



# Flash flood in Tuscania 23 april 2016

- Castelfiorentino (Florence) 148mm/(<24hr)





**22 april 2016 Friday  
CNMCA WARNING**

**DALLA MATTINATA DI DOMANI, SABATO 23 APRILE  
2016, E PER LE SUCCESSIVE 24-36 ORE SI  
PREVEDONO SULLA TOSCANA PRECIPITAZIONI  
INTENSE A PREVALENTE CARATTERE  
TEMPORALESCO.**





# National Civil Protection Service

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PROTEZIONE CIVILE  
Presidenza del Consiglio dei Ministri  
Dipartimento della Protezione Civile

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## National Weather Bulletins

### National Weather Vigilance Bulletins of April 22, 2016

- > Fase Previsionale April 22, 2016
- ▶ Fase Previsionale April 23, 2016
- > Fase Previsionale April 24, 2016

#### Precipitazioni:

- diffuse, anche a carattere di rovescio o temporale, su Liguria di Levante, settori settentrionali della Toscana e crinali appenninici emiliani, con quantitativi cumulati generalmente moderati;
- da sparse a diffuse, anche a carattere di rovescio o temporale, su Umbria, Lazio centro-meridionale e Campania centro-settentrionale, con quantitativi cumulati puntualmente moderati;
- sparse, localmente anche a carattere di rovescio, sul resto della penisola e sulla Sardegna, con quantitativi cumulati generalmente deboli.

**Visibilità:** nessun fenomeno significativo.

**Temperature:** massime in generale calo, anche sensibile specie sulle regioni centrali.

**Venti:** forti occidentali sui settori settentrionali della Sardegna.

**Mari:** molto mossi il Mar di Sardegna, il Mar Ligure e il Tirreno centro-settentrionale.

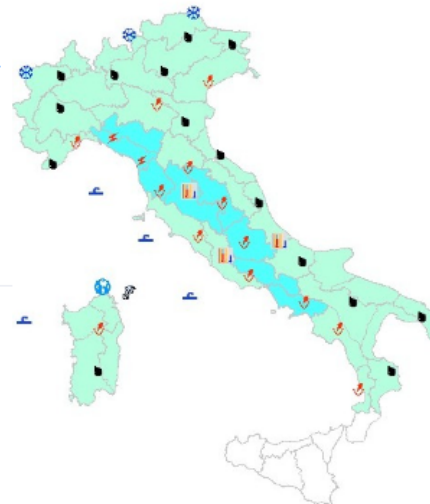
#### Riferimenti normativi

- [Direttiva Presidenza Consiglio dei Ministri 27 febbraio 2004](#) "Indirizzi operativi per la gestione organizzativa e funzionale del sistema di allertamento nazionale, statale e regionale, per il rischio idrogeologico ed idraulico ai fini di protezione civile".

Vai alla [mappa delle zone di vigilanza](#) in cui è suddiviso il territorio nazionale



Centro Funzionale Centrale - Settore Meteo



#### LEGENDA

Aree di vigilanza meteo

**Quantitativi giornalieri di Precipitazione previsti**

Assenti o non rilevanti

Deboli

Moderati

Elevati

Molto elevati

#### Caratteristiche delle precipitazioni previste

Piogge sparse o intermittenti

Piogge diffuse e continue

Nevicate deboli o moderate

Nevicate abbondanti

Rovesci o temporali a carattere isolato

Rovesci o temporali a carattere sperso

Rovesci o temporali a carattere diffuso

#### Altri fenomeni meteorologici di rilievo

##### Venti

Forti

Burrasca

Tempesta

Frequenti raffiche

##### Mari

Molto mosso

Agitato o molto agitato

Grosso e molto grosso

##### Moto ondoso

In aumento

In diminuzione





# National Civil Protection Service warning



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Home > Risk activities > Meteo-Hydro Risk > Activities > Prediction and prevention > Central Functional Centre for weather, hydrogeological and hydraulic risks > Prediction phase > Criticality Bulletins

## Criticality Bulletins

### Criticality bulletin of April 22, 2016

> Fase Previsionale April 22, 2016

▶ Fase Previsionale April 23, 2016

PER LA GIORNATA DI DOMANI, SABATO 23 APRILE 2016:

ORDINARIA CRITICITA' PER RISCHIO IDROGEOLOGICO LOCALIZZATO SU:

LIGURIA: Bacini Liguri Marittimi di Levante, Bacini Liguri Padani di Levante, Bacini Liguri Padani di Ponente, Bacini Liguri Marittimi di Centro;

TOSCANA: Bisenzio e Ombrone Pt, Serchio-Garfagnana-Lima, Valdarno Inf., Versilia, Lunigiana, Arno-Costa, Serchio-Costa, Serchio-Lucca, Reno;

#### Avvertenze

- Il sito [www.protezionecivile.gov.it](http://www.protezionecivile.gov.it) chiede, su ogni browser di navigazione (Internet Explorer, Google Chrome, Firefox, eccetera), di abilitare la posizione del computer su cui si sta navigando. Per visualizzare le mappe del bollettino di criticità e



Centro Funzionale Centrale - Settore Idro



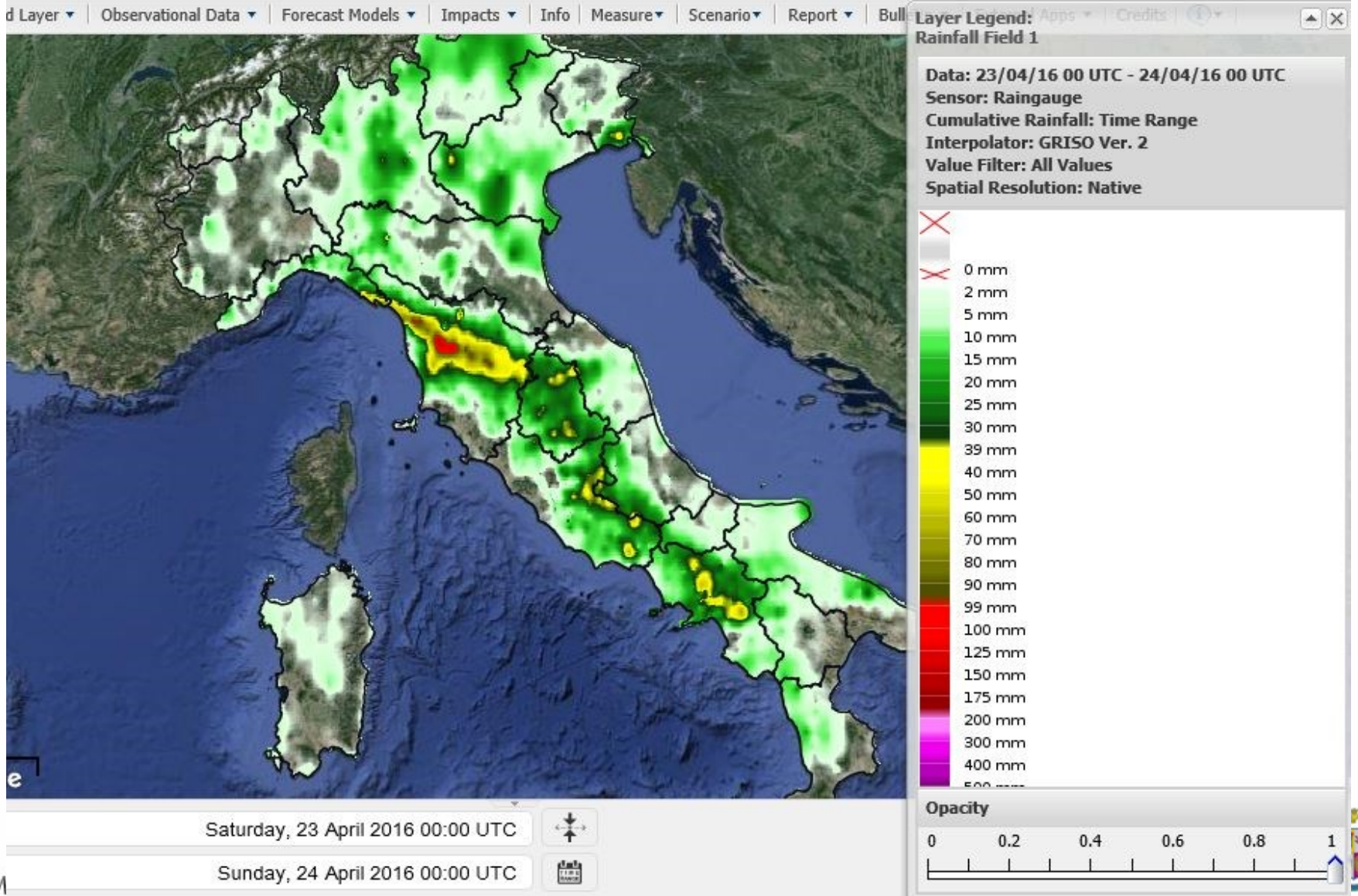
#### LEGENDA

- Limiti regionali
- Zone di Allerta
- Assenza di fenomeni significativi prevedibili
- Ordinaria criticità per rischio idrogeologico localizzato
- Ordinaria criticità per rischio idraulico diffuso
- Moderata criticità per rischio idrogeologico localizzato
- Moderata criticità per rischio idraulico diffuso
- Elevata criticità per rischio idrogeologico localizzato
- Elevata criticità per rischio idraulico diffuso



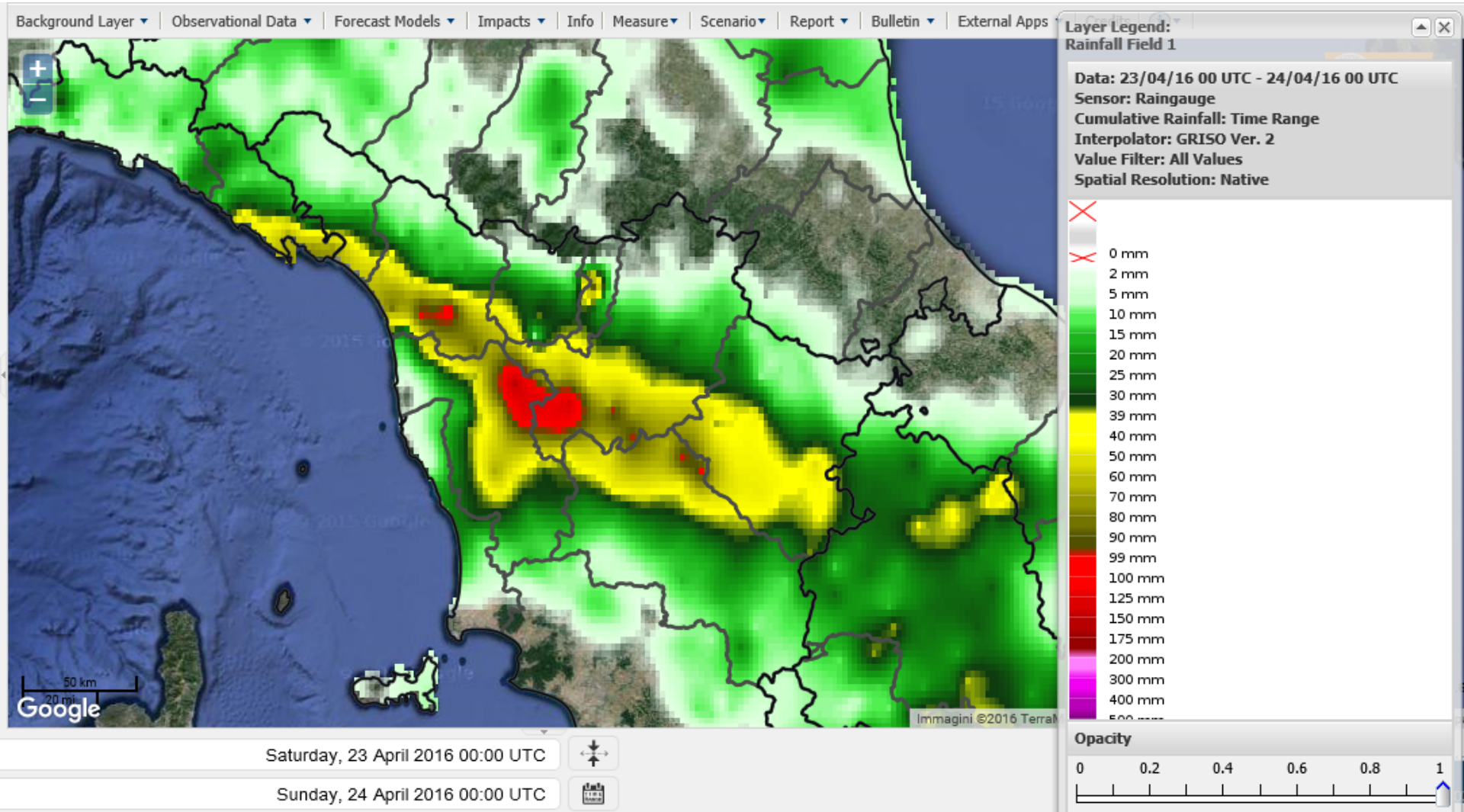


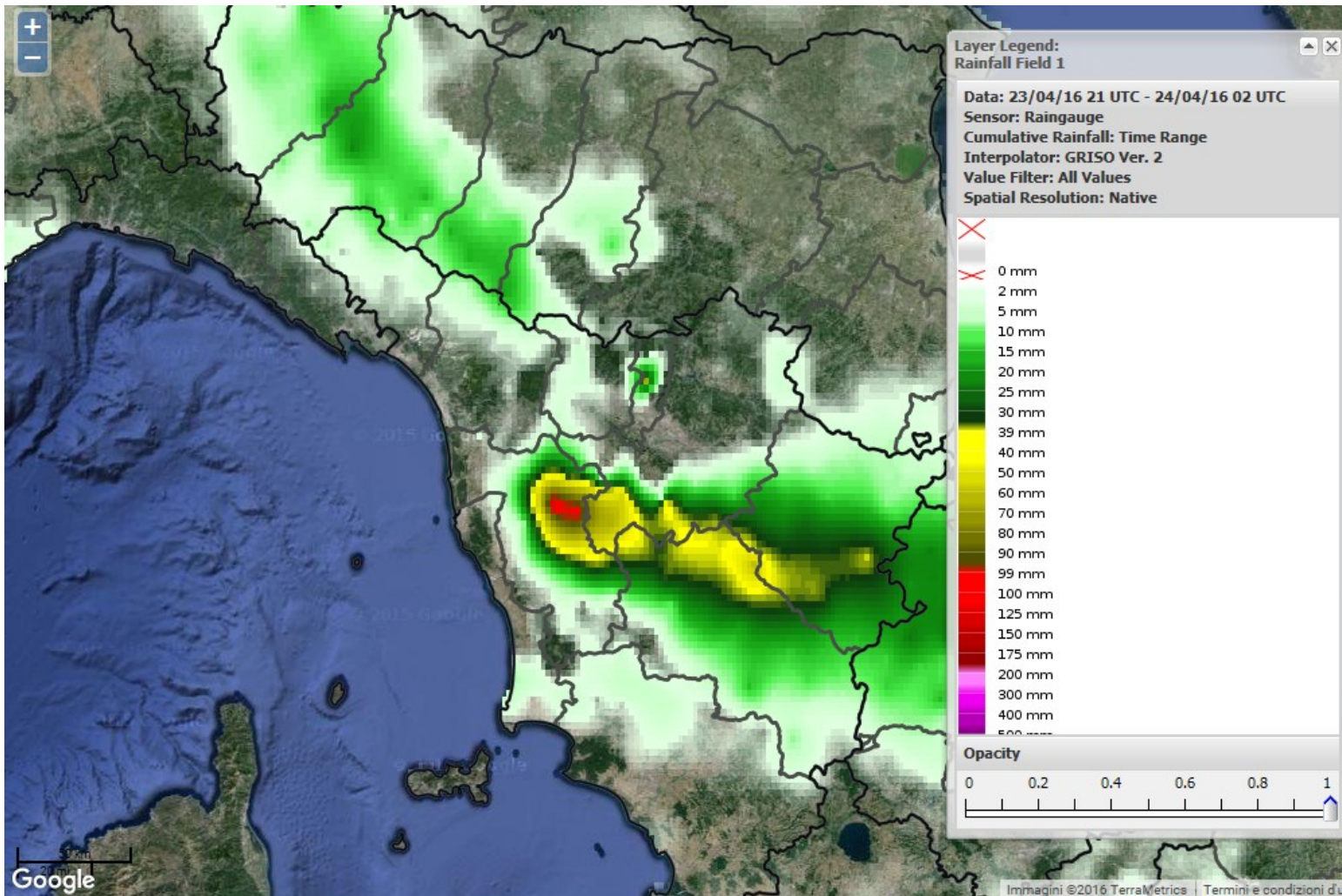
# 24 HR OBSERVED PRECIPITATION





# 24 HR OBSERVED PRECIPITATION



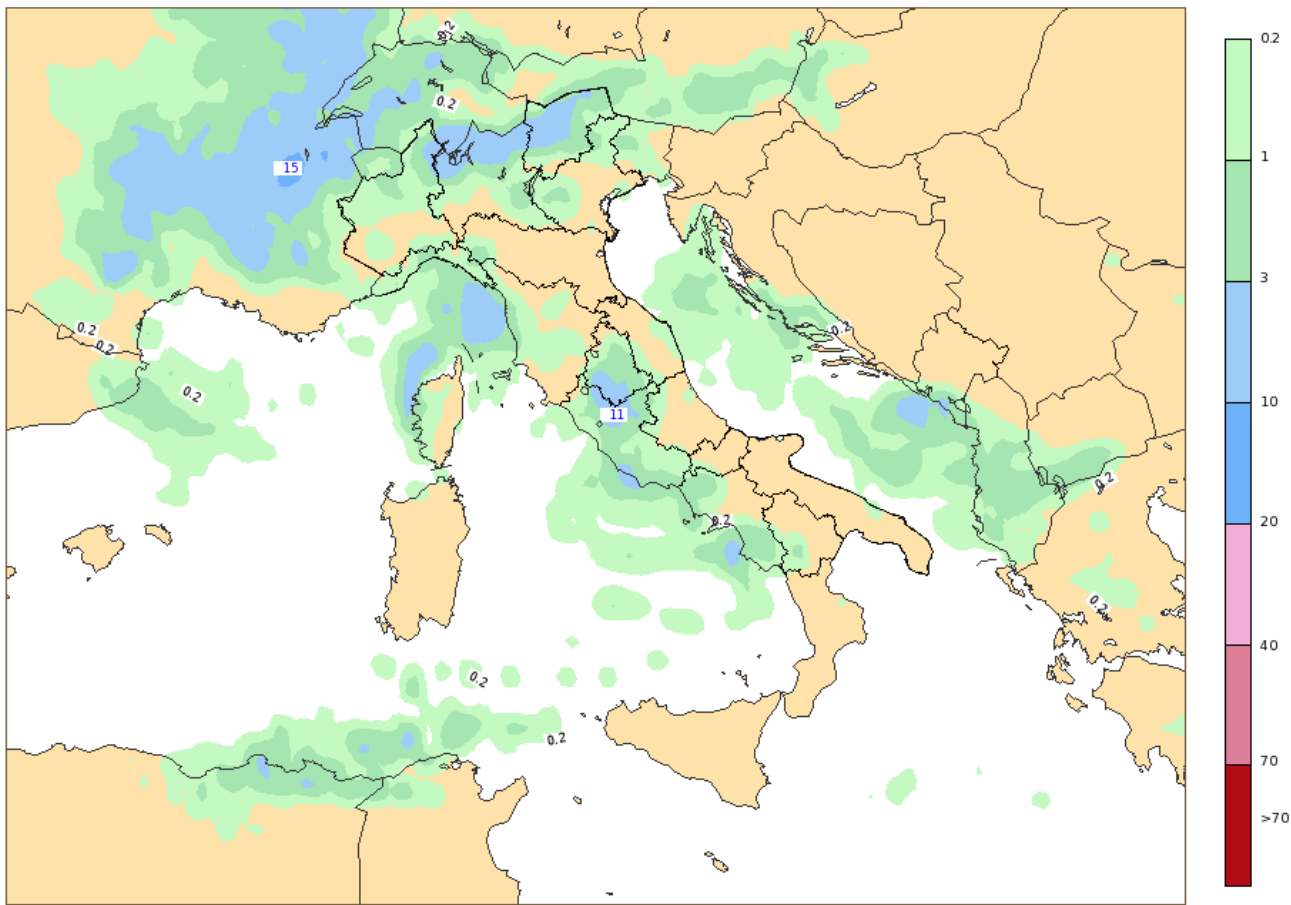


Saturday, 23 April 2016 21:00 UTC

Sunday, 24 April 2016 02:00 UTC



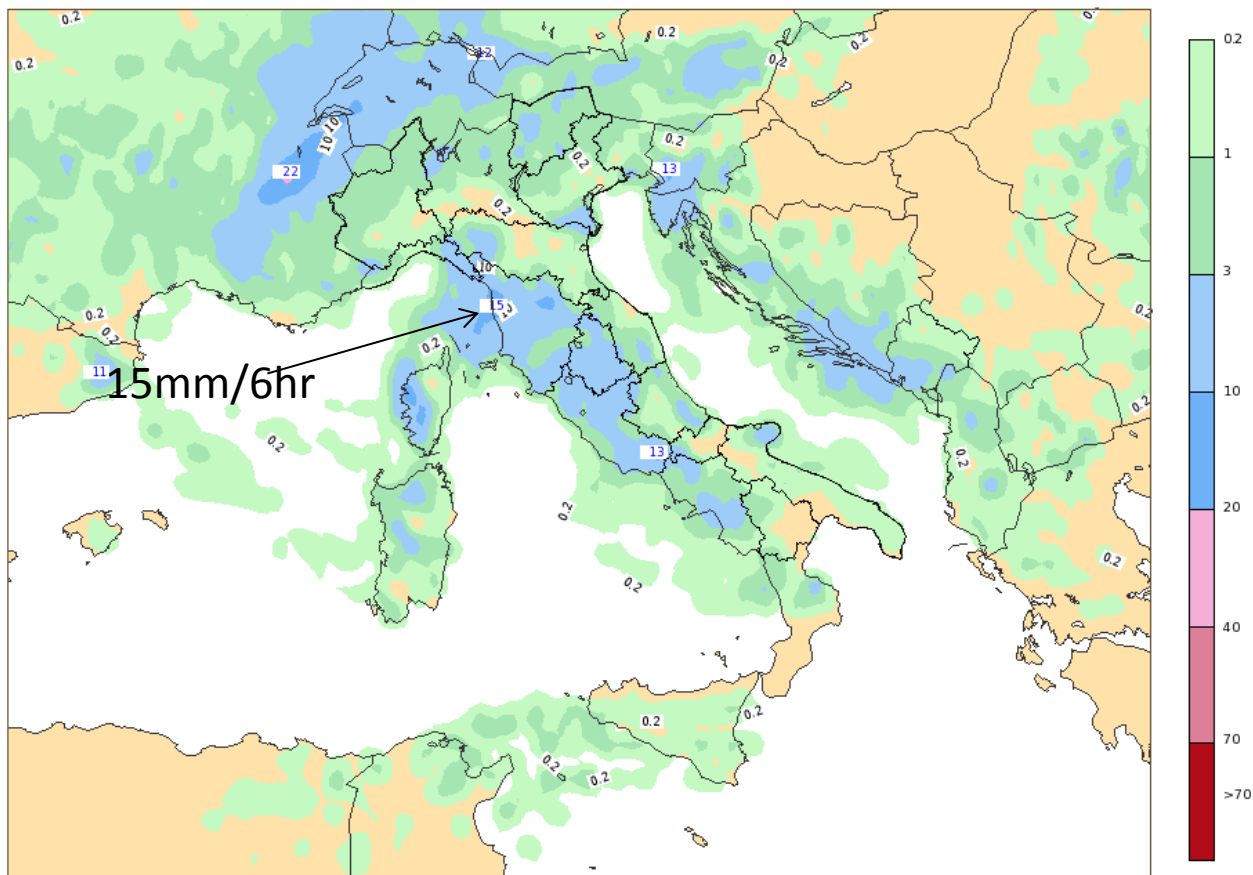
**ECMWF 22 April 2016 00UTC Forecast T+30 VT: Saturday 23 April 2016 06UTC  
ITALY - 6h accumulated precipitations (mm)**





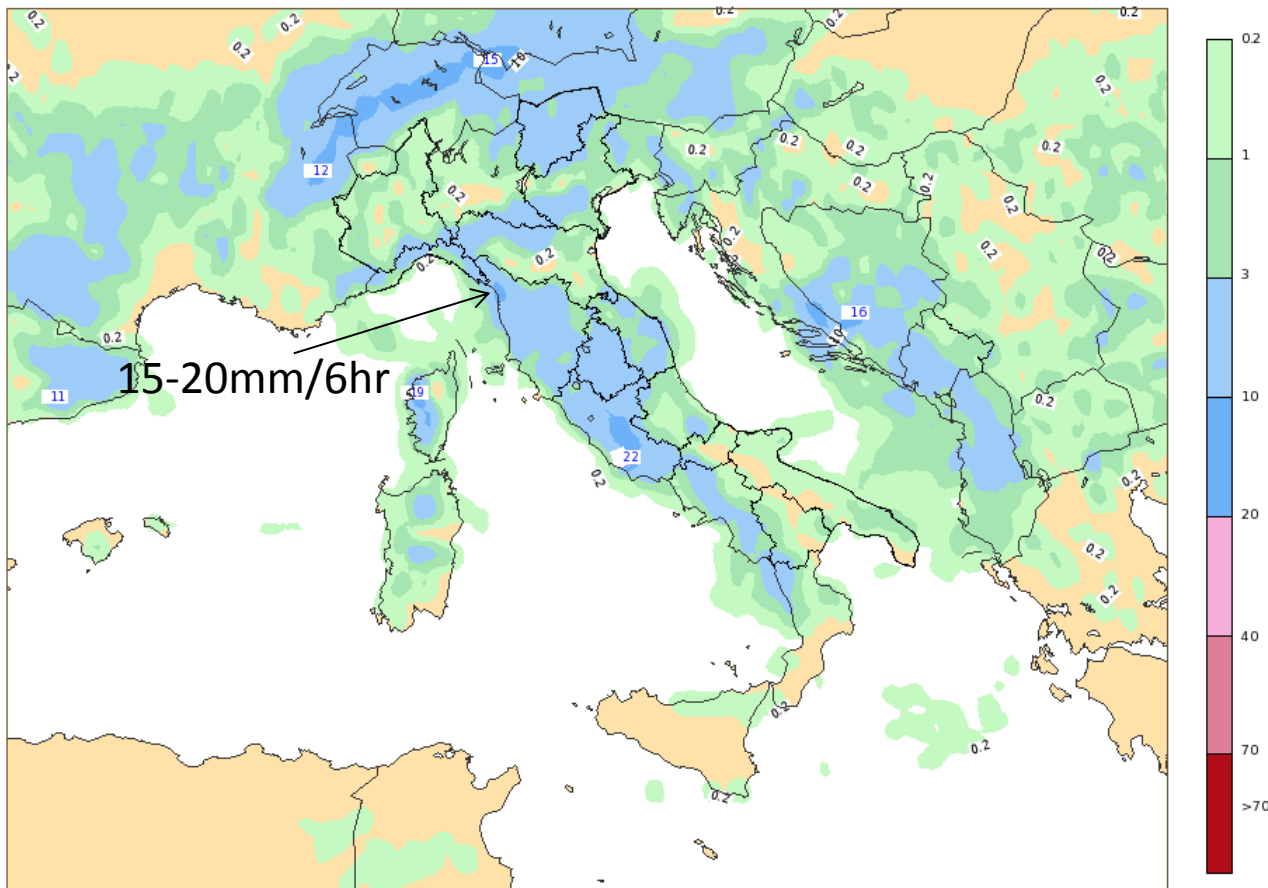


ECMWF 22 April 2016 00UTC Forecast T+36 VT: Saturday 23 April 2016 12UTC  
ITALY - 6h accumulated precipitations (mm)



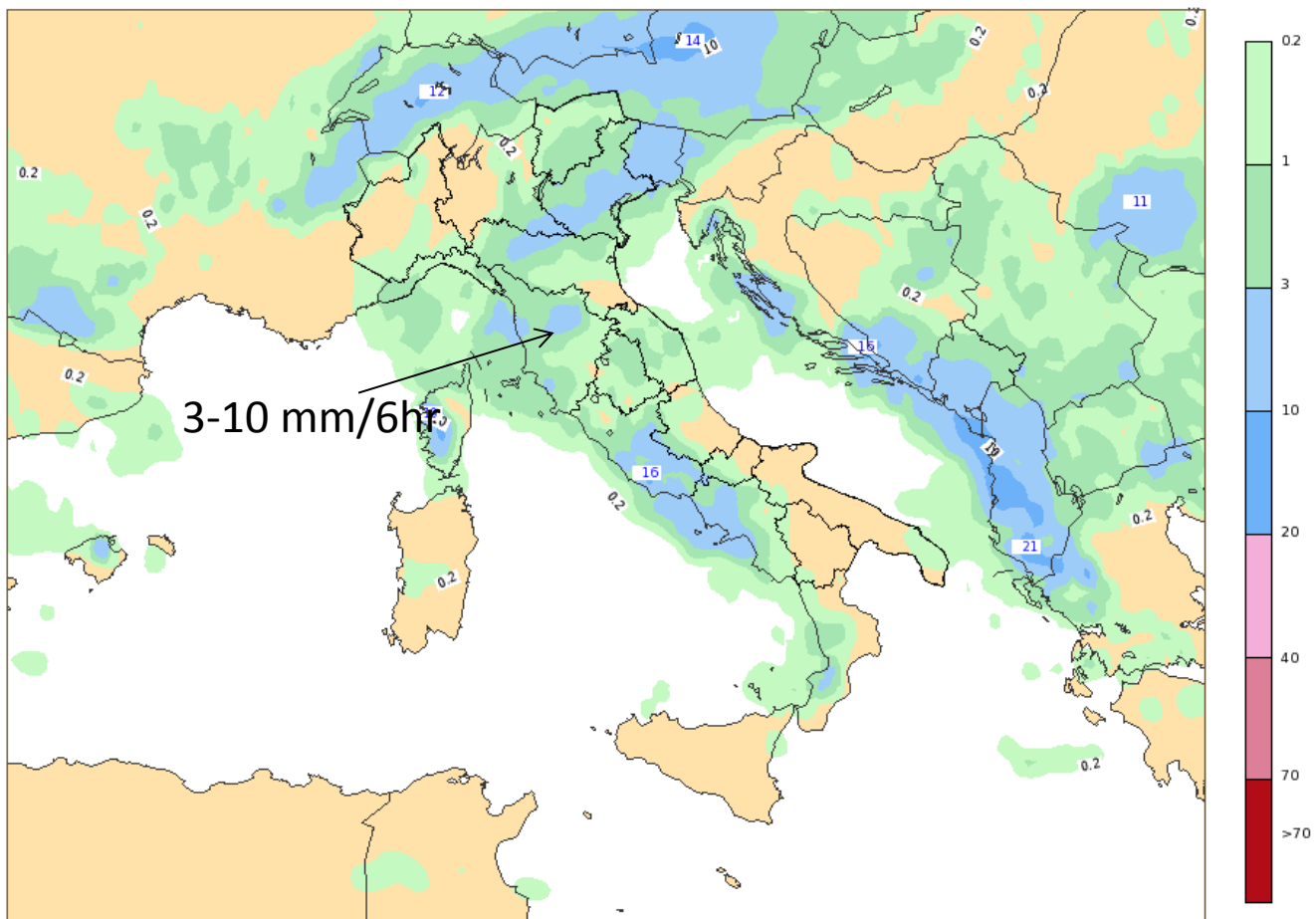


ECMWF 22 April 2016 00UTC Forecast T+42 VT: Saturday 23 April 2016 18UTC  
ITALY - 6h accumulated precipitations (mm)





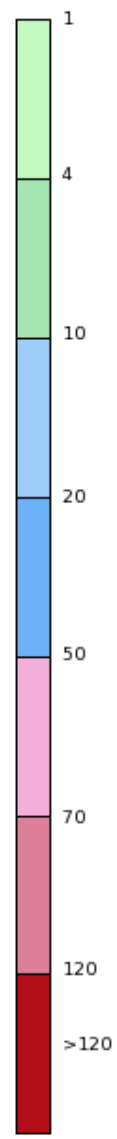
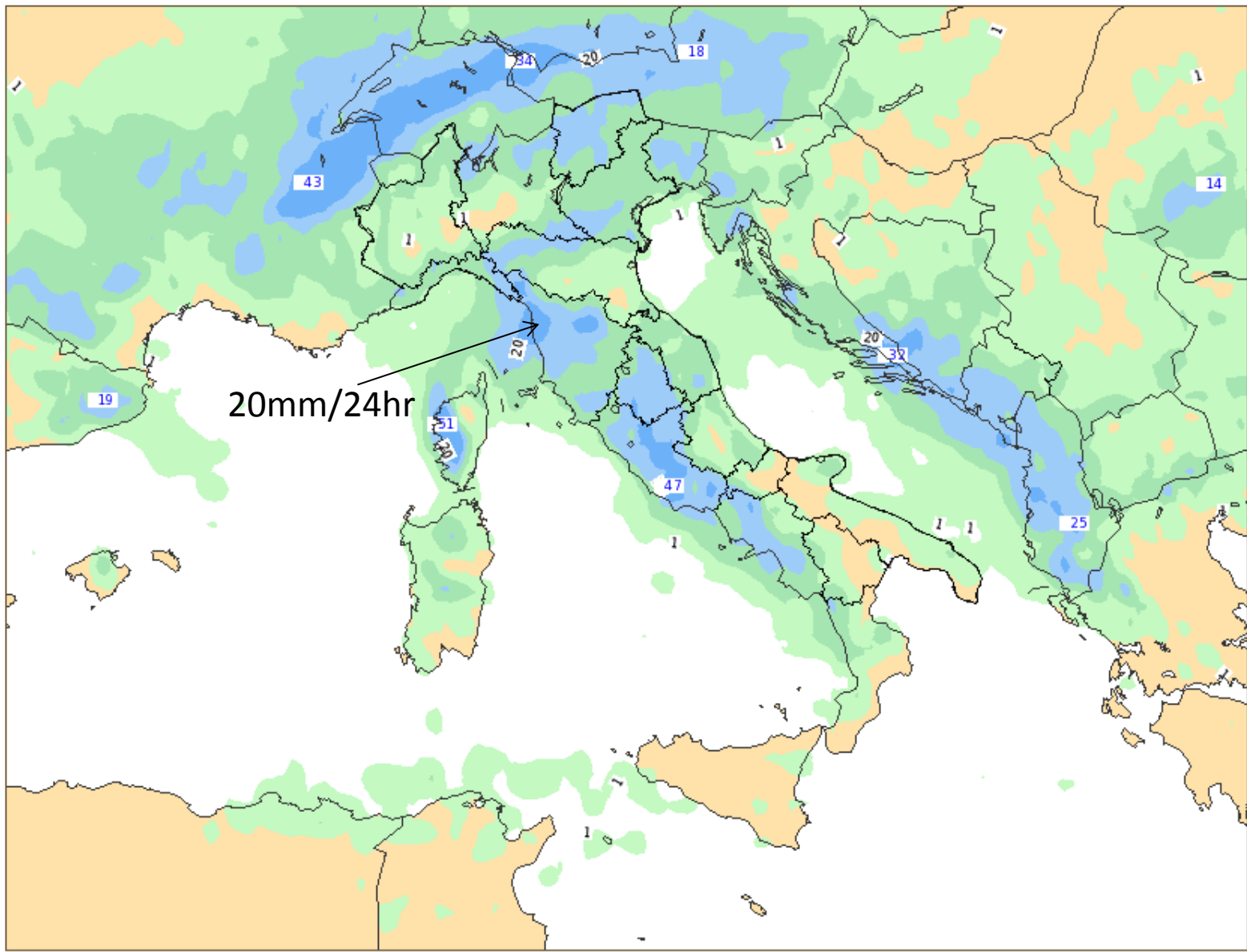
ECMWF 22 April 2016 00UTC Forecast T+48 VT: Sunday 24 April 2016 00UTC  
ITALY - 6h accumulated precipitations (mm)





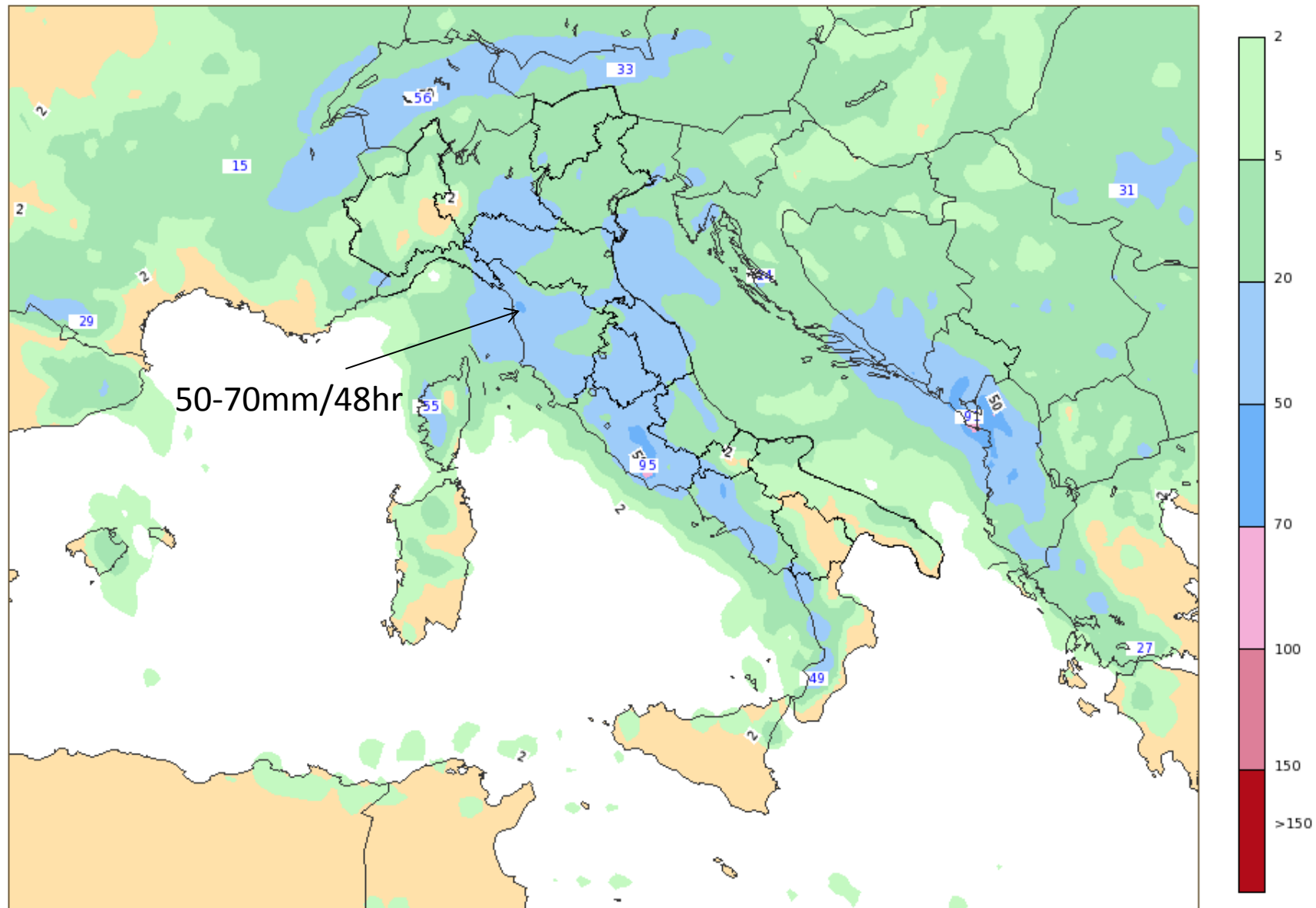
# ECMWF 22 April 2016 00UTC Forecast T+48 VT: Sunday 24 April 2016 00UTC

## ITALY - 24h accumulated precipitations (mm)



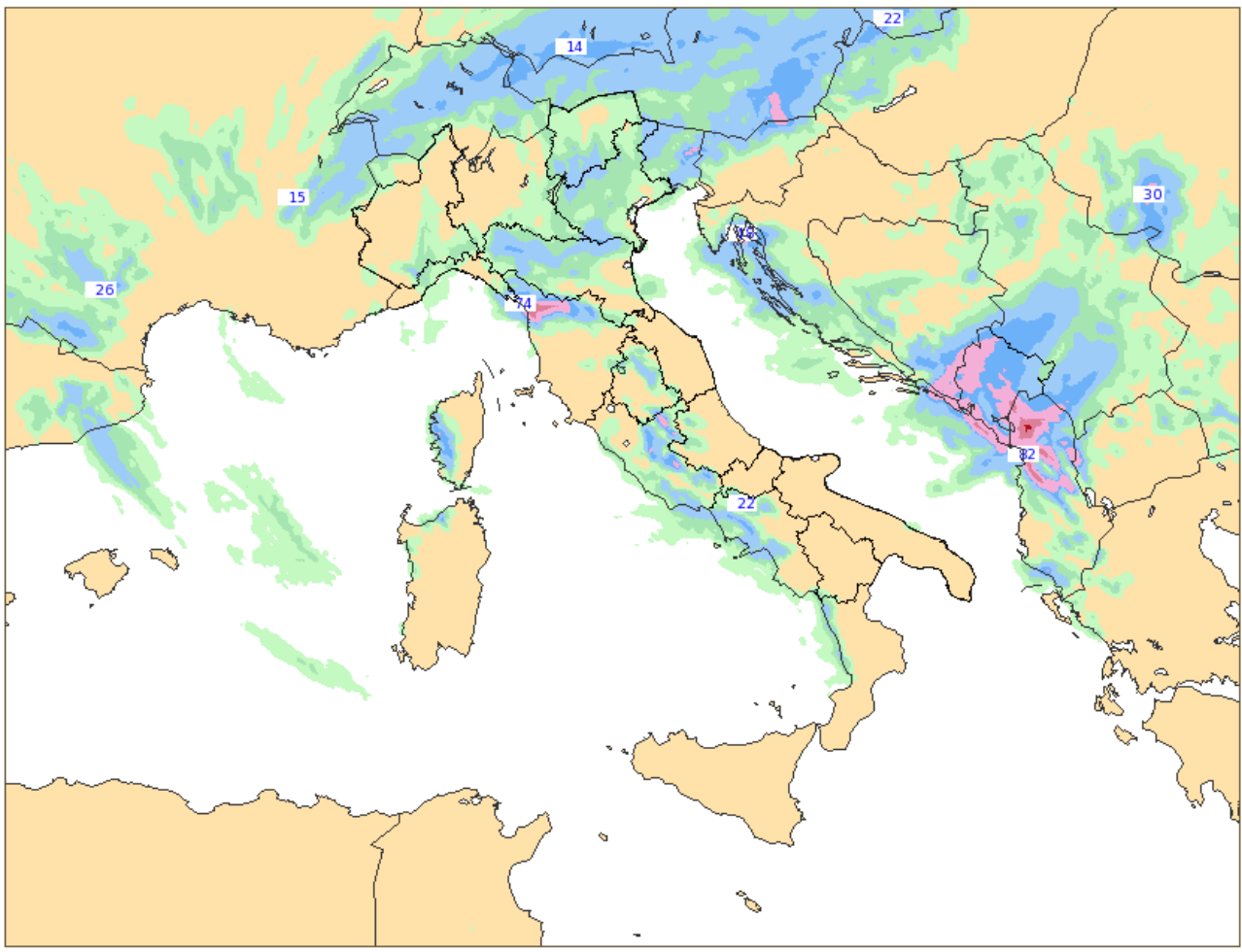


# ECMWF 22 April 2016 00UTC Forecast T+72 VT: Monday 25 April 2016 00UTC ITALY - 48h accumulated precipitations (mm)





**COSMOME 22 April 2016 00UTC Forecast T+48 VT: Sunday 24 April 2016 00UTC  
ITALY - 6h accumulated precipitations (mm)**



EFI Tmax + SOT - Friday 22 Apr 2016, 00 UTC VT Sunday 24 Apr 2016, 00 UTC Step 48

Navigation icons: Close, Pan, Refresh, Zoom In, Zoom Out, Hand, Lasso, Pan, Home, Search, Full Screen

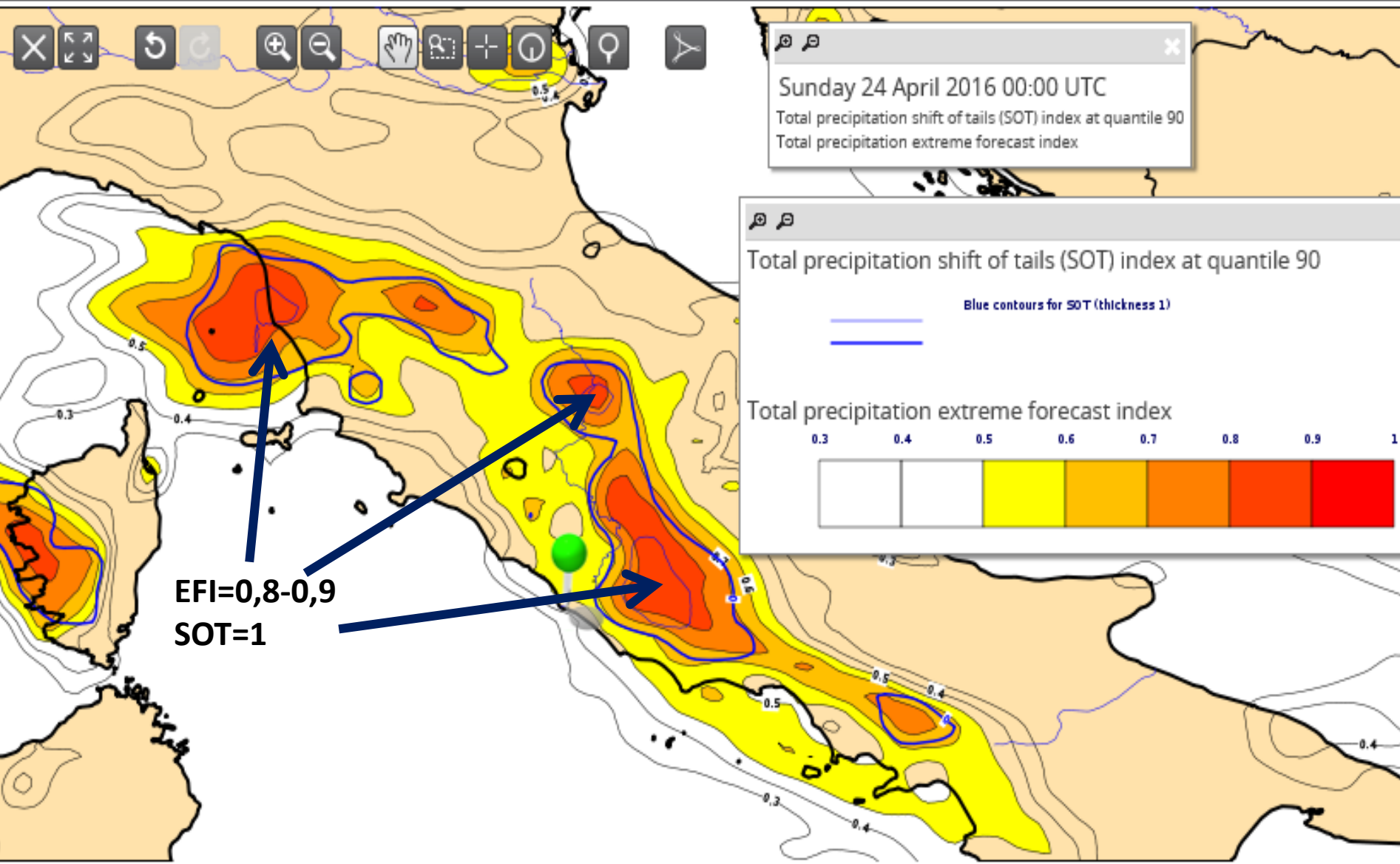
Sunday 24 April 2016 00:00 UTC  
Total precipitation shift of tails (SOT) index at quantile 90  
Total precipitation extreme forecast index

Total precipitation shift of tails (SOT) index at quantile 90

Blue contours for SOT (thickness 1)

Total precipitation extreme forecast index

0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
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EFI=0,8-0,9  
SOT=1

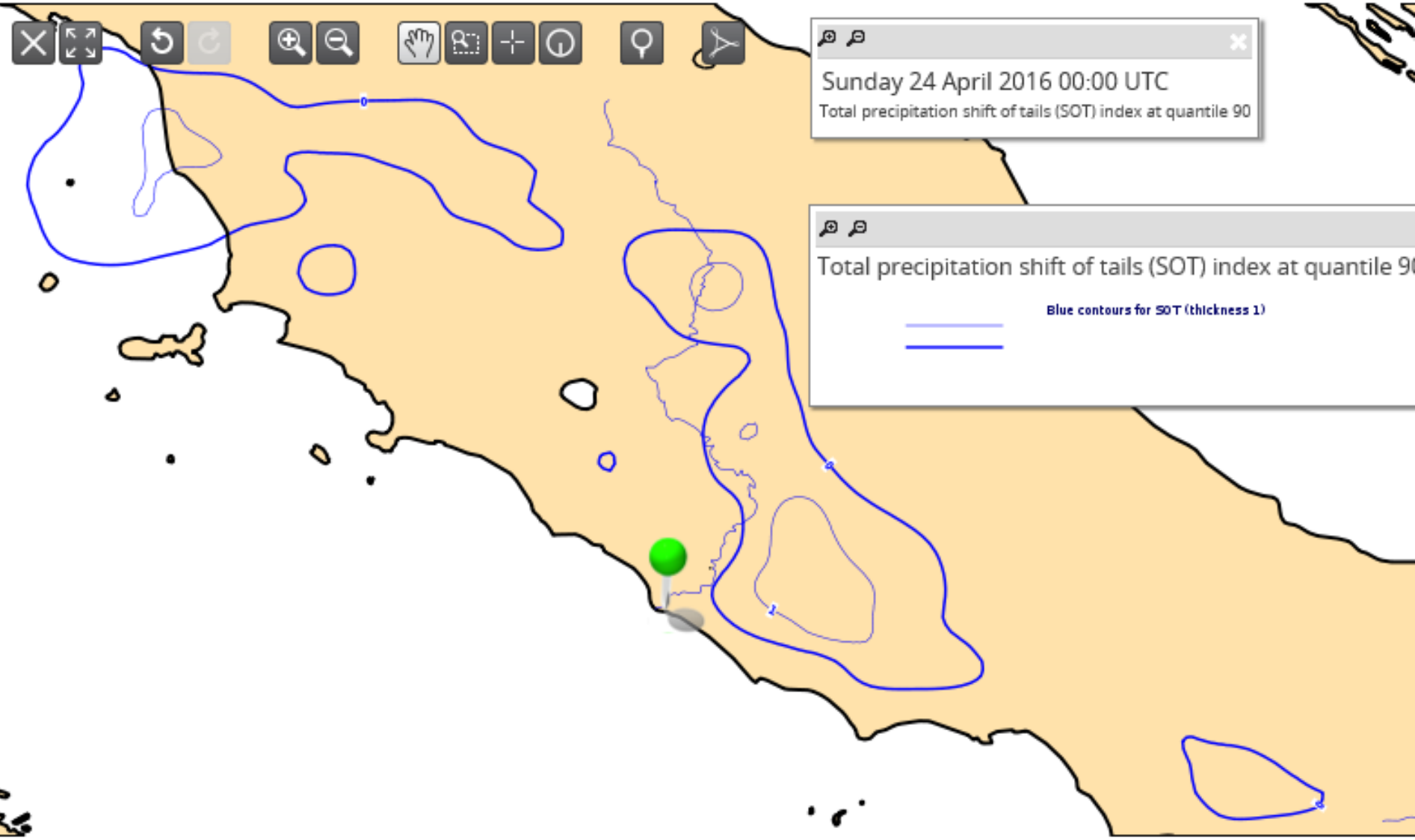
EFI Tmax + SOT - Friday 22 Apr 2016, 00 UTC VT Sunday 24 Apr 2016, 00 UTC Step 48



Sunday 24 April 2016 00:00 UTC  
Total precipitation shift of tails (SOT) index at quantile 90

Total precipitation shift of tails (SOT) index at quantile 90

Blue contours for SOT (thickness 1)

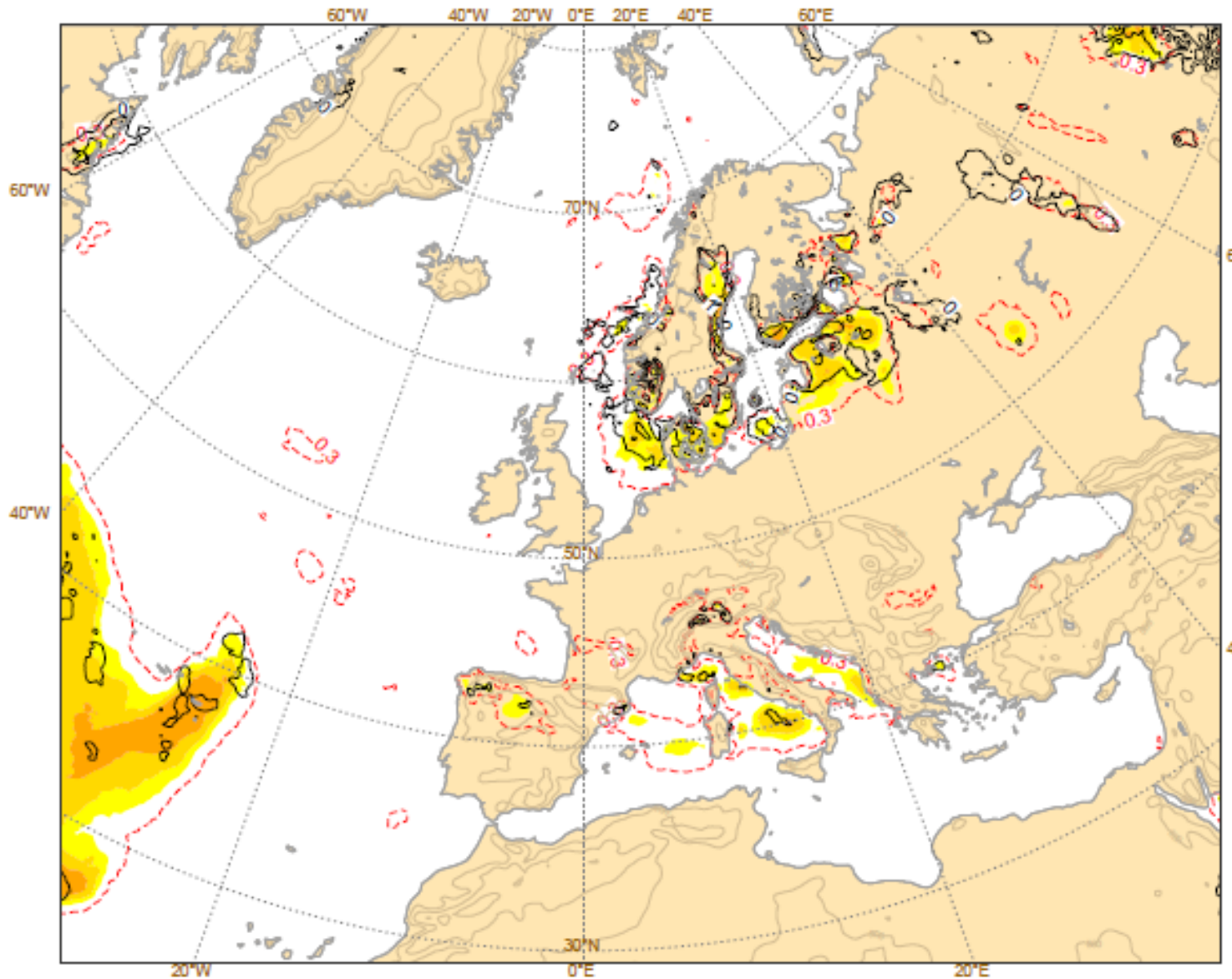


< > BT: Fri 22 Apr, 00Z VT: Sat 23 Sun 24 Mon 25





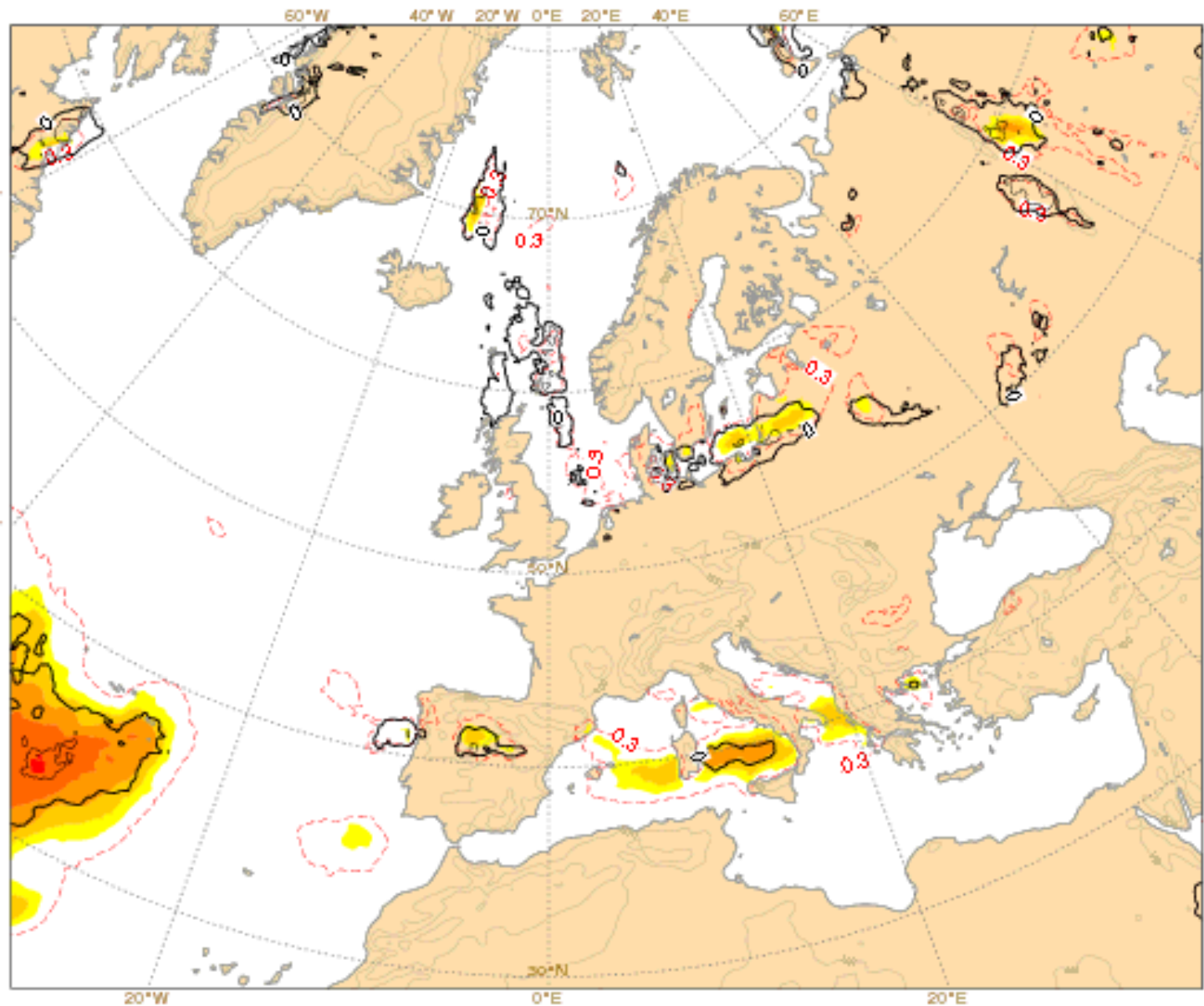
Fri 22 Apr 2016 00UTC ©ECMWF t+24-48h VT: Sat 23 Apr 2016 00UTC - Sun 24 Apr 2016 00UTC  
Extreme forecast index and Shift of Tails (black contours 0,1,2,5,8) for CAPE



# CAPE



Fri 22 Apr 2016 00UTC ©ECMWF t+24-48h VT: Sat 23 Apr 2016 00UTC - Sun 24 Apr 2016 00UTC  
Extreme forecast index and Shift of Tails (black contours 0,1,2,5,8) for CAPESHEAR



# CAPE SHEAR



# Total precipitation probability

[Charts](#)

[Datasets](#)

[Quality of our forecasts](#)

[Documentation and support](#)

[Accessing forecasts](#)

## Filters

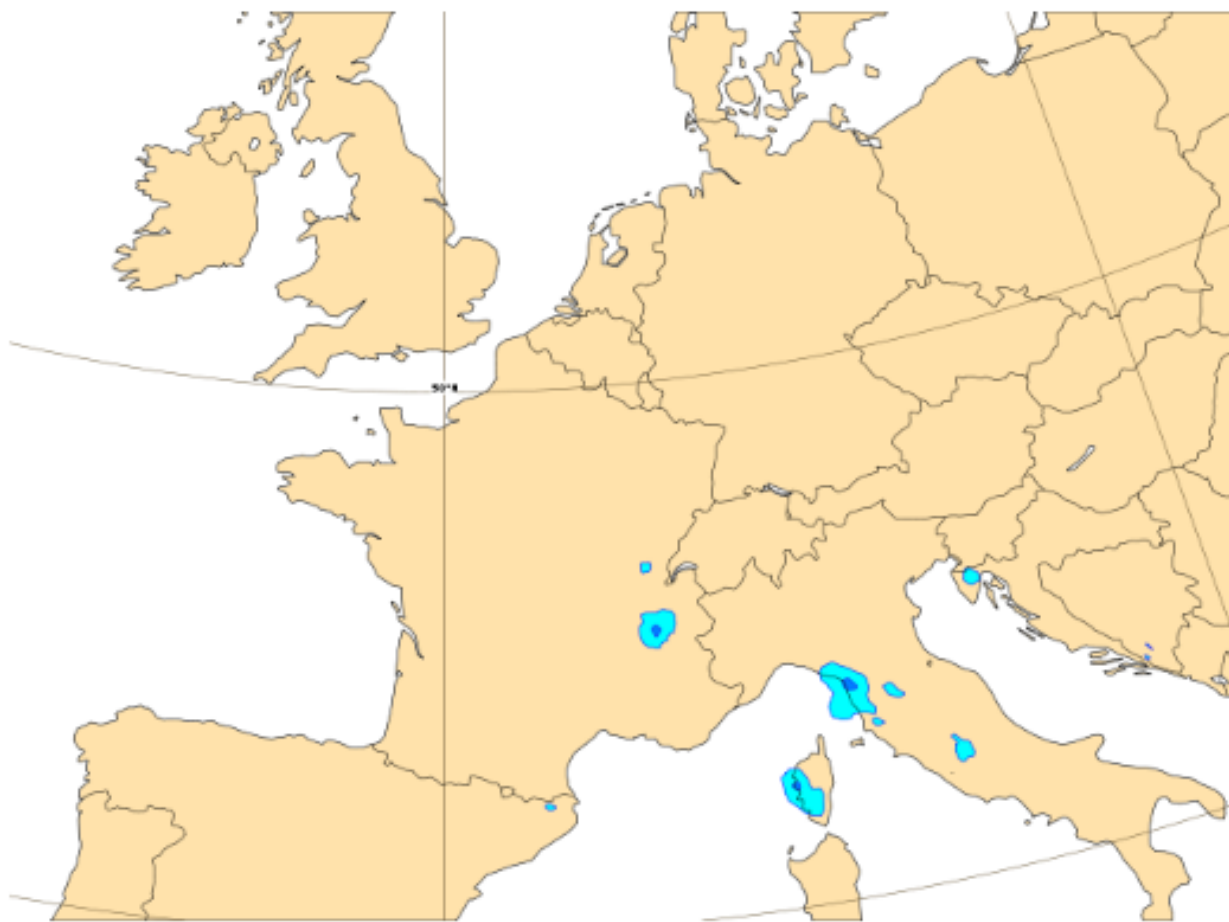
### Product type

- ENS (2)
- Extreme forecast Index (1)
- HRES (1)

Base time ▾ Area ▾ Threshold (mm/6hr) ▾

**Probability of total precipitation > 15 mm over last 6 hour (s)**

Friday 22 Apr, 00 UTC T+36 Valid: Saturday 23 Apr, 12 UTC



< > VT: Sa 23 Sun 24 Mon 25 Tue 26 Wed 27 Thu 28 Fri 29 Sat 30 Sun 01 Mon 02



# Total precipitation probability

[Charts](#)[Datasets](#)[Quality of our forecasts](#)[Documentation and support](#)[Accessing forecasts](#)

## Filters

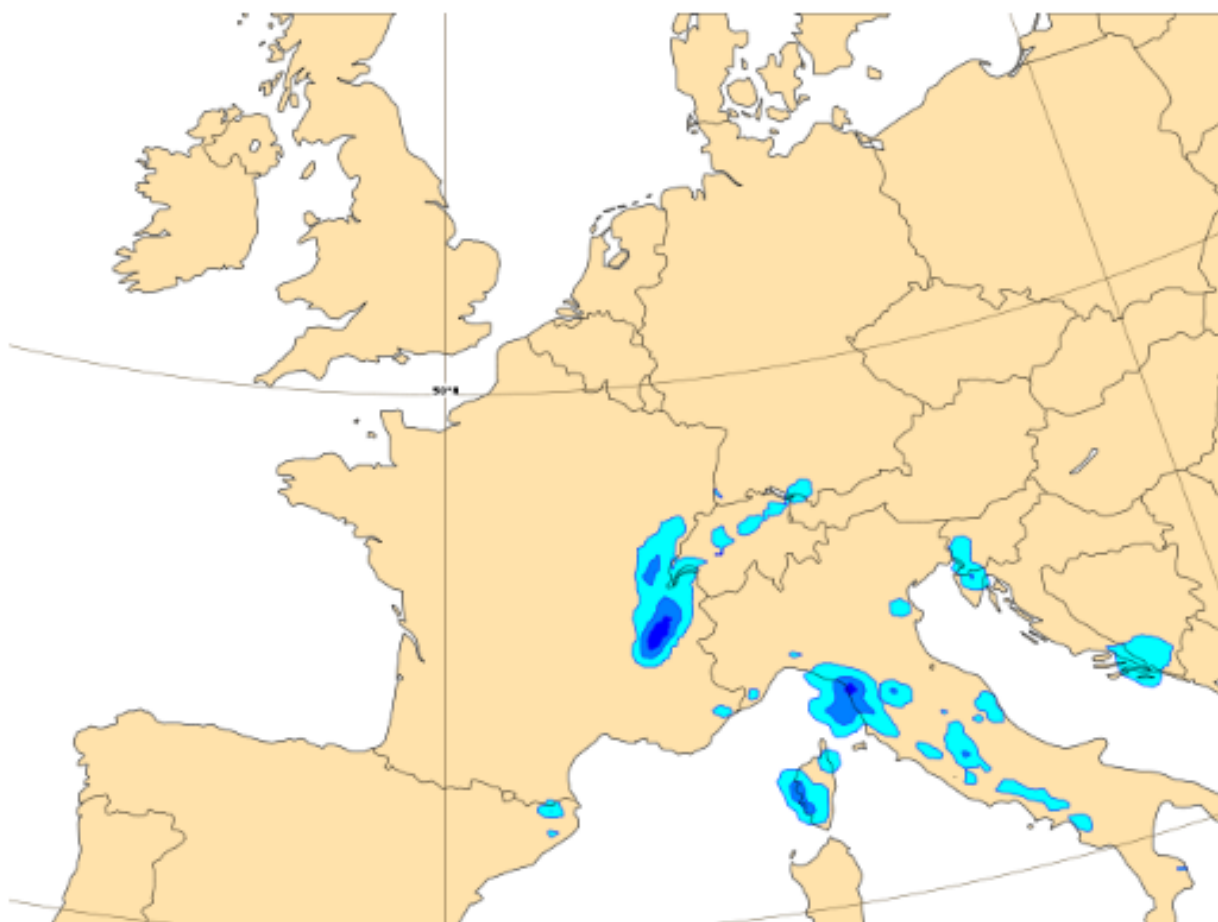
### Product type

- ENS (2)
- Extreme forecast Index (1)
- HRES (1)

Base time ▾ Area ▾ Threshold (mm/6hr) ▾

### Probability of total precipitation > 10 mm over last 6 hour (s)

Friday 22 Apr, 00 UTC T+36 Valid: Saturday 23 Apr, 12 UTC



VT: | Se 23 | Sun 24 | Mon 25 | Tue 26 | Wed 27 | Thu 28





# ENSEMBLE JUMPINESS

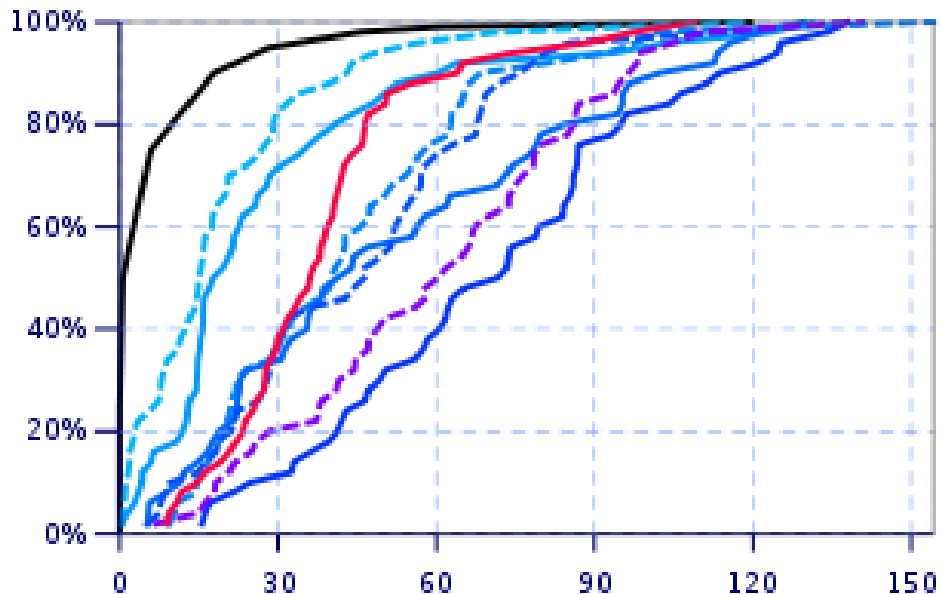
Forecast and M-Climate cumulative distribution functions with EFI values

43.93°N 10.3°E

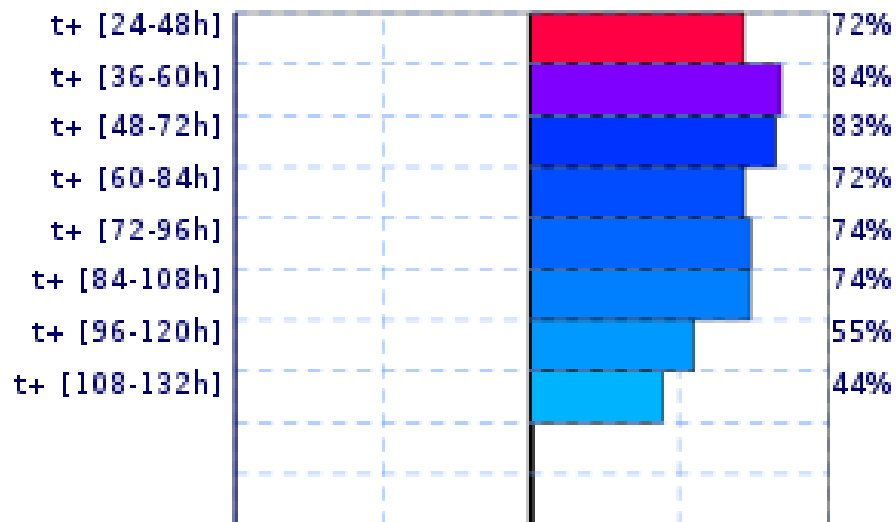
Valid for 24 hours from Saturday 23 April 2016 00 UTC to Sunday 24 April 2016 00 UTC

CDF for 24h precipitation (mm)

— 24-48h Climate extrema [Max = 120, Min = 0]



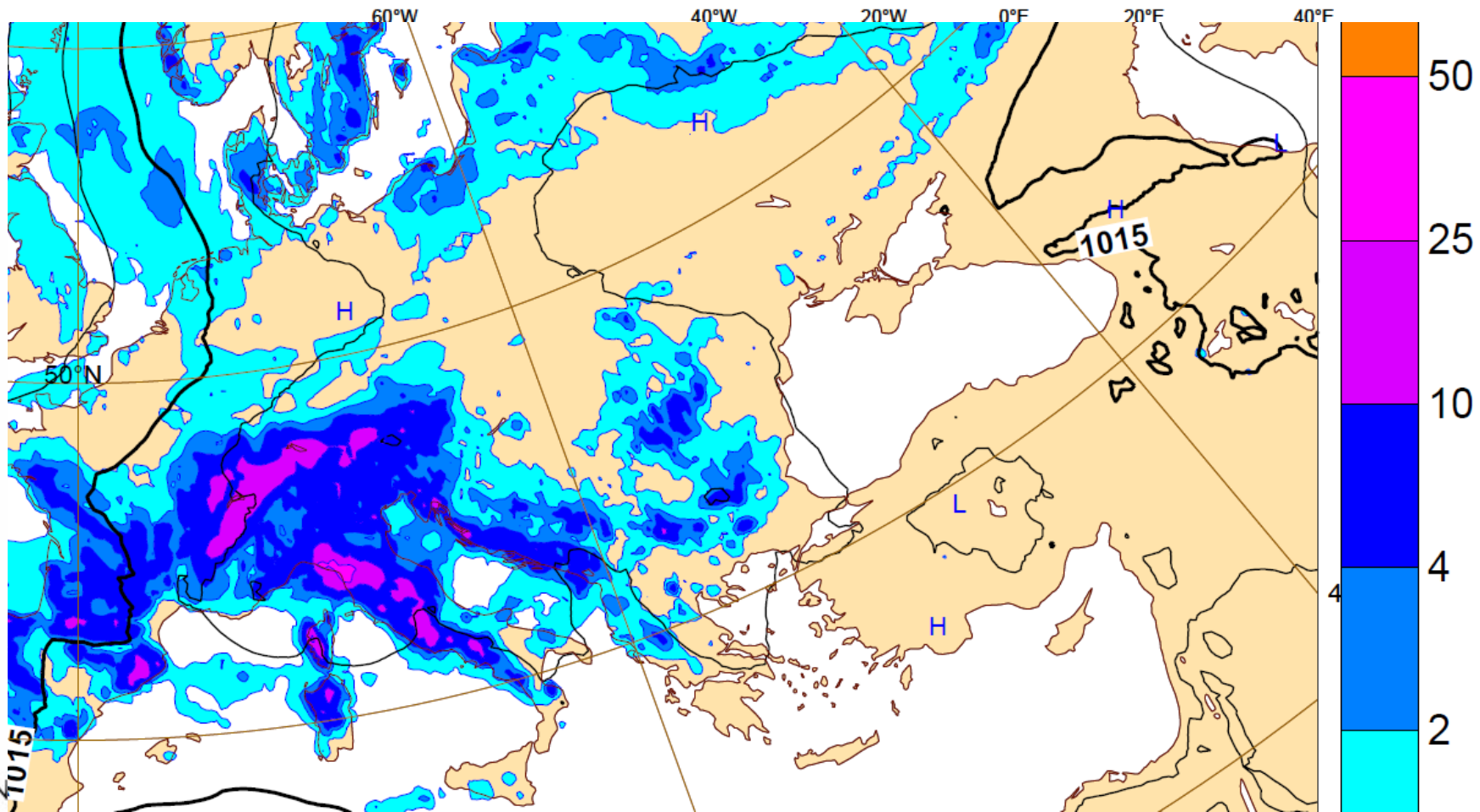
-100%    -50%    EFI    50%    100%





# HRES JUMPINESS

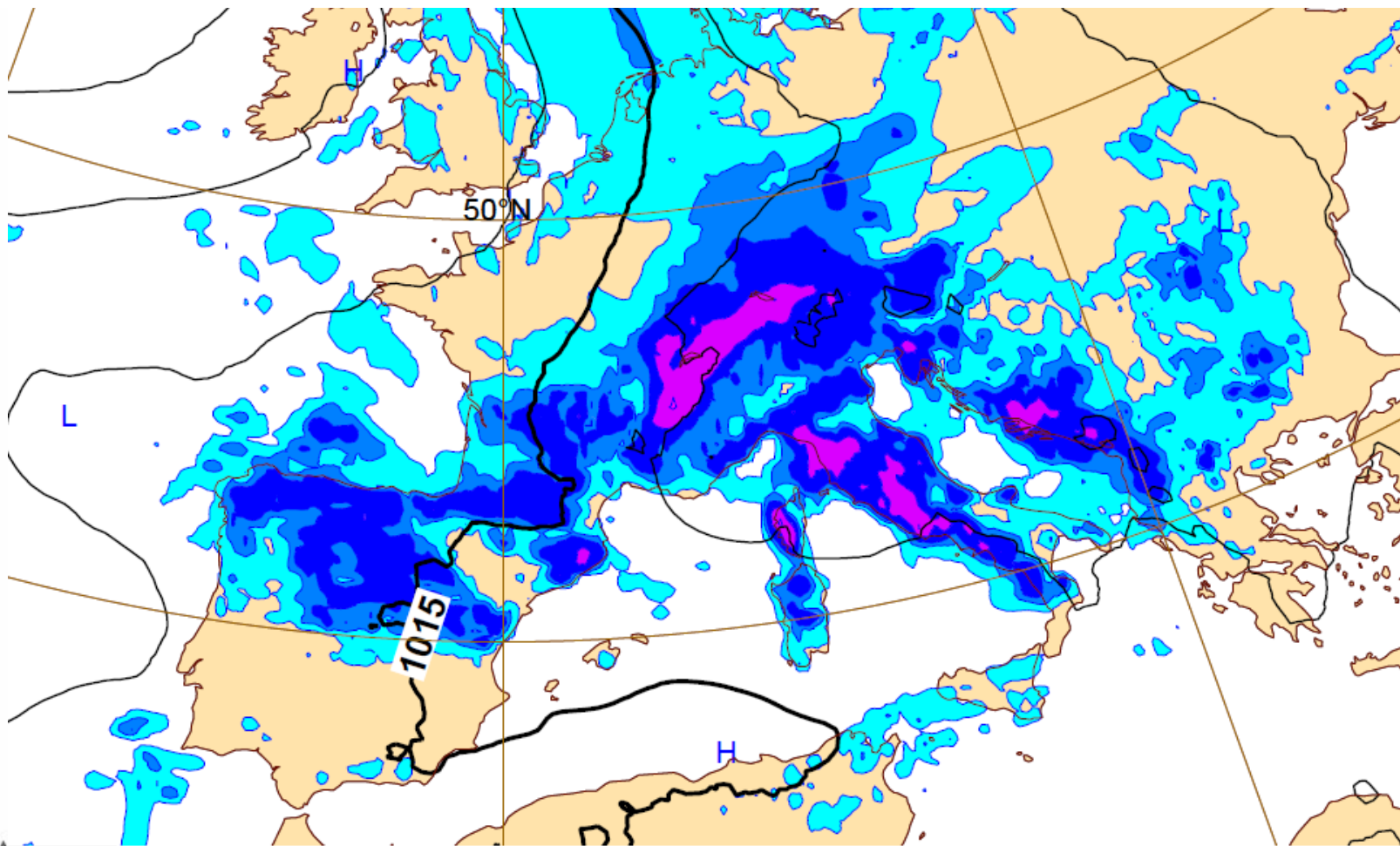
Thursday 21 April 2016 00UTC ©ECMWF Forecast t+060 VT: Saturday 23 April 2016 12UTC  
Surface: Mean sea level pressure / 12hr Accumulated precipitation (VT-6h/VT+6h)





# HRES JUMPINESS

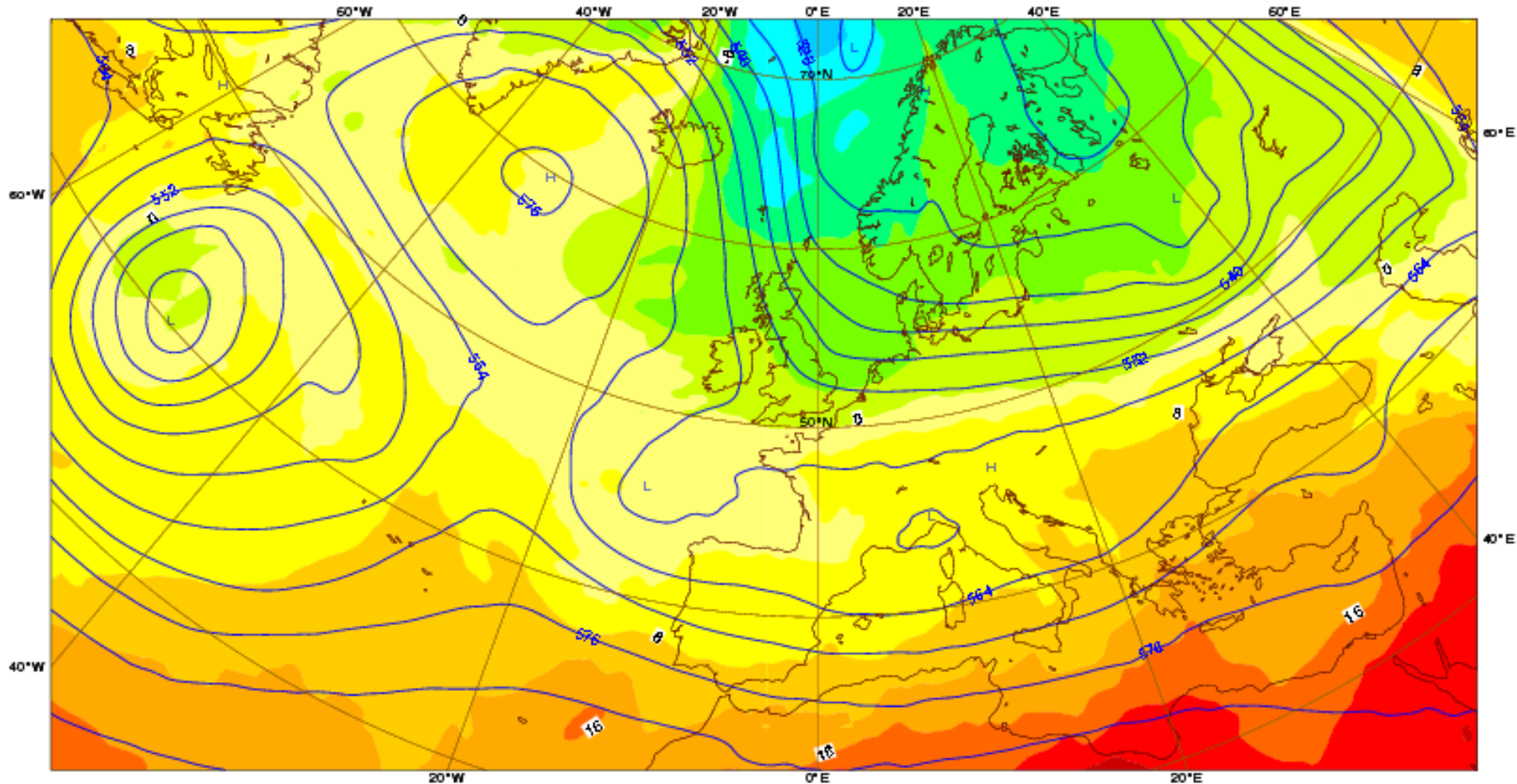
Friday 22 April 2016 00UTC ©ECMWF Forecast t+036 VT: Saturday 23 April 2016 12UTC  
Surface: Mean sea level pressure / 12hr Accumulated precipitation (VT-6h/VT+6h)





# ANALYSIS

Saturday 23 April 2016 00UTC ©ECMWF Analysis t+000 VT: Saturday 23 April 2016 00UTC  
850 hPa Temperature / 500 hPa Geopotential

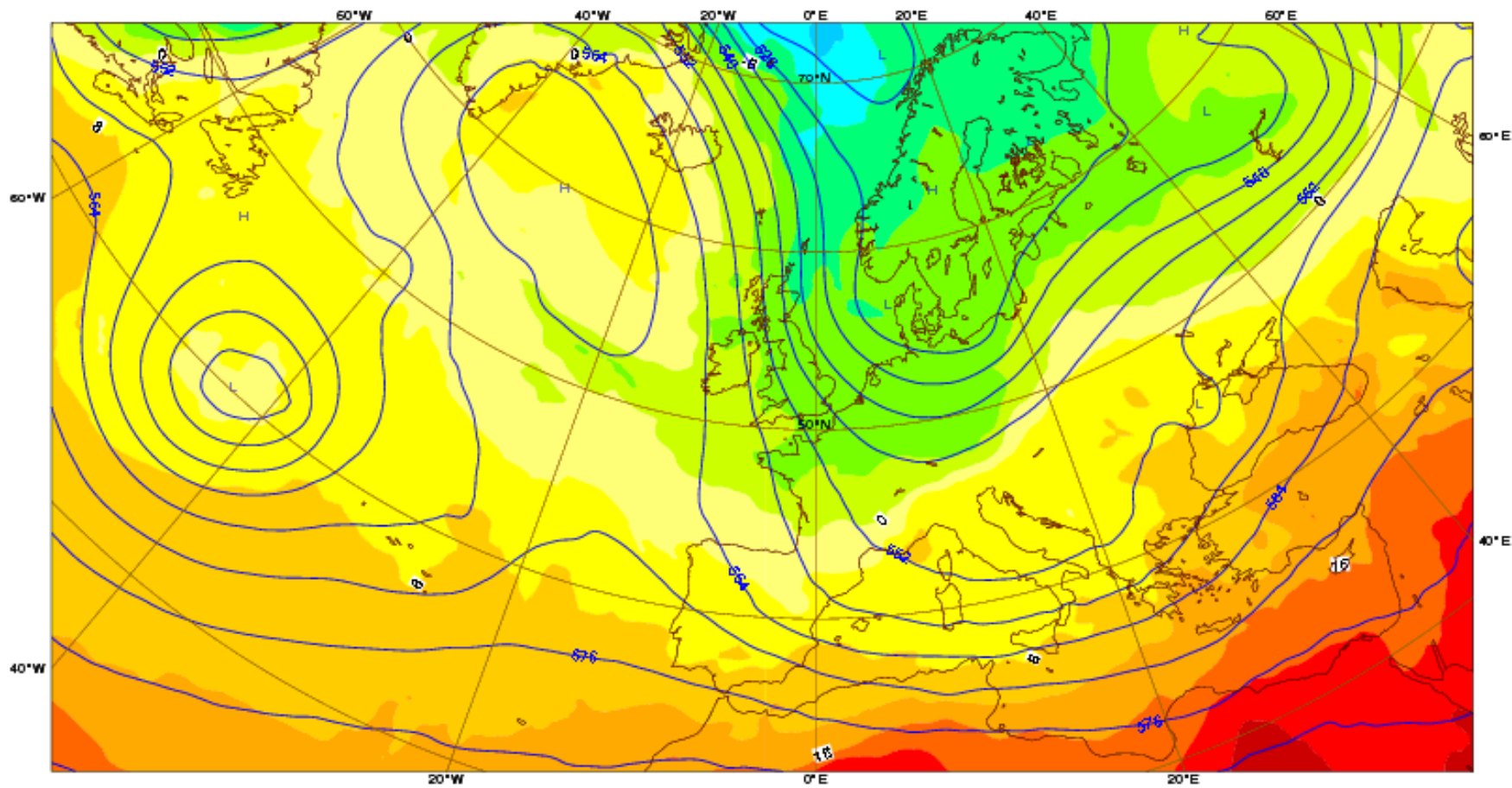






# ANALYSIS

Sunday 24 April 2016 00UTC ©ECMWF Analysis t+000 VT: Sunday 24 April 2016 00UTC  
850 hPa Temperature / 500 hPa Geopotential

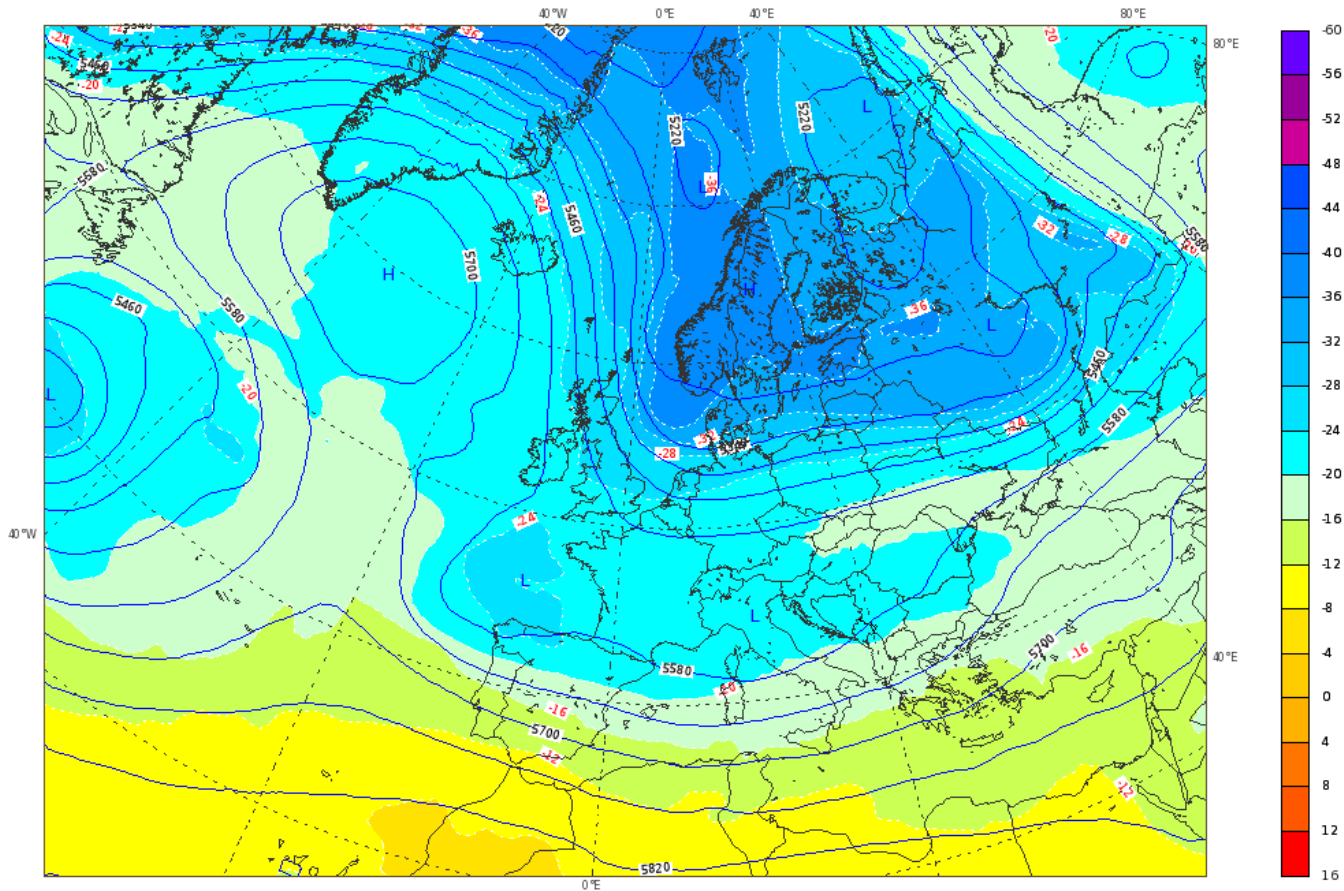




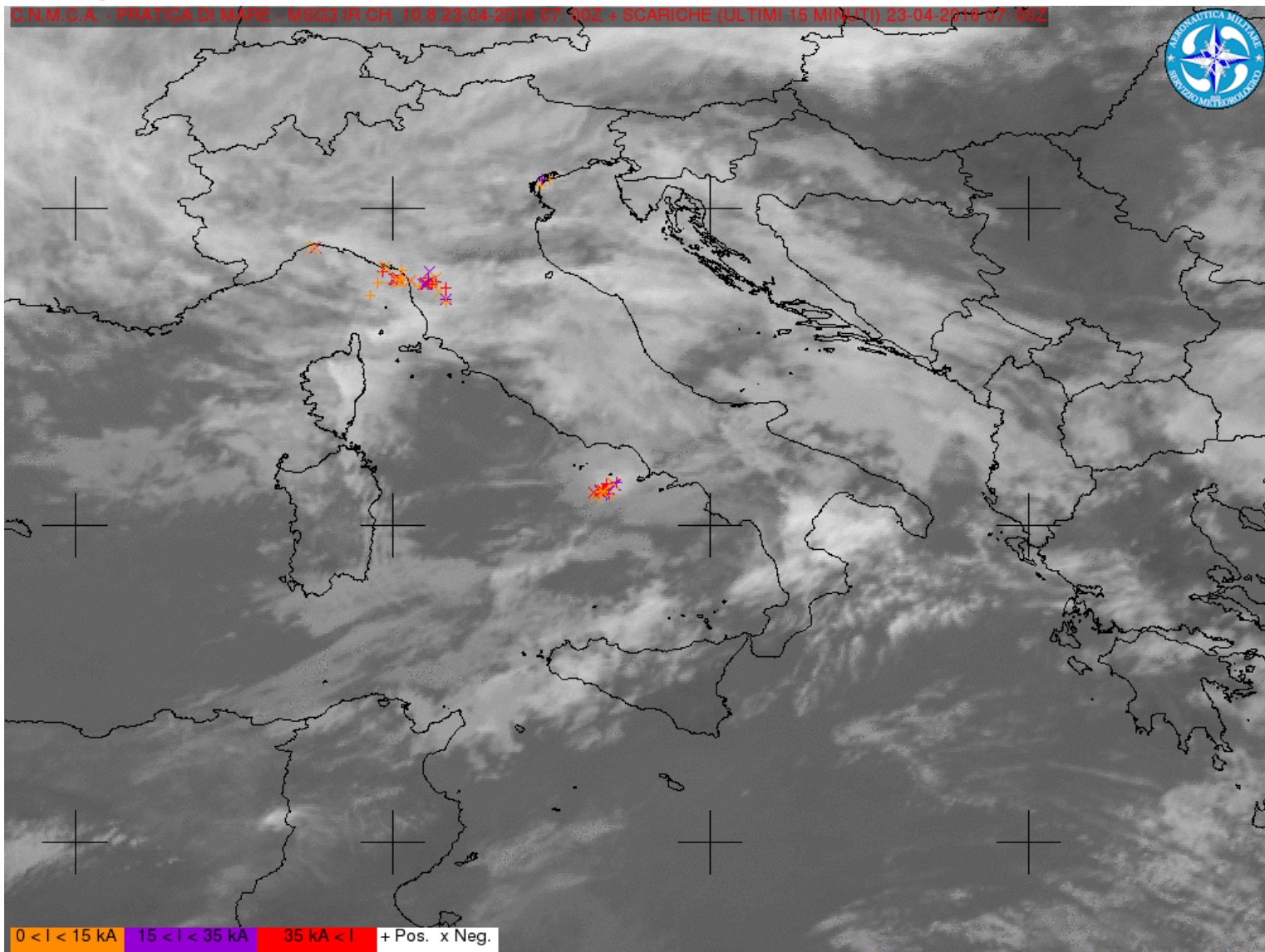
# SATURDAY 23 APRIL 2016



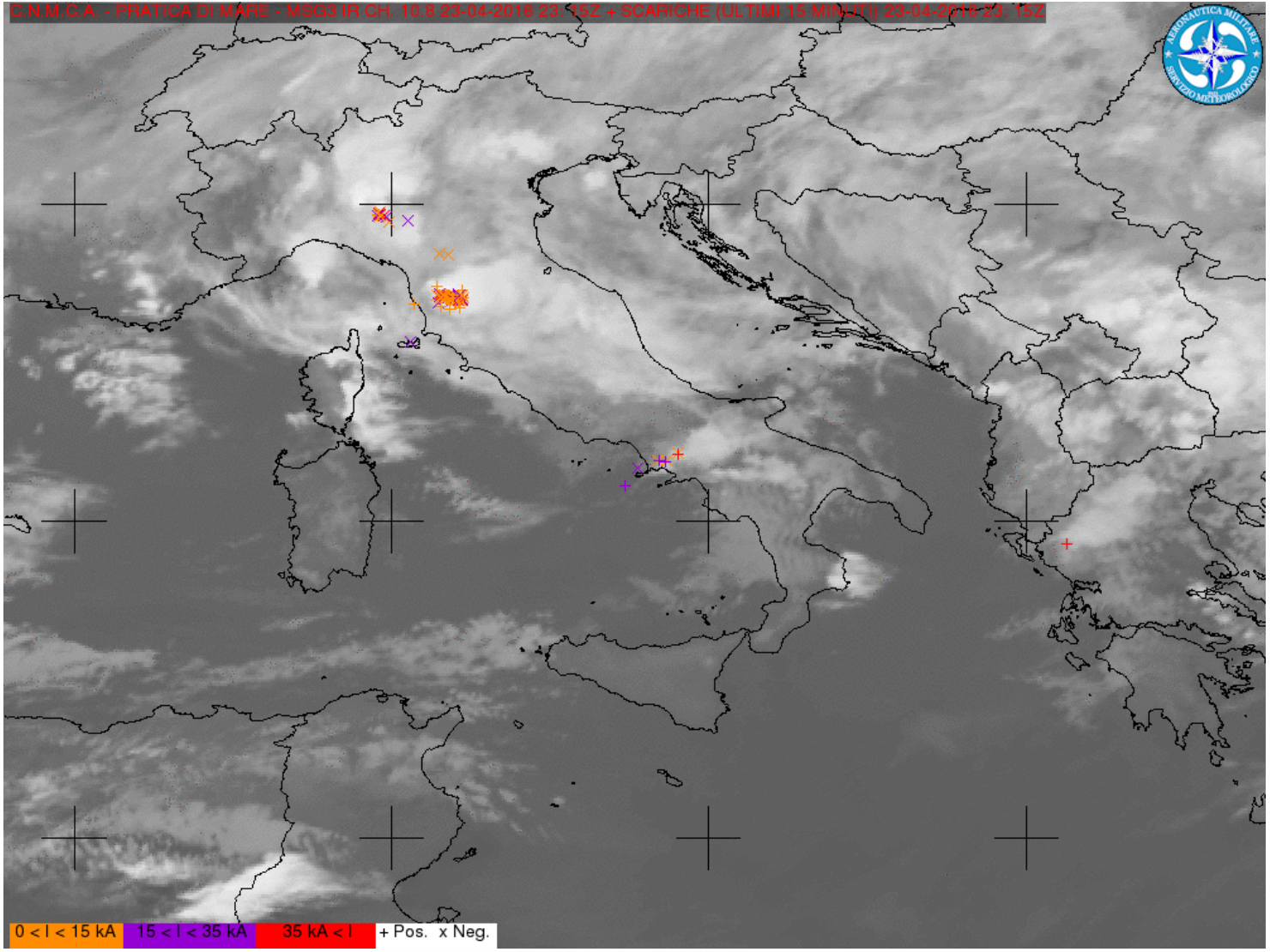
ECMWF 22 April 2016 00UTC Forecast T+30 VT: Saturday 23 April 2016 06UTC  
EUROATLANTIC - Geopotential at 500 hPa + Temperature at 500 hPa



C.N.M.C.A. - PRATICA DI MARE - MSG3 IN CH. 10 F 23-04-2018 07:00Z + SCARICHE (ULTIMI 15 MINUTI) 23-04-2018 07:00Z

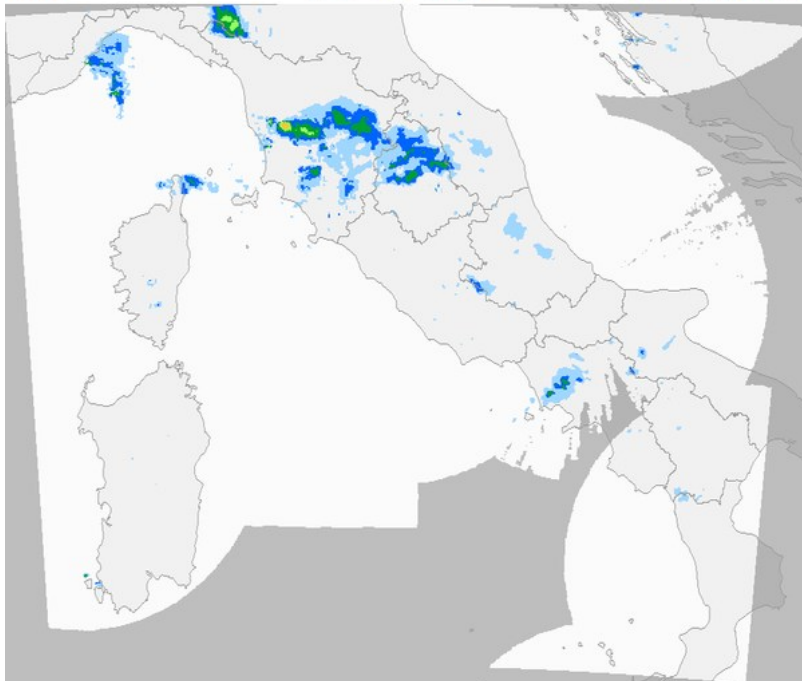


C.N.M.C.A. - PRATICA DI MARE - MSGS IR CH. 10.8 23-04-2016 23.15Z + SCARICHE (ULTIMI 15 MINUTI) 23-04-2016 23.15Z

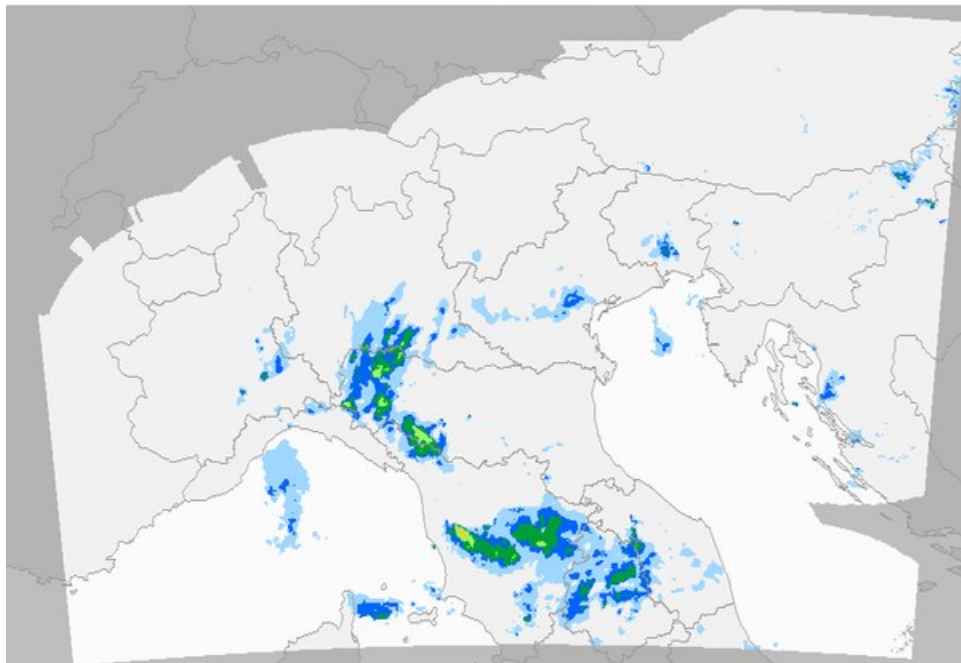




Centro Italia 23-04-2016 22.40 UTC - Radar SRI (mm/h)



Nord Italia 23-04-2016 23.40 UTC - Radar SRI (mm/h)



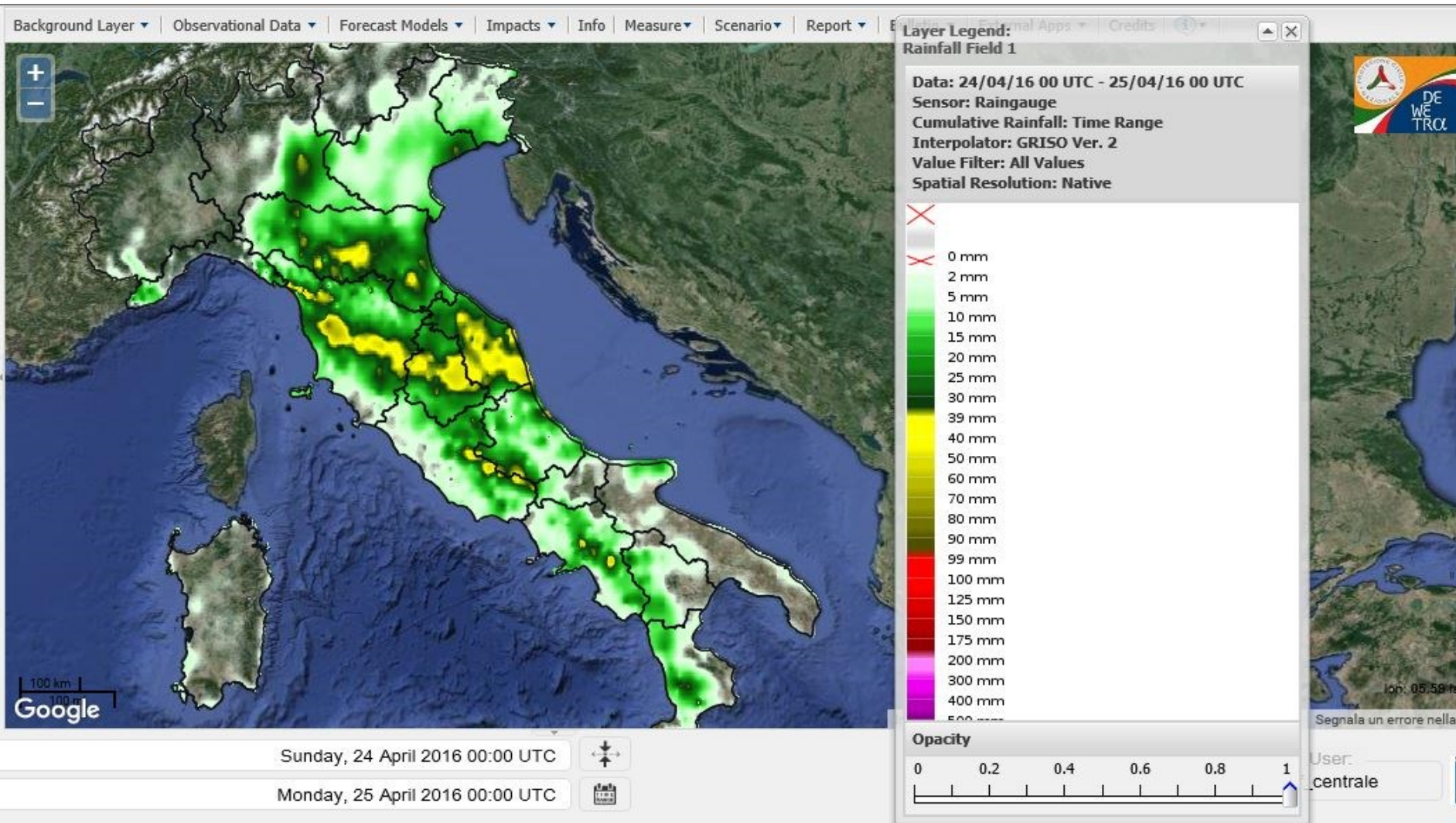


Sunday 24 april 2016



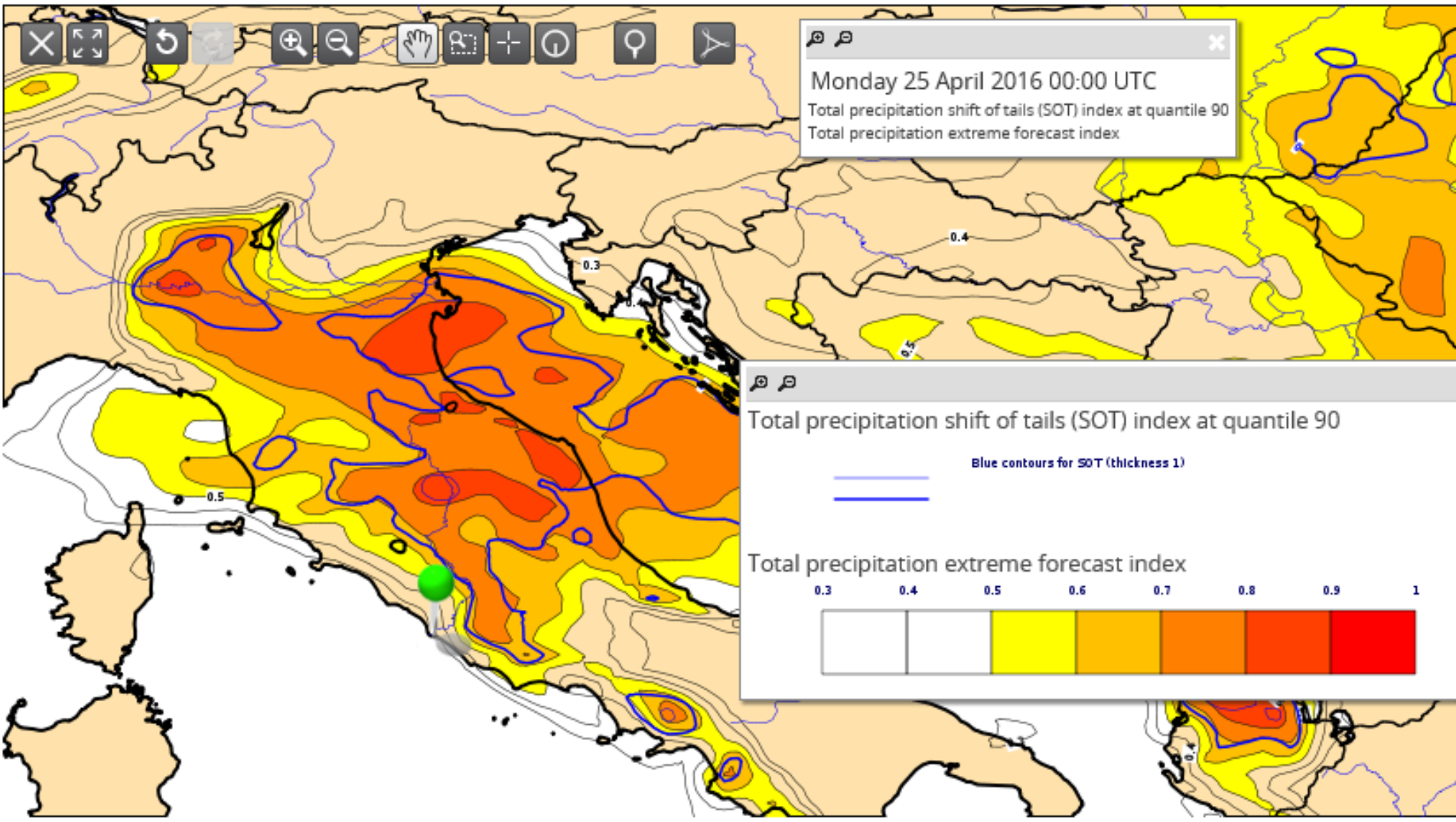


# Sunday 24 april 2016





Monday 25 April 2016 00:00 UTC  
Total precipitation shift of tails (SOT) index at quantile 90  
Total precipitation extreme forecast index



Total precipitation shift of tails (SOT) index at quantile 90

Blue contours for SOT (thickness 1)

Total precipitation extreme forecast index

0.3	0.4	0.5	0.6	0.7	0.8	0.9	1



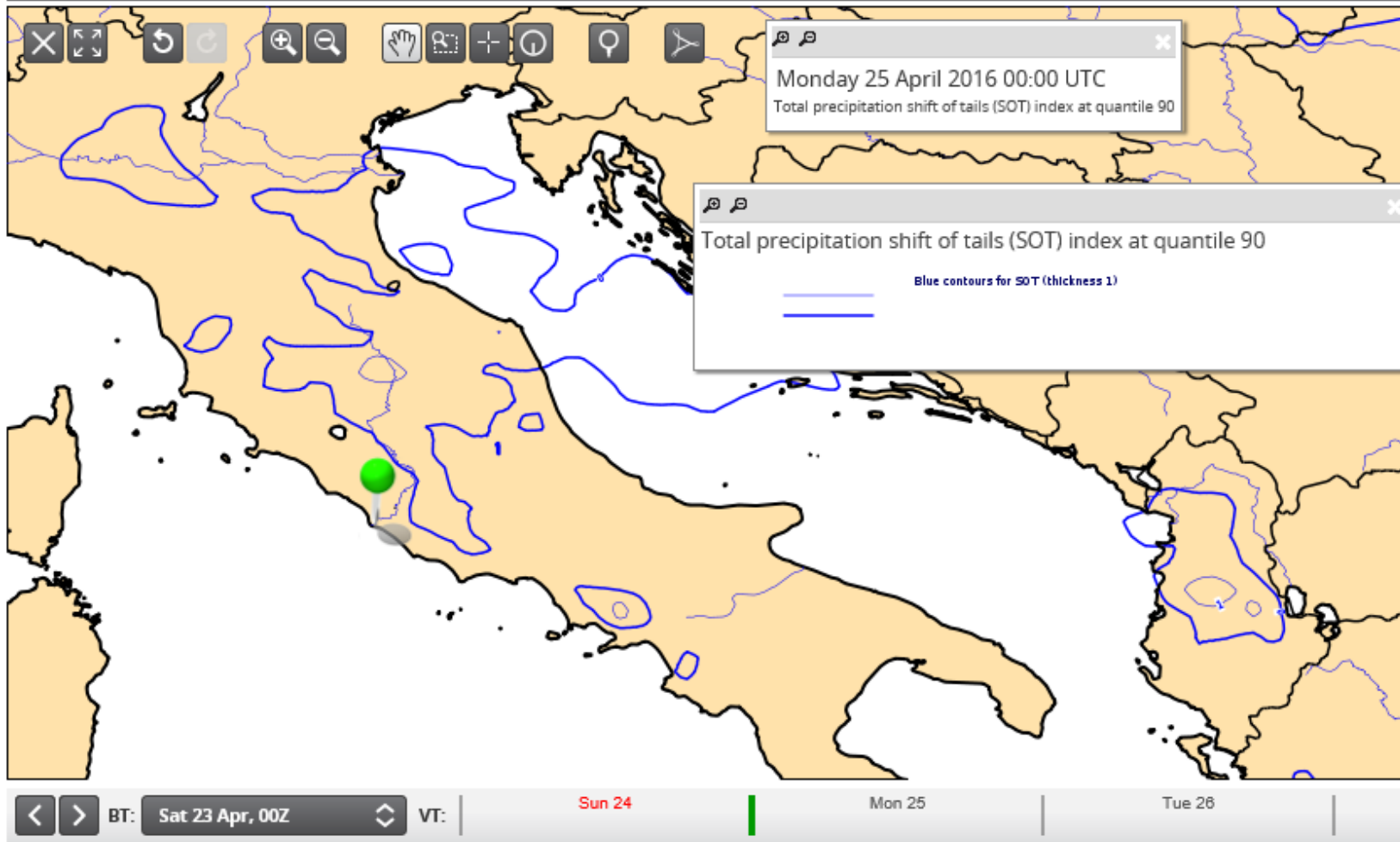


**CECMWF**

Products Projections Views Save Data availability Help Go

City Finder ✕

EFI Tmax + SOT - Saturday 23 Apr 2016, 00 UTC VT Monday 25 Apr 2016, 00 UTC Step 48





# Conclusions

- Insufficient marine convection propagation (during morning TS)?
- Underestimation of orographically-enhanced precipitation?
- HRES underestimation of convective precipitation extremes
- ENS, despite jumpiness, was good
- EFI step 12 hours?

