

NAWDEX – Weather summary
Wed 12th October
Author: Paolo Ghinassi

Synoptic Analysis - Wed 12 Oct

In the upper levels a trough is located over Greenland extending to the south, while a ridge (associated with a broad area of low Potential Vorticity) is still present over Scandinavia from the previous days. Over the rest of Europe and the Mediterranean persists a cyclonic circulation pattern due to an upper level trough over central/eastern Europe and a cut-off located in the Atlantic ocean just west to France (named "Brigitte"). The cyclone at the surface associated with the trough over Greenland (named "Downstream cyclone") is approaching Iceland during the day (passing to the west, between Iceland and Greenland, with Iceland just in the middle of the warm conveyor belt) and it turned out to be stronger than how was predicted in yesterday's forecast, causing winds above the threshold for flying.

Forecast Day 1 - Thu 13 Oct

In the upper levels there are no substantial changes in the large scale pattern. At the surface, the Downstream cyclone is predicted to move further to the north, with the associated cold front reaching the western coast of Iceland. After the transit of such front (expected in the morning) the wind is predicted to decrease consistently. However, despite the short range, there is still uncertainty on the wind speed, due to the difficulties in predicting the exact position of the front. The WCB outflow of the Downstream cyclone is contributing to the diabatic production of low potential vorticity, with a new ridge building (named Thor/Peter in today's presentation) north of Iceland. This results in the broadening of the low PV area in the upper troposphere above the North Atlantic. Over the Mediterranean the cyclonic circulation is predicted to intensify, with the possibility of extreme precipitations over southern France.

Forecast Day 2 - Fri 14 Oct

In the upper level the ridge Thor/Peter is predicted to move further to the North, evolving in a cut-off. The upper level trough formerly over Greenland (PV streamer) is moving towards the middle of the Atlantic, with an associated frontal wave at the surface. This structure is predicted to trigger a new cyclogenesis west of Ireland (named "Frontal cyclone"). By the end of the day this PV streamer will move towards the high PV area located over Europe. Over the western Mediterranean the cyclone is moving slowly to the east, with severe precipitations reaching northern Italy.

Forecast Outlook - Sat 15/Dom 16

On Saturday the PV streamer formerly over Greenland is predicted to wrap around and merge with the high PV located over Europe in a single cut-off. The low PV cut-off (Ex ridge Thor/Peter) persists to the north of Iceland. It is worth to mention that this dipole structure (low PV to the North, high PV to the south) above the North Atlantic has a very weak PV gradient (particularly evident on the 330K isentrope) and therefore there is some uncertainty about

its precise structure and location. This area of very weak PV gradient will persist also on Sunday.

At the surface, during these days, the “Frontal cyclone” is predicted to stay quite stationary west of the British Isles. By Sunday the hurricane Nicole is predicted to interact with a very narrow PV filament located in the North Atlantic south of Greenland and east of Canada. Although not predicted from today's deterministic forecast, its extratropical transition might be a possible evolution.

Key aspects of today's scientific discussions:

Thursday HALO flight's aim will be to analyse the PV evolution in a forming ridge, WCB ascent and outflow as well as predictability aspects of diabatic processes in WCBs. FALCON instead will focus more on wind speed measurements in the jet streak. For Friday it is planned a radiometer intercomparison during a leg of coordinated flight of the UK FAAM/HALO/SAFIRE aircrafts.