

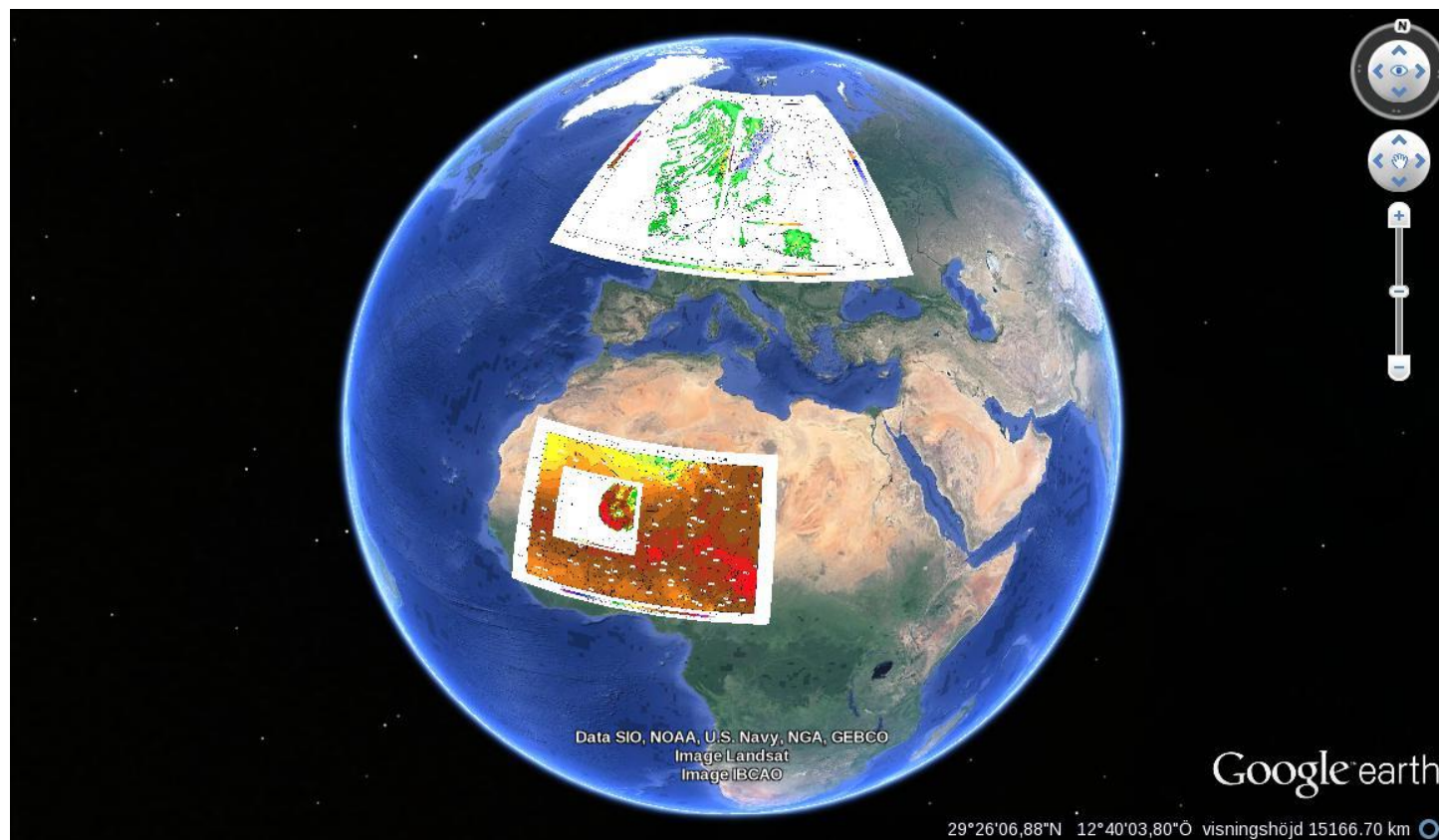
Visualisation and Communcation of uncertainties in the Swedish Armed Forces

UEF 2015

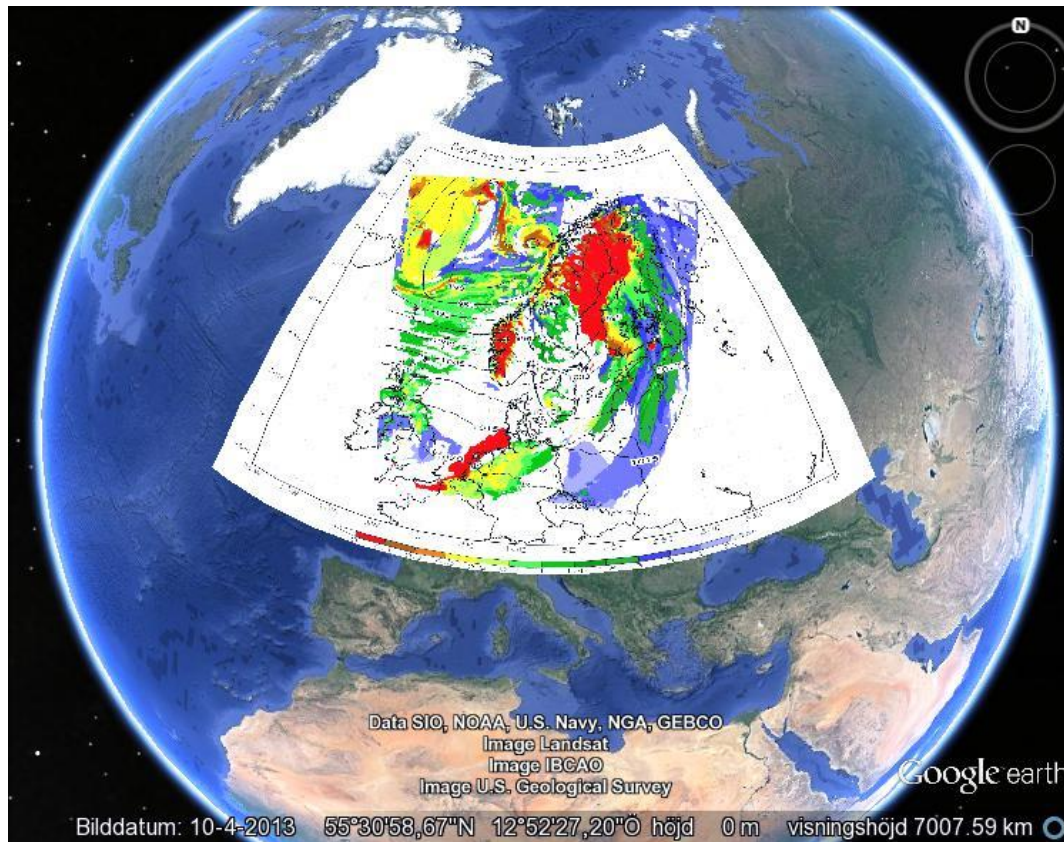
Outline

- The use of WRF Model in Swedish Armed Forces
- SAF-WRF LAMEPS (Limited Area Model Ensemble Prediction System)
- Showing some LAMEPS testproducts
- Future

WRF Model



WRF Northern Europe



LAMEPS

Limited **A**rea **M**odel **E**nsemble **P**rediction
System

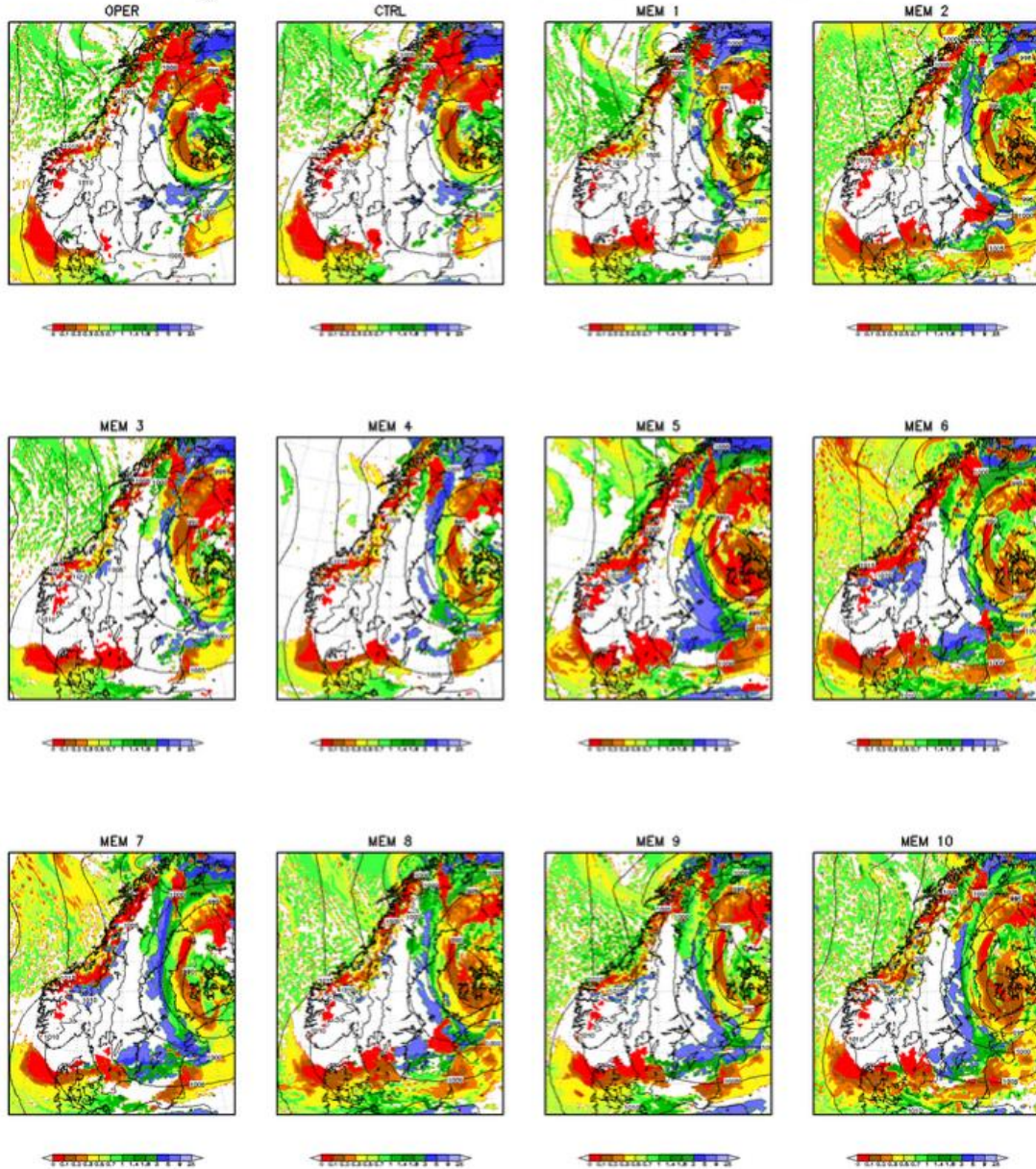
(9 km horizontal resolution)

SAF-WRF LAMEPS

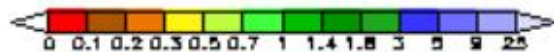
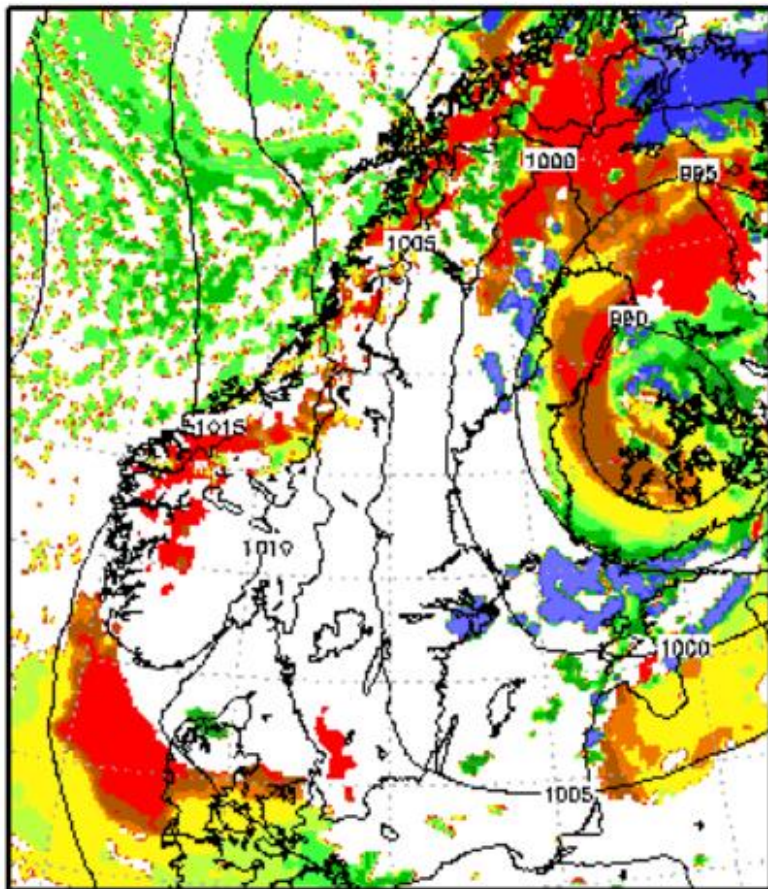
LAMEPS members parameterization

Medlem	Oper	CTRL	1	2	3	4	5	6	7	8	9	10
Indata	EC HRES	GFS Oper	GEFS medl 1	GEFS medl 2	GEFS medl 3	GEFS medl 4	GEFS med 5	GEFS medl 6	GEFS medl 7	GEFS medl 8	GEFS medl 9	GEFS me 10
DA	3Dvar	3Dvar	Cold start	Cold start	Cold start	Cold start	Cold start	Cold start	Cold start	Cold start	Cold start	Cold start
PBL	YSU	YSU	YSU	YSU	YSU	MYJ	QNSE	YSU	YSU	YSU	YSU	YSU
Mikrofysik	Thomp	Thomp	Thomp	Thomp	Thomp	Thomp	Thomp	Mill 2	Mill 2	Godd	Godd	Godd
Markschema	MonO	MonO	MonO	MonO	MonO	ETA	QNSE	MonO	MonO	MonO	MonO	MonO
LSM	Noah	Noah	Noah	Noah	RUC	Noah	Noah	Noah	Noah	Noah	Noah	Noah
Konvektion	KF	KF	KF	Grell	KF	KF	KF	Grell 3D	KF	Grell	KF	Grell 3D

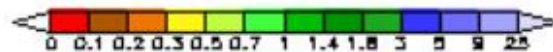
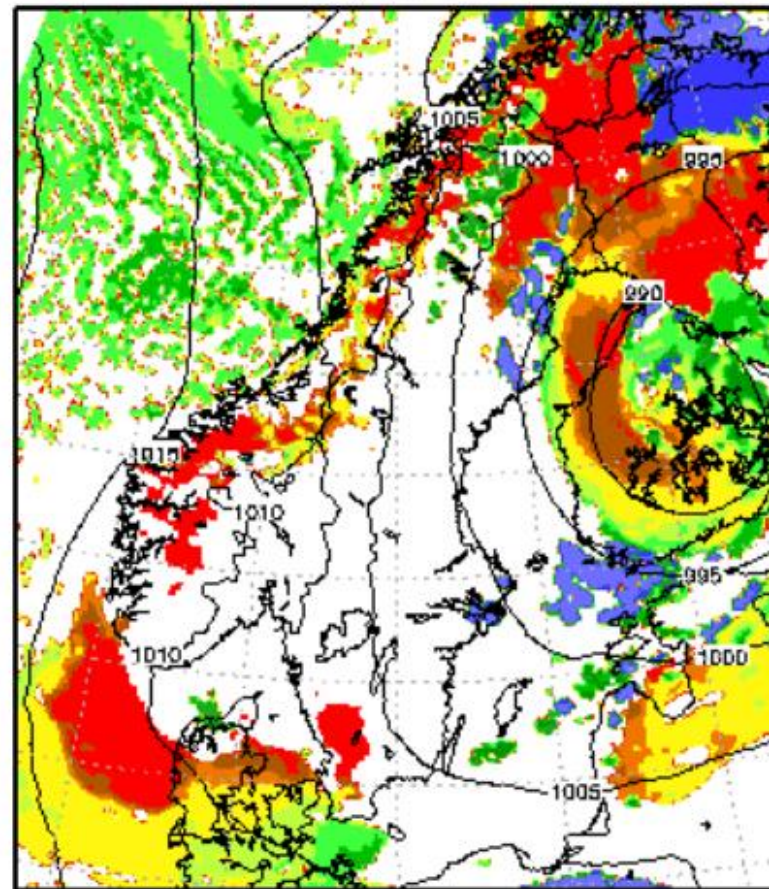
Clg members 2015-05-13 00z+24



OPER

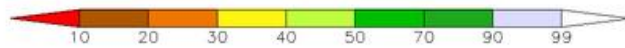
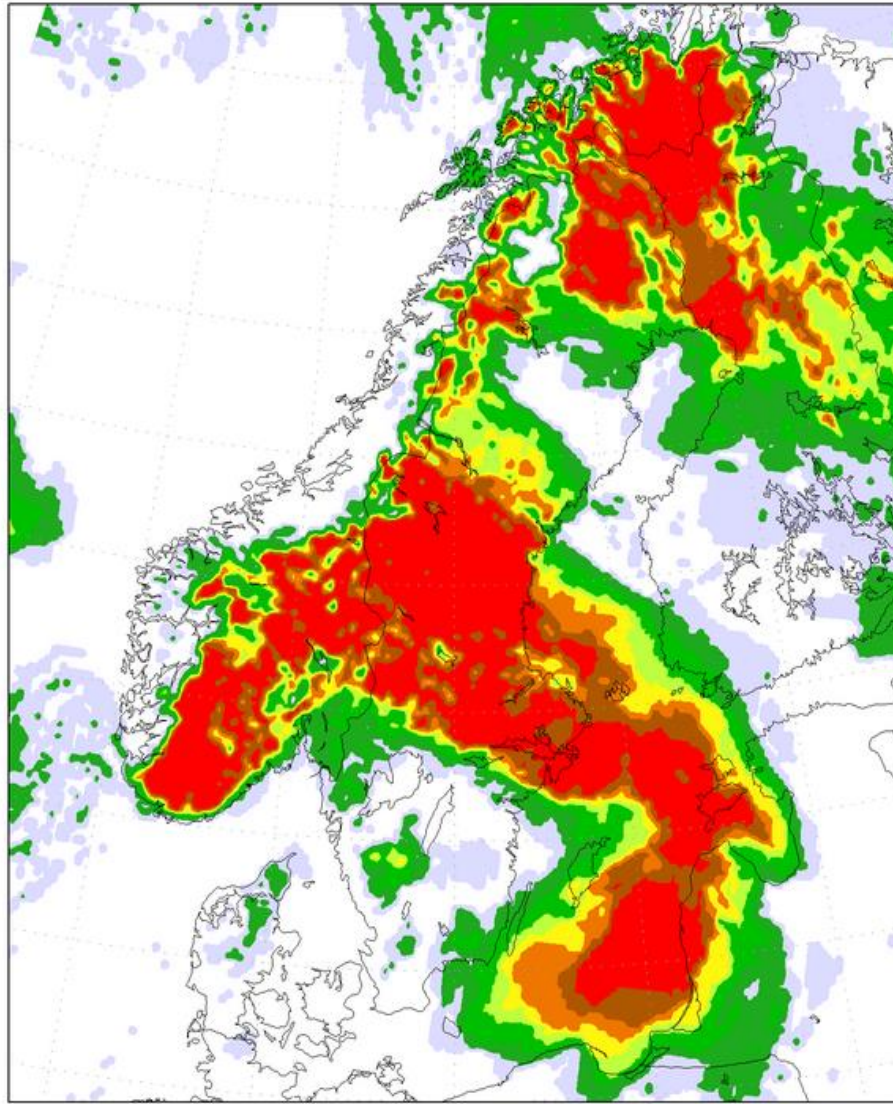


CTRL



SAFWRF LAMEPS - Prob [%] VFR (>5km/300m)

Prob VFR 2015-05-19 00z+24



WIMO database

IMPACT

(Not being able to conduct operations)

75%

50%

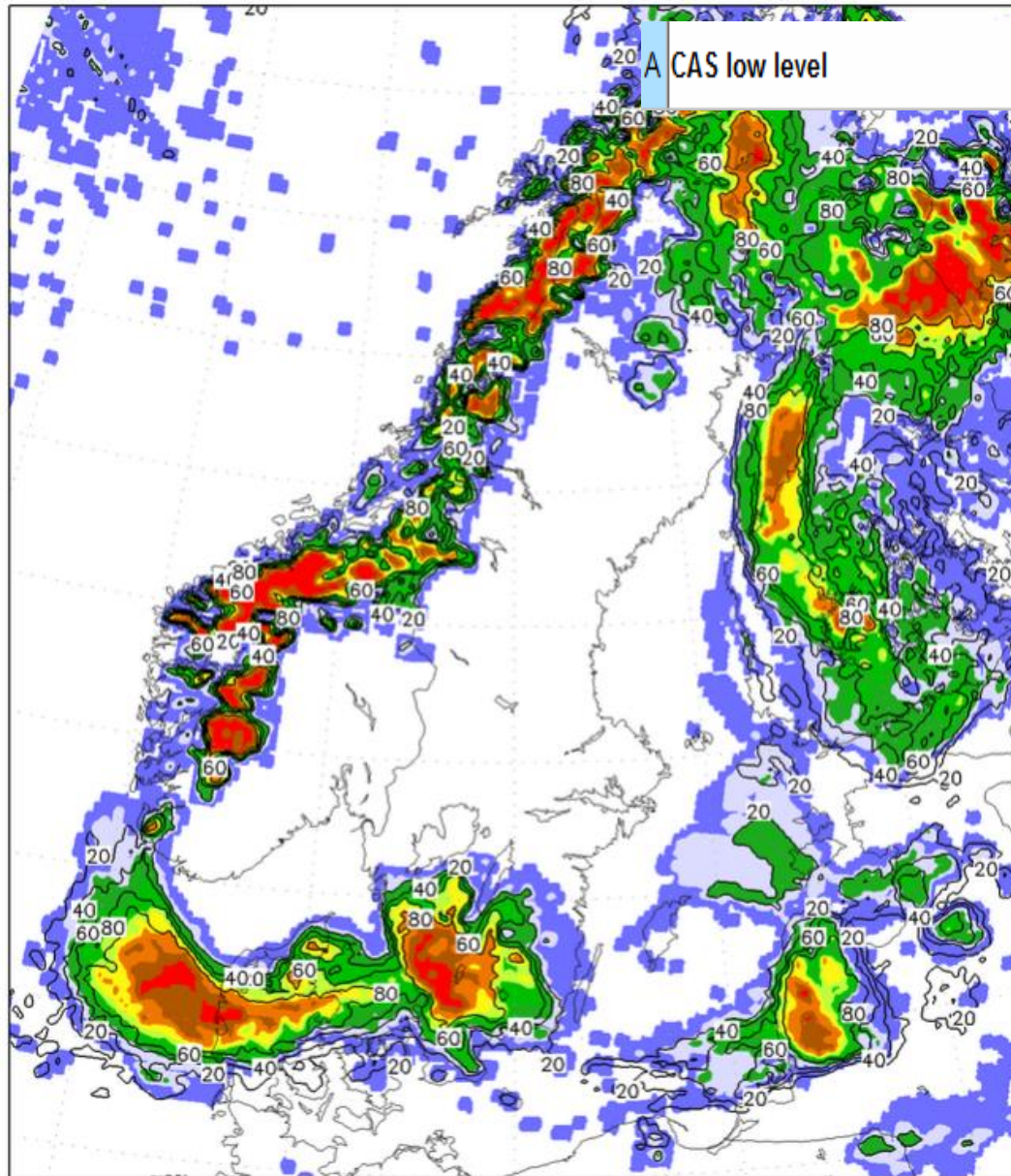
25%

A CAS low level

$clg < 180 < clg < 300 < clg$
 $vis < 5 < vis < 8 < vis$

CAS: Close Air Support

Prob CAS low[%] 2015-05-13 00z+24



clg < 180 < clg < 300 < clg
vis < 5 < vis < 8 < vis

Impact

75% 50% 25%

Risk= Probability * Impact

Example:

Orange area: $0,85 * 0,75 = 0.64$



Prob for values below red thres (color) and orange thres (contour)


Status
Område 1 - Europa
9 km

AOI	00z	06z	12z	18z
NV Europa/Sverige	X	X	X	X
LAMEPS	X	X		

3 km

AOI	00z	06z	12z	18z
Sverige	X	X	X	X

Område 2 - Sahel/V Afrika
9 km

AOI	00z	06z	12z	18z
Sahel/V	X	X	X	X
Afrika MPE				

3 km

AOI	00z	06z	12z	18z
Mali MPE	X	X	X	X

Punktprognoser

Meteogram	X
Sonderingar	X
LAMEPS-gram	X
Sonderingar LAMEPS	X
Höjdprognoser	X

TDA

Sky Diver TDA Test!	X
Bullerprognos	X

Model stn charts	Domains
Theatre 1	1 2
Theatre 2	1 2

Senaste modellkörningar/produkter:

Område	Prognosfält	Punktdata
NV Europa 9 km	2015051306Z	2015051306Z
Sverige 3 km	2015051306Z	2015051306Z
SAF-WRF LAMEPS	2015051300Z	2015051300Z
<hr/>		
Sahel/V Afrika 9 km	2015051306Z	2015051306Z
Mali 3 km	2015051306Z	2015051306Z

Klicka för plan av körningar

vid frågor om denna sida och innehåll kontakta:

Andreas Grantinger
 FM METOCC, LedR



Status

Område 1 - Europa

9 km	
AOI	00z 06z 12z 18z
NV	X X X X
Europa/Sverige	
LAMEPS	X X
3 km	
AOI	00z 06z 12z 18z
Sverige	X X X X

Område 2 - Sahel/V Afrika

9 km	
AOI	00z 06z 12z 18z
Sahel/V	X X X X
Afrika MPE	
3 km	
AOI	00z 06z 12z 18z
Mali MPE	X X X X

Punktprognoser

Meteogram	X
Sonderingar	X
LAMEPS-gram	X
Sonderingar LAMEPS	X
Höjdprognoser	X

TDA

Sky Diver TDA Test!	X
Bullerprognos	X

Model stn charts	Domains
Theatre 1	1 2
Theatre 2	1 2

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LAMEPS-gram

Sök plats:

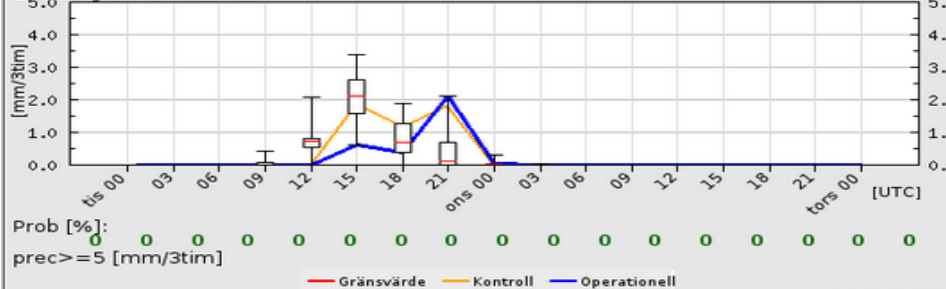
Stockholm eller Lat/lon: N /E [Instruction-pdf](#)

Välj parameter:

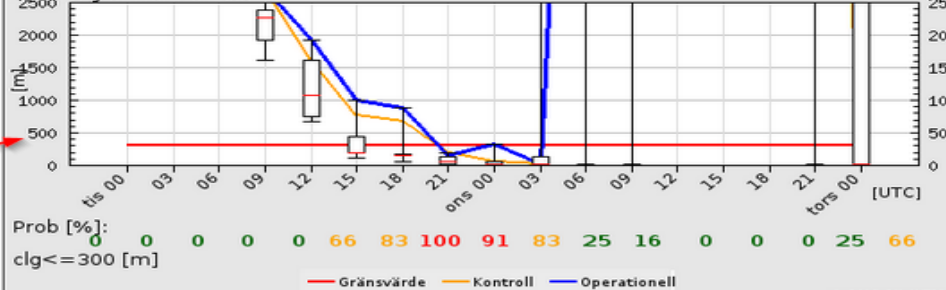
- Total nbd [mm/3tim] >= 5
- Molnbas [m] <= 300
- Sikt [km] <= 5

LAMEPS-gram för Stockholm mellan 20150519 00z till 20150521 00z

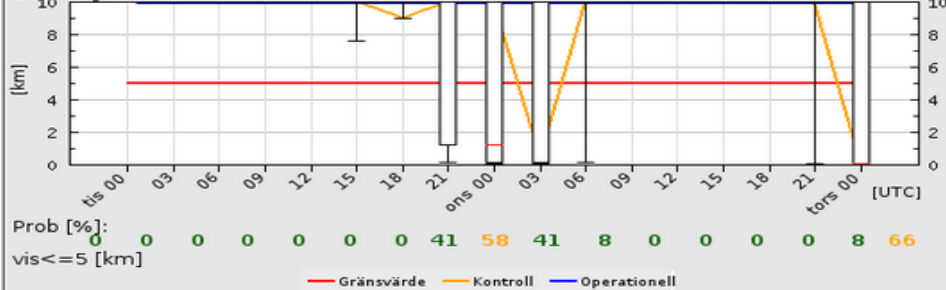
LAMEPS-gram för Total nbd



LAMEPS-gram för Molnbas



LAMEPS-gram för Sikt



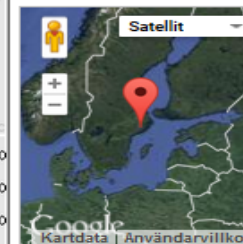
Prognosväder ges för N59.3E18.1 (10000.00 km ifrån vald ort). Klicka nedan:
Länk till punktchart!
[Skriv ut](#)

BLUE: Deterministic

ORANGE: Control

RED: Threshold

Klicka för position!





Status

Område 1 - Europa

9 km				
AOI	00z	06z	12z	18z
NV	X	X	X	X
Europa/Sverige				
LAMEPS	X	X		
3 km				
AOI	00z	06z	12z	18z
Sverige	X	X	X	X

Område 2 - Sahel/V Afrika

9 km				
AOI	00z	06z	12z	18z
Sahel/V	X	X	X	X
Afrika MPE				
3 km				
AOI	00z	06z	12z	18z
Mali MPE	X	X	X	X

Punktprognoser

Meteorgram	X
Sonderingar	X
LAMEPS-gram	X
Sonderingar LAMEPS	X
Höjdprediktioner	X

TDA

Sky Diver TDA Test!	X
Bullerprognos	X

Model stn charts	Domains
Theatre 1	1 2
Theatre 2	1 2

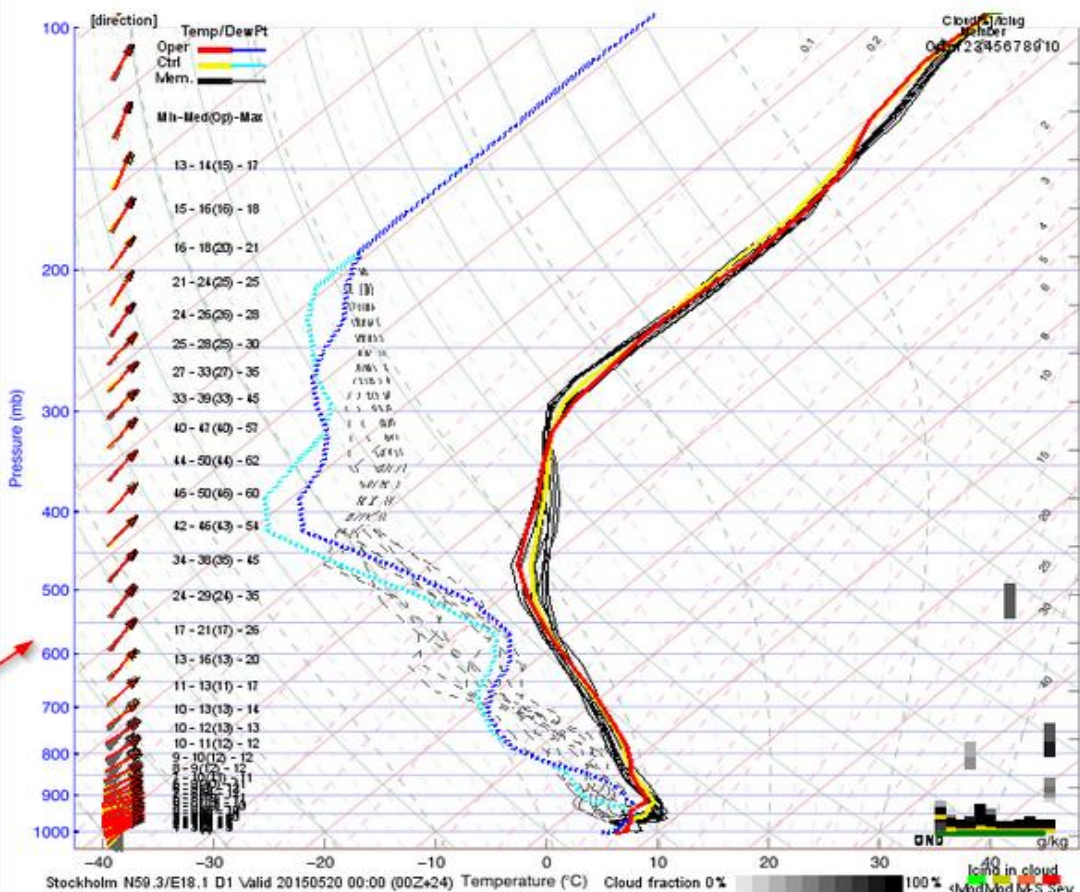
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Ensemble Prognossonderingar

Sök plats (prioriteras före Lat/Lon):

Stockholm eller Lat/lon: N /E



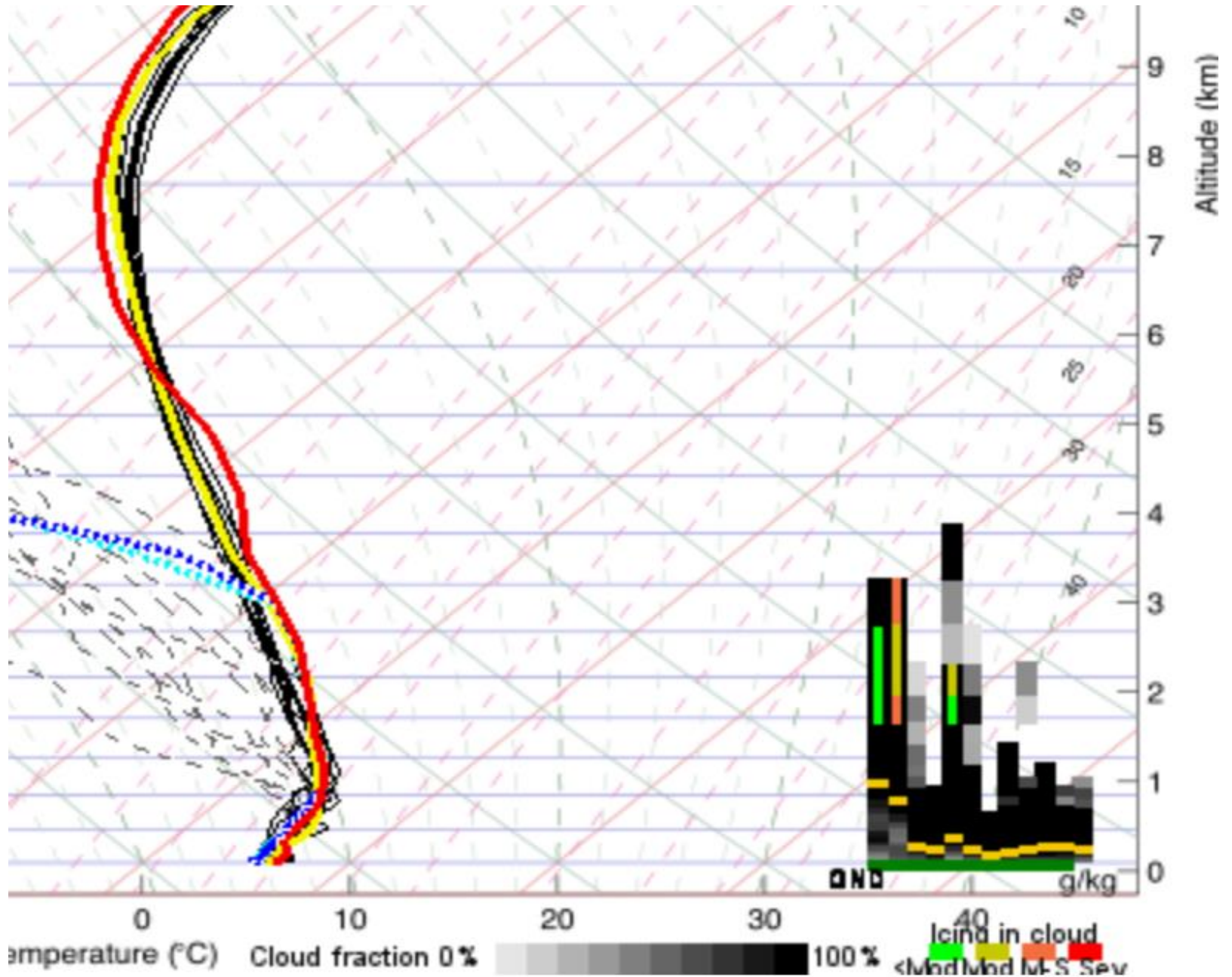
Klicka för position!

- Tidssteg:**
- kl 00z tis 19/5
 - kl 03z tis 19/5
 - kl 06z tis 19/5
 - kl 09z tis 19/5
 - kl 12z tis 19/5
 - kl 15z tis 19/5
 - kl 18z tis 19/5
 - kl 21z tis 19/5
 - kl 00z ons 20/5
 - kl 03z ons 20/5
 - kl 06z ons 20/5
 - kl 09z ons 20/5
 - kl 12z ons 20/5
 - kl 15z ons 20/5
 - kl 18z ons 20/5
 - kl 21z ons 20/5
 - kl 00z tors 21/5

Stockholm N59.3/E18.1 D1 Valid 20150520 00:00 (00Z+24) Temperature (°C) Cloud fraction 0% 100% g/kg

Prognosväder ges för N59.3E18.1 (100000.00 km från vald ort). Klicka nedan:
Länk till punktchart!

Sonderingar från DA: Välj WMO station ▼



FUTURE

A lot more is to be done with the EPS on the short-range timescale:

- Increased spatial resolution(9 km->3 km).
- To have ECMWF analysis every 6 hours, i.e using global perturbations from ECMWF EPS.
- To conduct own local perturbations using ETKF.
- Assess the uncertainty in general forecasts for the customers. Recently formed group SWaF-SMHI. Start to use short-range EPS products more regularly to assess the usefulness.
- Even more specific demands, for their specific system, from the customers.

QUESTIONS ?