

Short description of ECMWF LAGRANTO Ensemble Forecast products

Detailed documentation: [Lagranto_ECMWF_ENS_documentation.pdf](#)

webpage: <https://data.iac.ethz.ch/wcb-falcon/ec.ensemble/wcb-falcon.html>

Usage of Navigation Tool at webpage → browse plots

[home](#) IAC ETH Zurich: Experimental ECMWF Ensemble WCB Forecast Products

Plot width: (min 500px)

Mon Sep 03 2012 12:00:00 GMT+0200 (CEST)

Plot width: Enter width, click set and each panel width will be set to indicated pixels
reset: reload navigation tool page. *add plot:* add another plot panel
buttons: Click through forecast time (+/- 3,1 days; +/- 6 hours), OK to confirm all changes

latest: set forecast initial/base time (BT) to latest available.

textfields: <DD> <MM> <YYYY> <BT> BT enter forecast initial time here
+ <HH> forecast hour

checkbox "freeze": check to exclude panel from navigation by the buttons

2nd line: forecast valid time

menu left: selection of levels/layers (see plot descriptions)

menu middle: selection of plot type

textfield right: selection of ensemble member (only for plot "individual member")

link to plot: open a single plot without navigation panel (for zoom to actual pixels)

Probability of WCB occurrence (PofO):

A (0/1)-mask is created for each ensemble member (51) from the parcel locations of the 9 trajectory calculations that can have a trajectory at a given valid time. If one or more trajectories occur at a grid point the value of the mask will be 1 otherwise (no trajectory) 0.

These 51 masks are summed up at each grid point and divided by the total number of ensemble members (51). The result (multiplied by 100%) is the probability of WCB occurrence (PofO) in the ensemble in %. It is useful to detect regions of WCBs in the mid-range forecast. A layer separation is given (total layer, 1000-800 hPa, 800-600, 600-400, <400hPa) to distinguish the probability of WCB inflow, ascend and outflow regions. At forecast initial time and during the first 24 hours the ensemble has small spread and strong probability gradients occur. Later the PofO gradually decreases as spread increases. For a 6 day forecast a PofO of 30 % is alarming, while for a 3 day forecast values of more than 50% are alarming.

Trajectories panel / individual member trajectory:

For each of the 51 members, the panel shows all trajectories from the 48hour forward calculation started at the forecast/valid time, together with the pmsl at the valid time. The trajectories are shaded with pressure in hPa. An individual member can be visited by selecting "individual member: trajectory" and entering the 2digit number (01 to 50; "co" for control run). The plots highlight the variety of trajectory bundles in the ensemble. *Attention:* These plots only show one trajectory calculation while PofO is the combination of 9 trajectory such calculations that have data at the given valid time.

Other useful ensemble forecast products

PMSL ensemble mean & std

Contours show ensemble mean, shading standard deviation (both in hPa) of pressure at mean sea level (pmsl). Good for getting an idea of the variability of surface weather systems in the ensemble.

PROB: cloud ice/liquid water > 0.01 g/kg

Probability that cloud ice water (CIW) exceeds a certain threshold (in g/kg) in the ensemble at a given model level. The level has to be selected in the left menu (PROB/ENS ???hPa). Corresponding pressure height is indicated. Helps to detect the WCB outflow region (cirrus clouds). Same is available for cloud liquid water (CLW), reflecting the ascend/outflow regions. MEAN: mean (contours 0.00 to 0.04 every 0.01g/kg) and standard deviation (shaded in g/kg) of CIW, CLW at given level.

PROB/MEAN: cape

select total layer or PROB/ENS surface in left menu. Shows probability that CAPE exceeds 1000,2000,3000 J/kg in the ensemble.

MEAN: contours 1000-8000 every 1000 J/kg, standard deviation: shading 200-2000 every 200 J/kg

Indicates where (large scale) convection has to be expected.

PROB/MEAN: total column water

select total layer or PROB/ENS surface in left menu. Shows probability that total column water exceeds 20, 50,100 kg/m² in the ensemble.

MEAN: contours 10-80 every 10 kg/m², standard deviation: shading 2-20 every 2 kg/m²

Helps to identify regions with potential for heavy precipitation

All other plots currently available in the plot menu turned out to be less useful for WCB prediction.