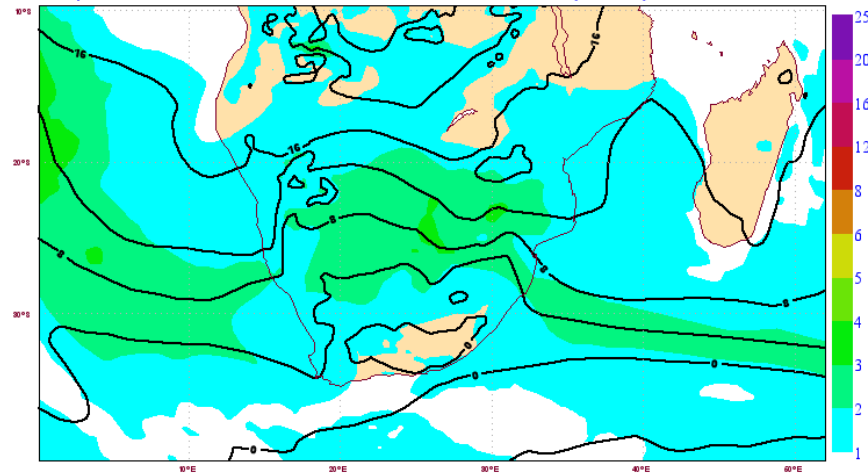
Friday 22 July 2011 00UTC @ECMWF Forecast T+96 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850hPa Deterministic Forecast



Friday 22 July 2011 00UTC @ECMWF Forecast T+72 VT: Monday 25 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)



Friday 22 July 2011 00UTC @ECMWF Forecast T+96 VT: Tuesday 26 July 2011 00UTC  
Temperature at 850 Ensemble Mean and Standard Deviation (shaded)

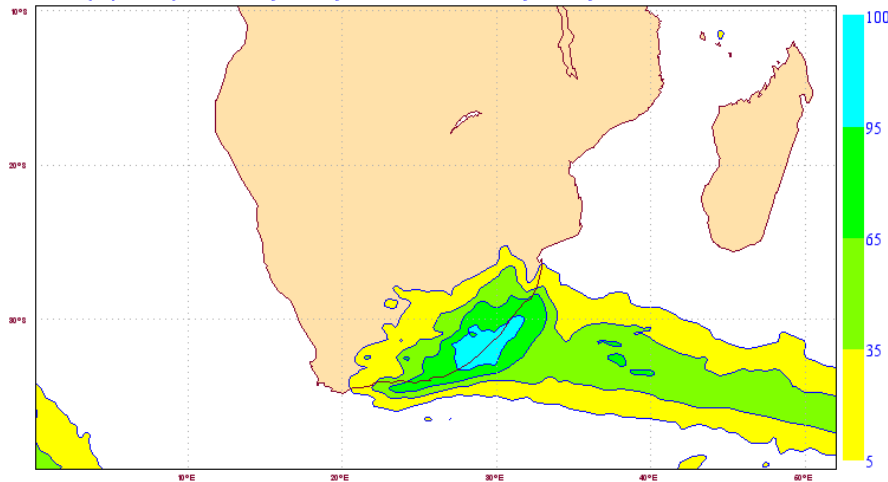


# ENS Probabilities T+72-96

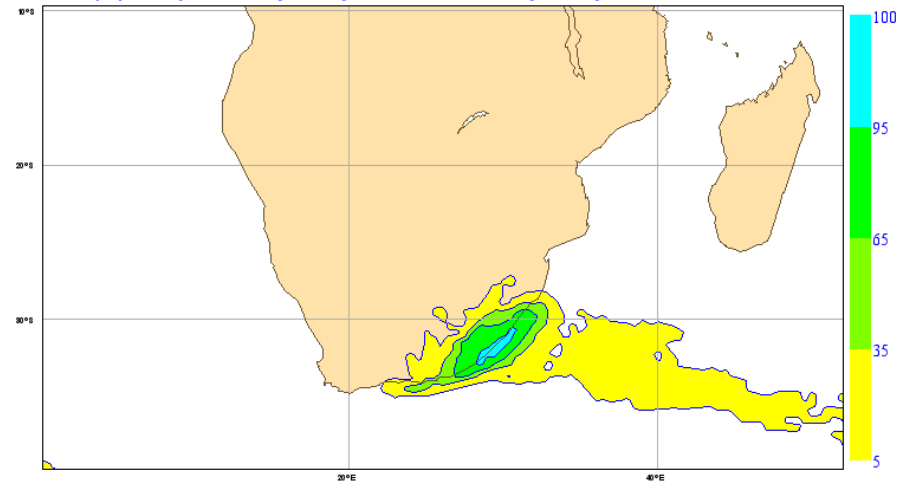
## >10mm

## >20mm

Friday 22 July 2011 00UTC @ECMWF EPS: probability of total precipitation exceeding 10mm  
(expper =1) VT: Monday 25 July 2011 00UTC - Tuesday 26 July 2011 00UTC t+72-96h



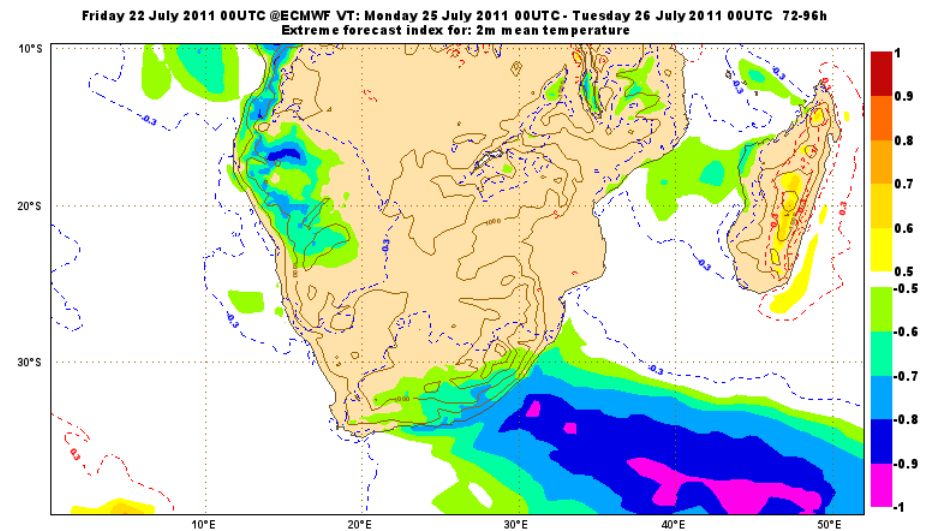
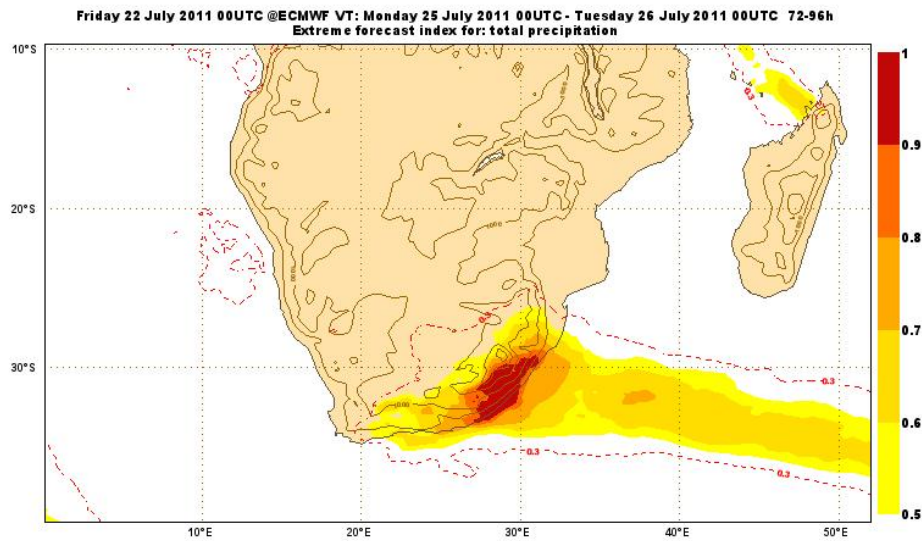
Friday 22 July 2011 00UTC @ECMWF EPS: probability of total precipitation exceeding 20mm  
(expper =1) VT: Monday 25 July 2011 00UTC - Tuesday 26 July 2011 00UTC t+72-96h



# EFI T+72-92

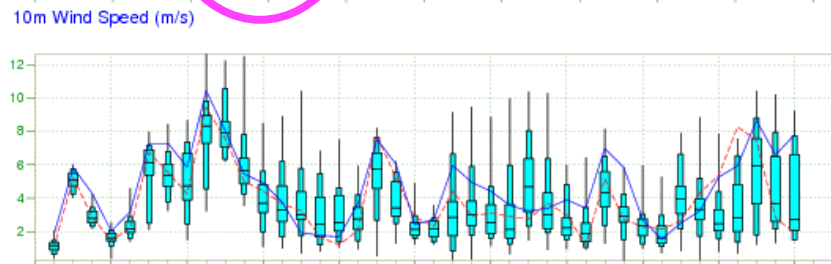
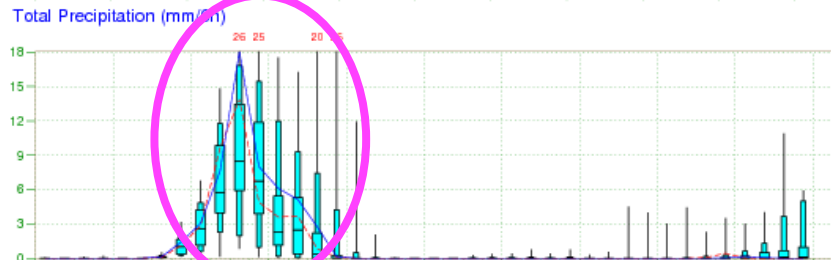
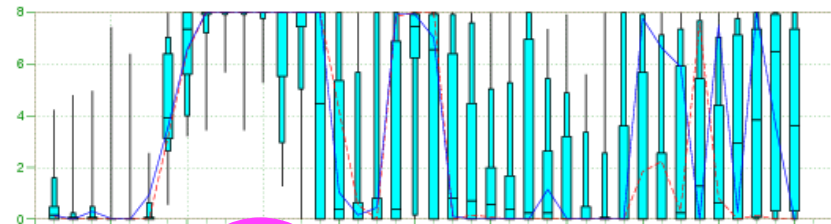
## Precipitation

## Temperature

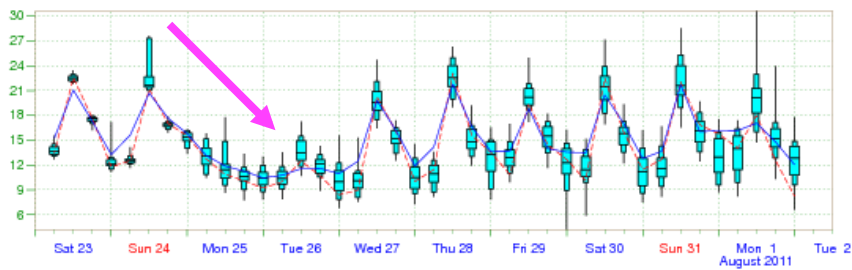


# EPSgrams – D+2

EPS Meteogram  
 Durban 29.93°S 30.94°E (EPS land point) 129 m (T1279)  
 Deterministic Forecast and EPS Distribution Saturday 23 July 2011 00 UTC  
 Total Cloud Cover (okta)

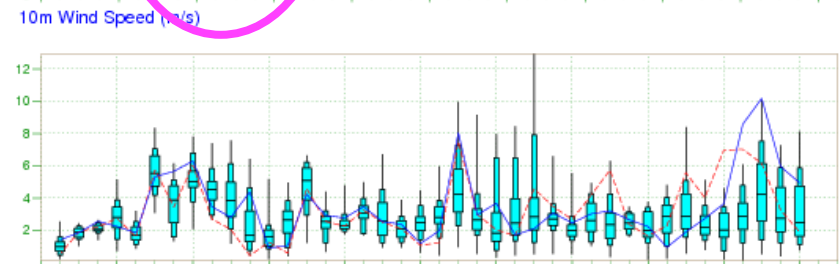
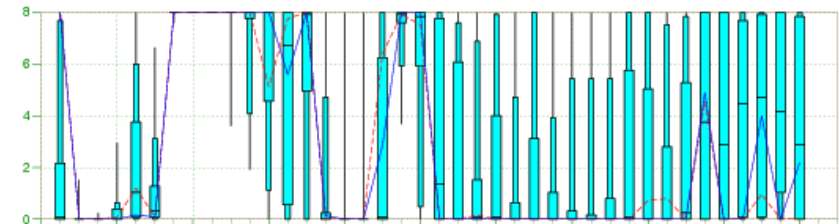


2m Temperature (°C) reduced to the station height from 129 m (T1279) and 159 m (T639)

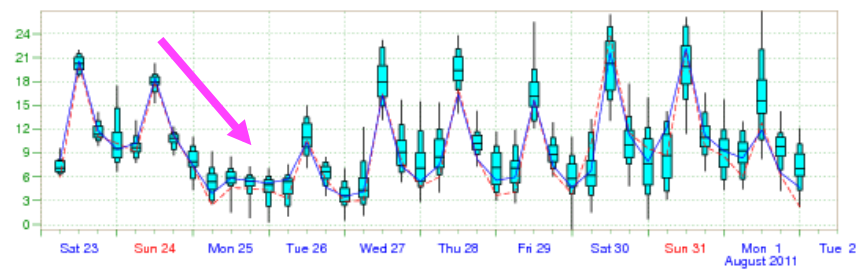


EPS Control(31 km) High Resolution Deterministic(16 km)

EPS Meteogram  
 Umtata 31.62°S 28.8°E (EPS land point) 729 m (T1279)  
 Deterministic Forecast and EPS Distribution Saturday 23 July 2011 00 UTC  
 Total Cloud Cover (okta)



2m Temperature (°C) reduced to the station height from 729 m (T1279) and 753 m (T639)

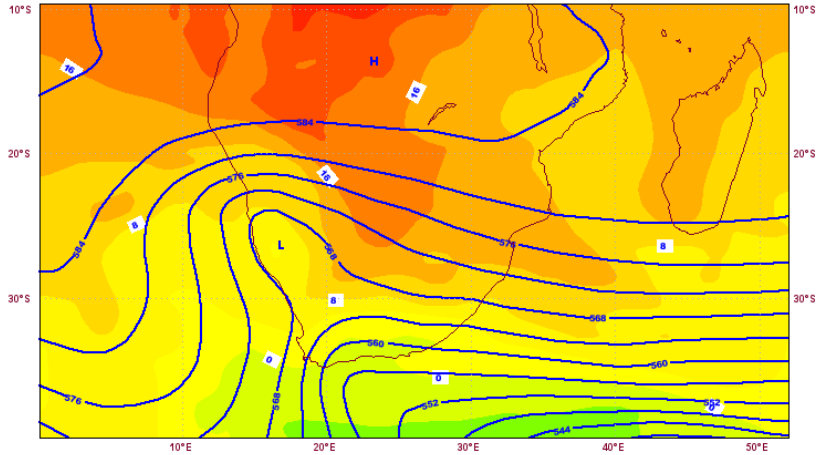


EPS Control(31 km) High Resolution Deterministic(16 km)

# HRES & ENS

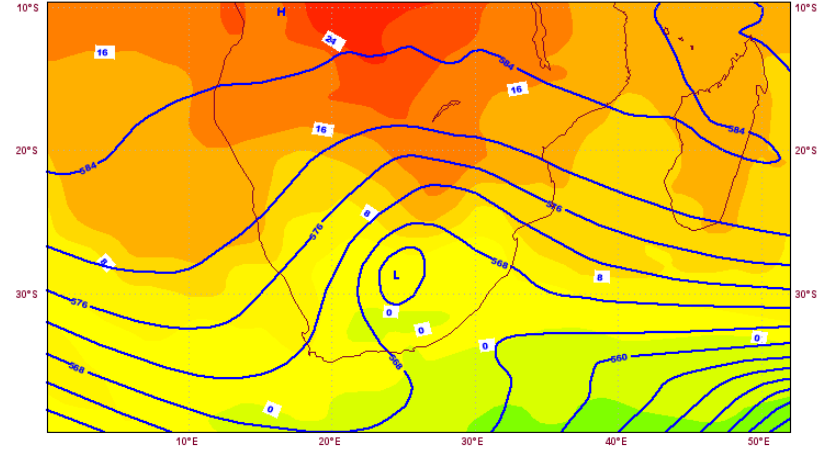
## D+2

Saturday 23 July 2011 00UTC ECMWF Forecast t+ 48 VT: Monday 25 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature

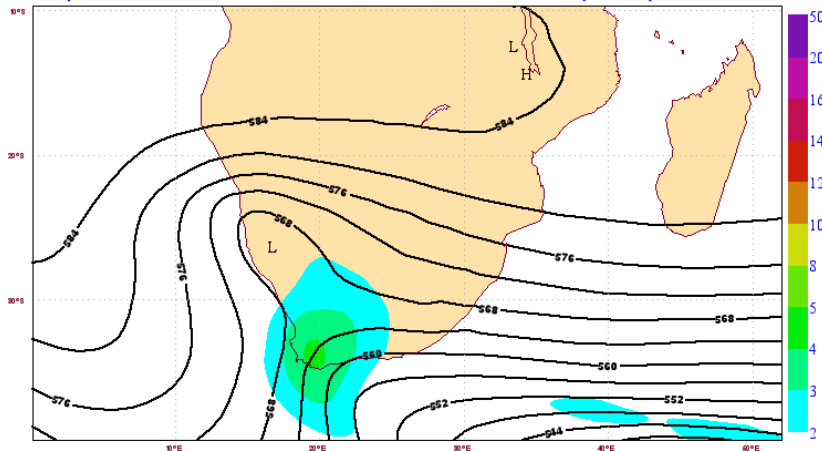


## D+3

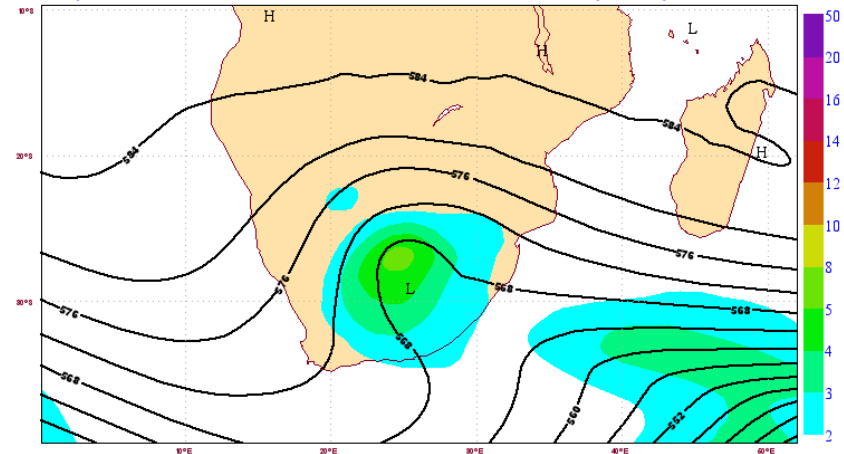
Saturday 23 July 2011 00UTC ECMWF Forecast t+ 72 VT: Tuesday 26 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature



Saturday 23 July 2011 00UTC @ECMWF Forecast T+48 VT: Monday 25 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



Saturday 23 July 2011 00UTC @ECMWF Forecast T+72 VT: Tuesday 26 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)

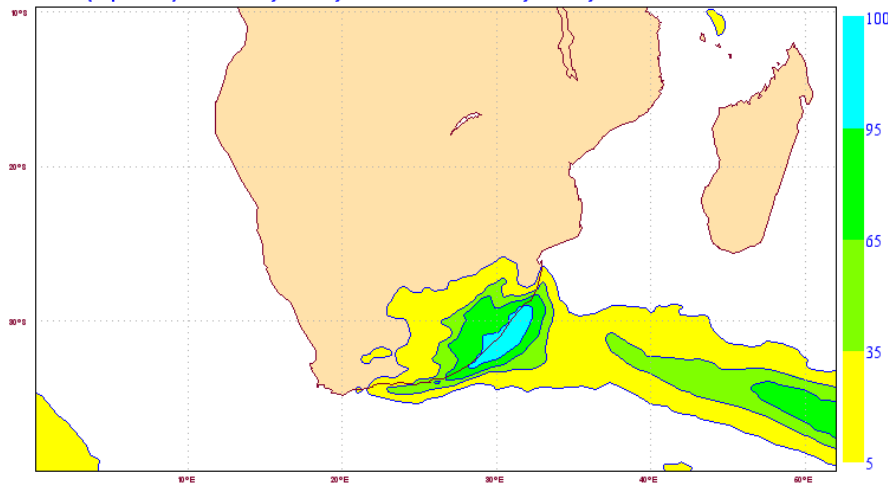


# ENS Probabilities T+48-72

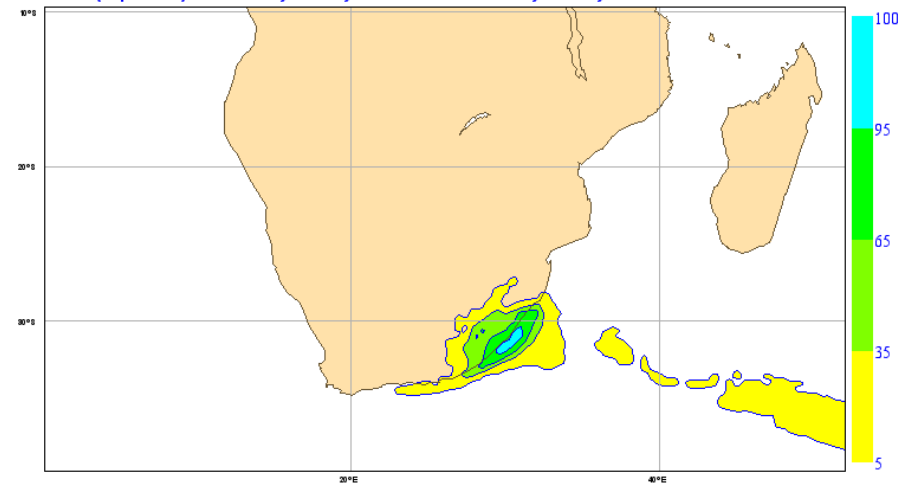
## >10mm

## >20mm

Saturday 23 July 2011 00UTC @ECMWF EPS: probability of total precipitation exceeding 10mm (expver =1) VT: Monday 25 July 2011 00UTC - Tuesday 26 July 2011 00UTC t+48-72h



Saturday 23 July 2011 00UTC @ECMWF EPS: probability of total precipitation exceeding 20mm (expver =1) VT: Monday 25 July 2011 00UTC - Tuesday 26 July 2011 00UTC t+48-72h

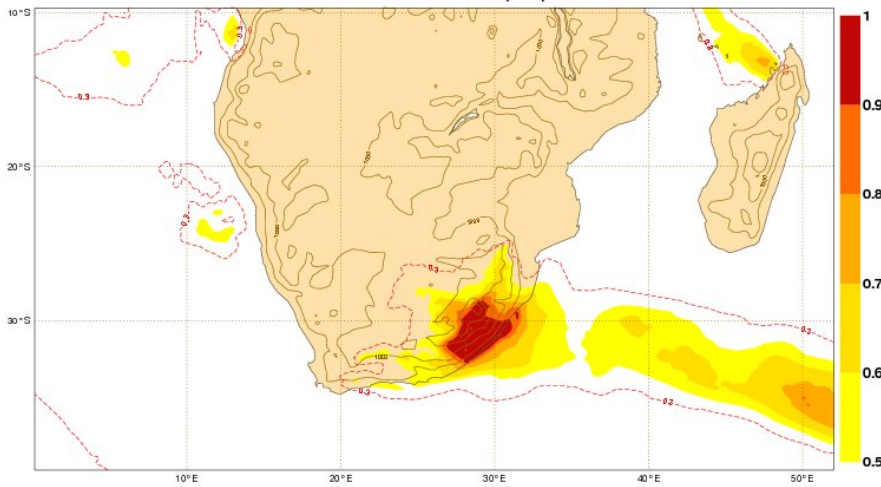


# EFI T+48-72

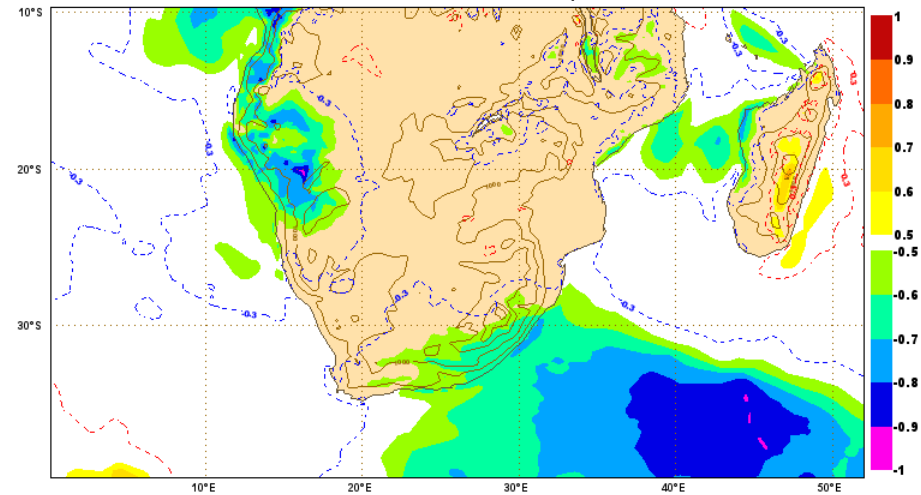
## Precipitation

## Temperature

Saturday 23 July 2011 00UTC @ECMWF VT: Monday 25 July 2011 00UTC - Tuesday 26 July 2011 00UTC 48-72h  
Extreme forecast index for: total precipitation

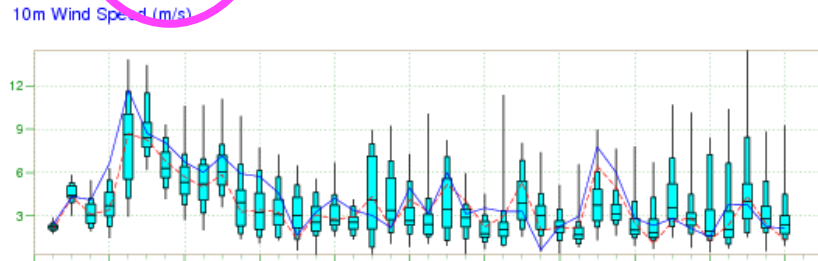
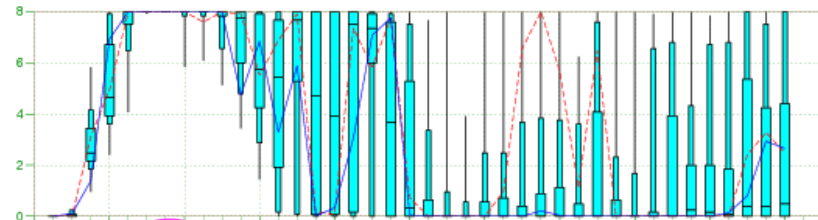


Saturday 23 July 2011 00UTC @ECMWF VT: Monday 25 July 2011 00UTC - Tuesday 26 July 2011 00UTC 48-72h  
Extreme forecast index for: 2m mean temperature

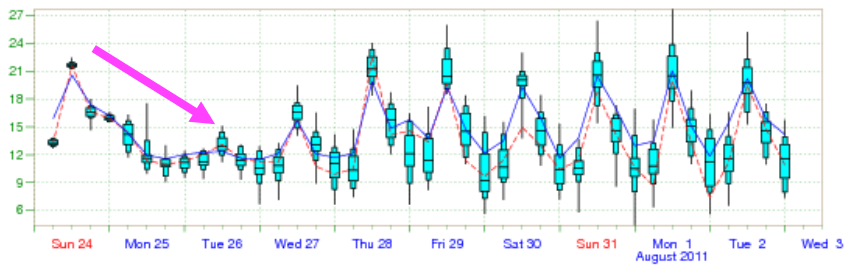


# EPSgrams – D+1

EPS Meteogram  
 Durban 29.93°S 30.94°E (EPS land point) 129 m (T1279)  
 Deterministic Forecast and EPS Distribution Sunday 24 July 2011 00 UTC  
 Total Cloud Cover (okta)

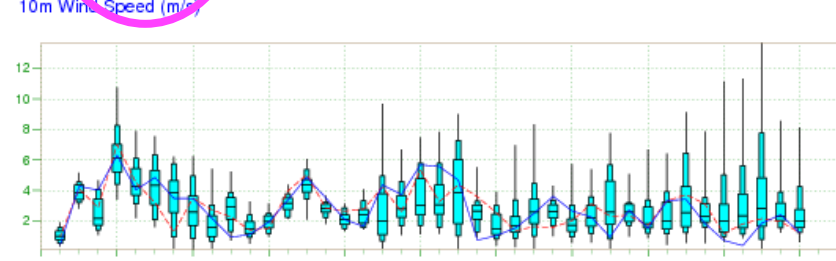
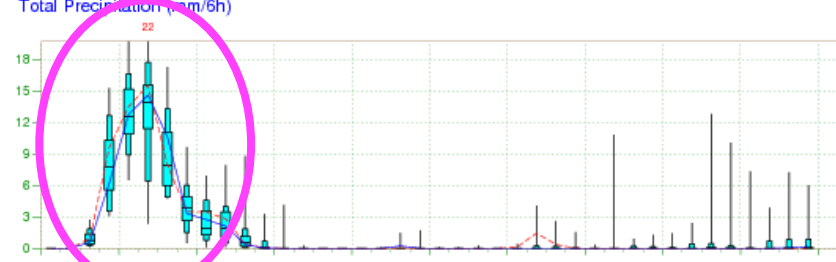
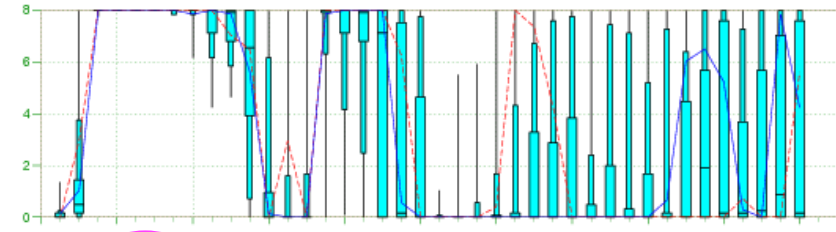


2m Temperature (°C) reduced to the station height from 129 m (T1279) and 159 m (T639)

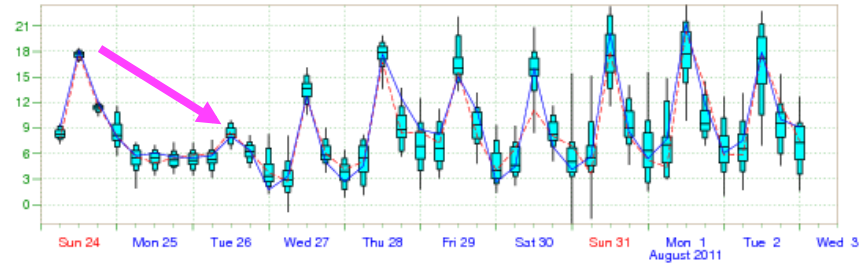


EPS Control(31 km) High Resolution Deterministic(16 km)  
 494.95e+09-1.3634e+13 2007e-309 7.06653e+109-2.35344e-155

EPS Meteogram  
 Umtata 31.62°S 28.8°E (EPS land point) 729 m (T1279)  
 Deterministic Forecast and EPS Distribution Sunday 24 July 2011 00 UTC  
 Total Cloud Cover (okta)



2m Temperature (°C) reduced to the station height from 729 m (T1279) and 753 m (T639)



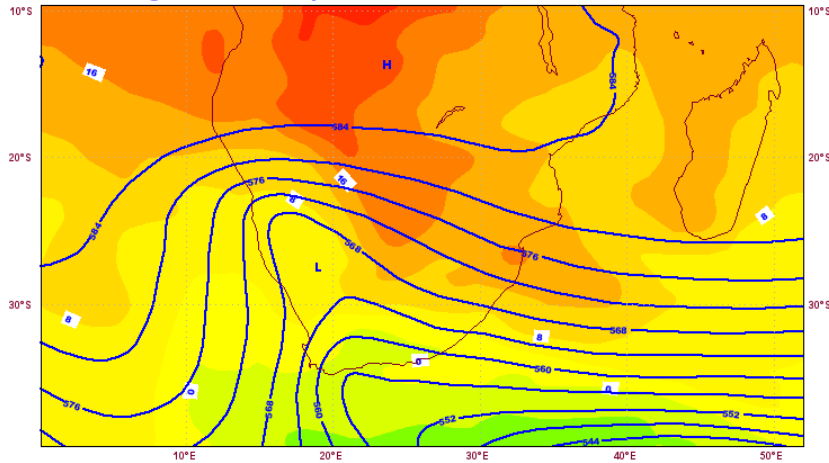
EPS Control(31 km) High Resolution Deterministic(16 km)  
 5053.40e+09-1.35802e+13 2007e-309 0



# HRES & ENS

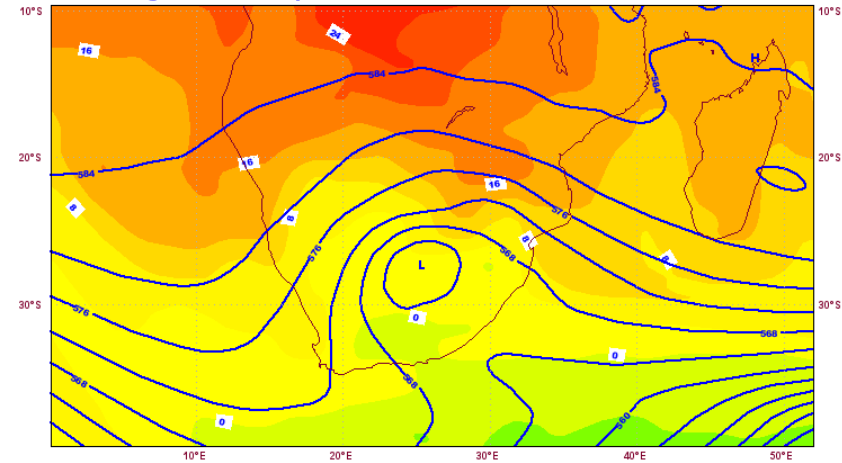
## D+1

Sunday 24 July 2011 00UTC ECMWF Forecast t+ 24 VT: Monday 25 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature

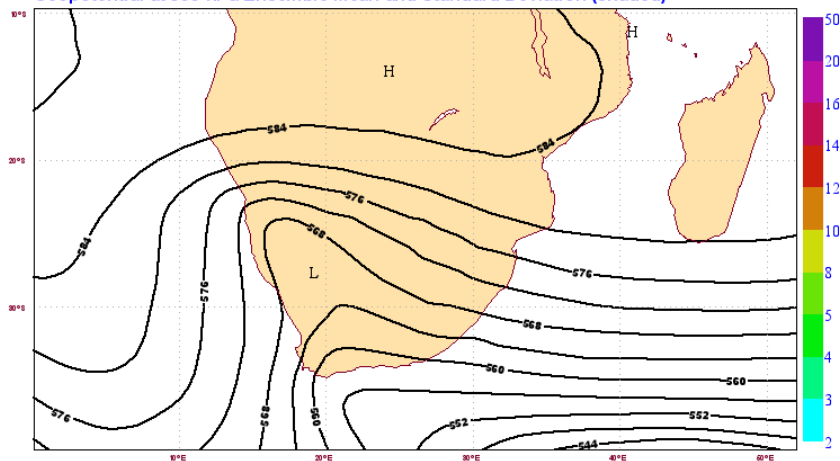


## D+2

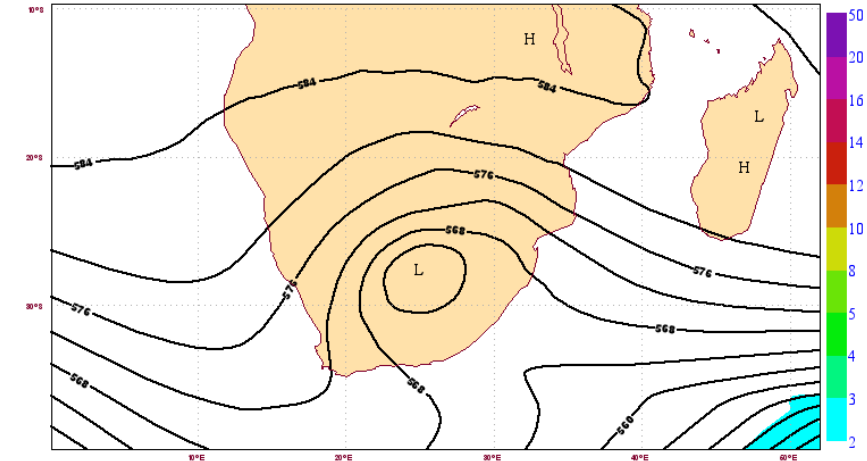
Sunday 24 July 2011 00UTC ECMWF Forecast t+ 48 VT: Tuesday 26 July 2011 00UTC  
500 hPa Height / 850 hPa Temperature



Sunday 24 July 2011 00UTC @ECMWF Forecast T+24 VT: Monday 25 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



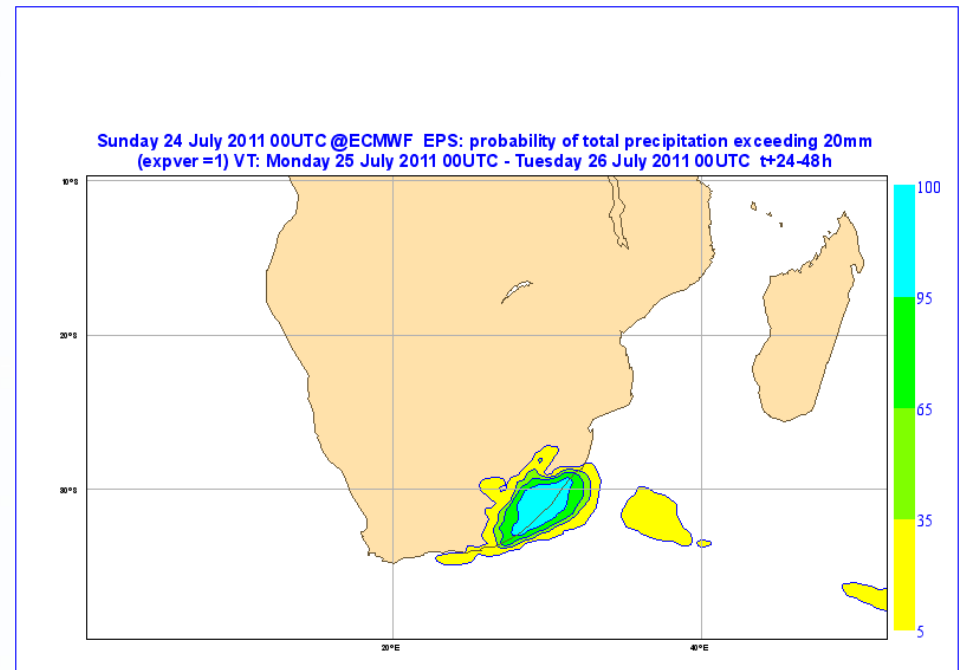
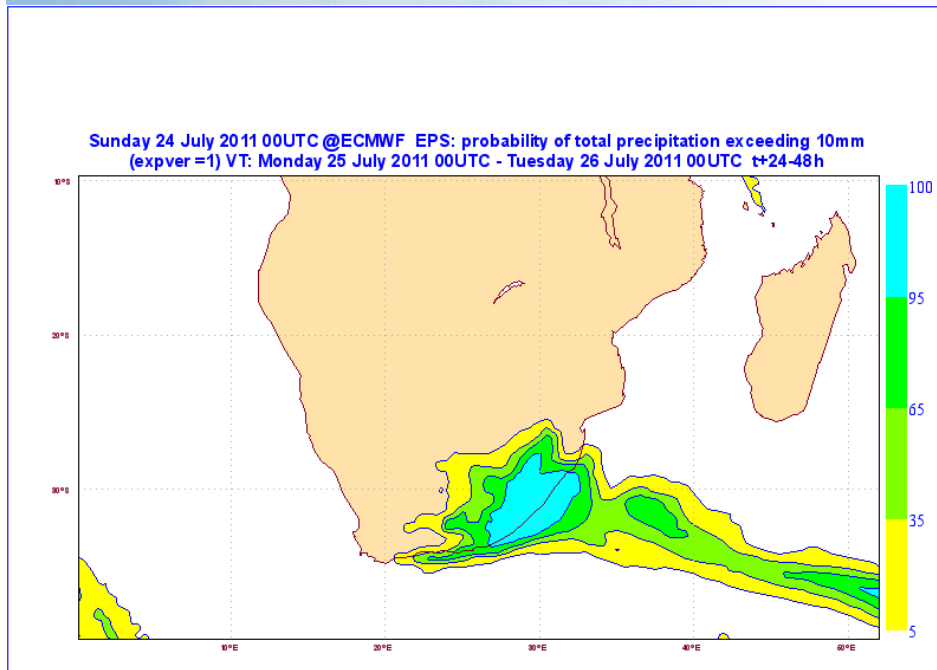
Sunday 24 July 2011 00UTC @ECMWF Forecast T+48 VT: Tuesday 26 July 2011 00UTC  
Geopotential at 500 hPa Ensemble Mean and Standard Deviation (shaded)



# ENS Probabilities T+24-48

## >10mm

## >20mm

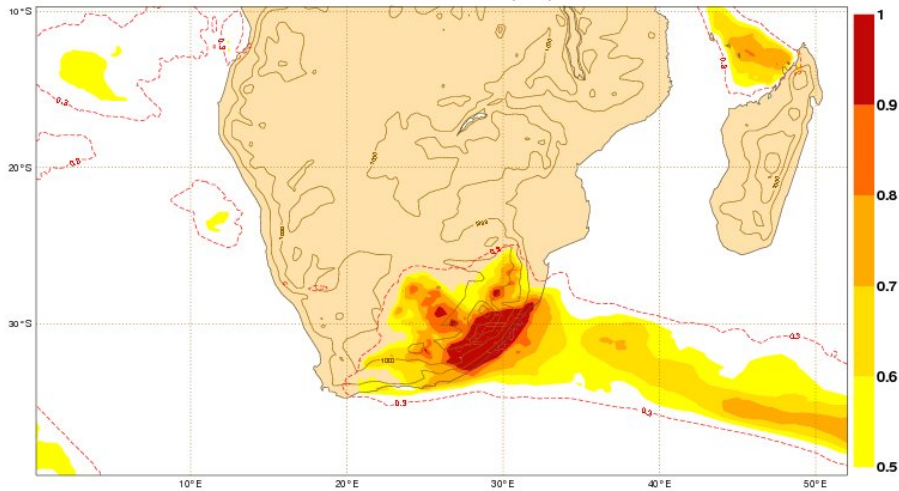


# EFI T+24-48

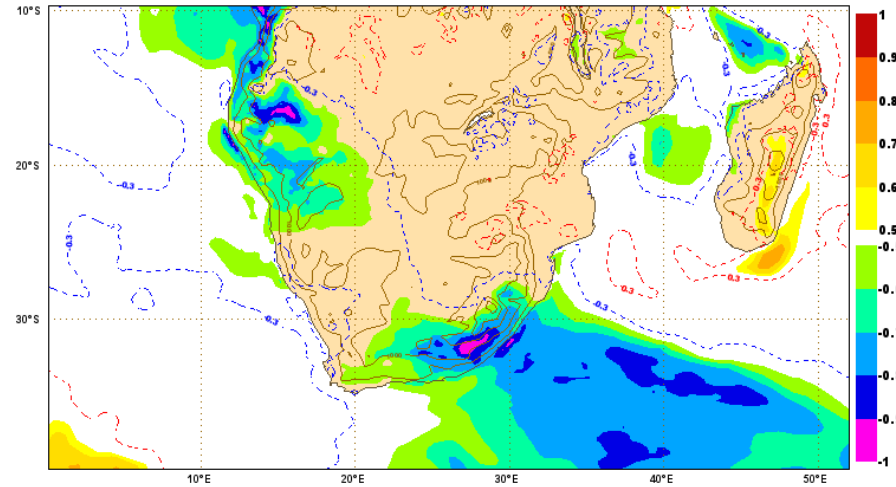
## Precipitation

## Temperature

Sunday 24 July 2011 00UTC @ECMWF VT: Monday 25 July 2011 00UTC - Tuesday 26 July 2011 00UTC 24-48h  
Extreme forecast index for: total precipitation

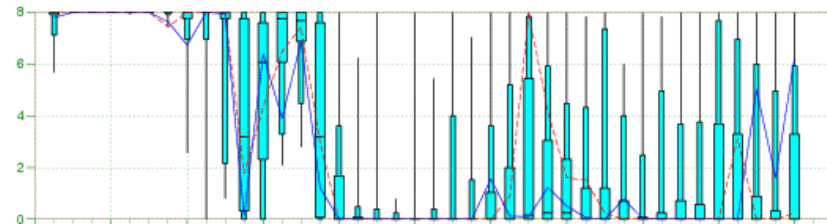


Sunday 24 July 2011 00UTC @ECMWF VT: Monday 25 July 2011 00UTC - Tuesday 26 July 2011 00UTC 24-48h  
Extreme forecast index for: 2m mean temperature



# EPSgrams – D+0

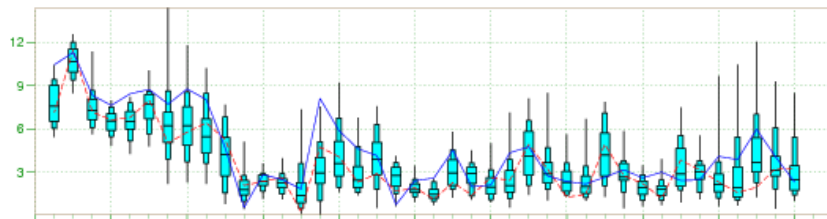
EPS Meteogram  
 Durban 29.93°S 30.94°E (EPS land point) 129 m (T1279)  
 Deterministic Forecast and EPS Distribution Monday 25 July 2011 00 UTC  
 Total Cloud Cover (okta)



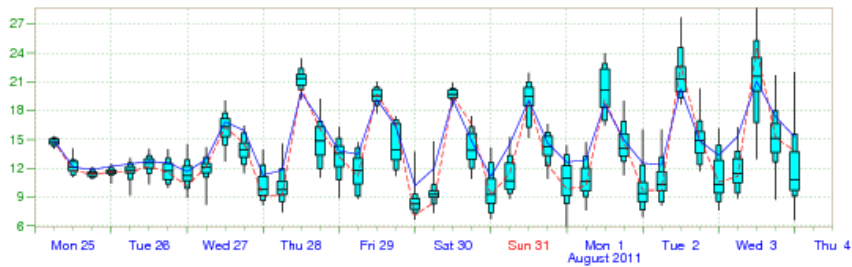
Total Precipitation (mm/6h)



10m Wind Speed (m/s)

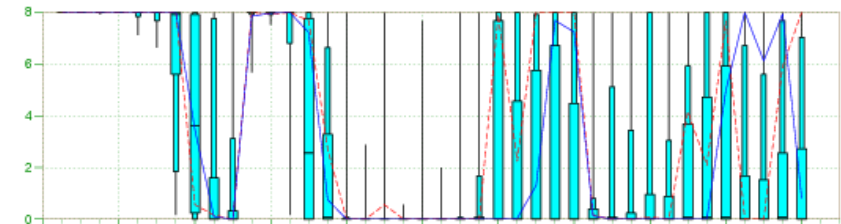


2m Temperature (°C) reduced to the station height from 129 m (T1279) and 159 m (T639)



EPS Control(31 km) High Resolution Deterministic(16 km)

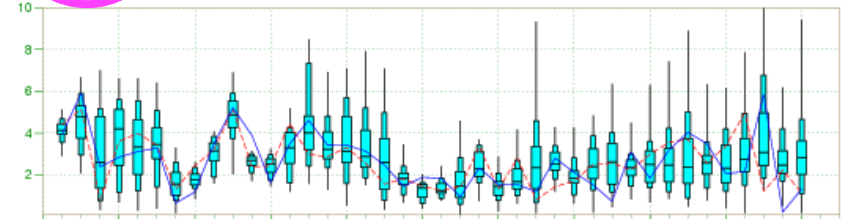
EPS Meteogram  
 Umtata 31.62°S 28.8°E (EPS land point) 729 m (T1279)  
 Deterministic Forecast and EPS Distribution Monday 25 July 2011 00 UTC  
 Total Cloud Cover (okta)



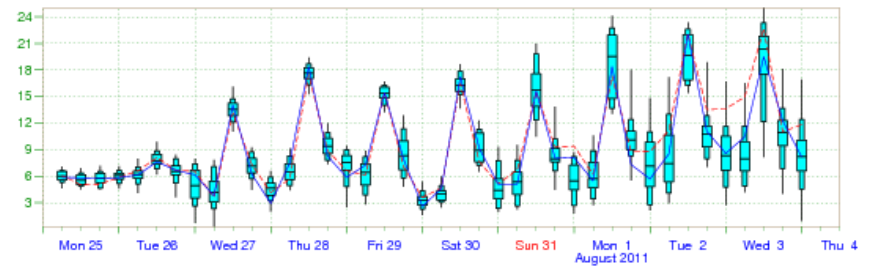
Total Precipitation (mm/6h)



10m Wind Speed (m/s)



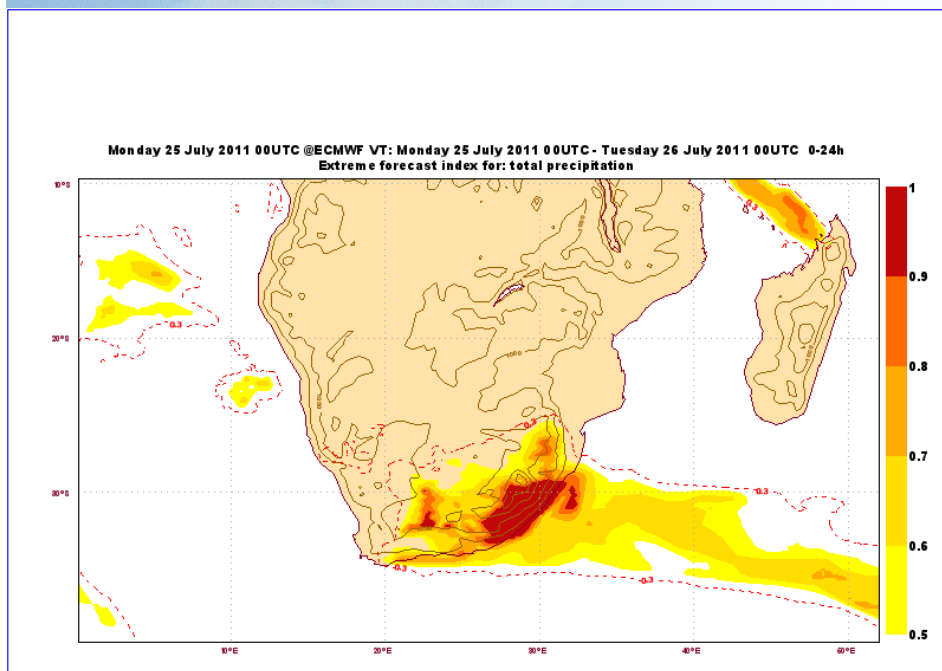
2m Temperature (°C) reduced to the station height from 729 m (T1279) and 753 m (T639)



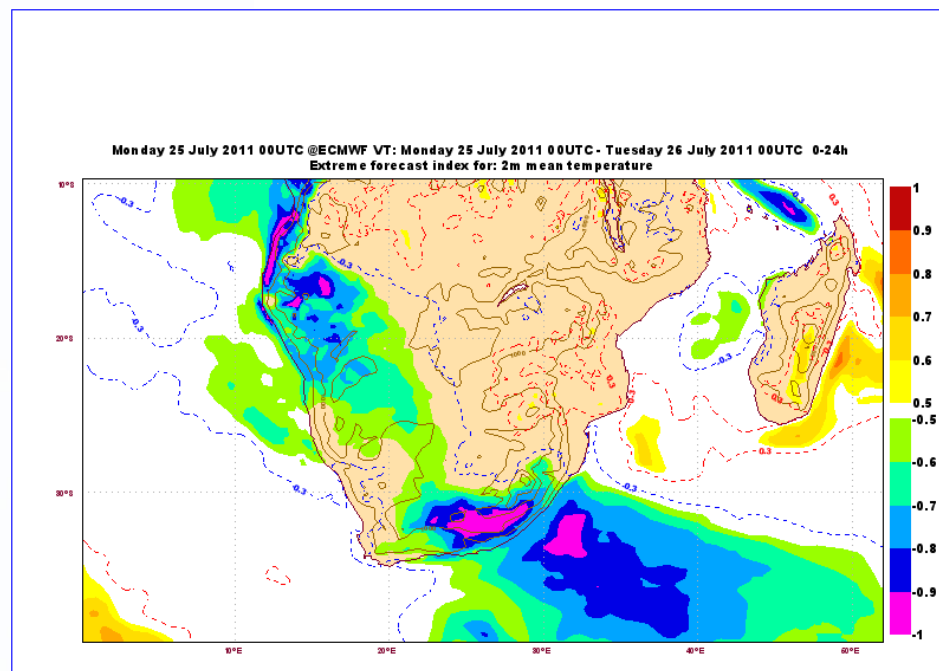
EPS Control(31 km) High Resolution Deterministic(16 km)

# EFI T+00-24

## Precipitation

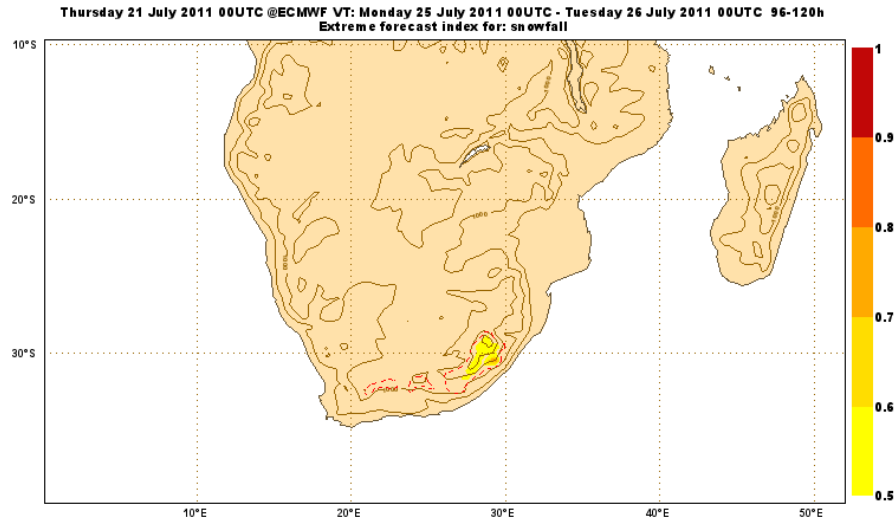


## Temperature

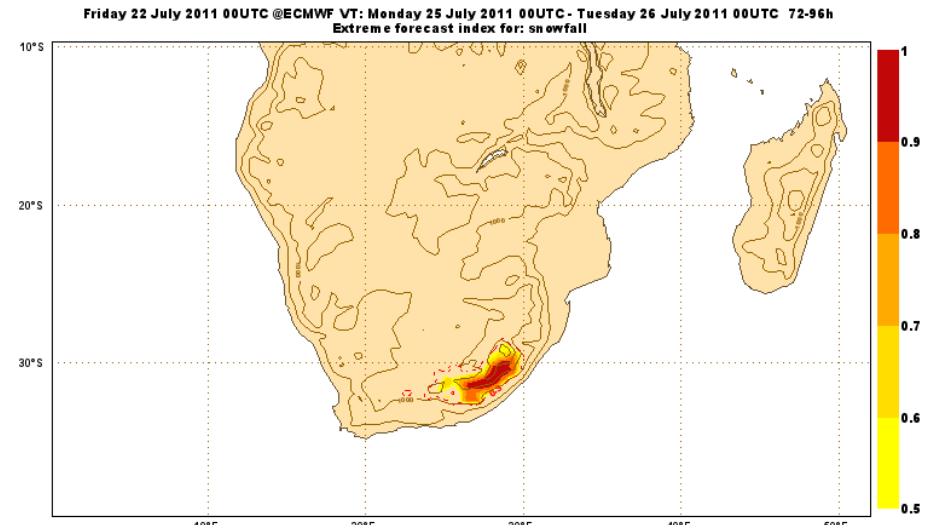


# EFI snow

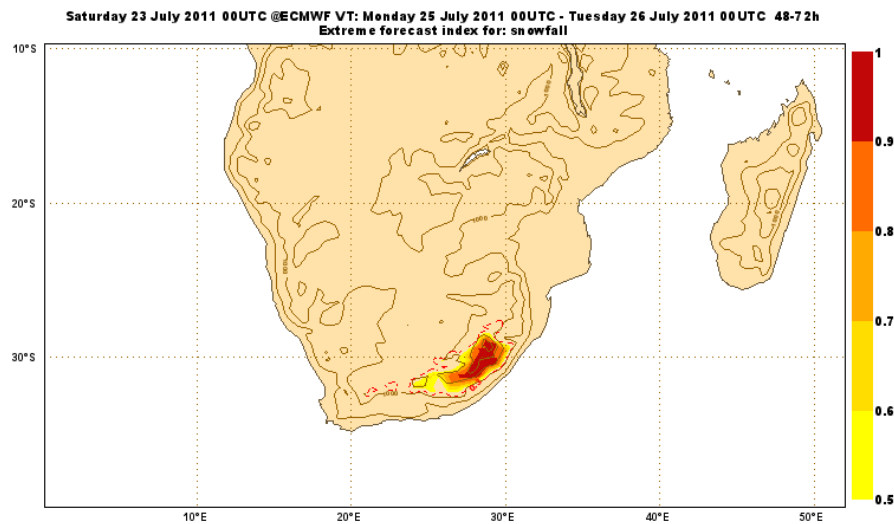
## 96-120h



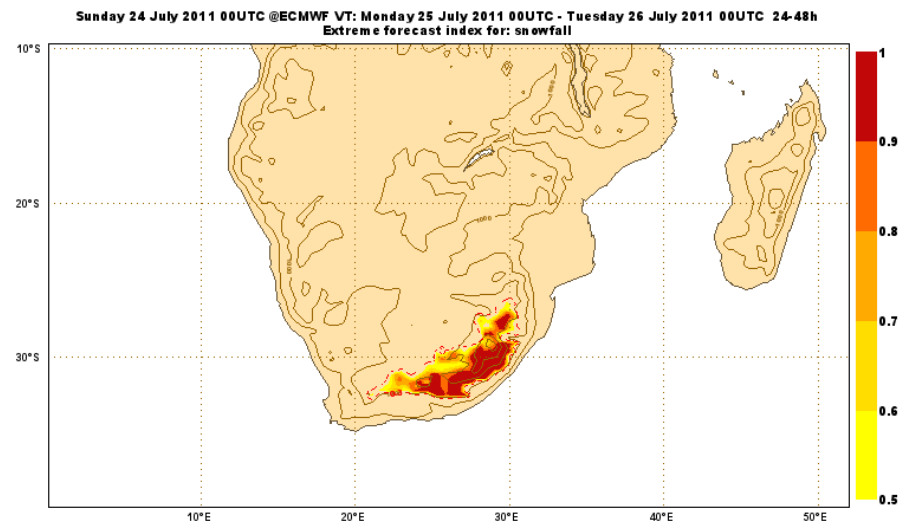
## 72-96h



## 48-72h



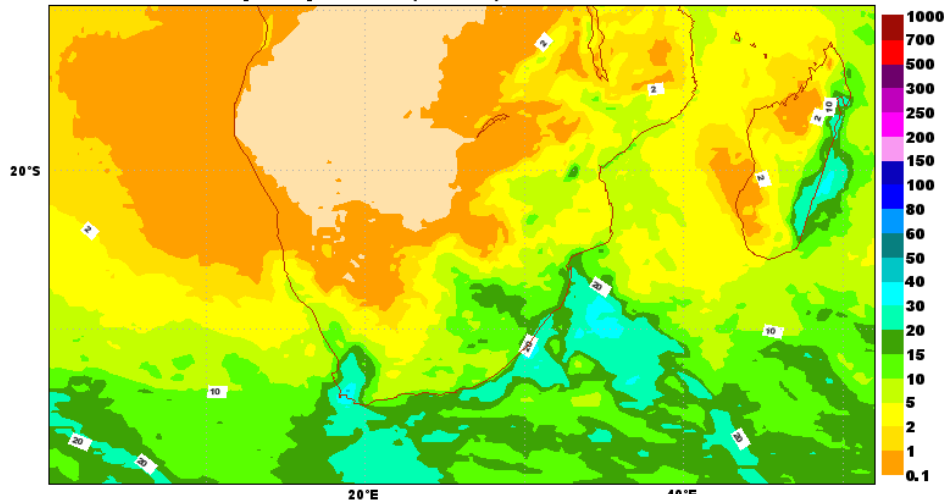
## 24-48h



# M-Climate

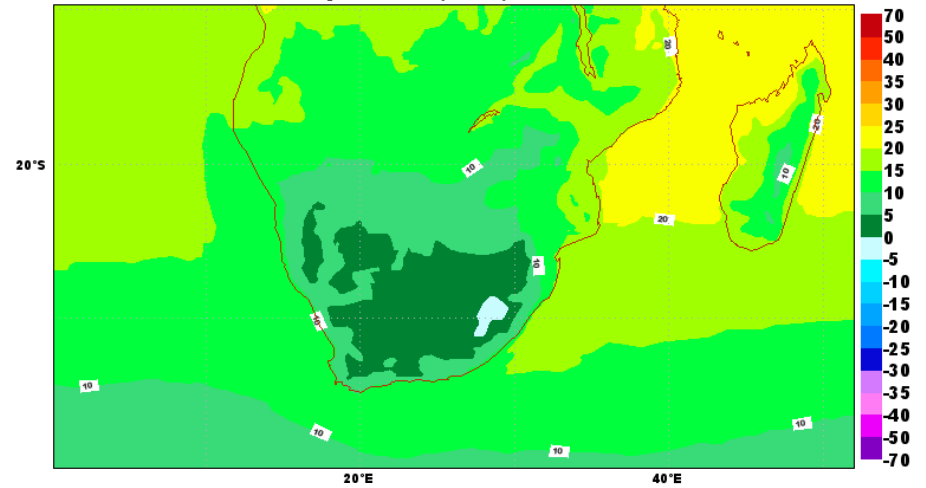
## Precipitation - Q98

Thursday 21 July 2011 00UTC @ECMWF Model climate Q=98:100  
total precipitation (in mm) lead time: 00-24h



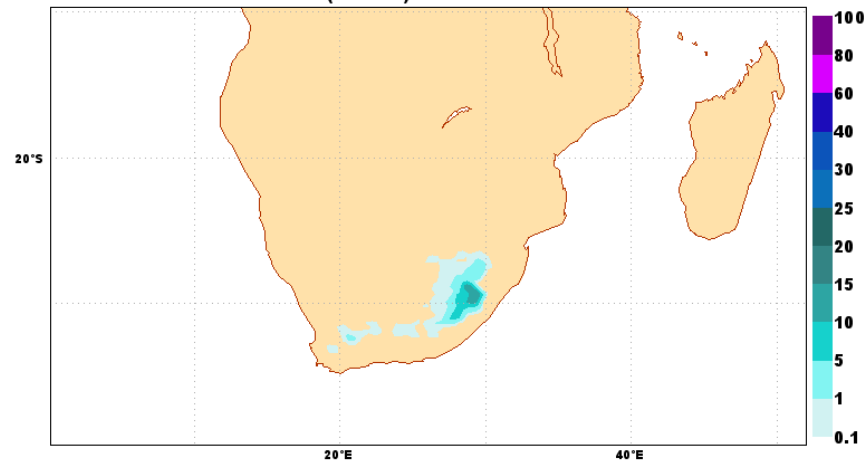
## Temperature – Q2

Thursday 21 July 2011 00UTC @ECMWF Model climate Q=2:100  
2m mean temperature (in °C) lead time: 00-24h



## Snow – Q98

Thursday 21 July 2011 00UTC @ECMWF Model climate Q=98:100  
snowfall (in mm) lead time: 00-24h



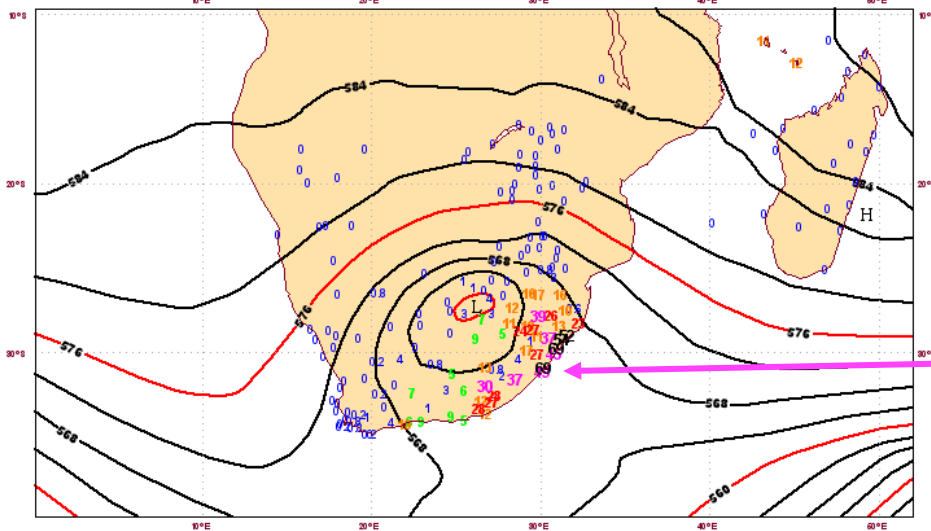
---

# Verification



ECMWF Analysis VT: Tuesday 26 July 2011 00UTC 500hPa Geopotential

× 0-5   × 5-10   × 10-20   × 20-30   × 30-50   × 50-100



Observed Precipitation

25.07/06UTC-26.07/06UTC

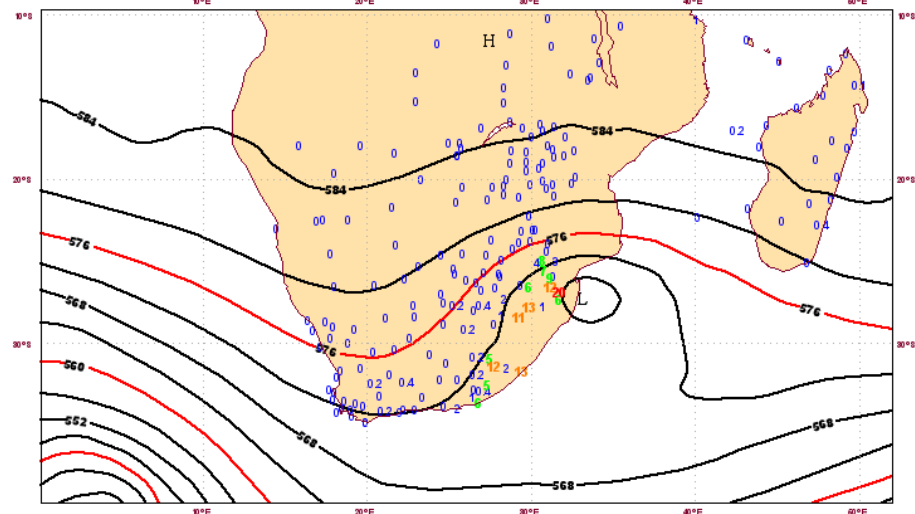
Durban

Observed Precipitation

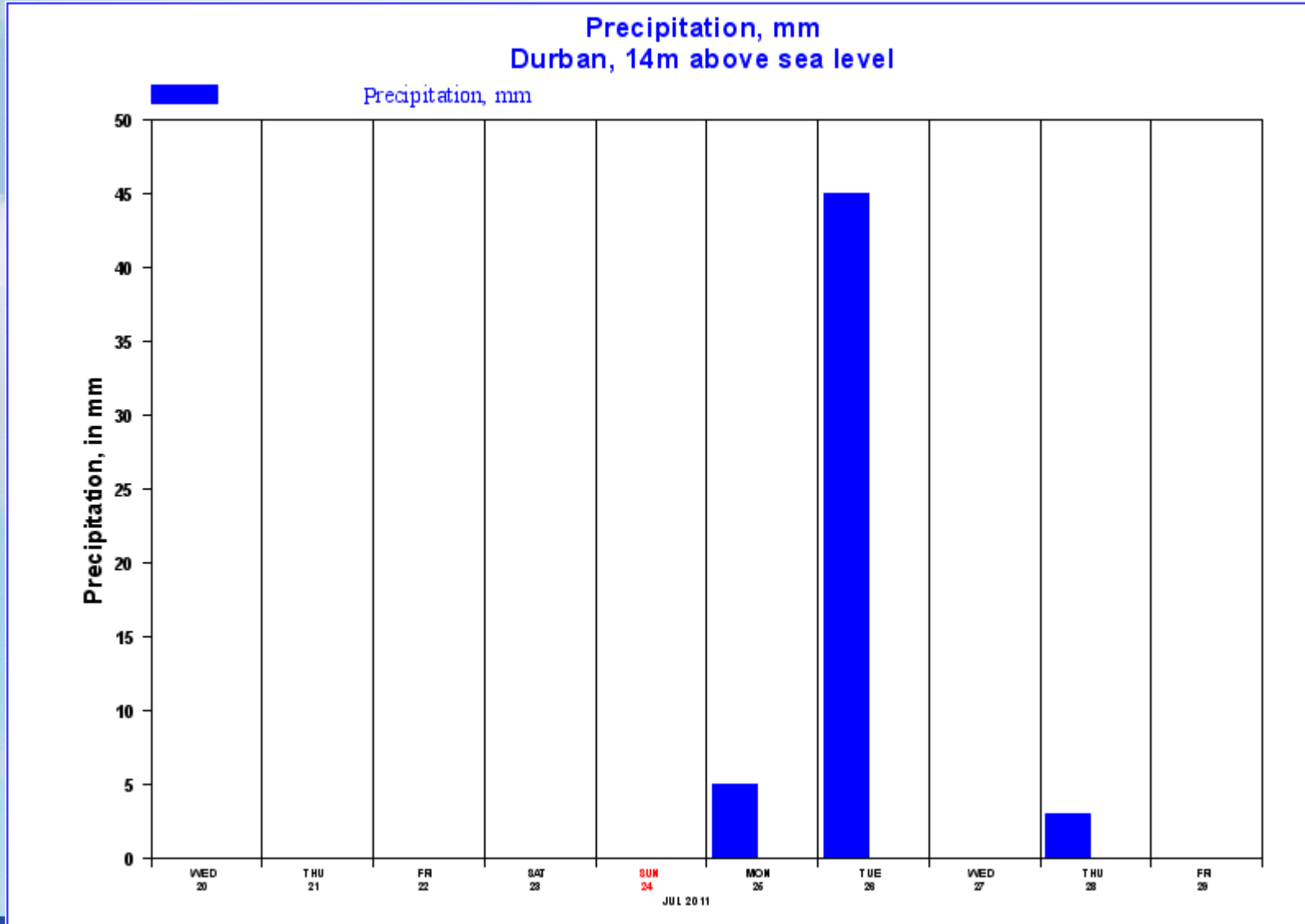
26.07/06UTC-27.07/06UTC

ECMWF Analysis VT: Wednesday 27 July 2011 00UTC 500hPa Geopotential

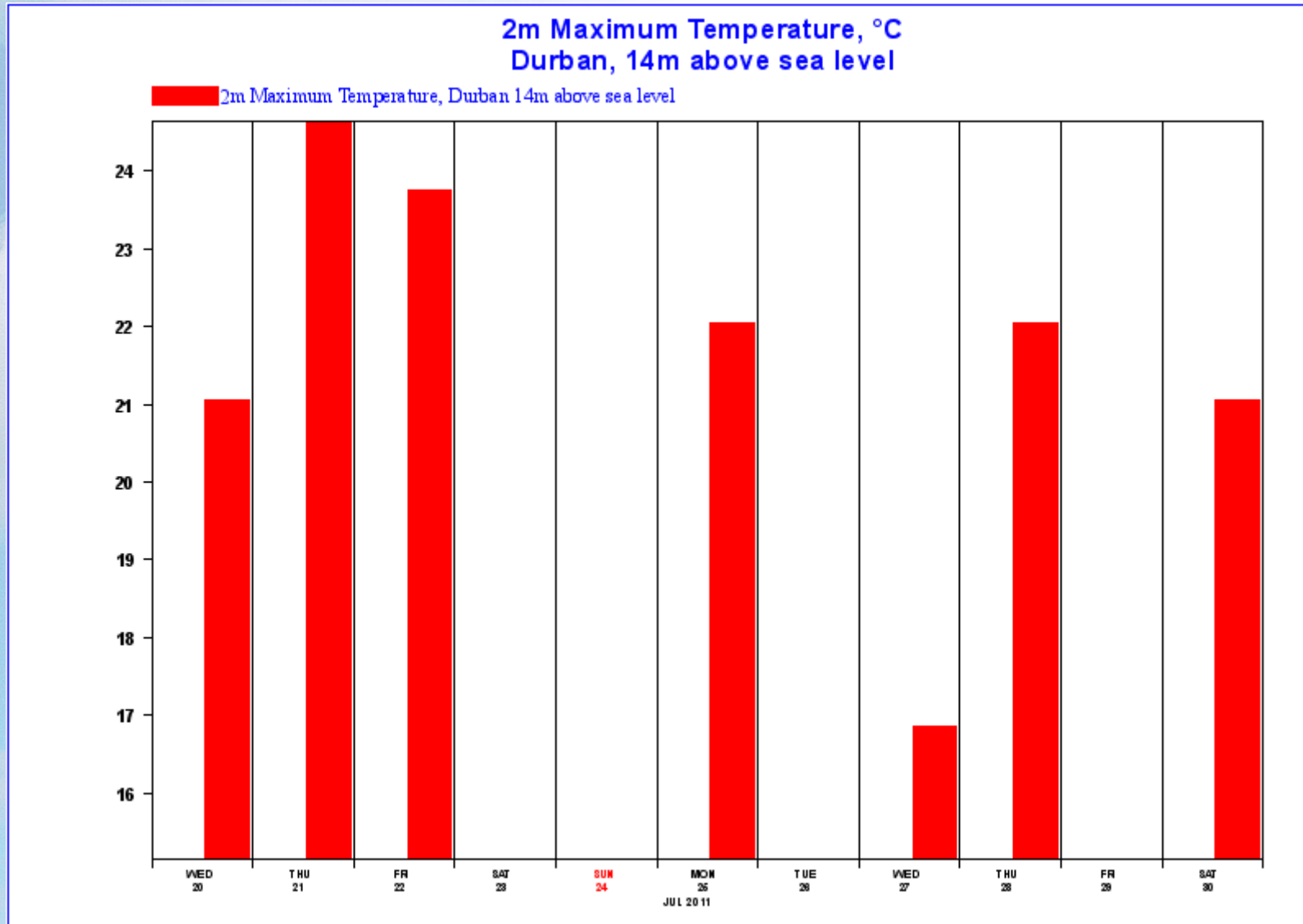
× 0-5   × 5-10   × 10-20   × 20-30   × 30-50   × 50-100



# Observations

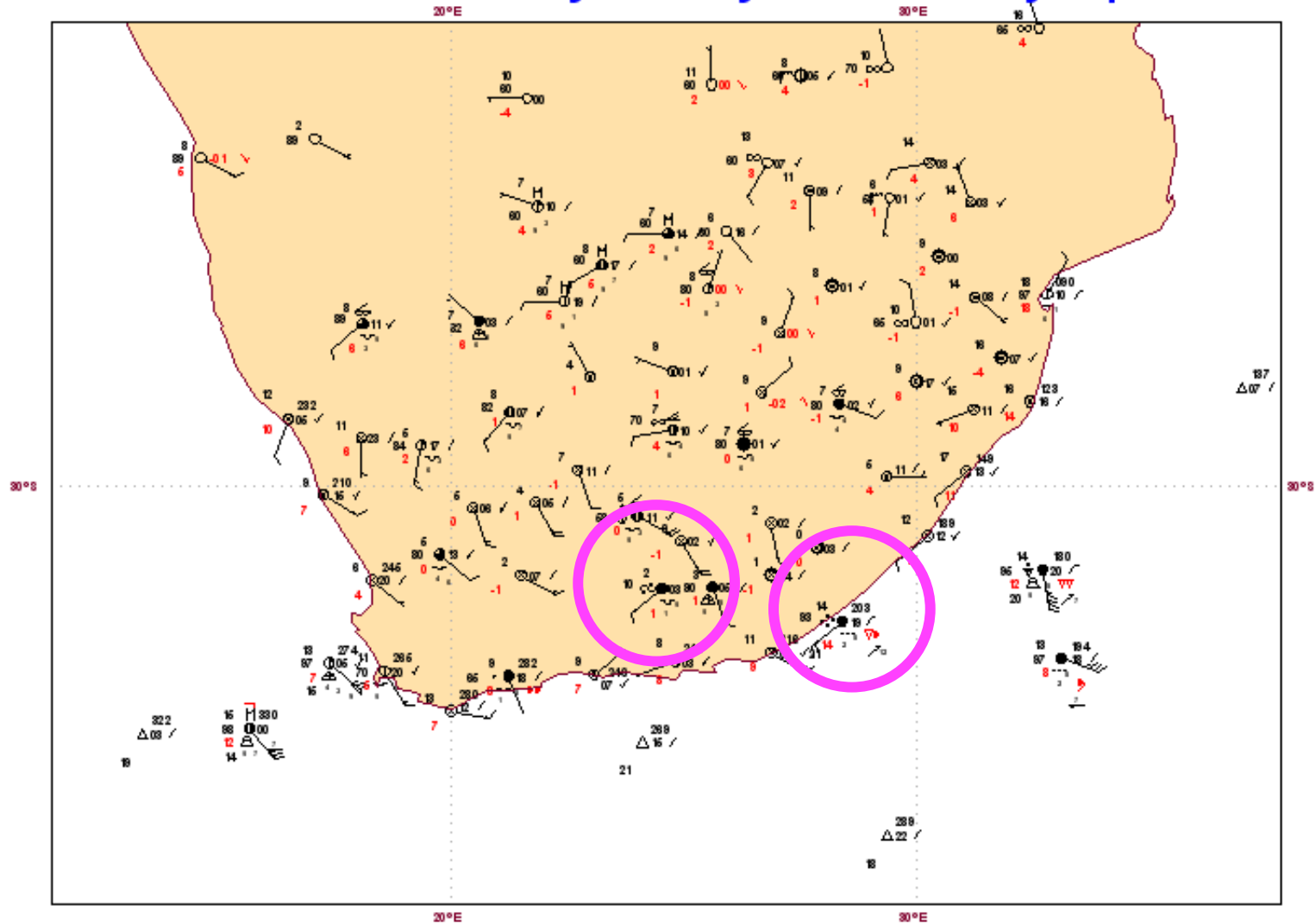


# Observations



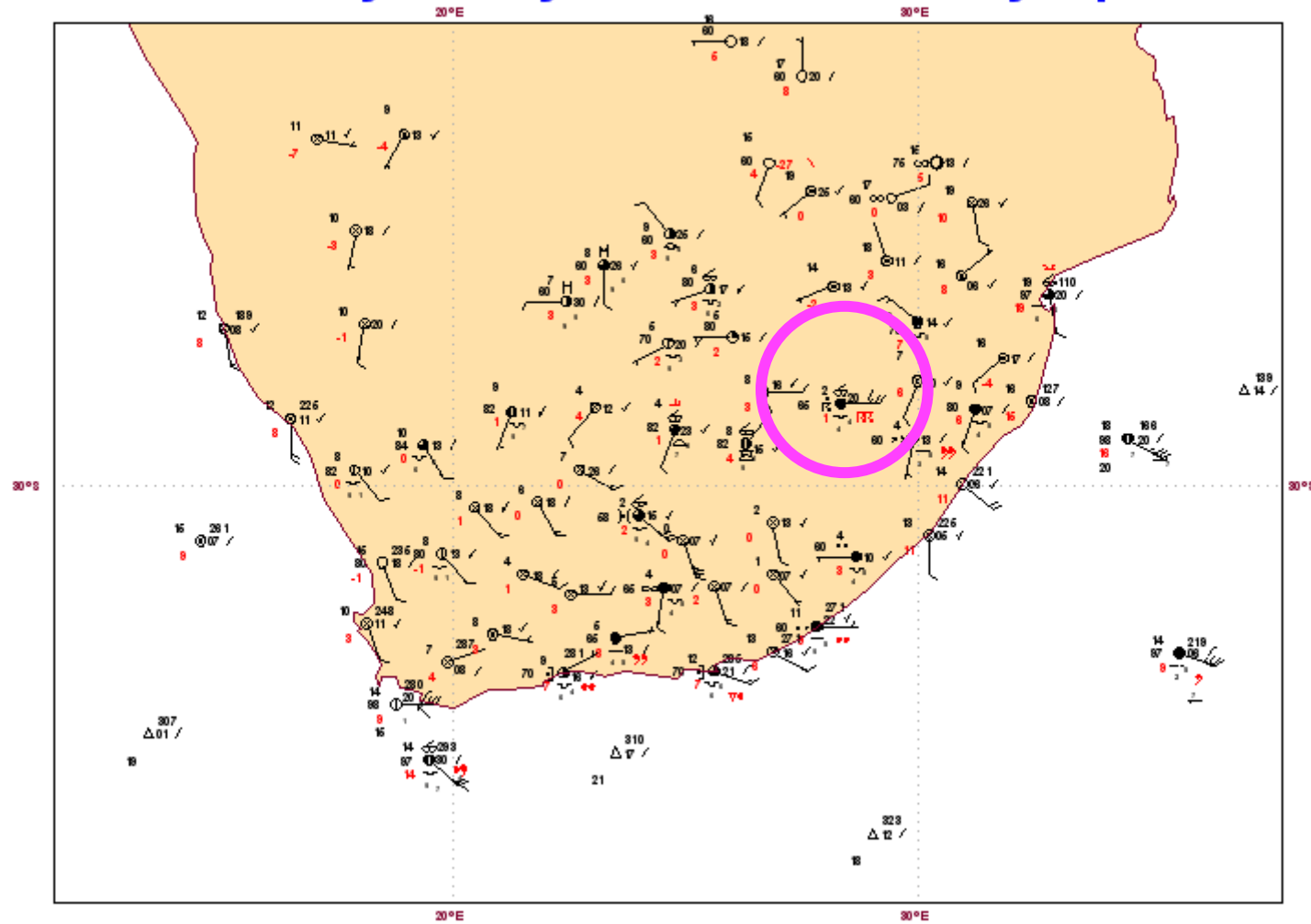
# Observations

Obs: 06-07UTC Monday 25 July 2011 Surf:synop/dribu



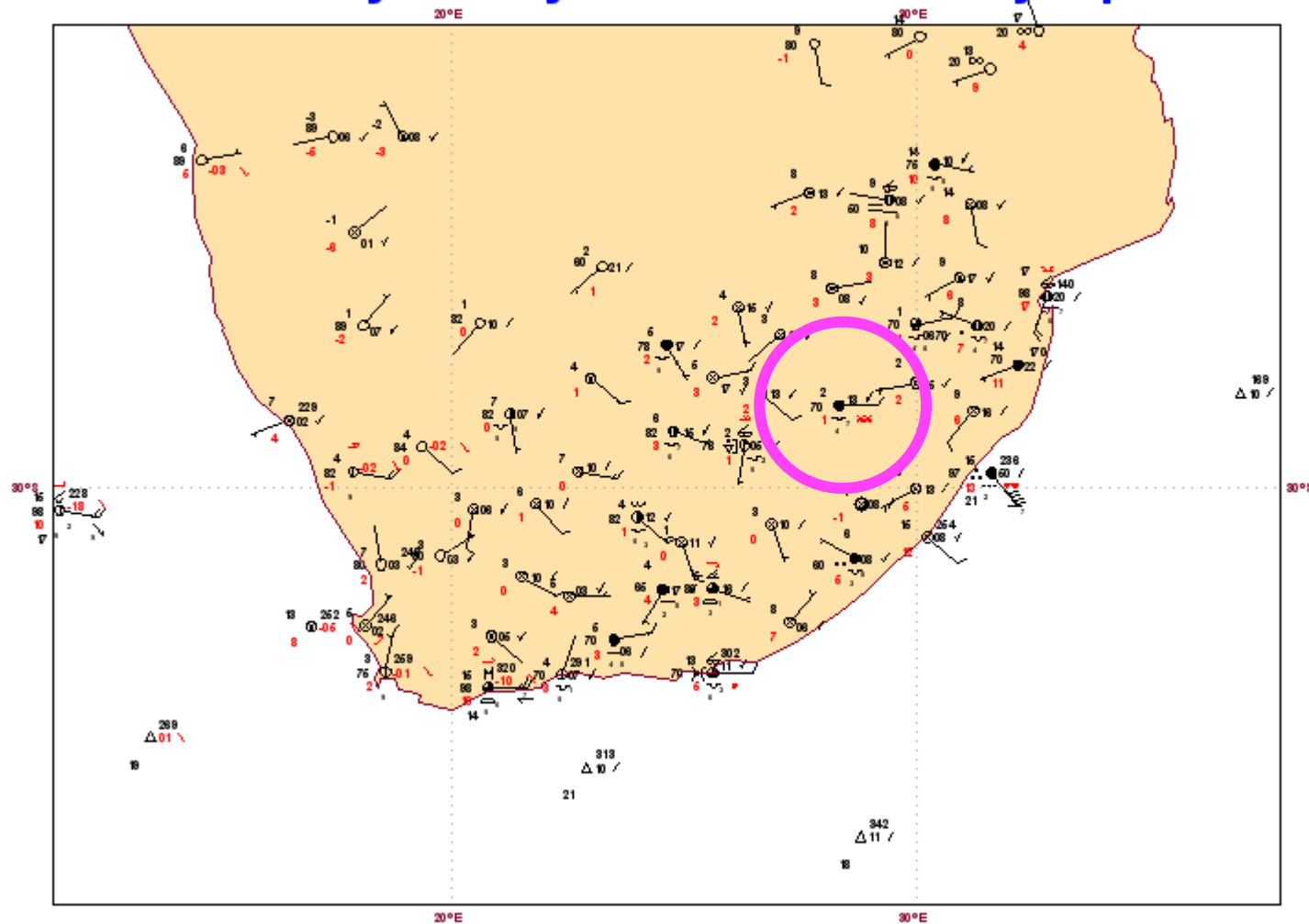
# Observations

Obs: Monday 25 July 2011 18UTC Surf:synop/dribu



# Observations

Obs: Tuesday 26 July 2011 06UTC Surf:synop/dribu

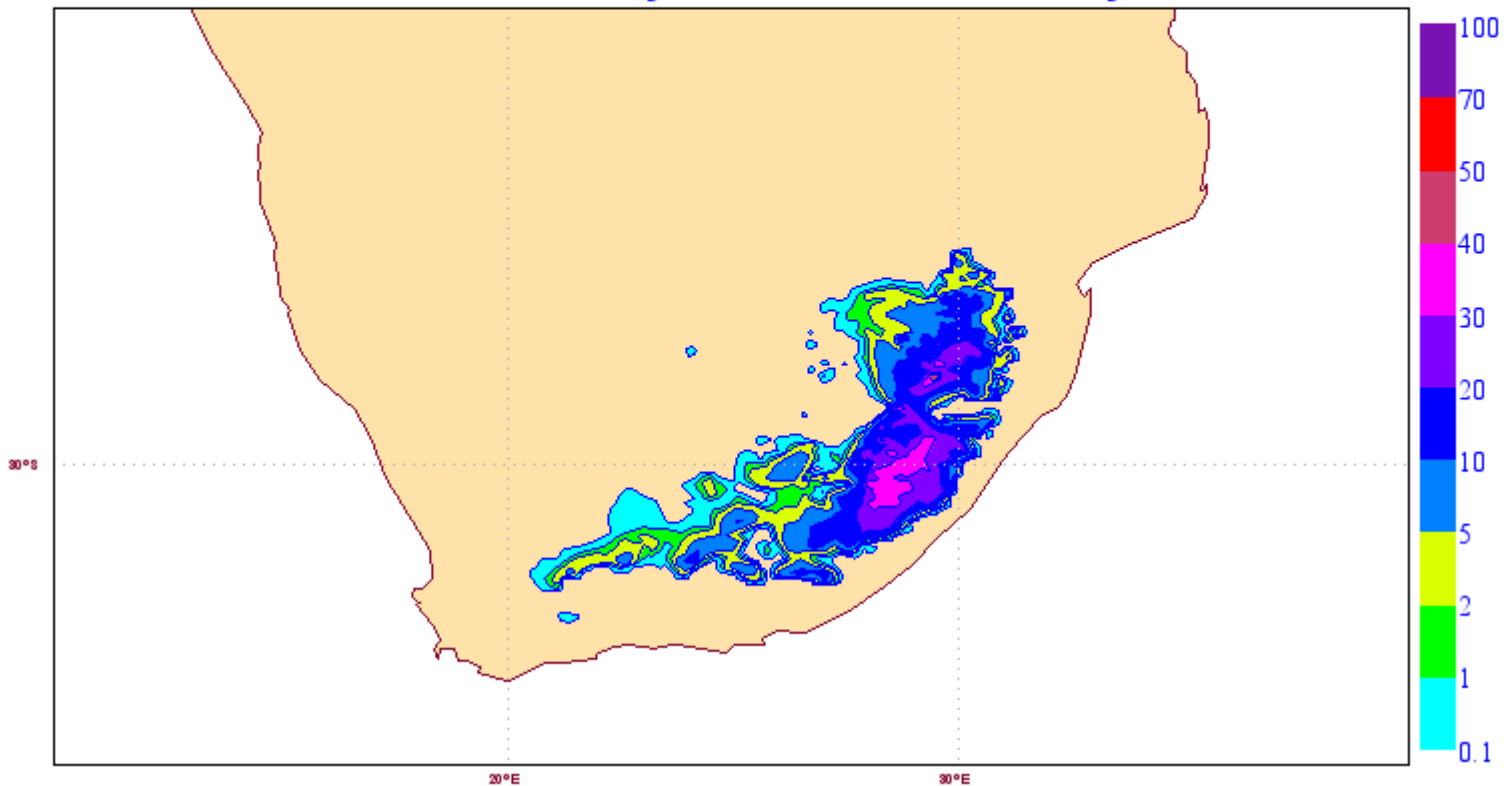


# Snow



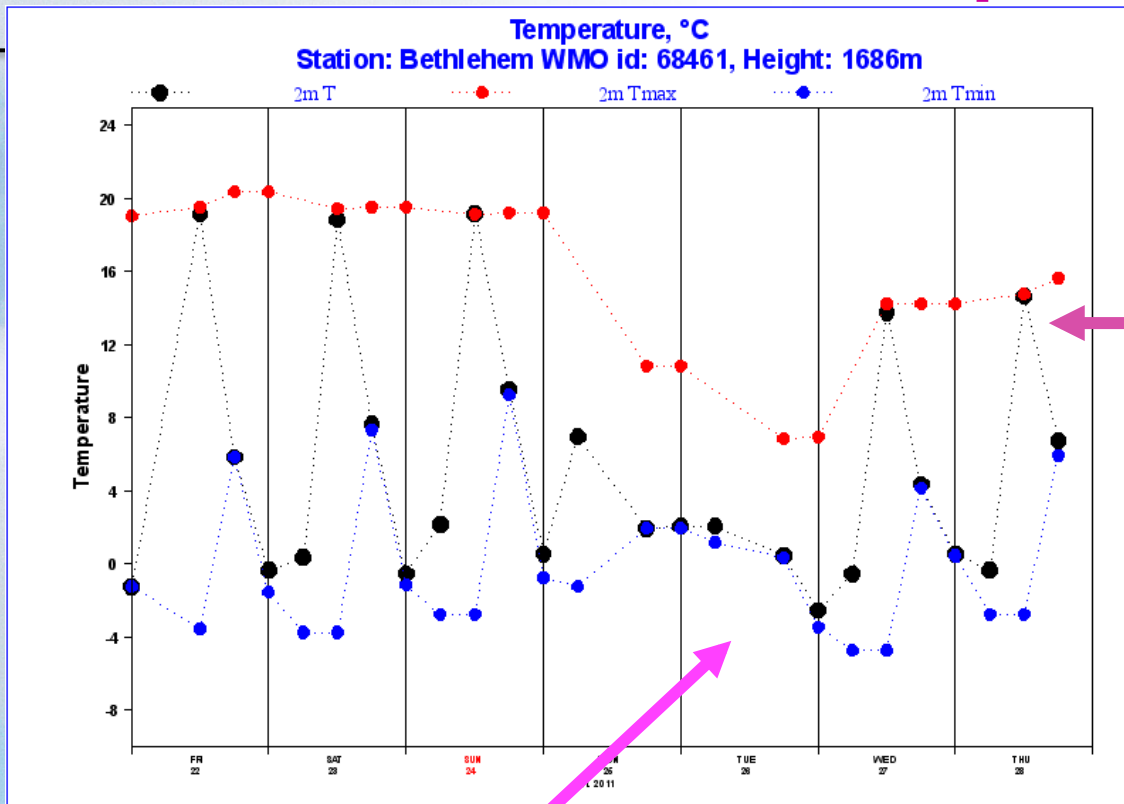
# Snow, Forecast

Sunday 24 July 2011 00UTC ECMWF Snowfall, mm  
Forecast T+30-54 VT: 25 July 2011 06UTC - 26 July 2011 06UTC



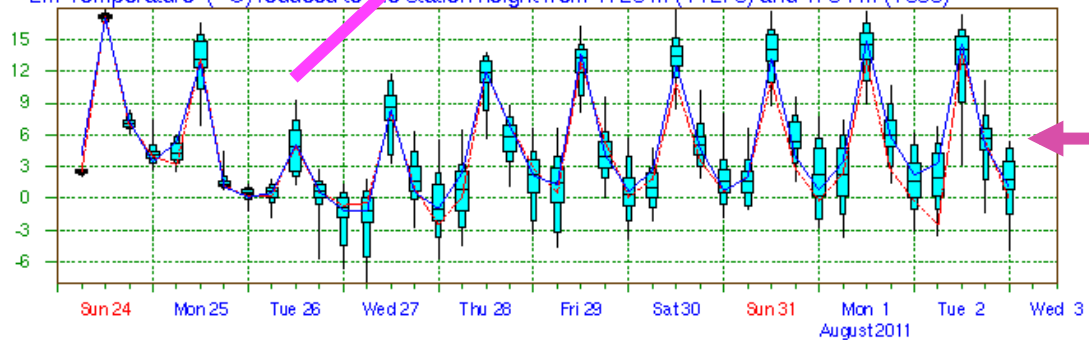


# Bethlehem Airport



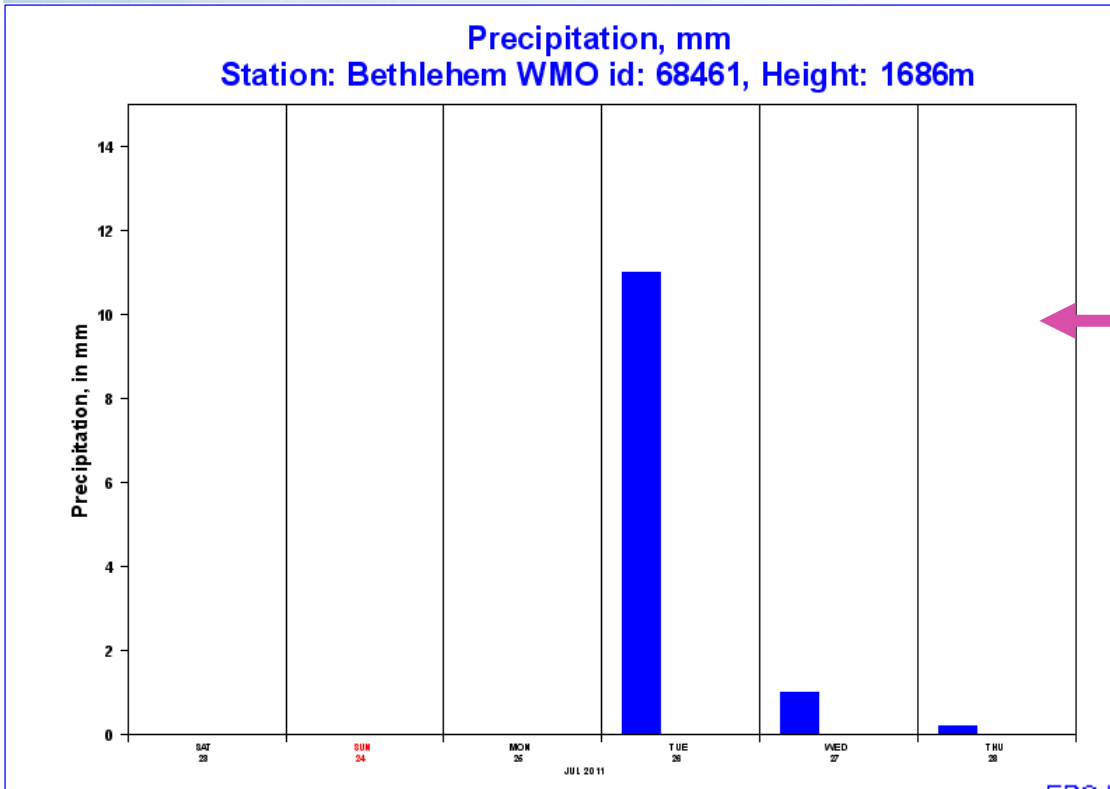
Observed

EPS Meteogram  
Bethlehem 28.24° S 28.44° E (EPS land point) 1728 m (T1279)  
Deterministic Forecast and EPS Distribution Sunday 24 July 2011 00 UTC  
Total Cloud Cover (okta)  
2m Temperature (°C) reduced to the station height from 1728 m (T1279) and 1734 m (T639)



Forecast

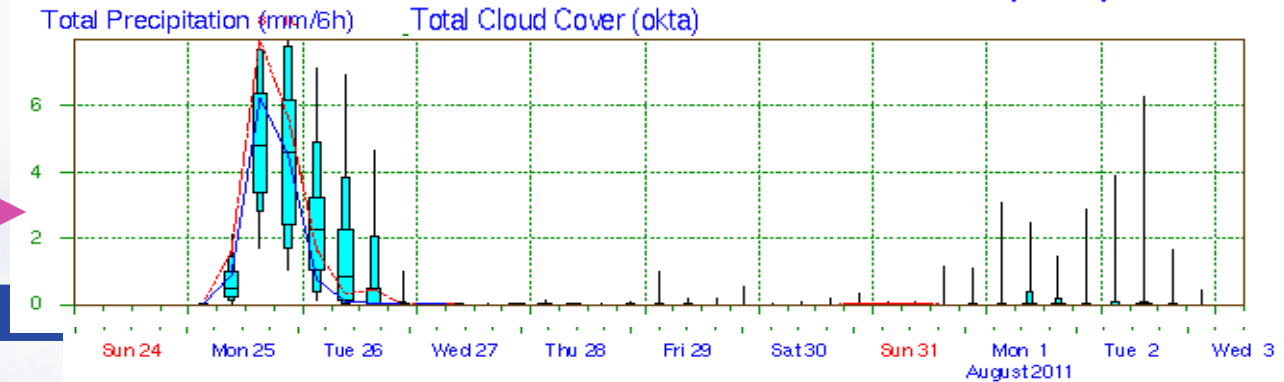
# Bethlehem Airport



← **Observed**

EPS Meteogram  
Bethlehem 28.24° S 28.44° E (EPS land point) 1728 m (T1279)  
Deterministic Forecast and EPS Distribution Sunday 24 July 2011 00 UTC  
Total Precipitation (mm/6h)  
Total Cloud Cover (okta)

**Forecast** →

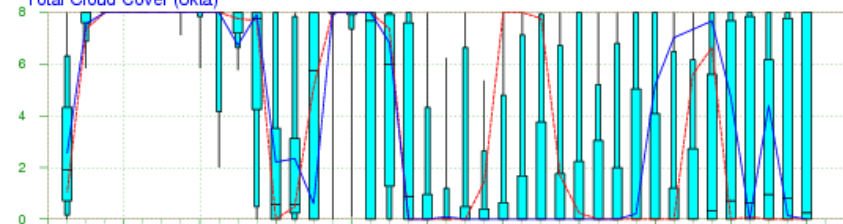


# Hogsback, 1543m above sea level

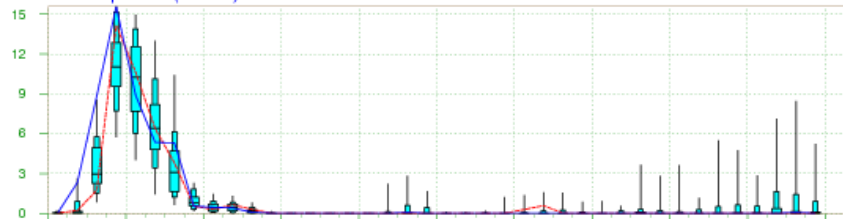


## M-climate, snow

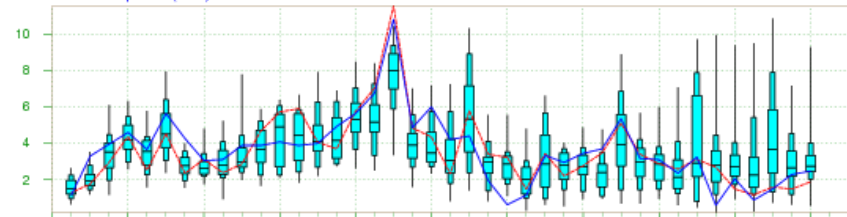
EPS Meteogram  
 Hogsback 32.46°S 26.88°E (EPS land point) 1375 m (T1279)  
 Deterministic Forecast and EPS Distribution Sunday 24 July 2011 00 UTC  
 Total Cloud Cover (okta)



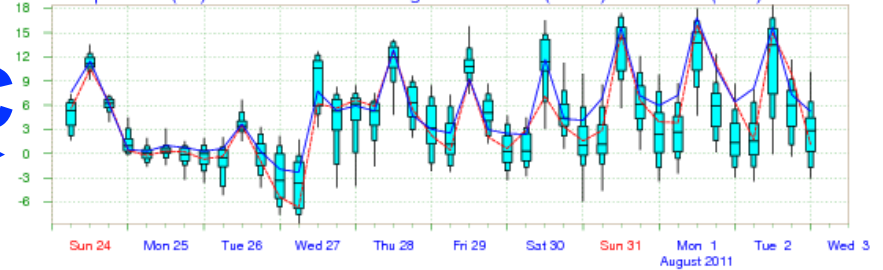
Total Precipitation (mm/6h)



10m Wind Speed (m/s)



2m Temperature (°C) reduced to the station height from 1375 m (T1279) and 1243 m (T639)



max 90%  
 75%  
 EPS Control(31 km) High Resolution Deterministic(16 km)  
 3.23861e+177-3.23863e+20034e+180-6.11445e-154  
 10%  
 min

0°C  
 ↓

Cumulative Distribution Functions -32.46°/26.88°  
 total snowfall; min: 0 (in mm) ; max: 9 (in mm)

