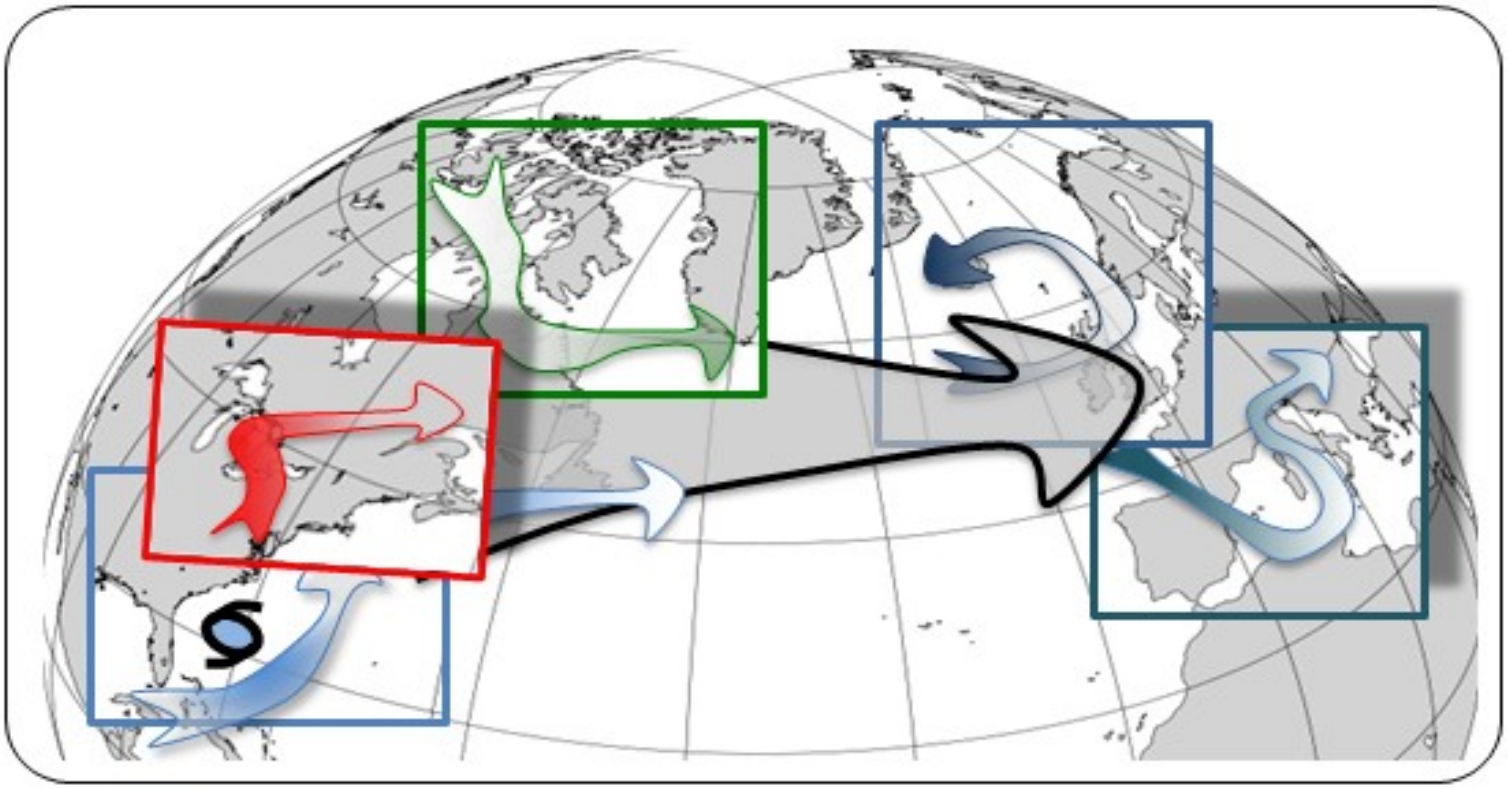
NAWDEX – Weather discussion

29 September 2016, Keflavik, Iceland



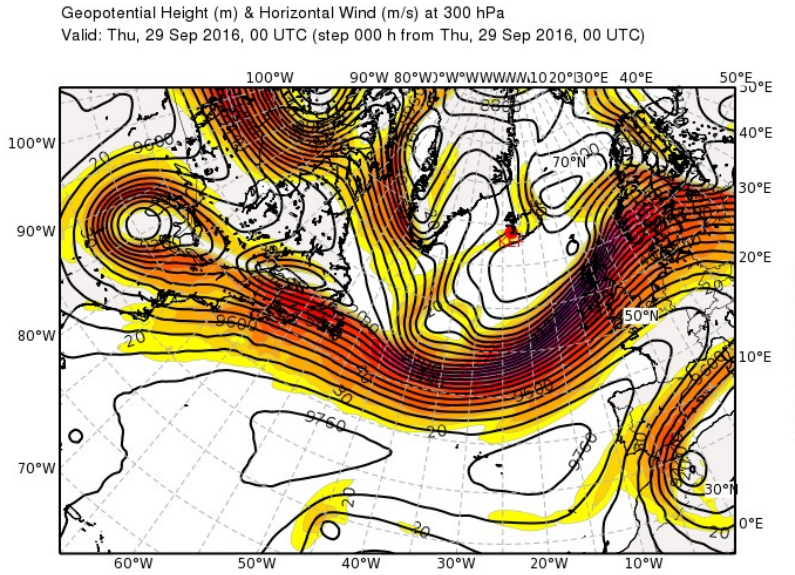
Agenda

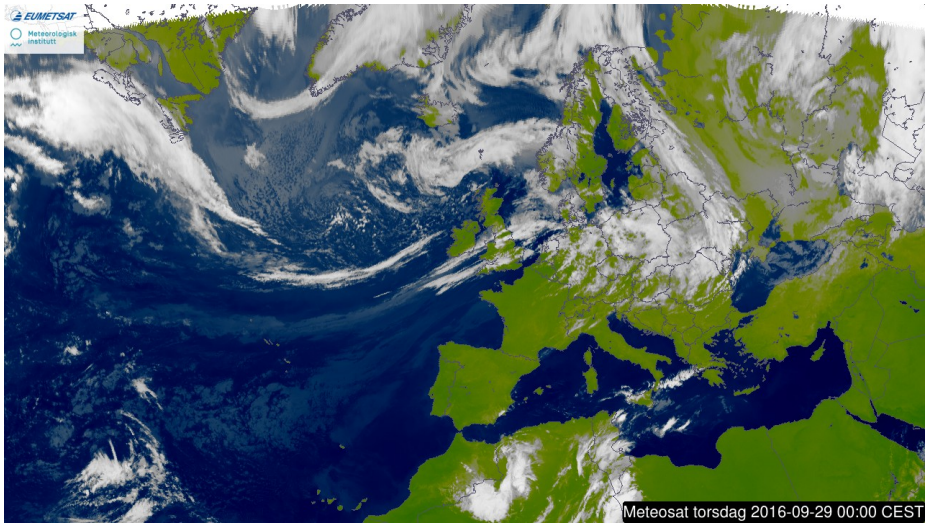
- Current synoptic situation and forecast until Monday
- HALO flight plan for Saturday (Andreas, Florian, Pila)
- Additional soundings from the Azores/Atlantic ships
- HALO/Falcon flight plans for Sunday (Christian K., Jim)
- Outlook

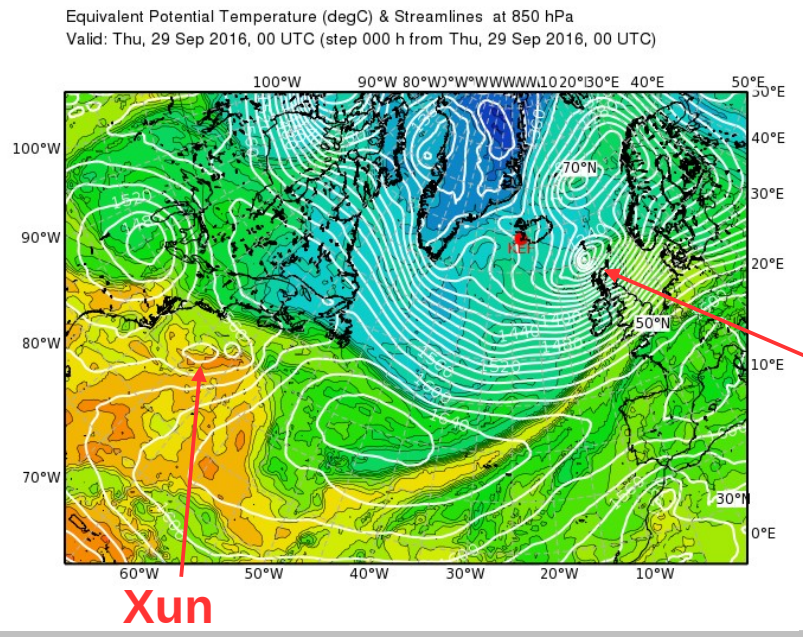
Current synoptic situation and forecast until Monday

Analysis – 29 Sep 2016, 00 UTC

Z300, SAT
THE850

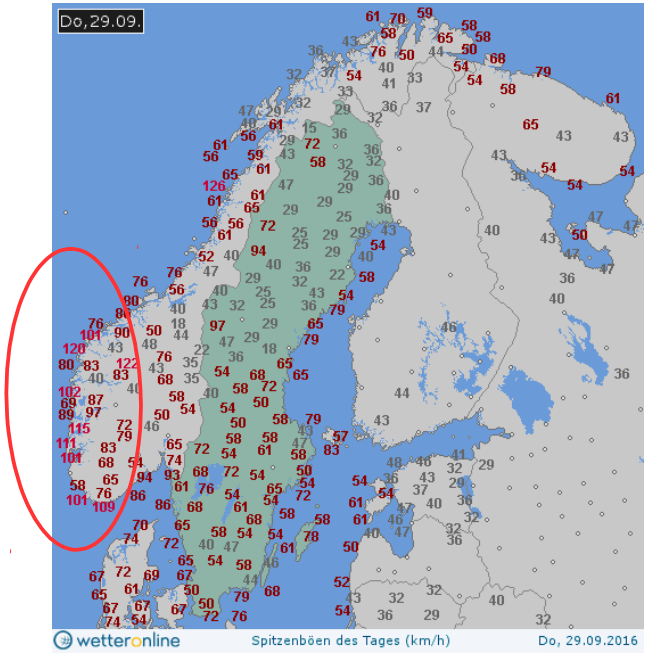






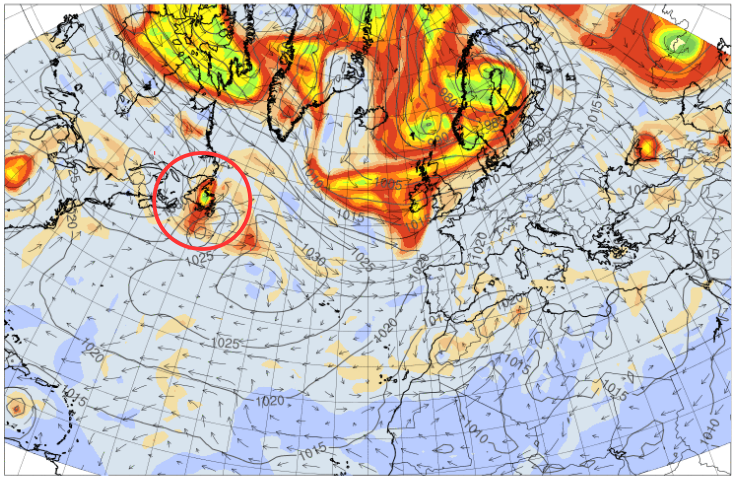
Xun

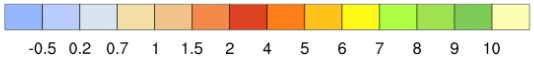
Walpurga



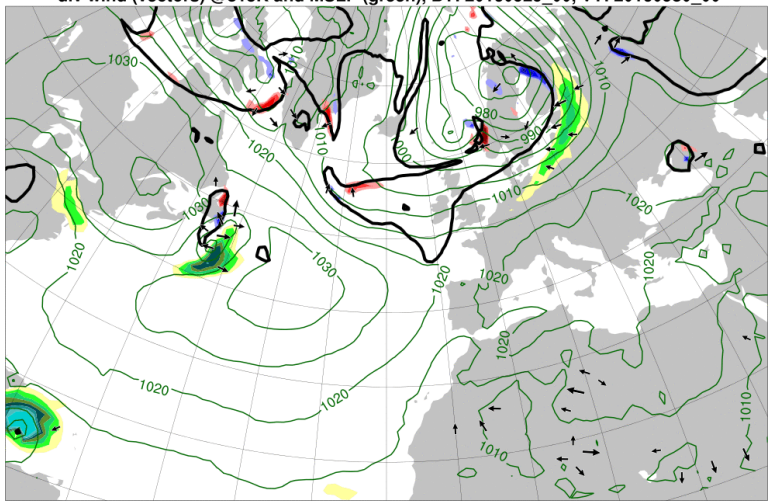
Forecast – Fri, 30 Sep 2016, 00 UTC

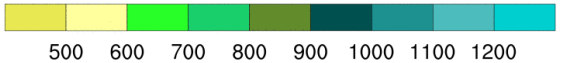
PV@315K at 20160930_00

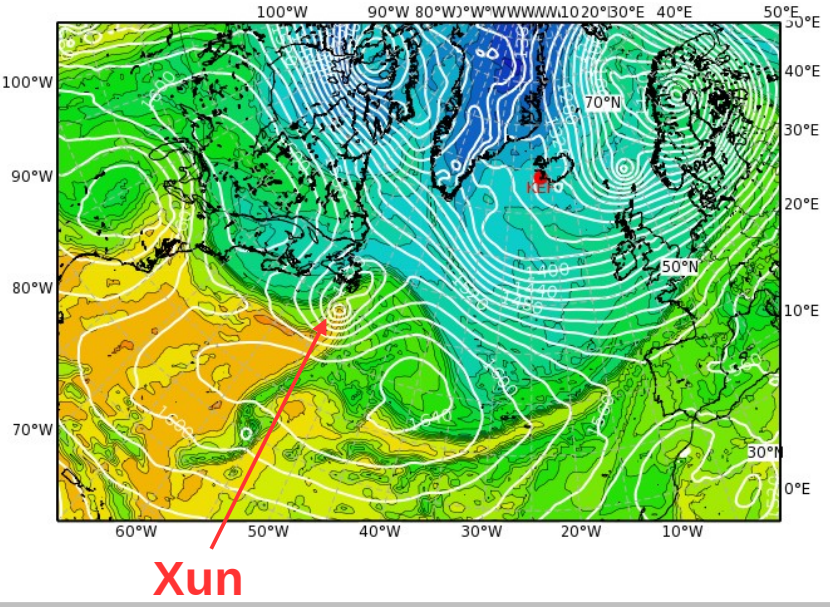




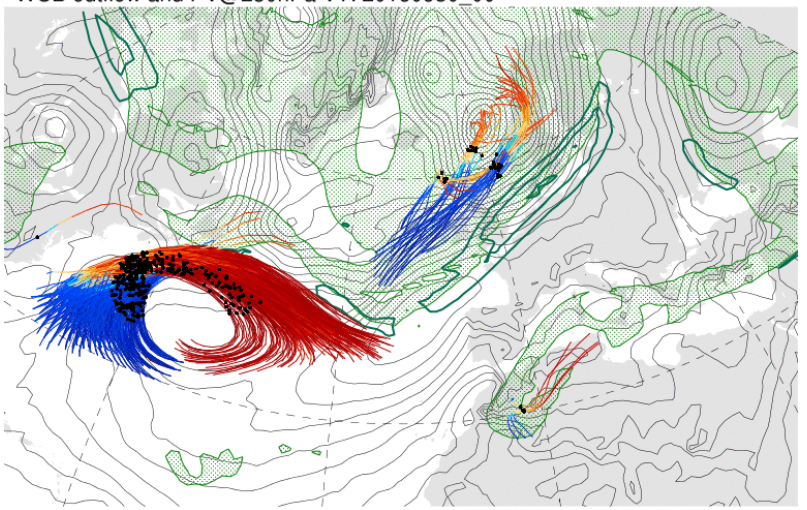
2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @315K and MSLP (green), BT: 20160929_00, VT: 20160930_00





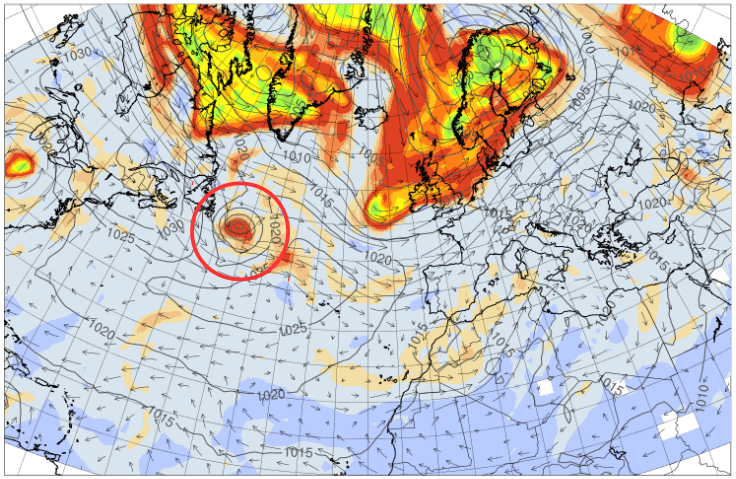


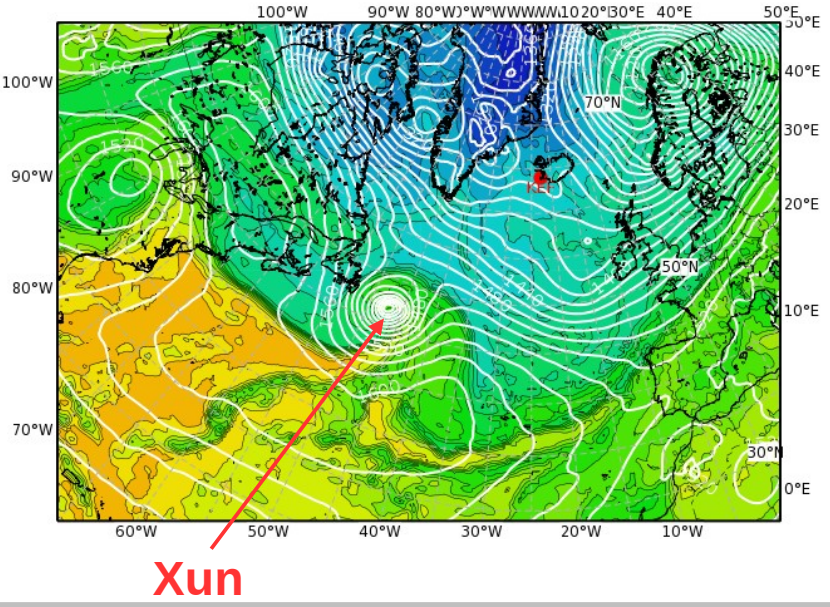
Trajectory start and SLP VT: 20160928_00
WCB outflow and PV@250hPa VT: 20160930_00



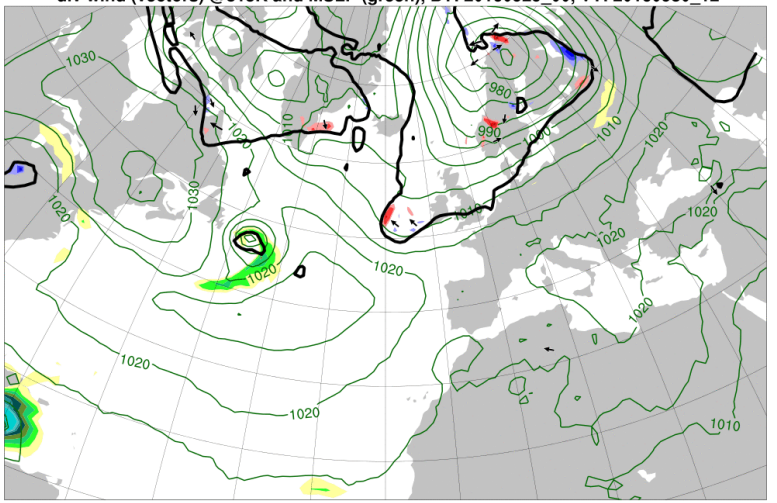
Forecast – Fri, 30 Sep 2016, 12 UTC

PV@315K at 20160930_12

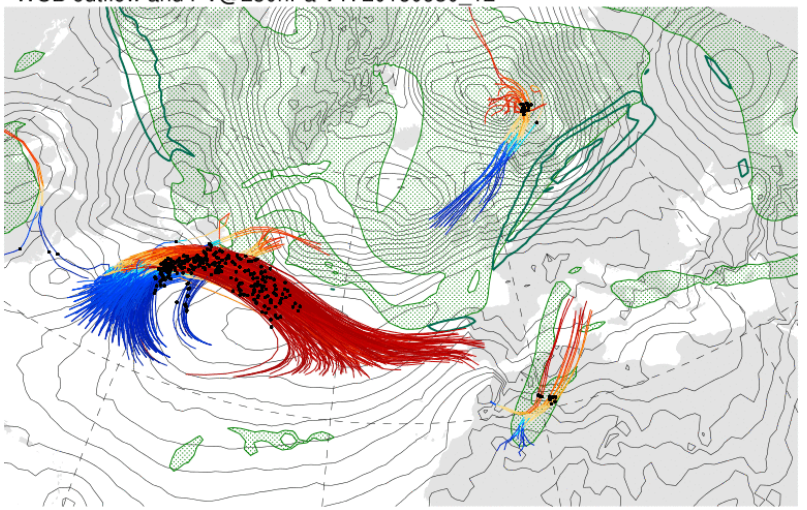




2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @315K and MSLP (green), BT: 20160929_00, VT: 20160930_12

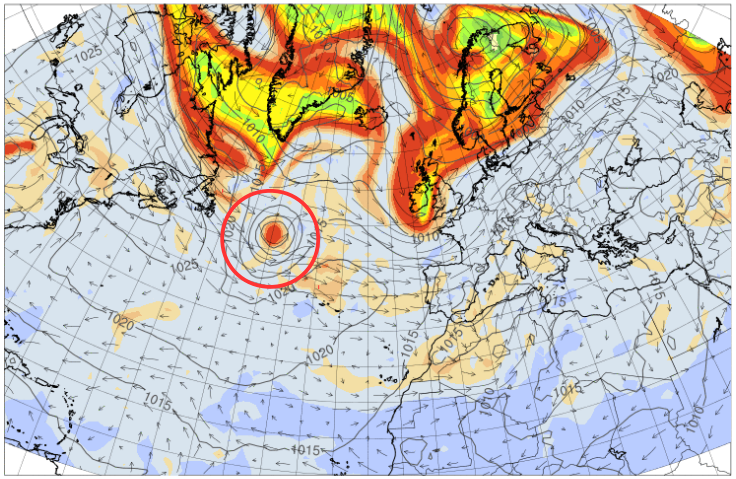


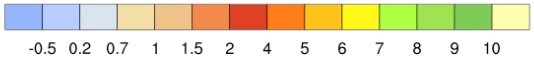
Trajectory start and SLP VT: 20160928_12
WCB outflow and PV@250hPa VT: 20160930_12

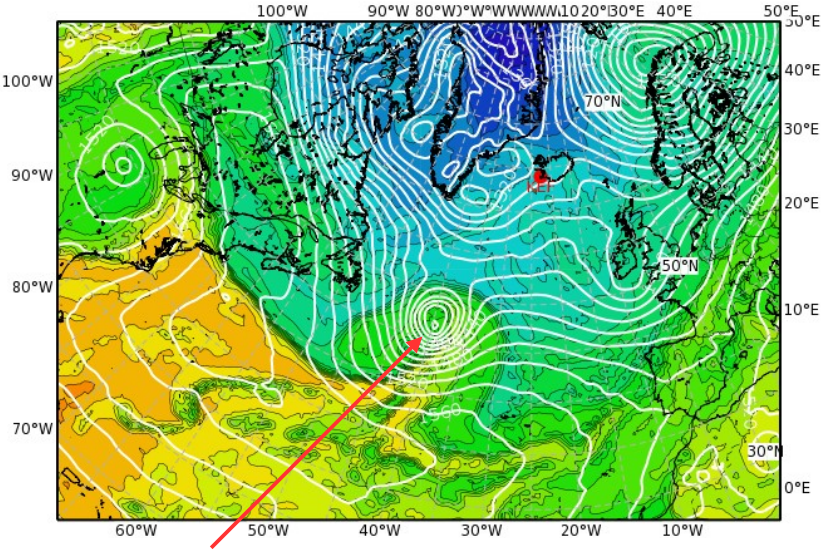


Forecast – Sat, 01 Oct 2016, 00 UTC

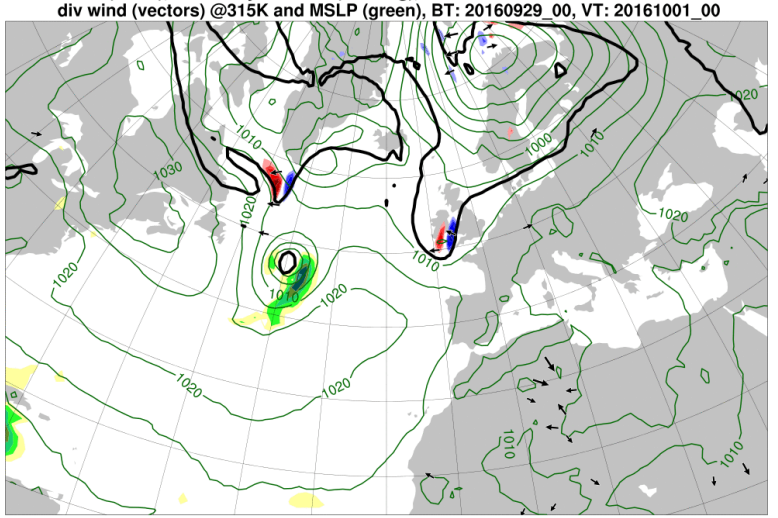
PV@315K at 20161001_00

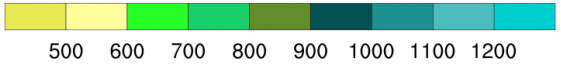




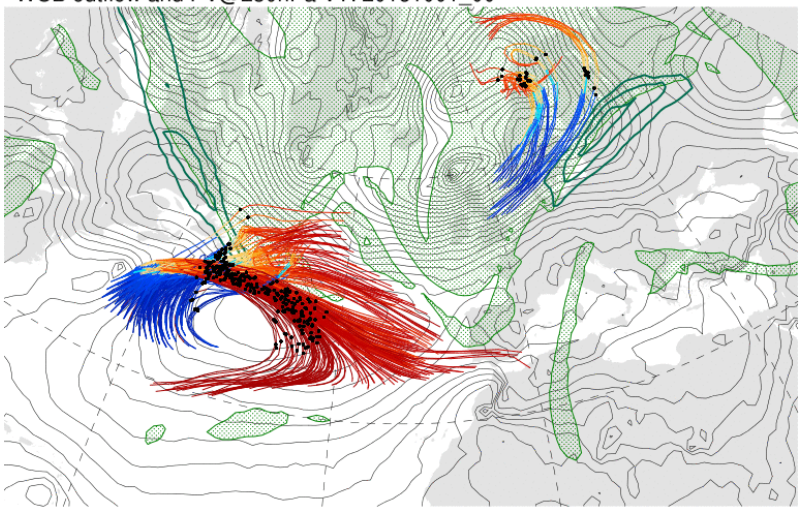


2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @315K and MSLP (green), BT: 20160929_00, VT: 20161001_00



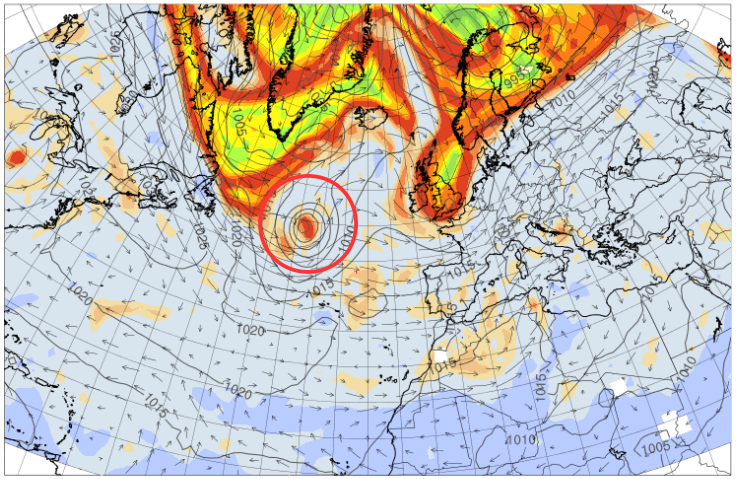


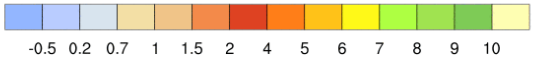
Trajectory start and SLP VT: 20160929_00
WCB outflow and PV@250hPa VT: 20161001_00

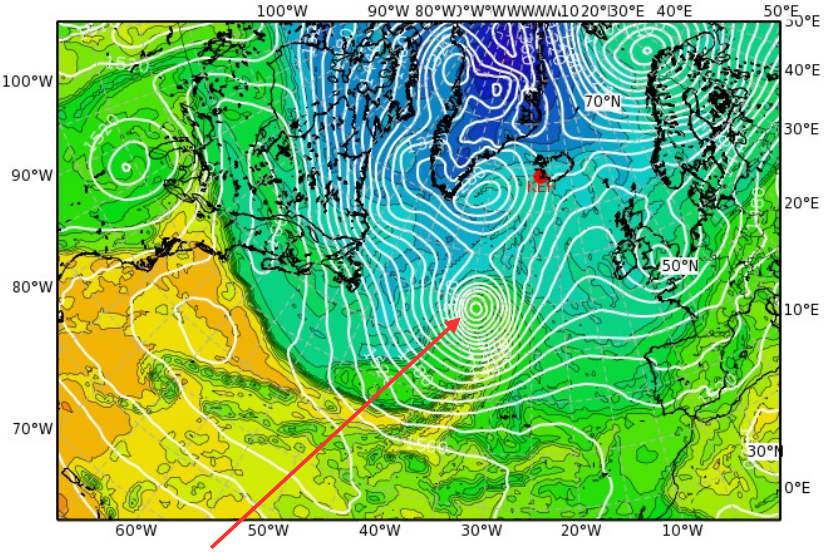


Forecast – Sat, 01 Oct 2016, 12 UTC

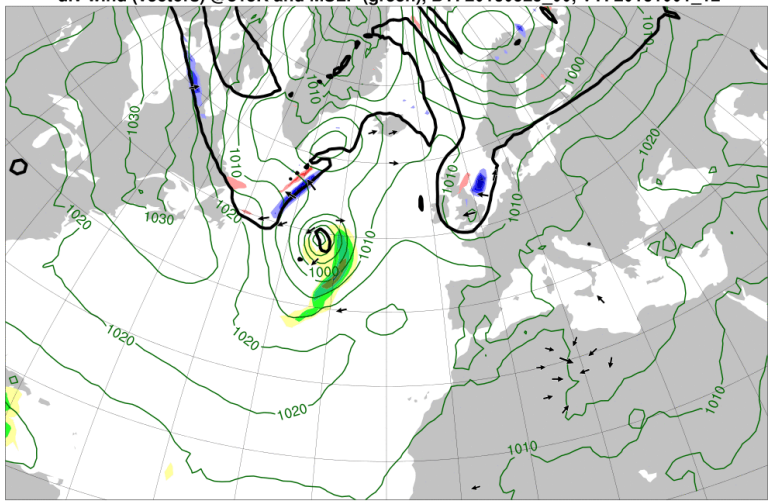
PV@315K at 20161001_12

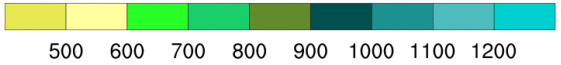




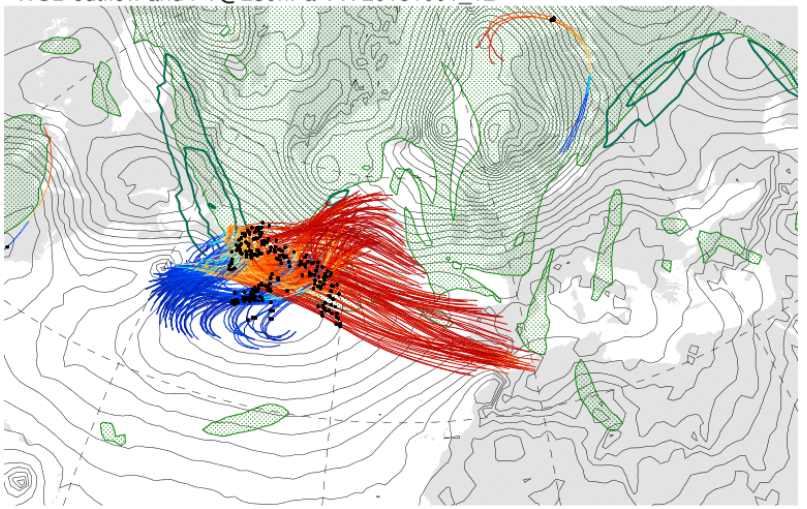


2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @315K and MSLP (green), BT: 20160929_00, VT: 20161001_12

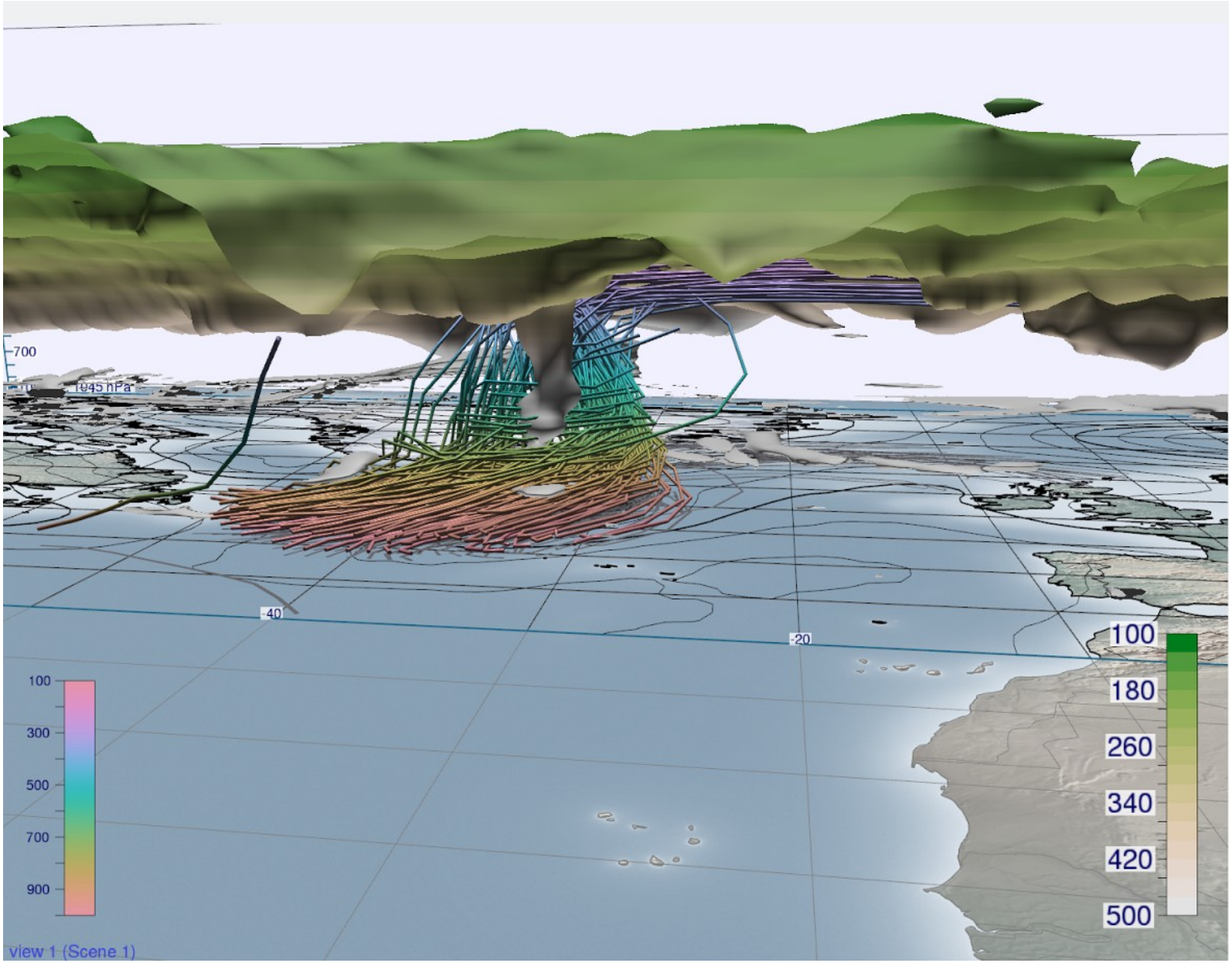




Trajectory start and SLP VT: 20160929_12
WCB outflow and PV@250hPa VT: 20161001_12

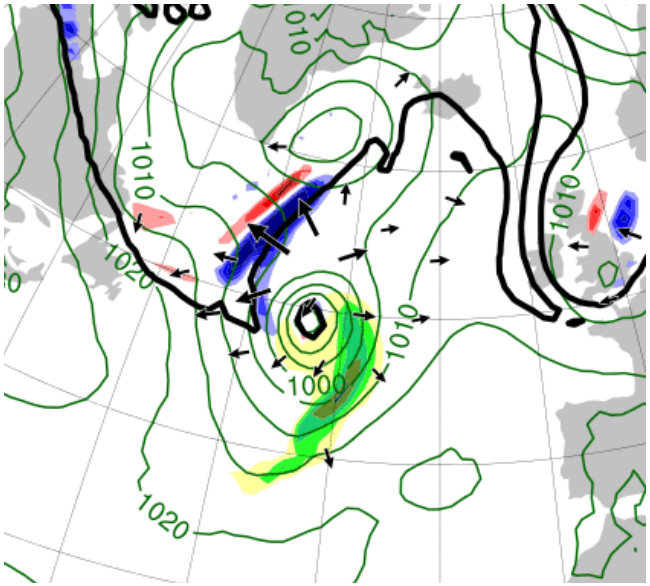


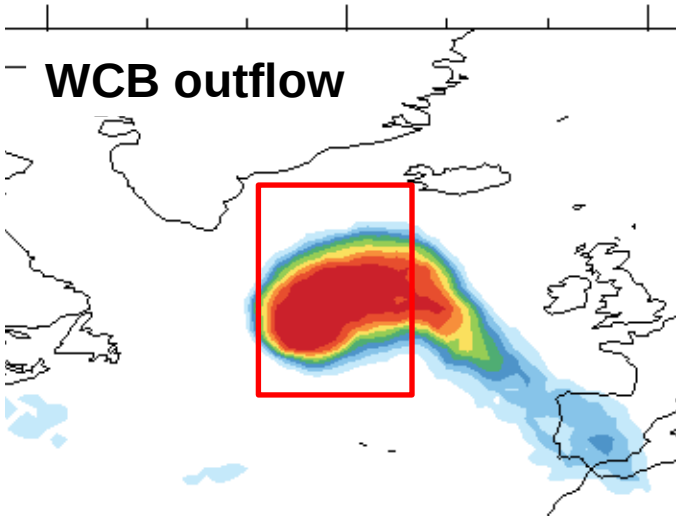
Forecast – Sat, 01 Oct 2016, 12 UTC

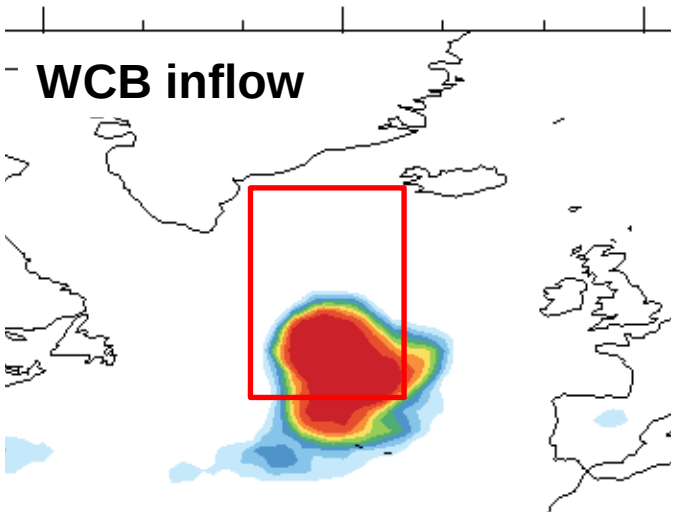


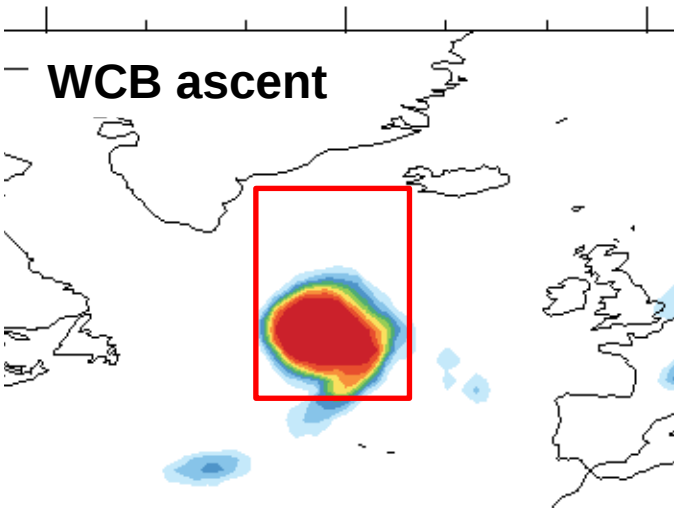
WCB probabilities Saturday 01 October, 12UTC

BT29/00Z



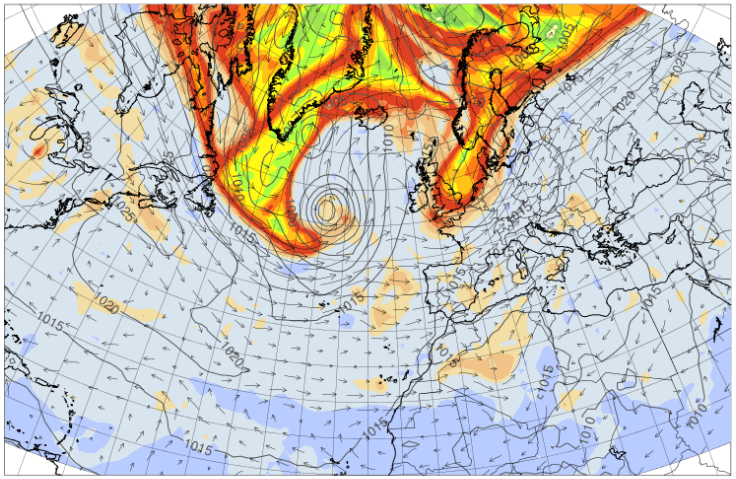


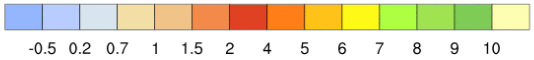


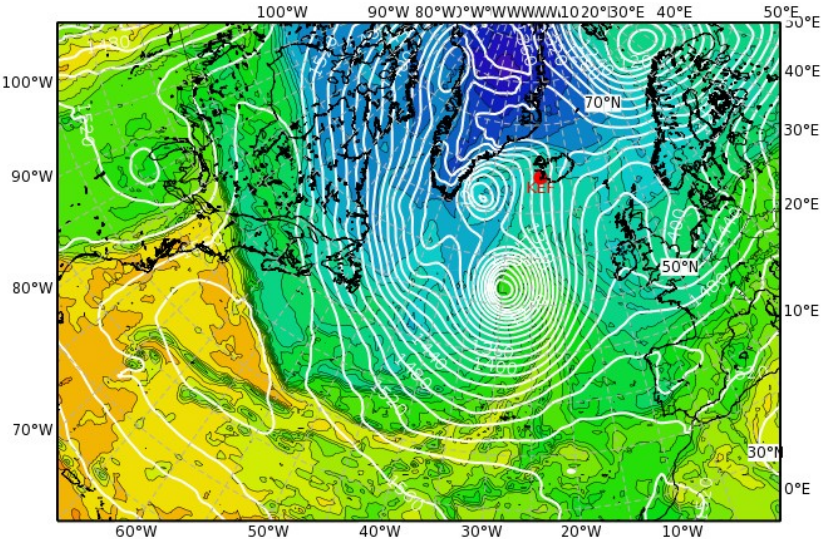


Forecast – Sun, 02 Oct 2016, 00 UTC

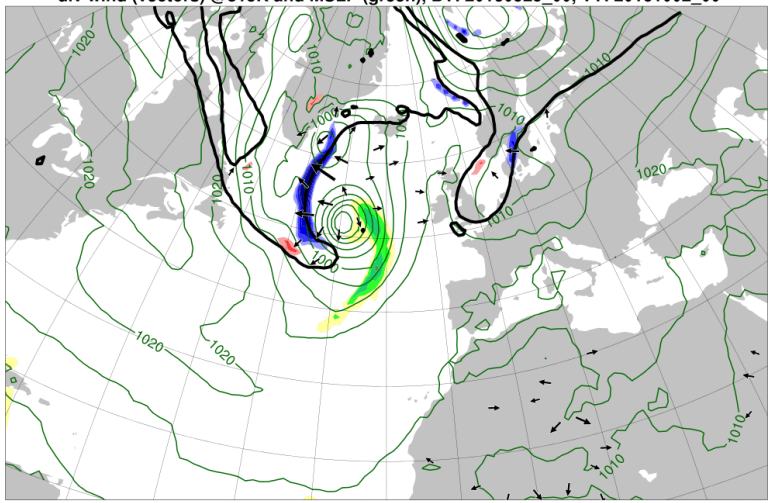
PV@315K at 20161002_00

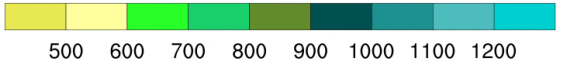




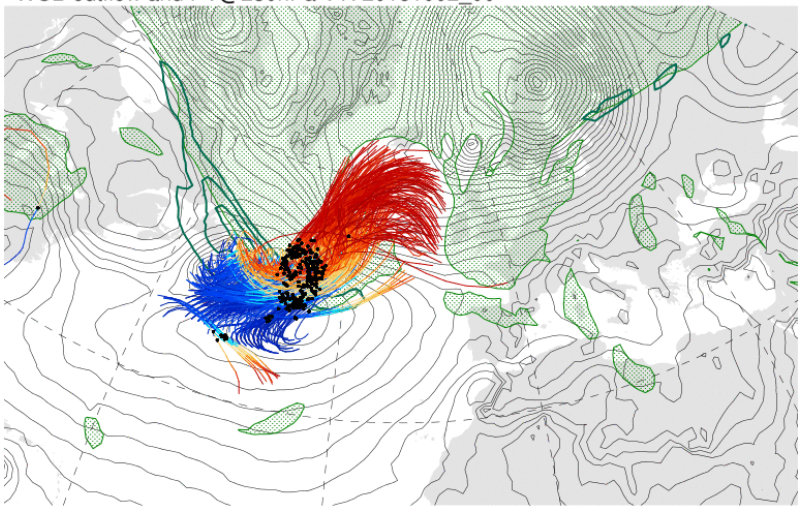


2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @315K and MSLP (green), BT: 20160929_00, VT: 20161002_00



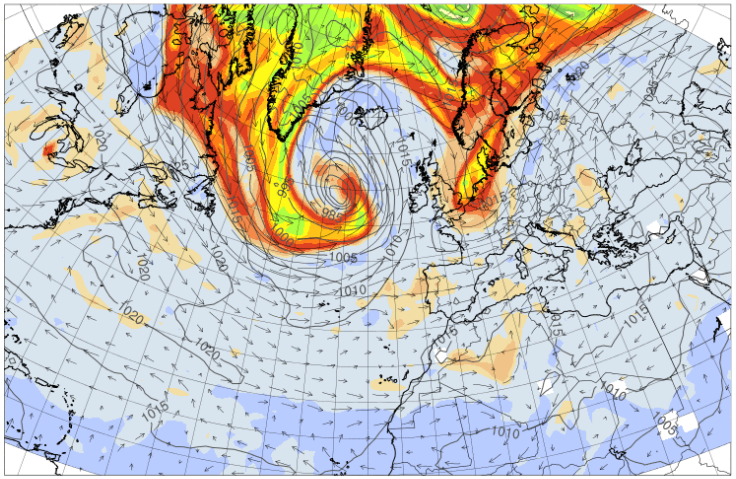


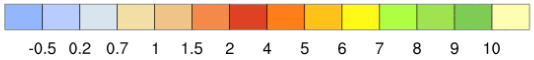
Trajectory start and SLP VT: 20160930_00
WCB outflow and PV@250hPa VT: 20161002_00

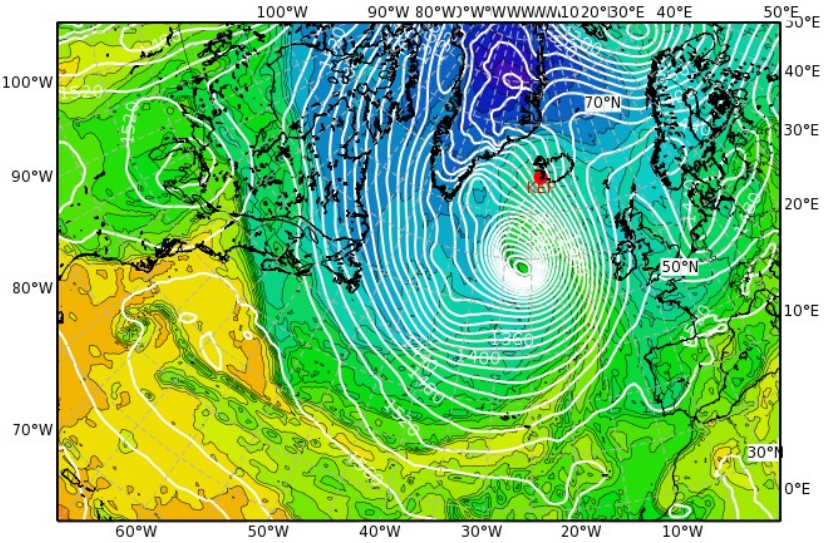


Forecast – Sun, 02 Oct 2016, 12 UTC

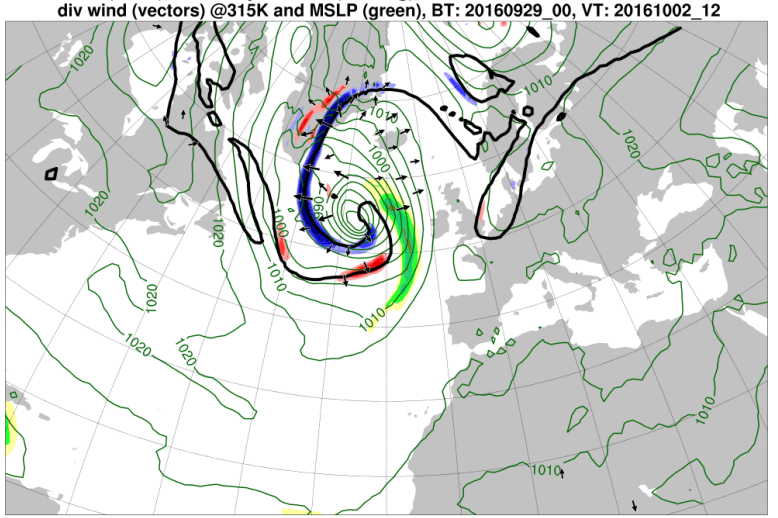
PV@315K at 20161002_12

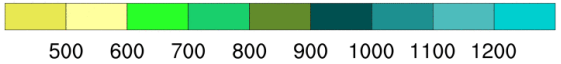




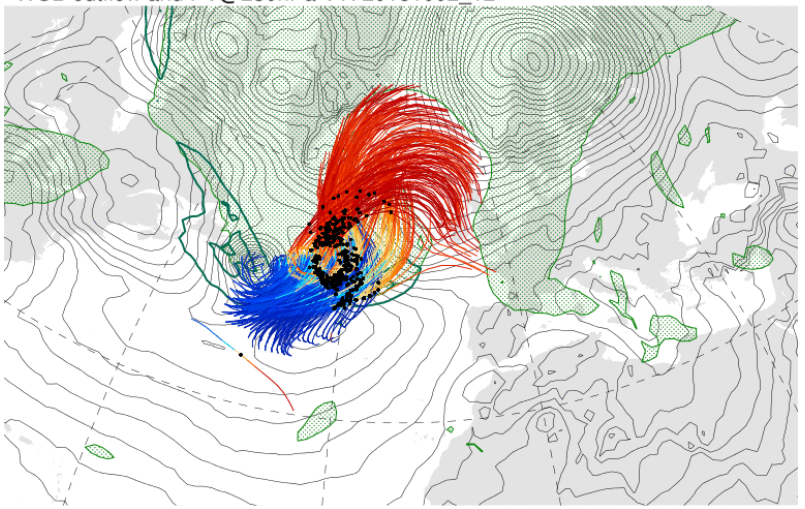


2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @315K and MSLP (green), BT: 20160929_00, VT: 20161002_12



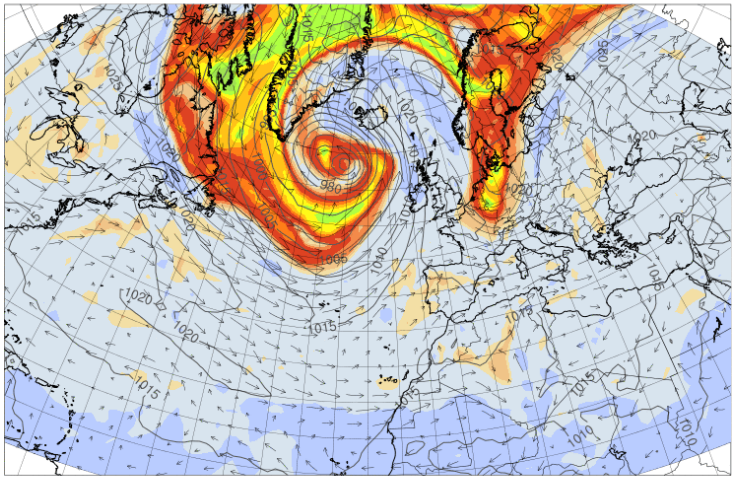


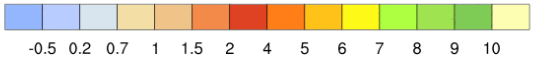
Trajectory start and SLP VT: 20160930_12
WCB outflow and PV@250hPa VT: 20161002_12

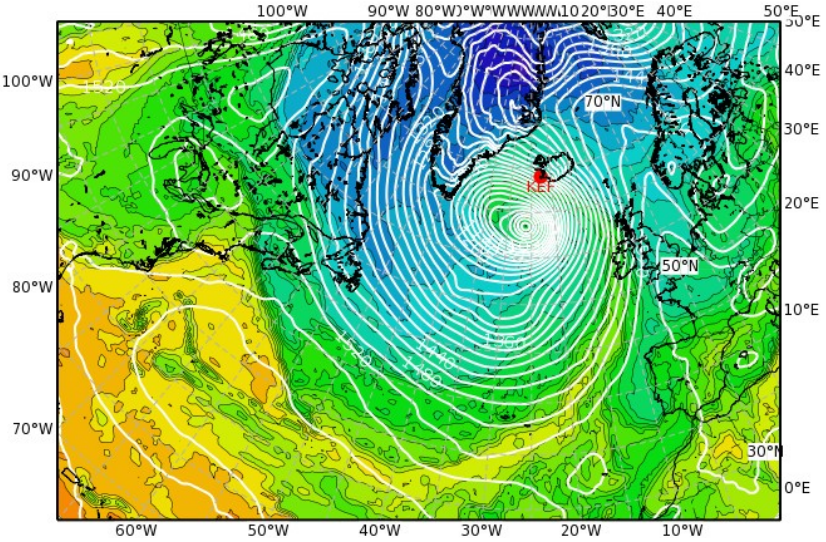


Forecast – Mon, 03 Oct 2016, 00 UTC

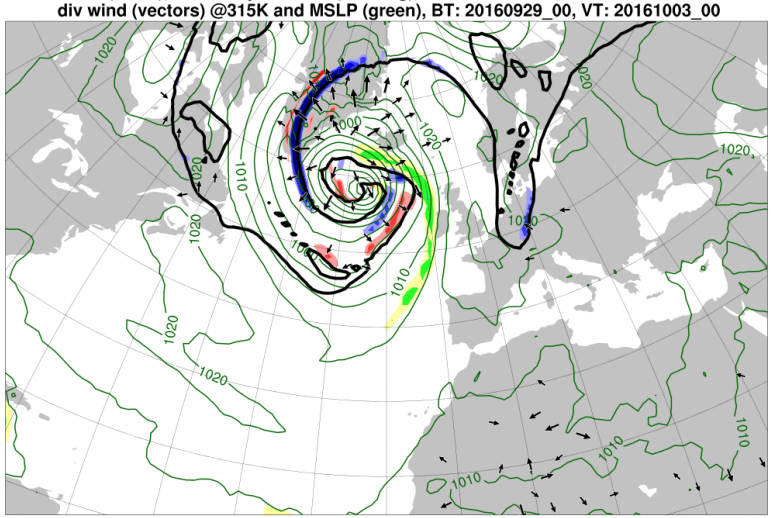
PV@315K at 20161003_00

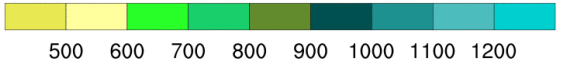




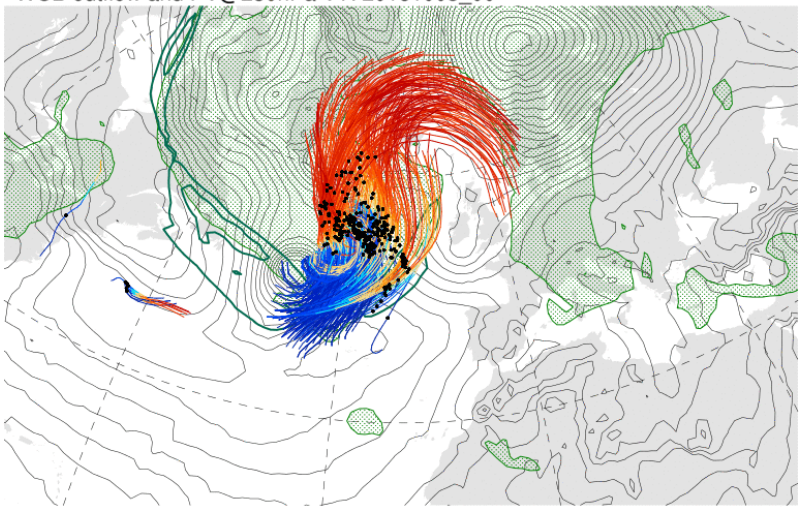


2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @315K and MSLP (green), BT: 20160929_00, VT: 20161003_00



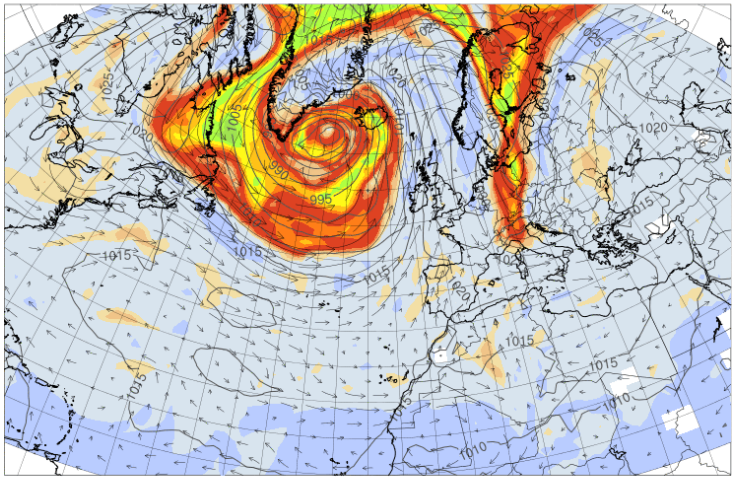


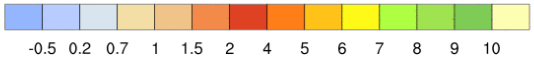
Trajectory start and SLP VT: 20161001_00
WCB outflow and PV@250hPa VT: 20161003_00

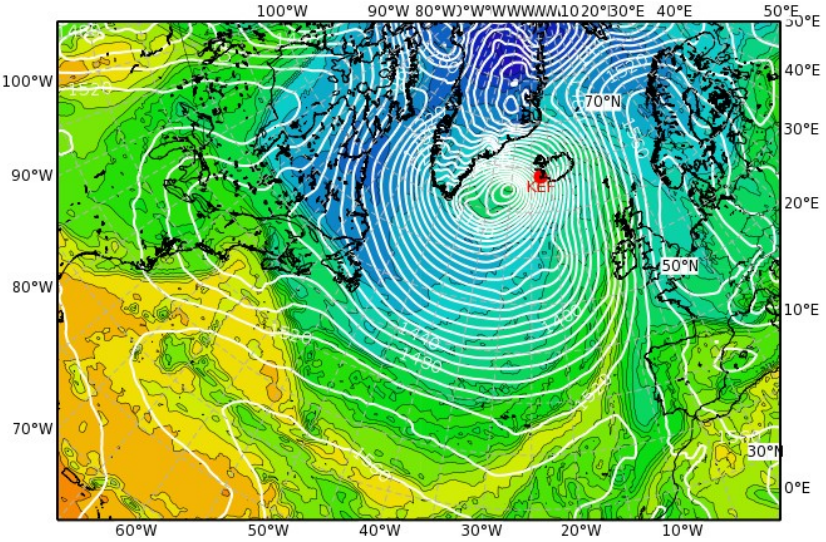


Forecast – Mon, 03 Oct 2016, 12 UTC

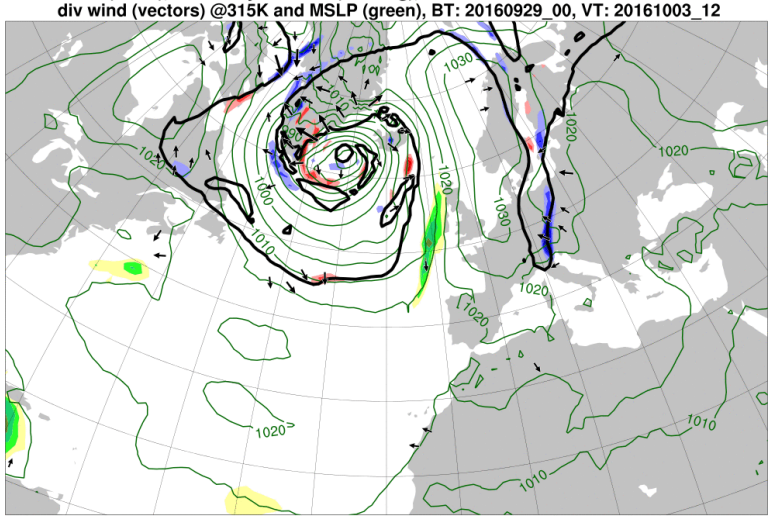
PV@315K at 20161003_12

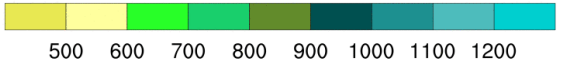




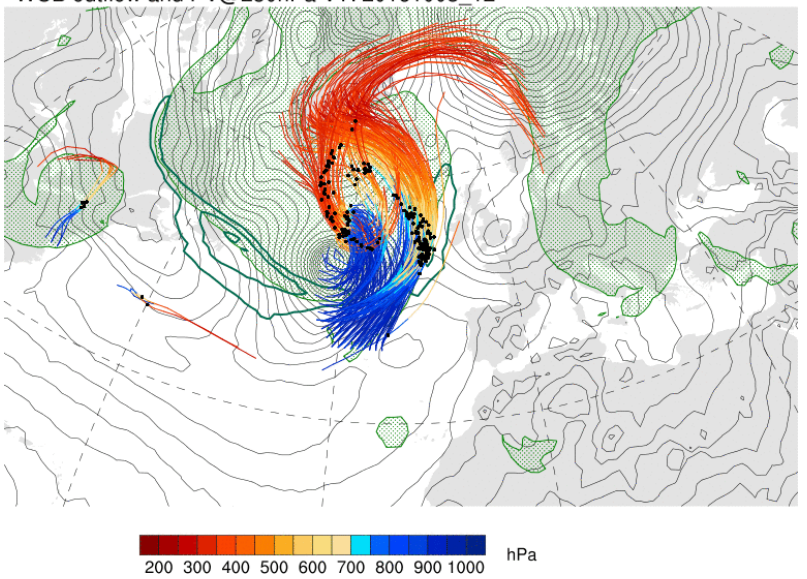


2 PVU (black), PV adv by div wind (shading),
div wind (vectors) @315K and MSLP (green), BT: 20160929_00, VT: 20161003_12

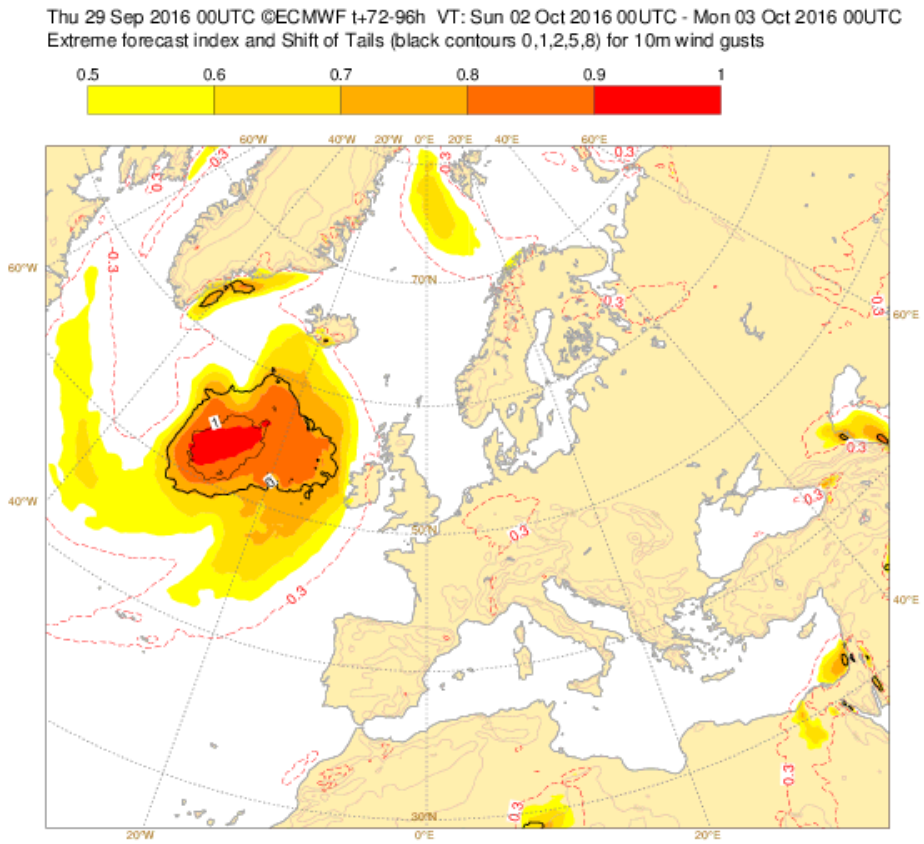


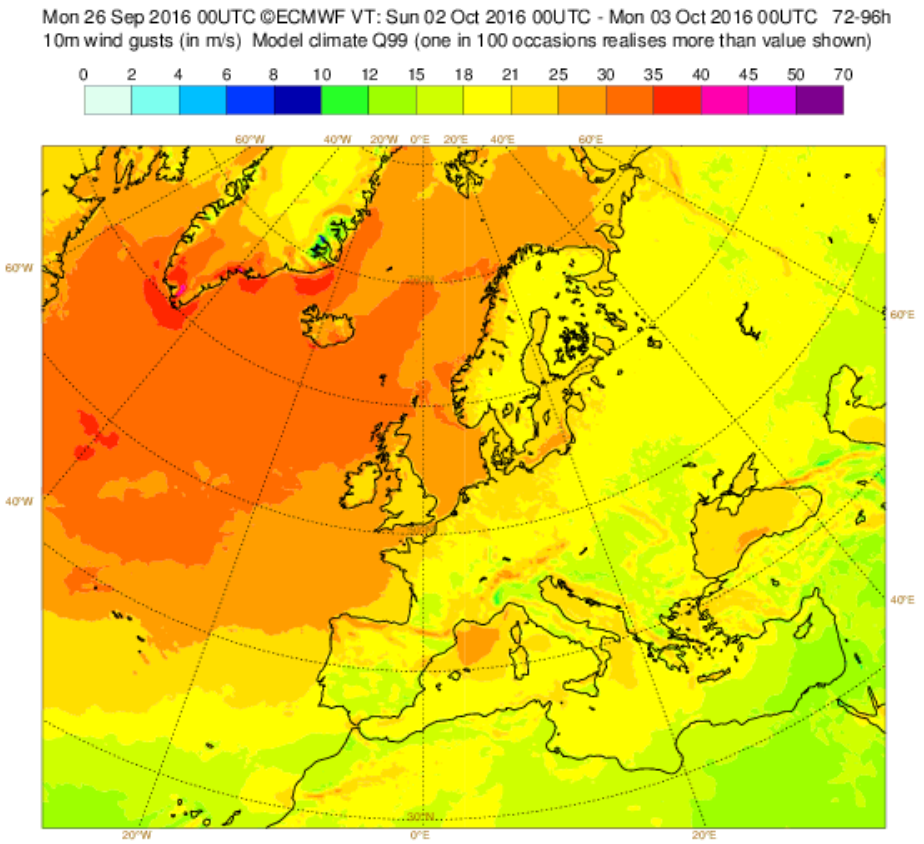


Trajectory start and SLP VT: 20161001_12
WCB outflow and PV@250hPa VT: 20161003_12



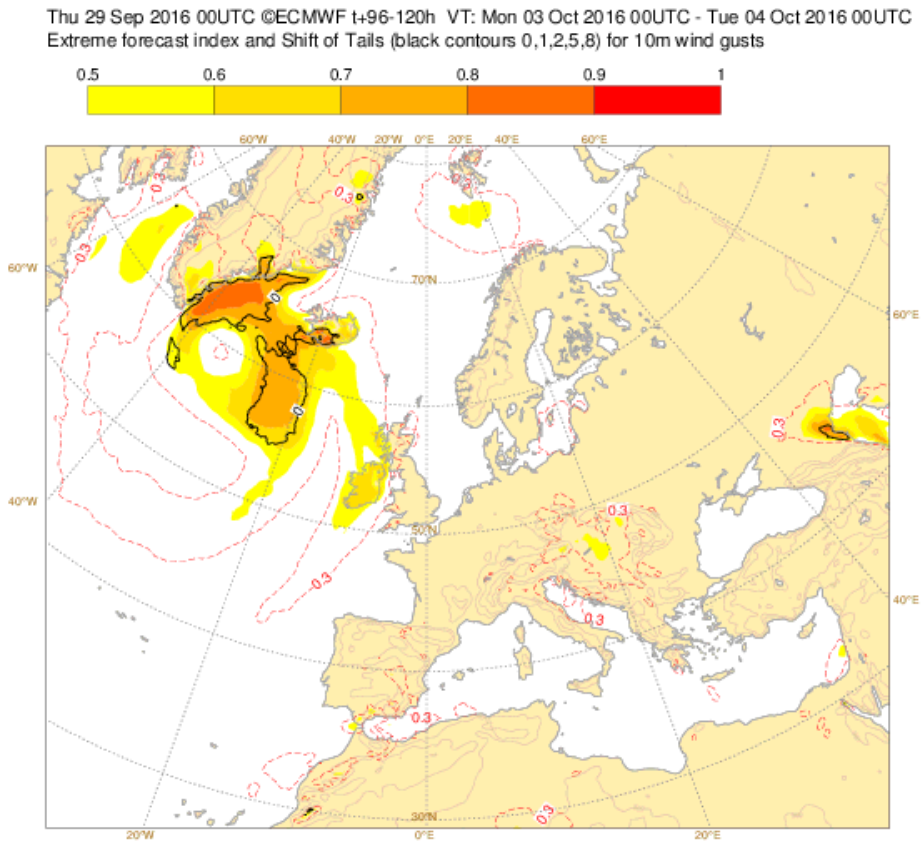
EFI wind for Sun 02/00Z to Mon 03/00Z

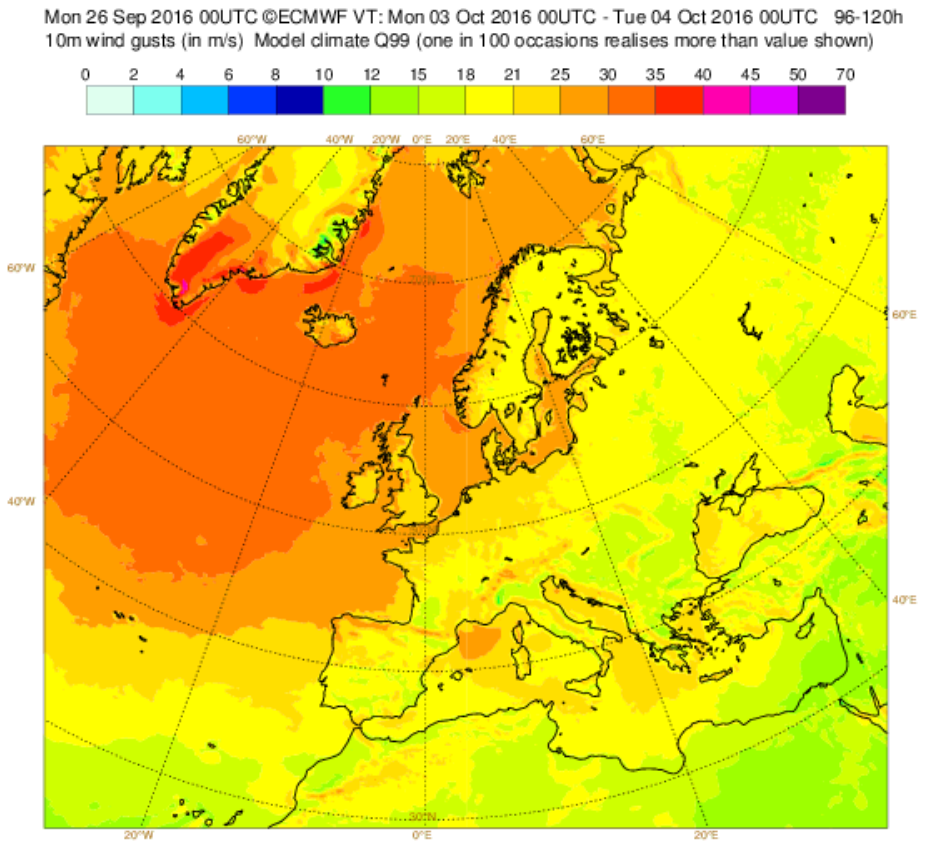




BT29/00Z

EFI wind for Mon 03/00Z to Tue 03/00Z

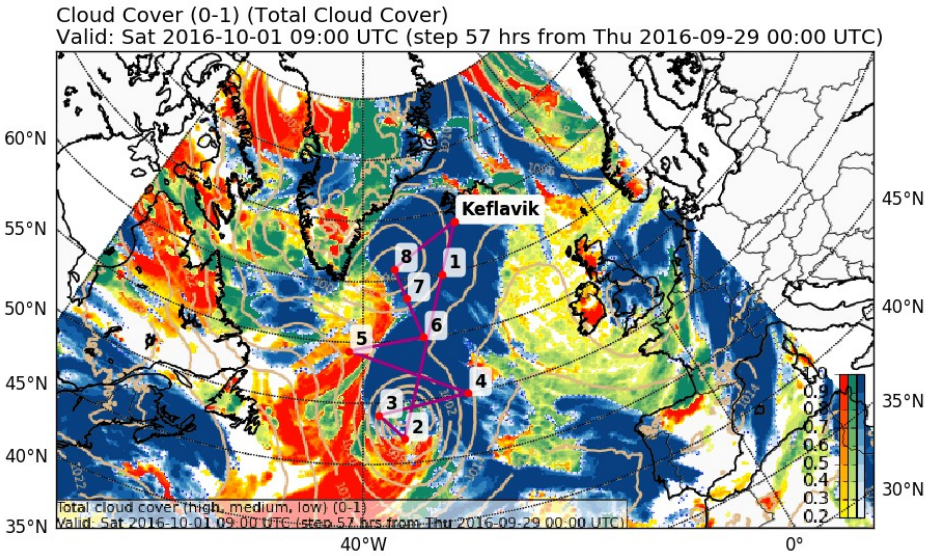


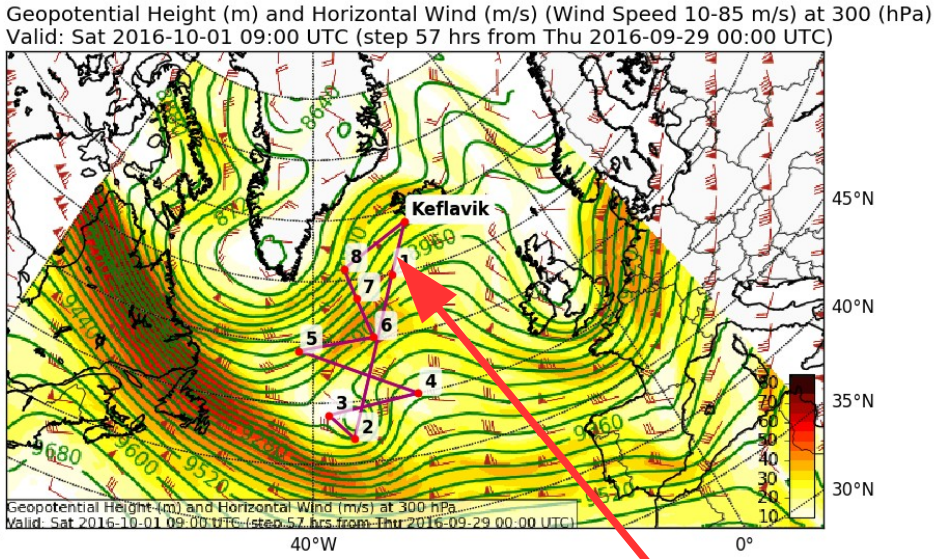


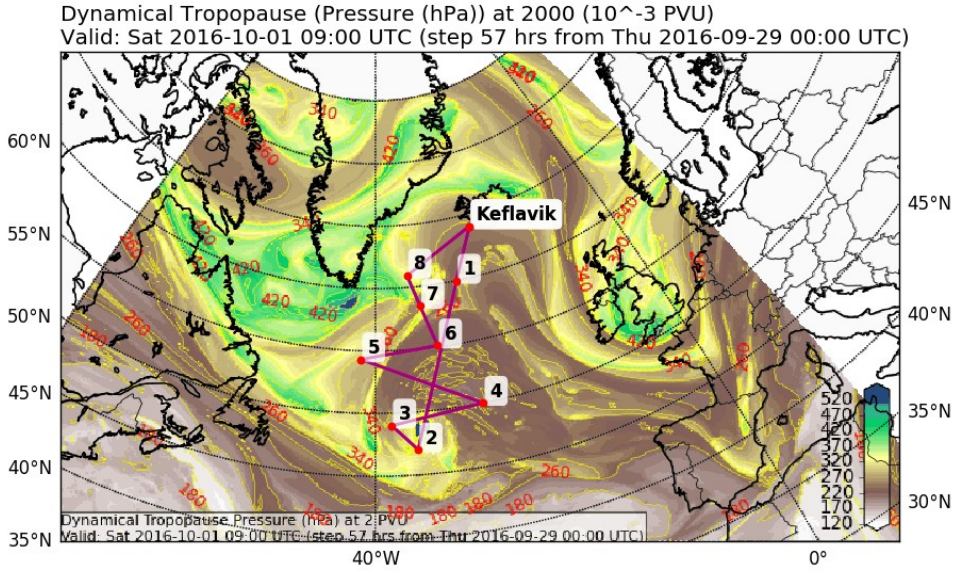
BT29/00Z

IOP6: HALO flight Saturday 1 Oct

Flight Plan for Sat (1. October)
Valid time: 09 UTC

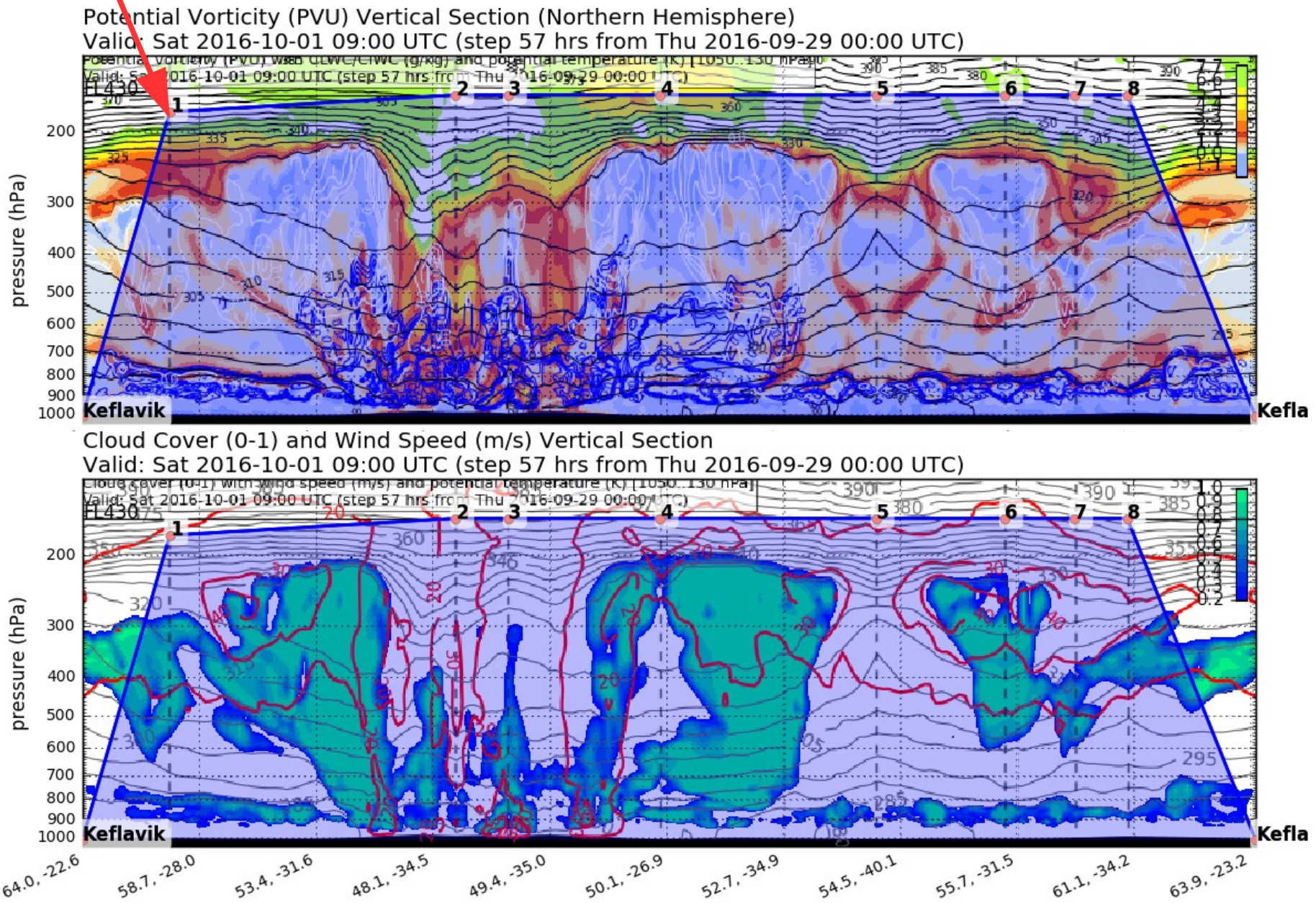




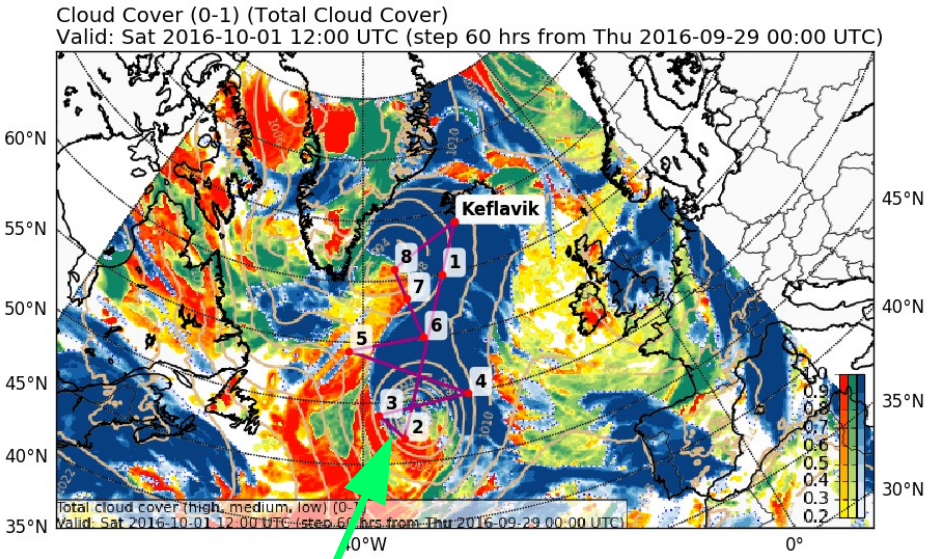


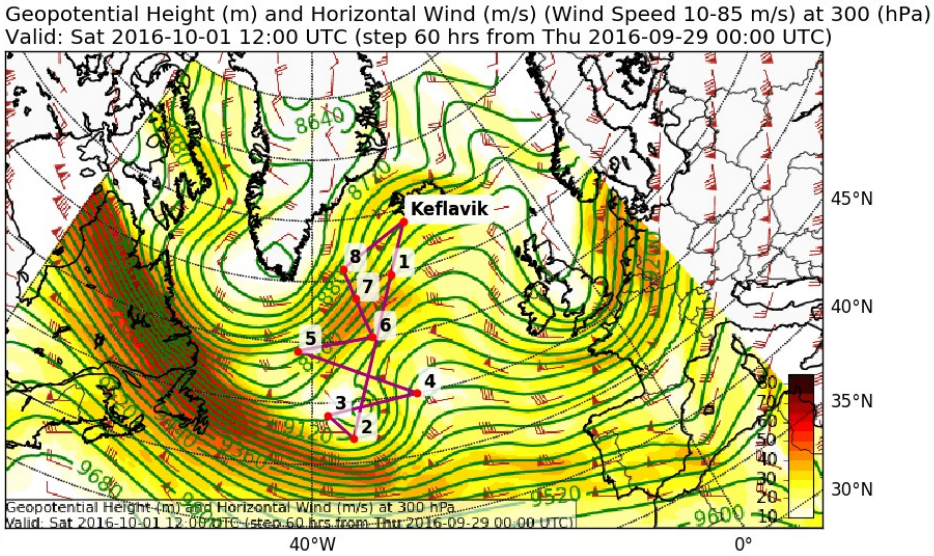
rise from FL410 to FL430

Valid time: 09 UTC

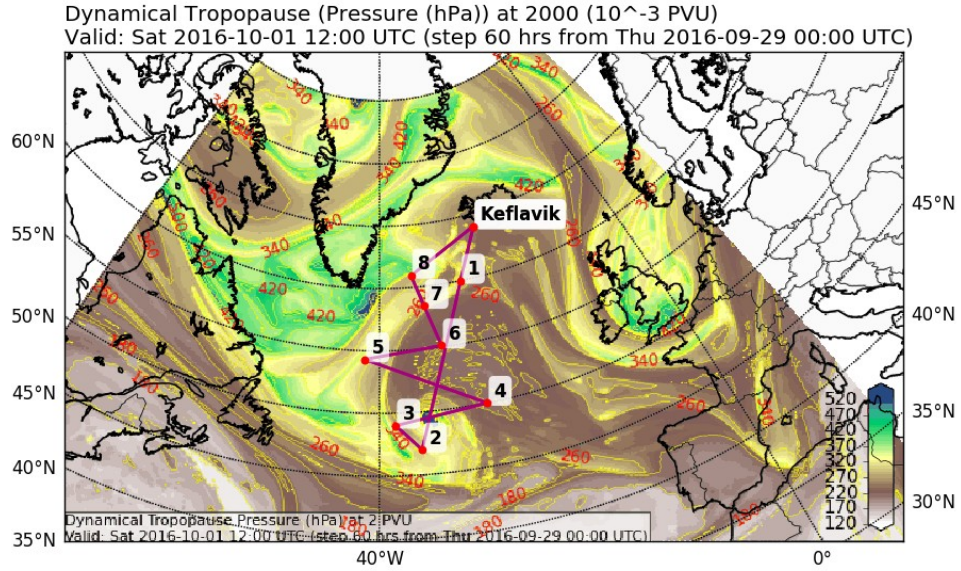


Flight Plan for Sat (1. October)
Valid time: 12 UTC



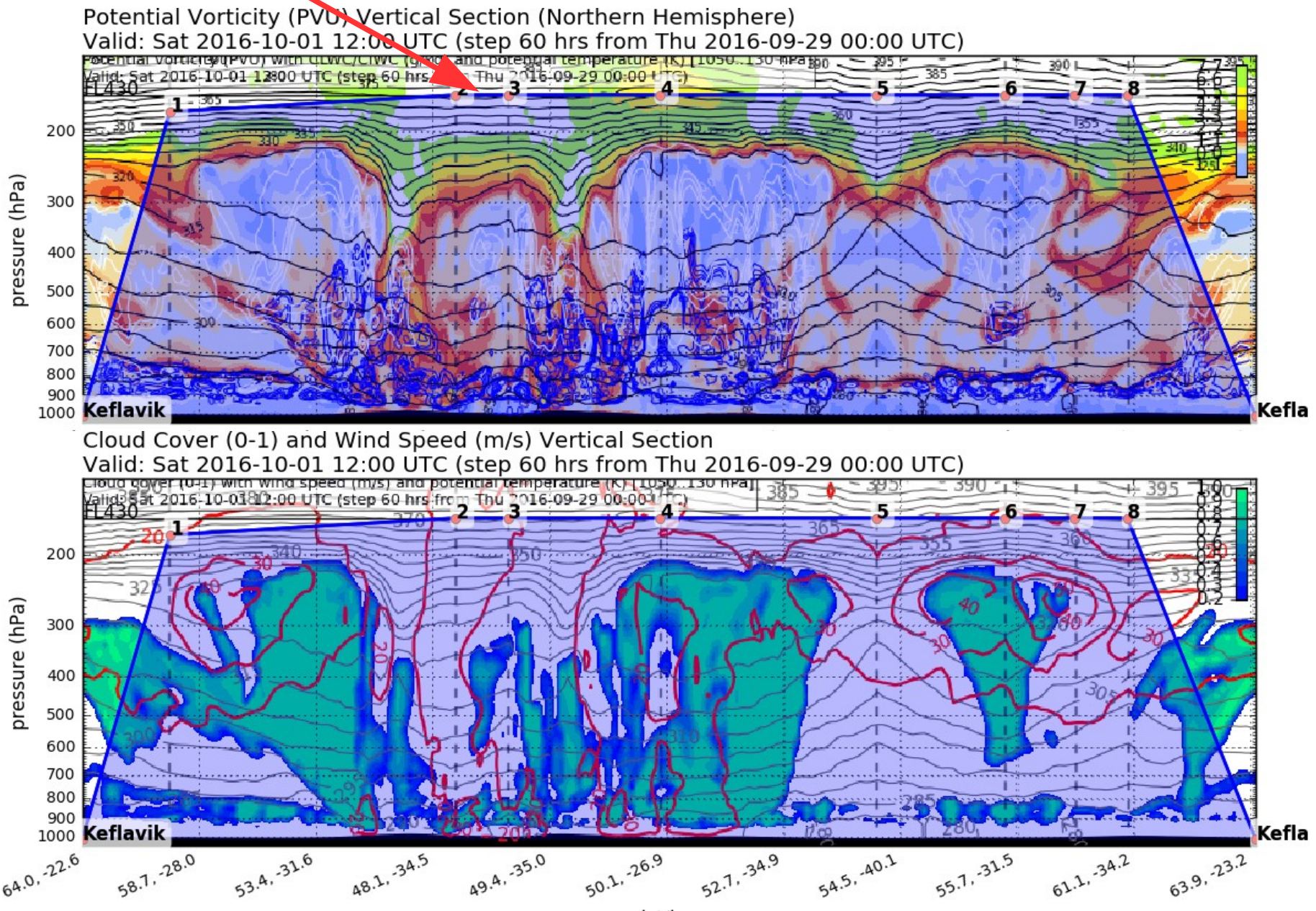


arrival at
southernmost point:
~11:15 UTC

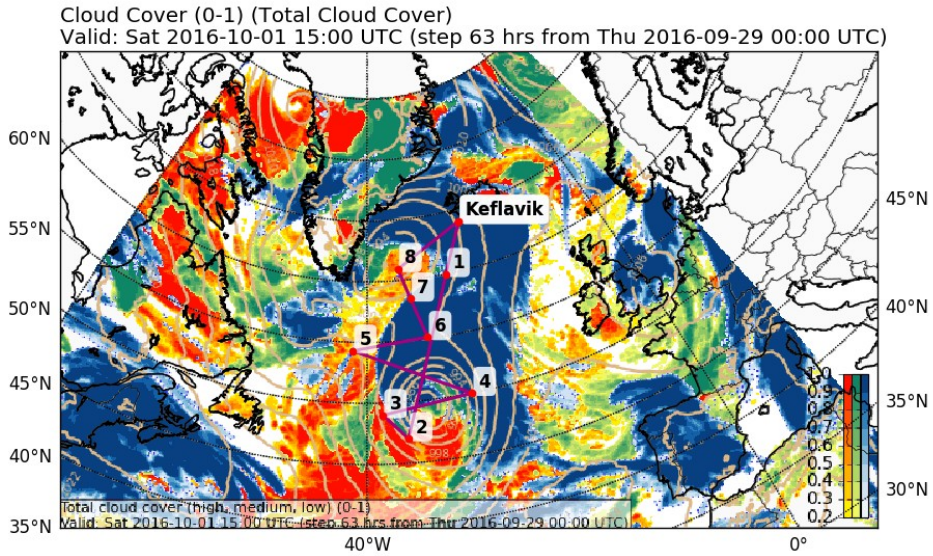


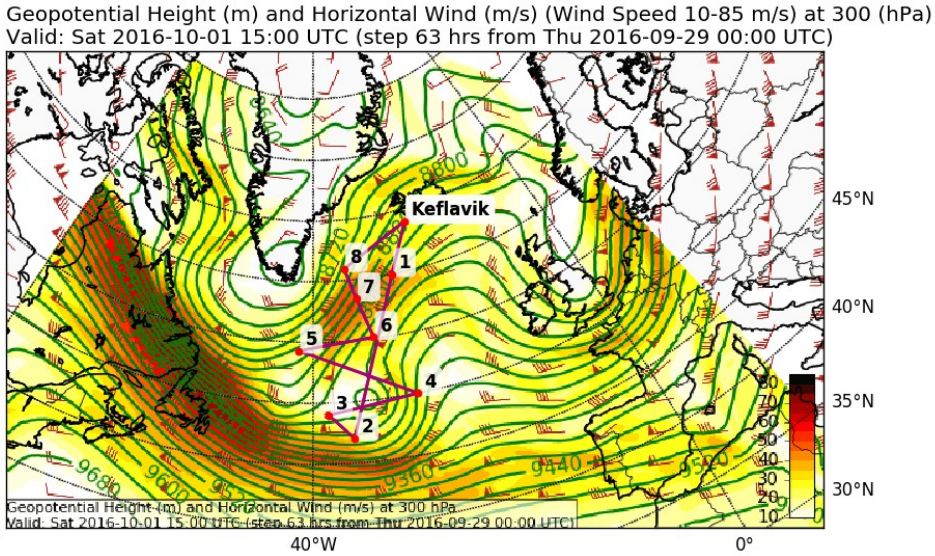
Measure temp. & moisture structure in PV-anomaly

Valid time: 12 UTC

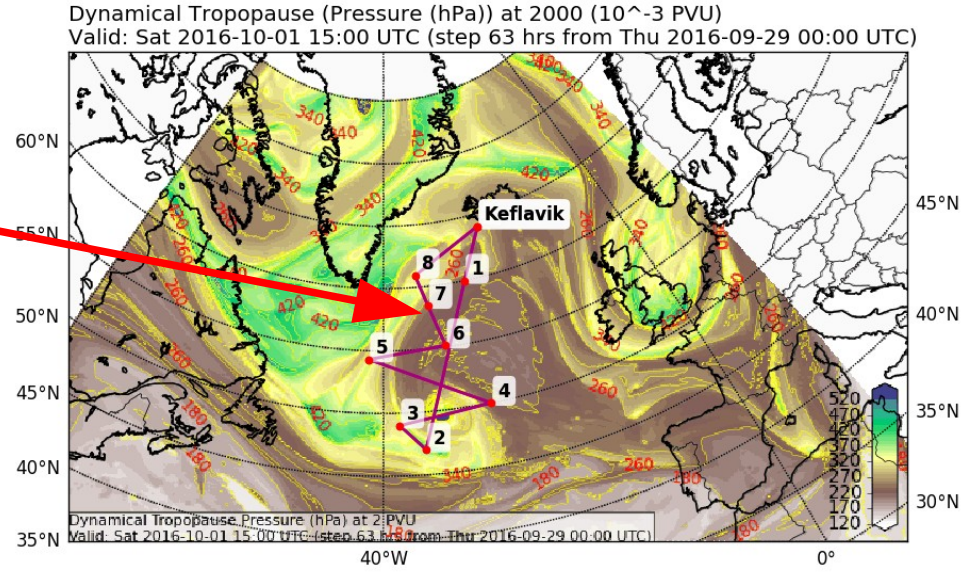


Flight Plan for Sat (1. October)
Valid time: 15 UTC



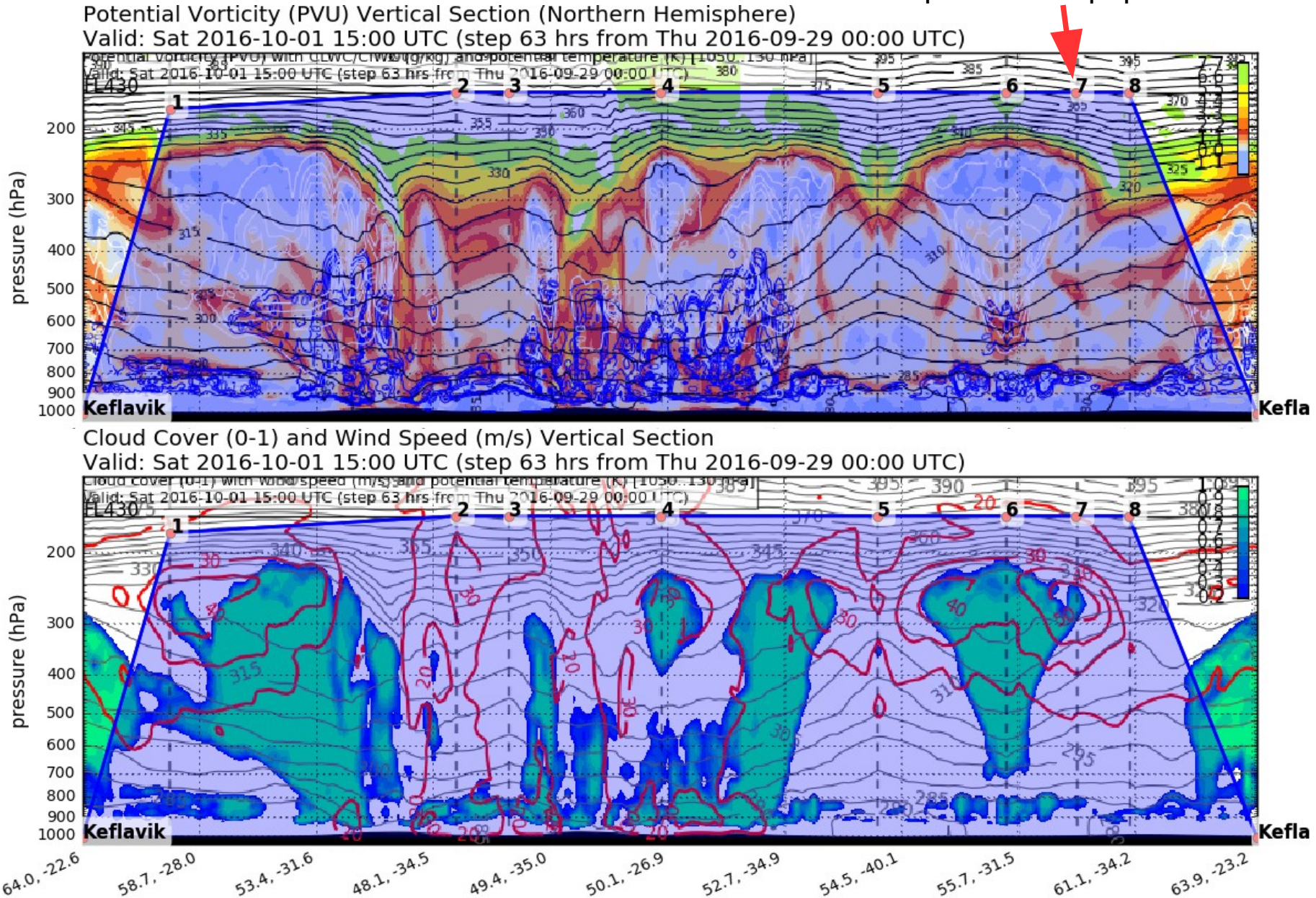


Satellite overpass at
15:01 UTC



Valid time: 15 UTC

Measure moisture structure in tropopause level and high wind speeds in tropopause fold

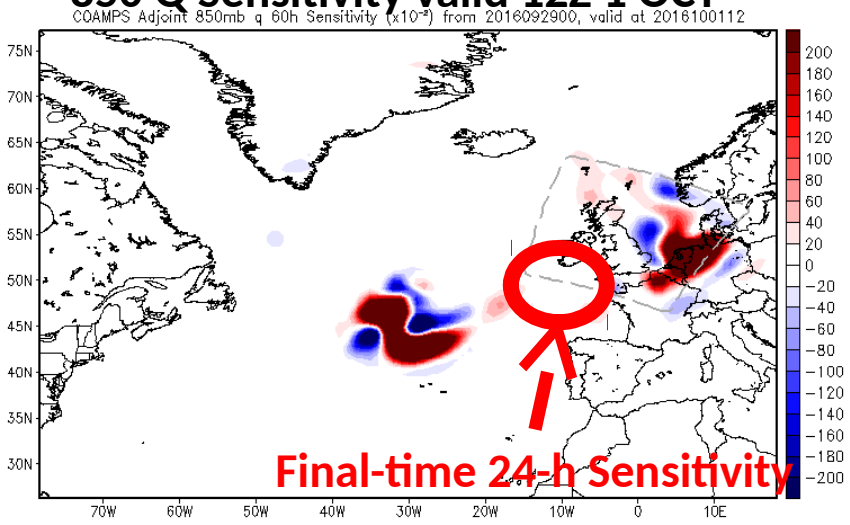


Additional soundings

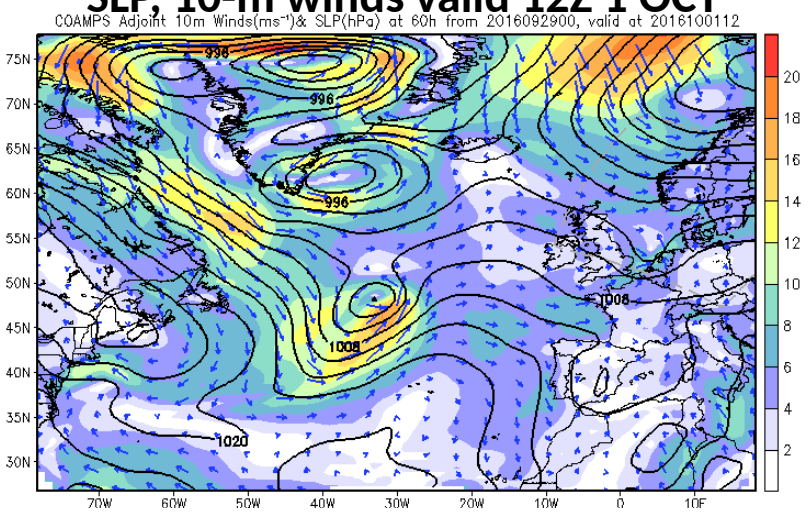
COAMPS Sensitivity (24h) Valid 12Z 1 Oct (Saturday)

Sensitivity centered on mid-Atlantic low. 00Z sondes from Azores?

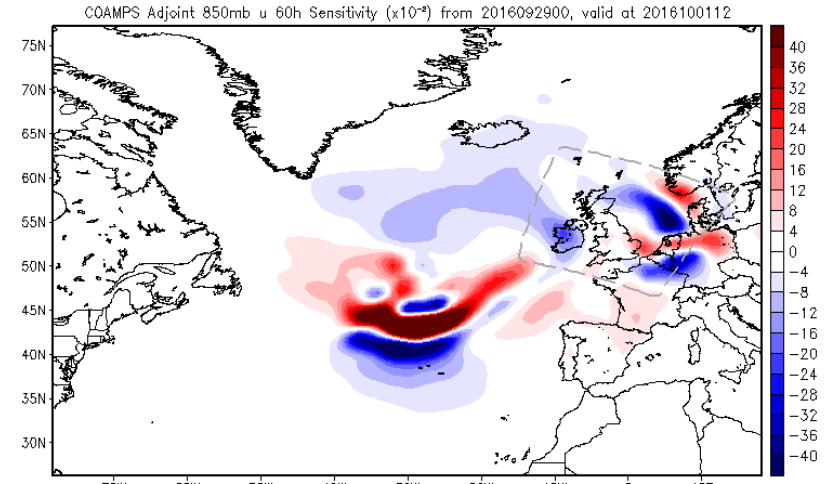
850 Q Sensitivity valid 12Z 1 OCT



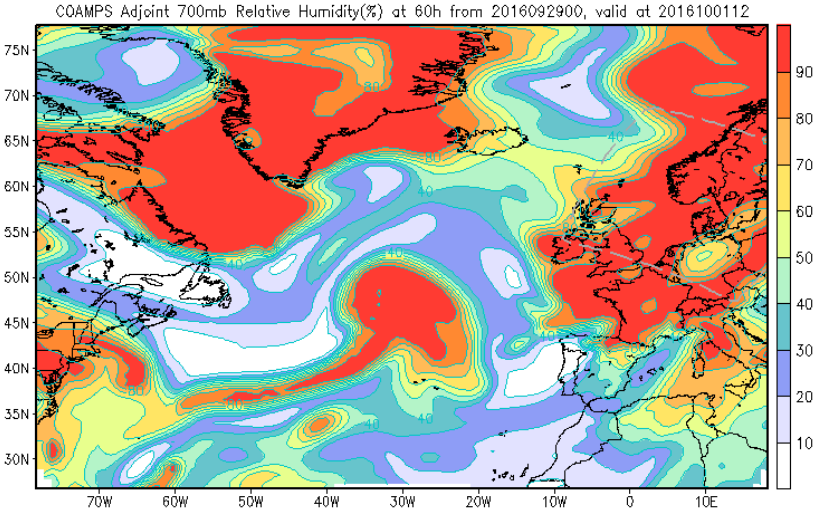
SLP, 10-m winds valid 12Z 1 OCT



850 U Sensitivitv valid 12Z 1 OCT



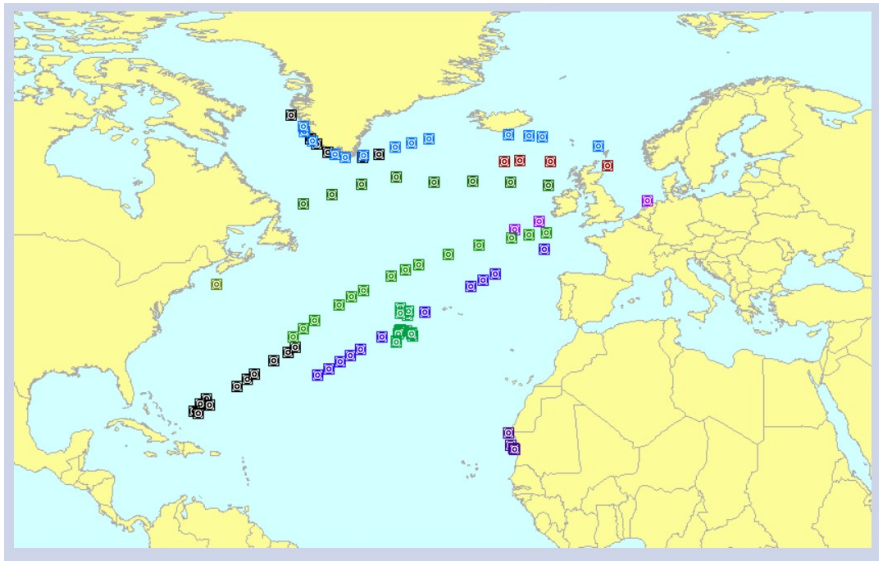
700 RH valid 12Z 1 OCT



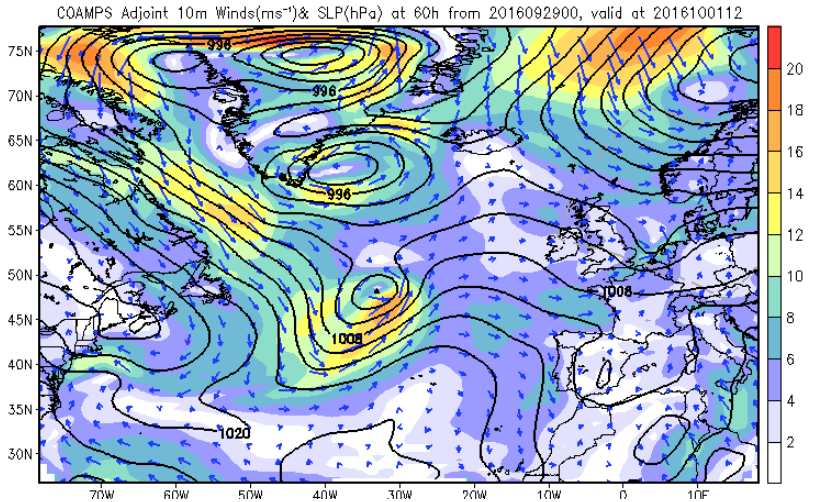
Location of final-time 24-h Sensitivity

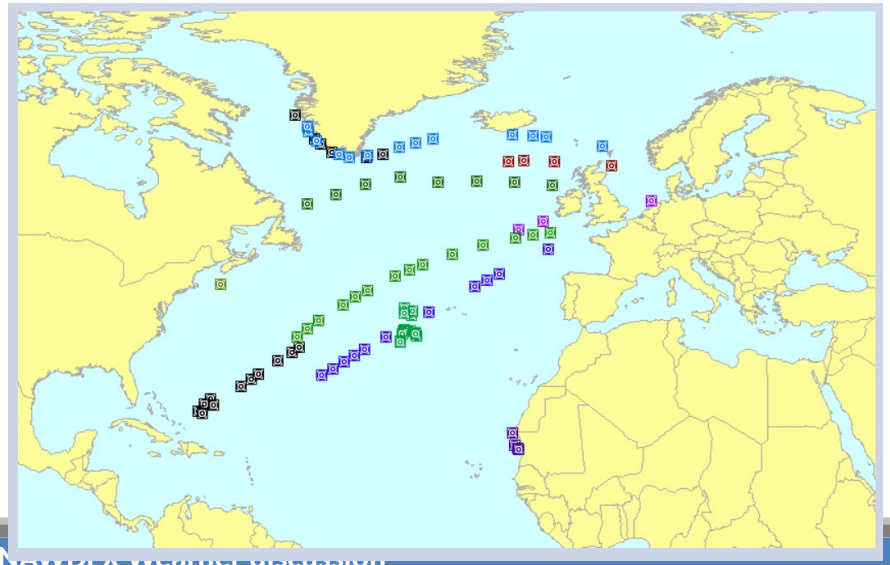
COAMPS Sensitivity (48h) Valid 12Z 1 Oct (Saturday)

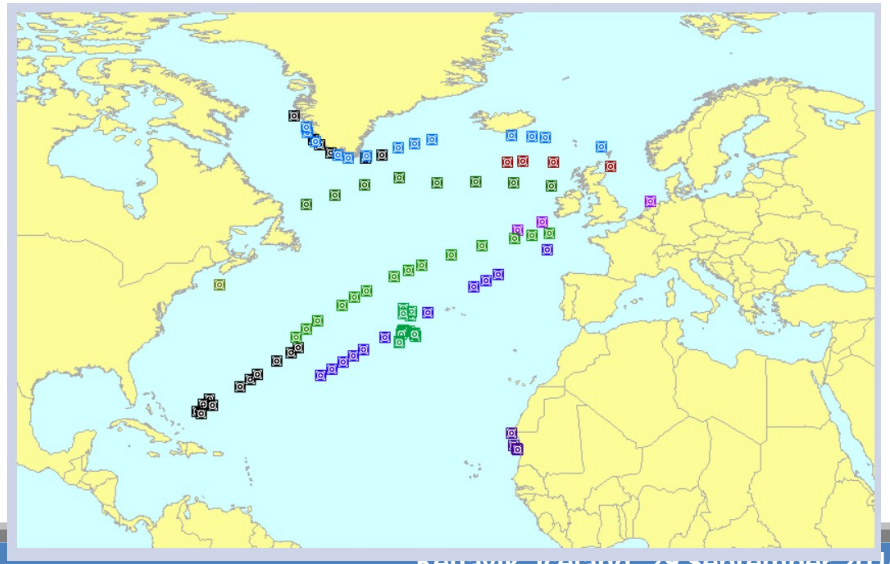
Radiosondes from ships



SLP, 10-m winds valid 12Z 1 OCT

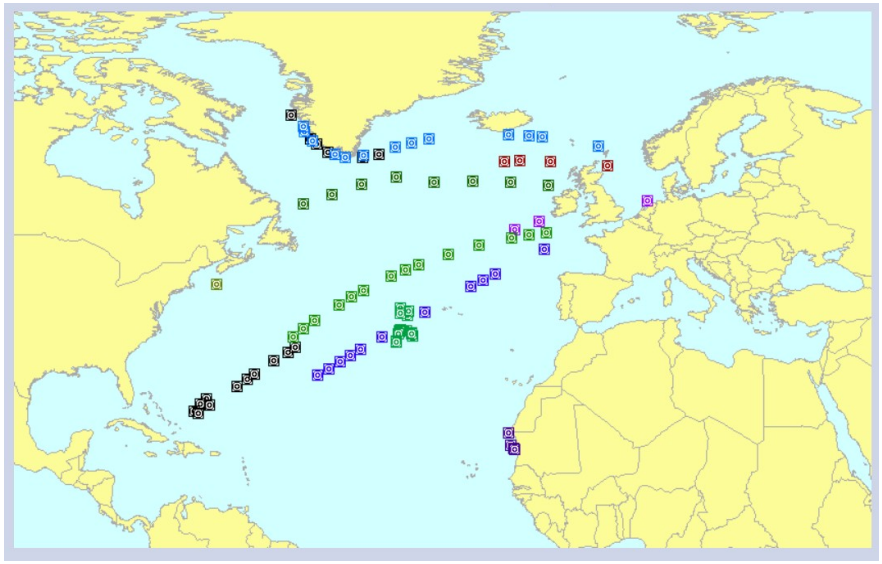




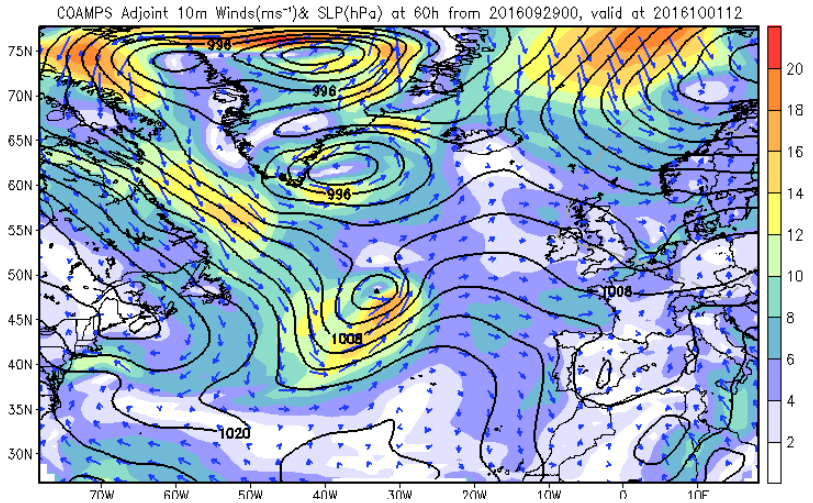


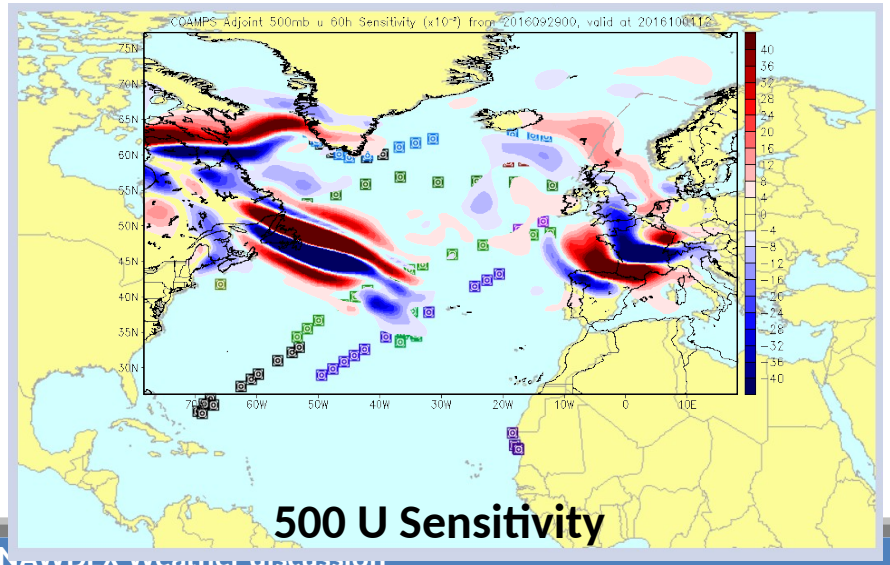
COAMPS Sensitivity (48h) Valid 12Z 1 Oct (Saturday)

Radiosondes from ships

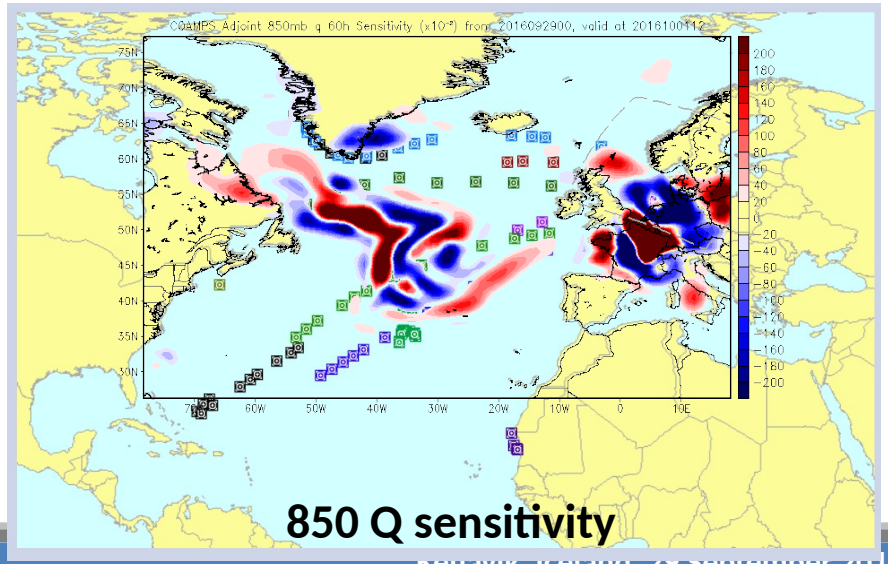


SLP, 10-m winds valid 12Z 1 OCT





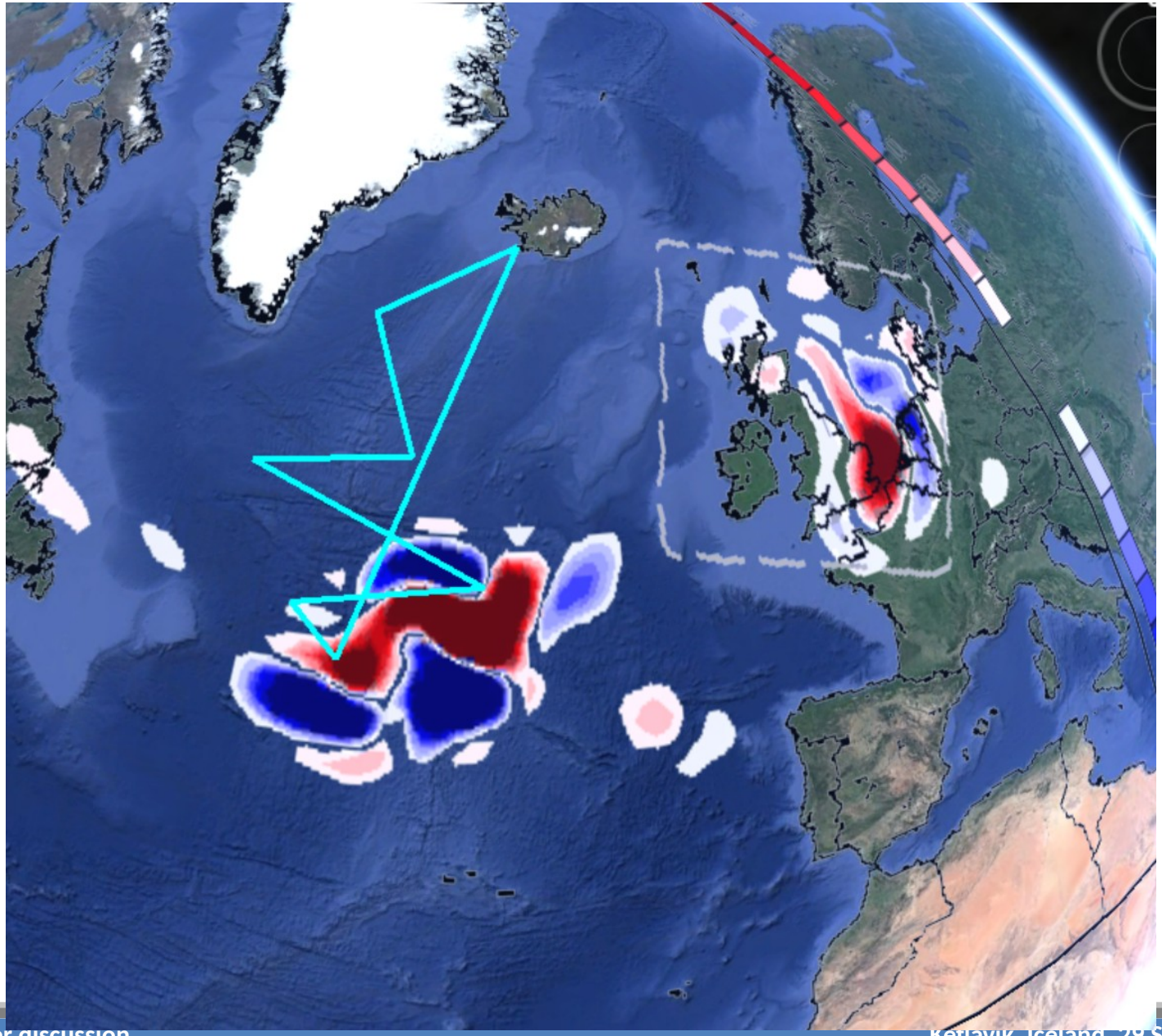
500 U Sensitivity



850 Q sensitivity

COAMPS Sensitivity (24h) Valid 12Z 1 Oct (Saturday)

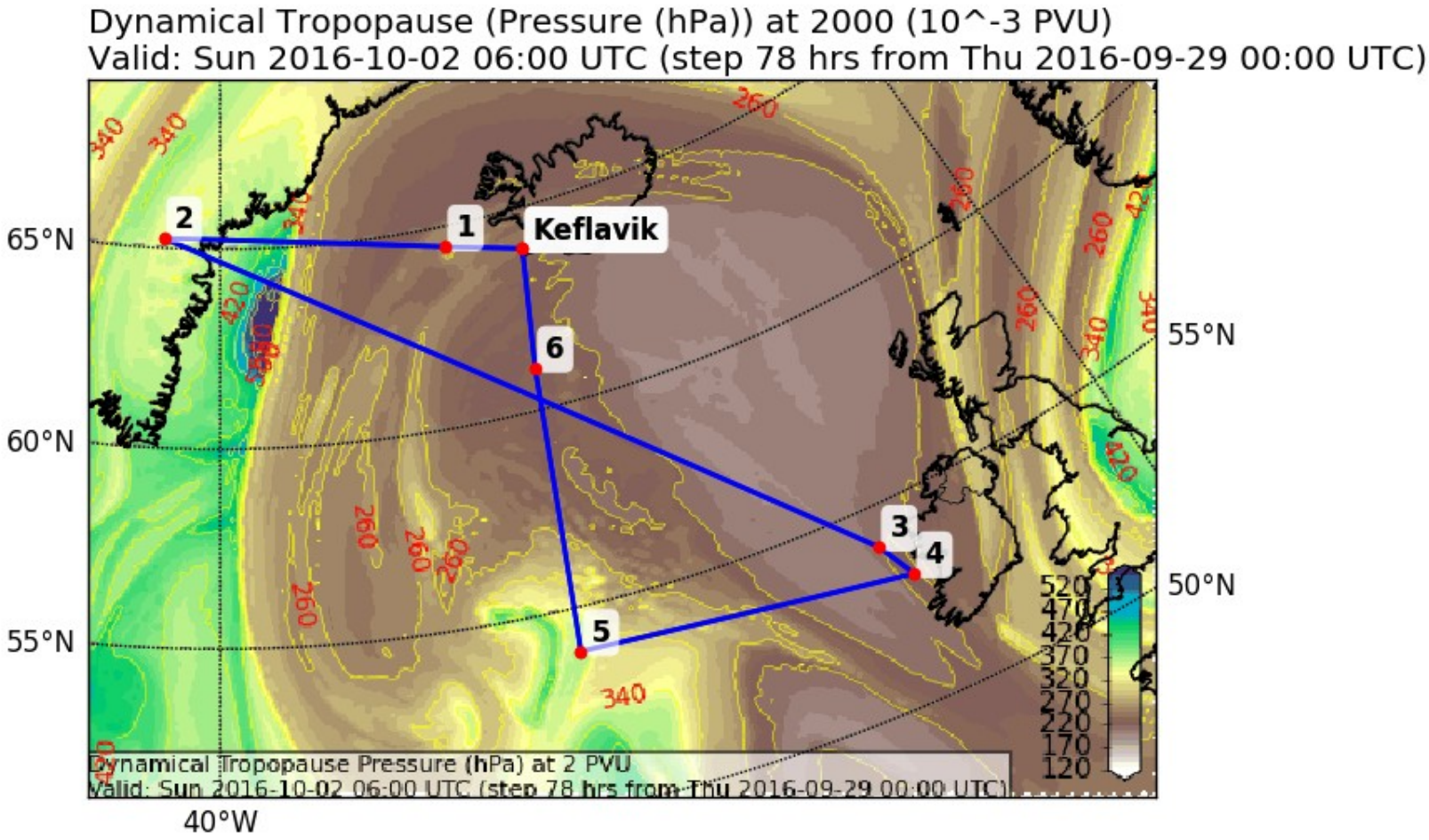
500-mb Water Vapor Sensitivity (to 24-h Rainfall Forecast over UK)

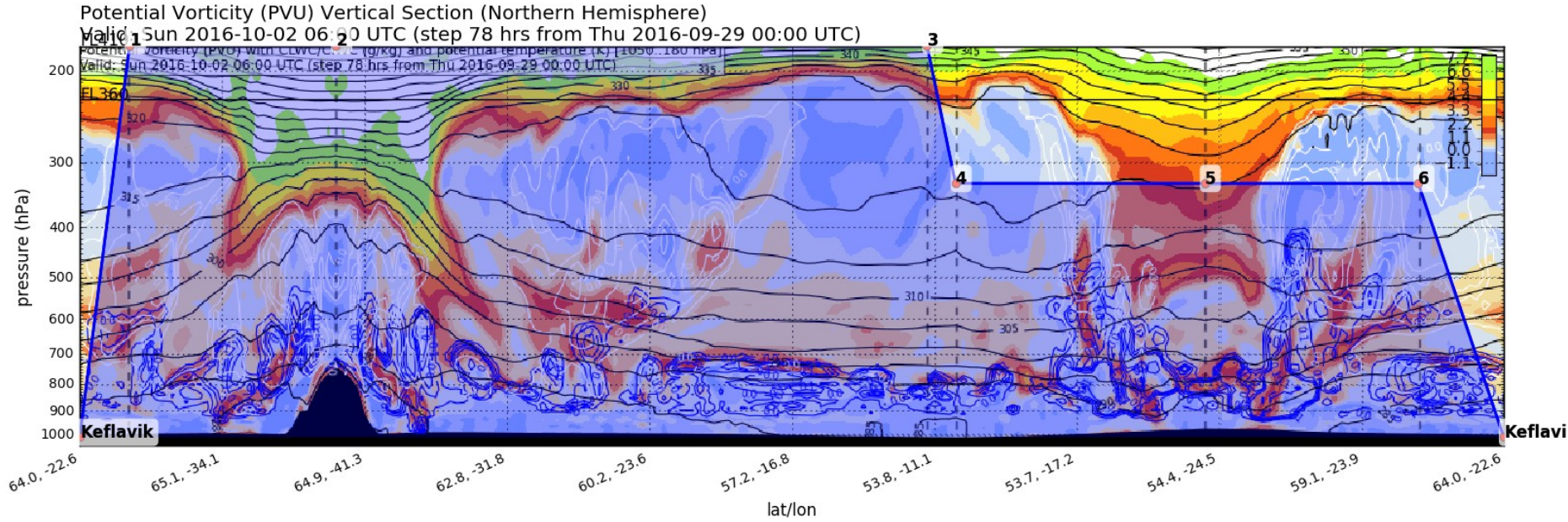


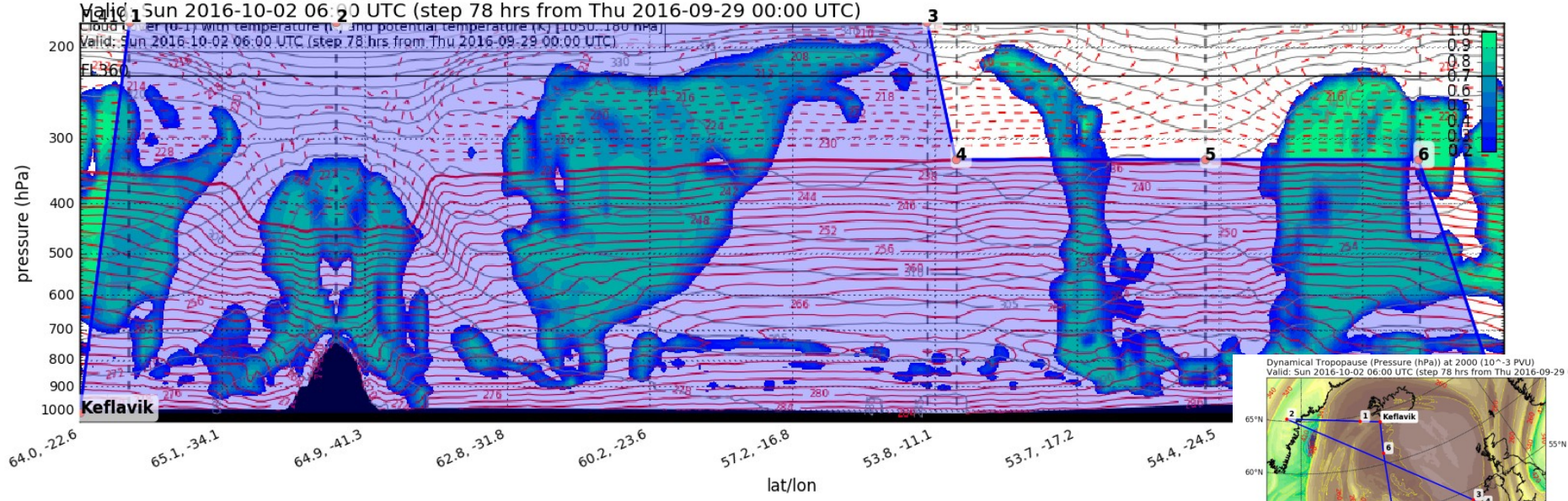
IOP7: HALO flight Sunday 2 Oct

Draft Objectives for IOP7 on Sunday 2 Oct 2016

- Sample the WCB outflow associated with the rapid cyclogenesis observed in IOP6 on Sat
  - Observe structure of 2 upper level jets and tropopause features incl. tropopause folds and finescale structure
  - Observe depth and variability of humidity in the ascending branch
  - Compare and contrast observations of the cyclone in differring phases of development (i.e., early rapid development stage on Sat and mature phase on Sun), and what are the implications for the WCB outflow
  - Sample regions around a cyclone that has relatively low intensity predictability (and higher position predictabilty)


Dynamical Tropopause (Pressure (hPa)) at 2000 (10^-3 PVU)
Valid: Sun 2016-10-02 06:00 UTC (step 78 hrs from Thu 2016-09-29 00:00 UTC)
Keflavik
1
2
3
4
5
6
65°N
60°N
55°N
55°N
50°N
40°W
520
470
420
370
320
270
220
170
120
Dynamical Tropopause Pressure (hPa) at 2 PVU
Valid: Sun 2016-10-02 06:00 UTC (step 78 hrs from Thu 2016-09-29 00:00 UTC)


Potential Vorticity (PVU) Vertical Section (Northern Hemisphere)
Valid: Sun 2016-10-02 06:00 UTC (step 78 hrs from Thu 2016-09-29 00:00 UTC)
pressure (hPa)
lat/lon
Keflavik
64.0, -22.6
65.1, -34.1
64.9, -41.3
62.8, -31.8
60.2, -23.6
57.2, -16.8
53.8, -11.1
53.7, -17.2
54.4, -24.5
59.1, -23.9

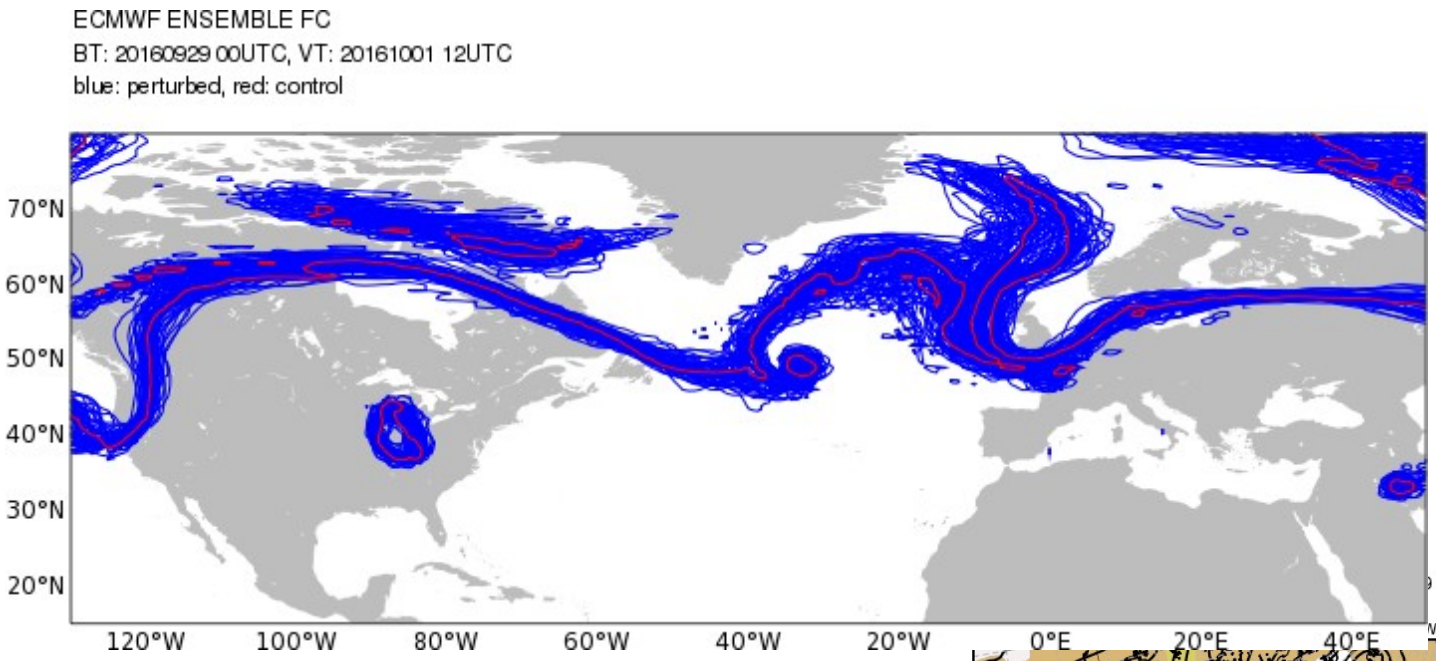

Cloud Cover (0-1) Vertical Section
Valid: Sun 2016-10-02 06:00 UTC (step 78 hrs from Thu 2016-09-29 00:00 UTC)
pressure (hPa)
lat/lon
Keflavik
64.0, -22.6
65.1, -34.1
64.9, -41.3
62.8, -31.8
60.2, -23.6
57.2, -16.8
53.8, -11.1
53.7, -17.2
54.4, -24.5

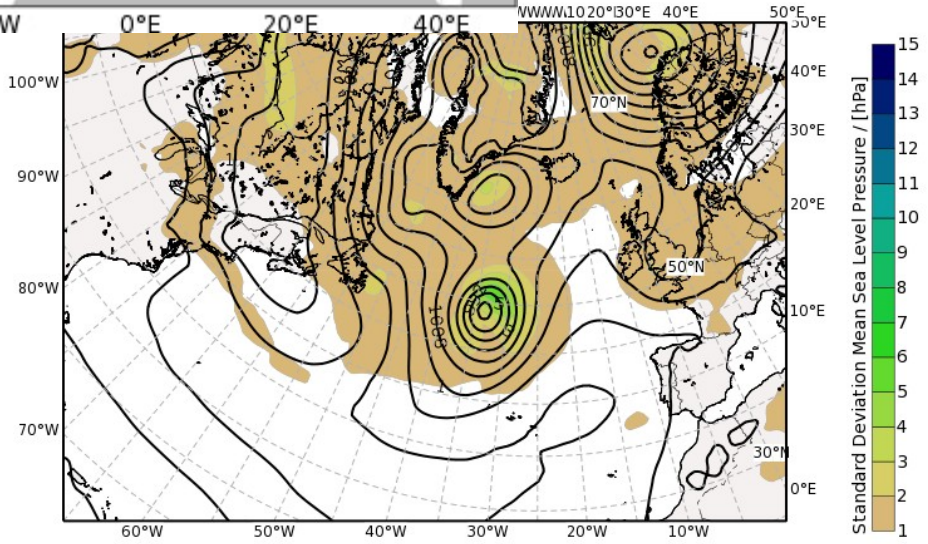
Dynamical Tropopause (Pressure (hPa)) at 2000 (10^-3 PVU)
Valid: Sun 2016-10-02 06:00 UTC (step 78 hrs from Thu 2016-09-29
Keflavik

Outlook

Outlook Sat 01/12Z to Thu 06/12Z : 2PVU@320K, MEAN & STDEV MLSP (based EC Ens 29/00Z)

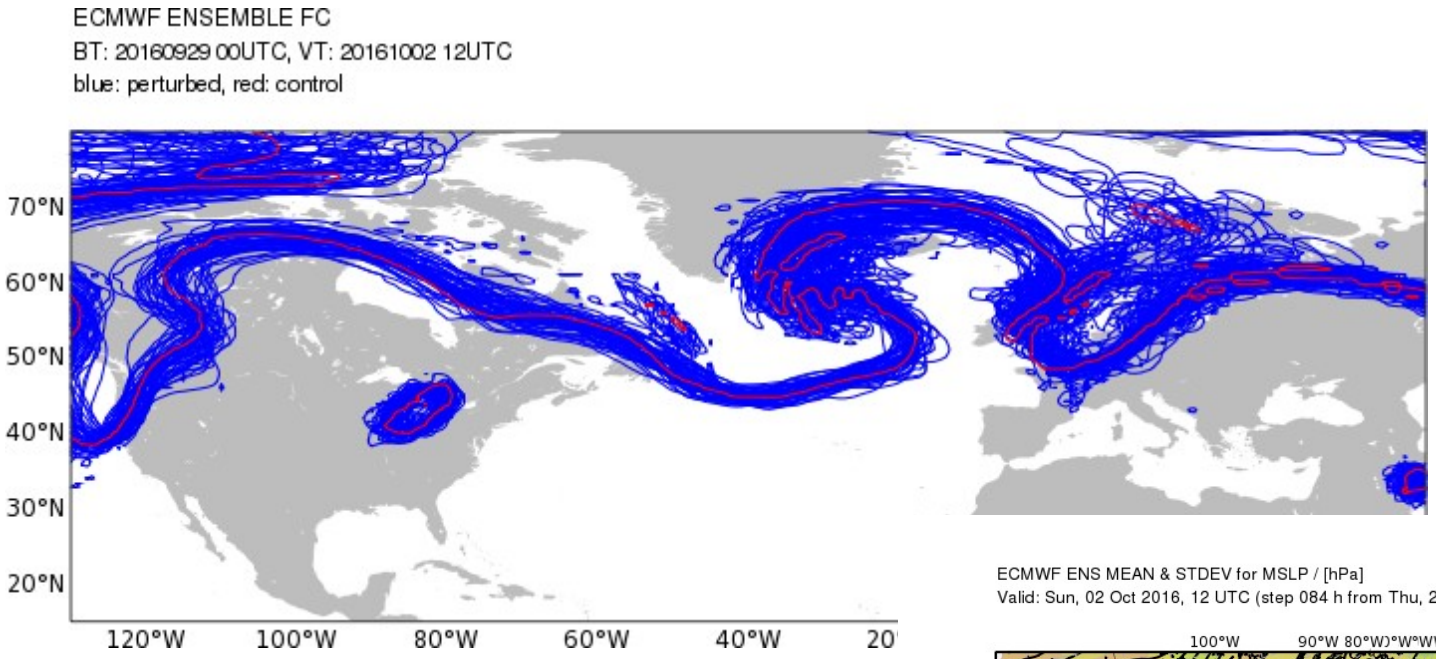
Sat 01/12Z

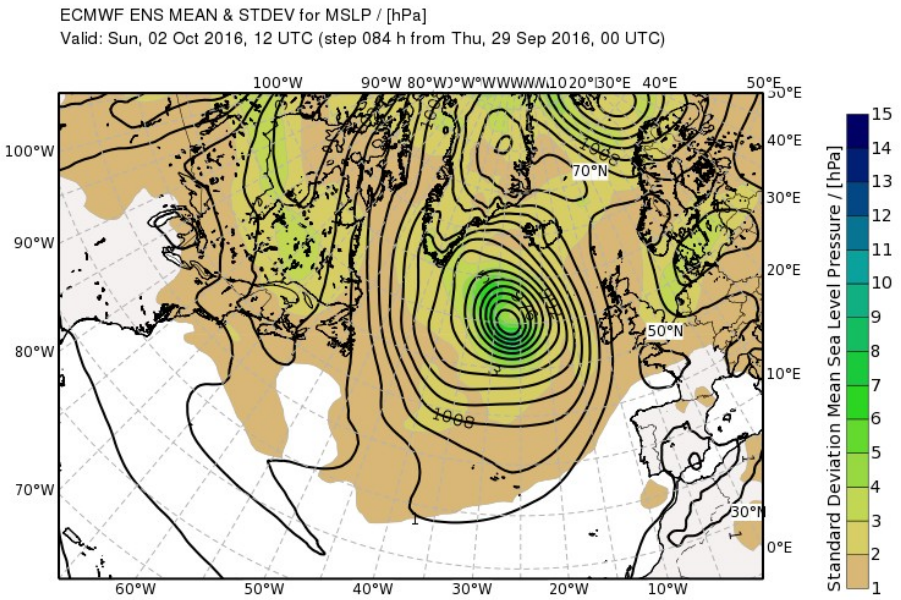




Outlook Sat 01/12Z to Thu 06/12Z : 2PVU@320K, MEAN & STDEV MLSP (based EC Ens 29/00Z)

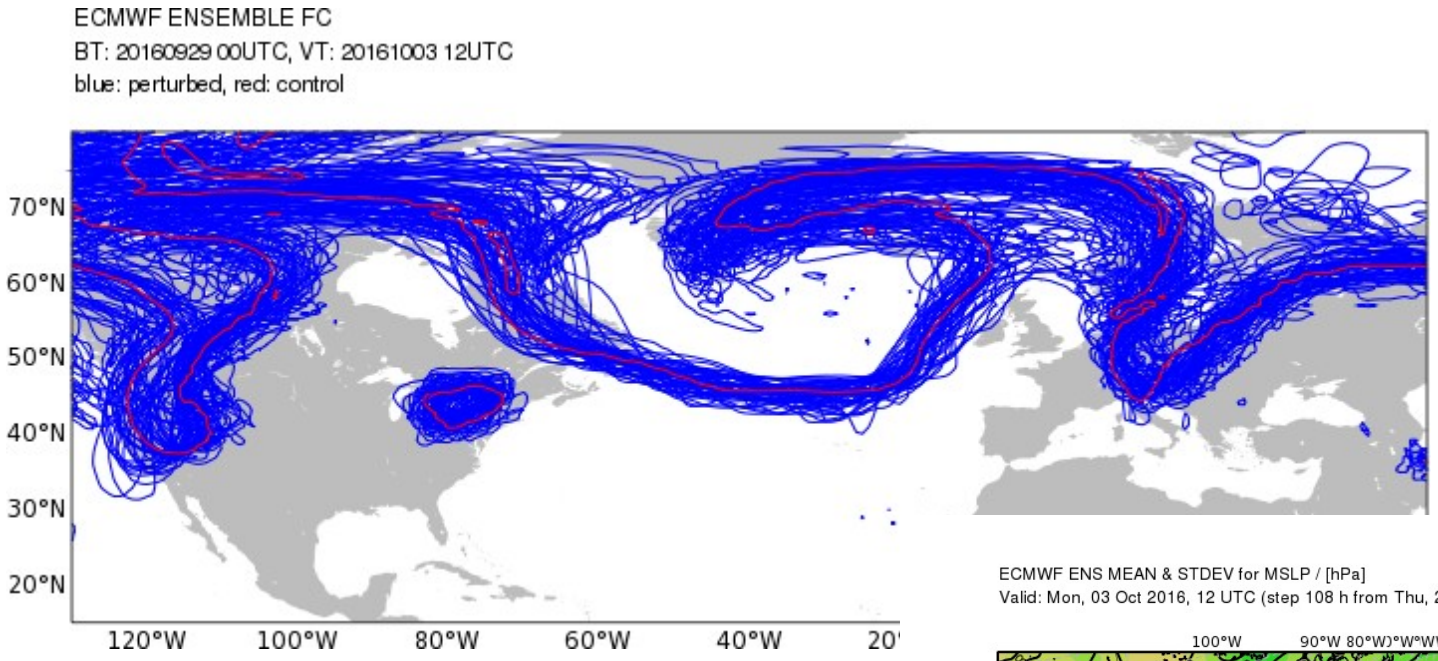
Sun 02/12Z

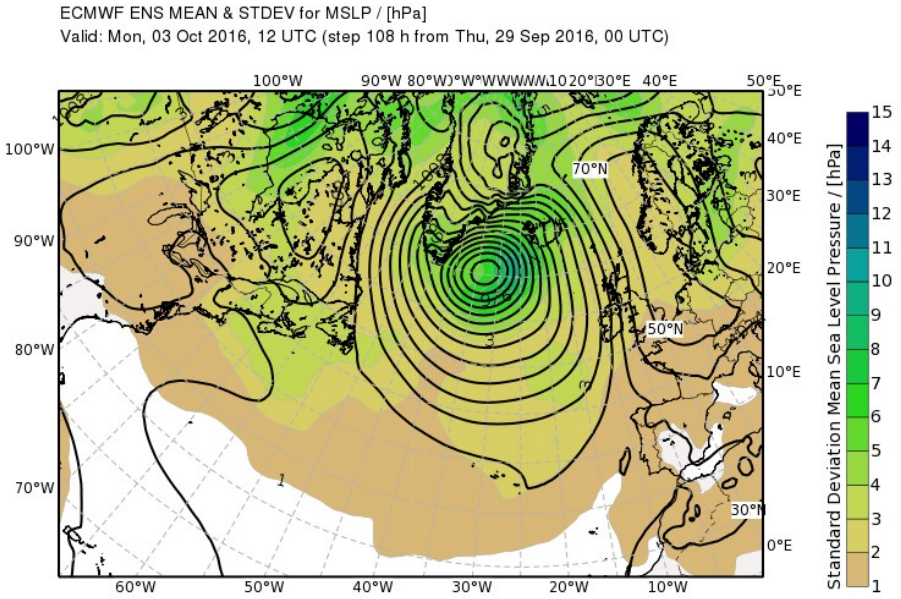




Outlook Sat 01/12Z to Thu 06/12Z : 2PVU@320K, MEAN & STDEV MLSP (based EC Ens 29/00Z)

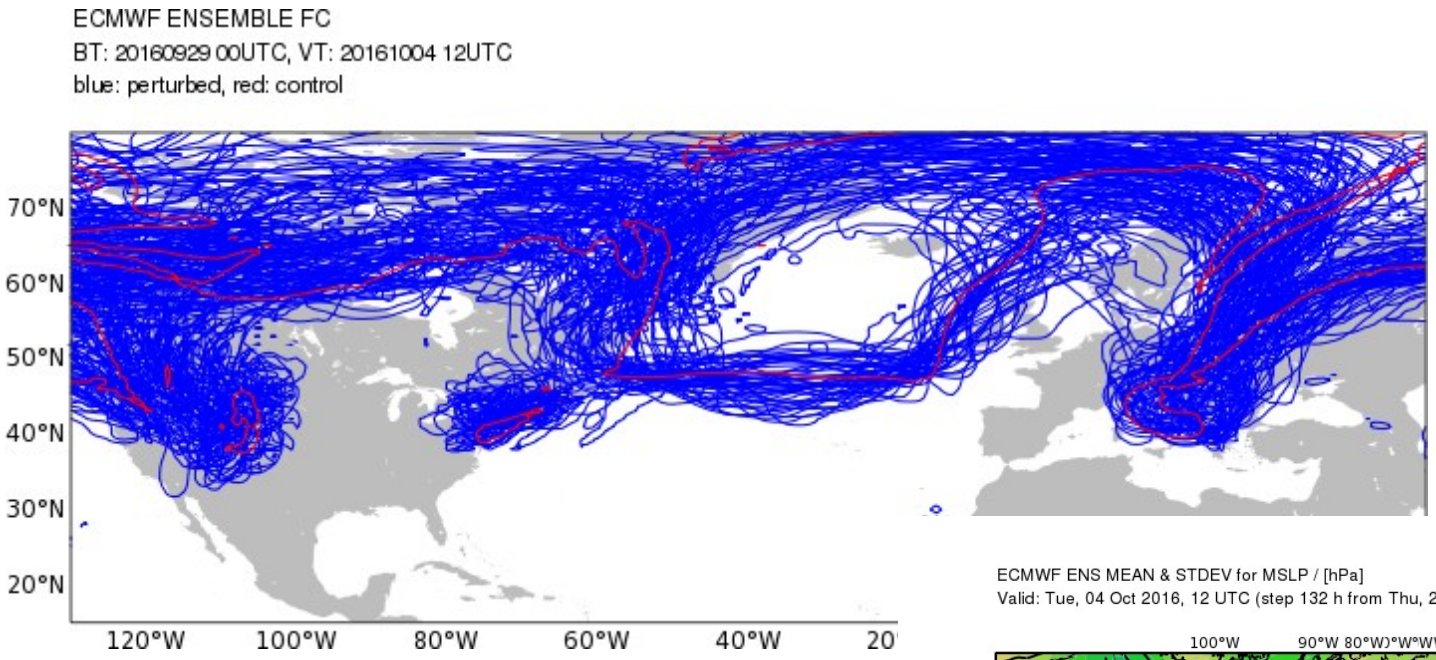
Mo 03/12Z

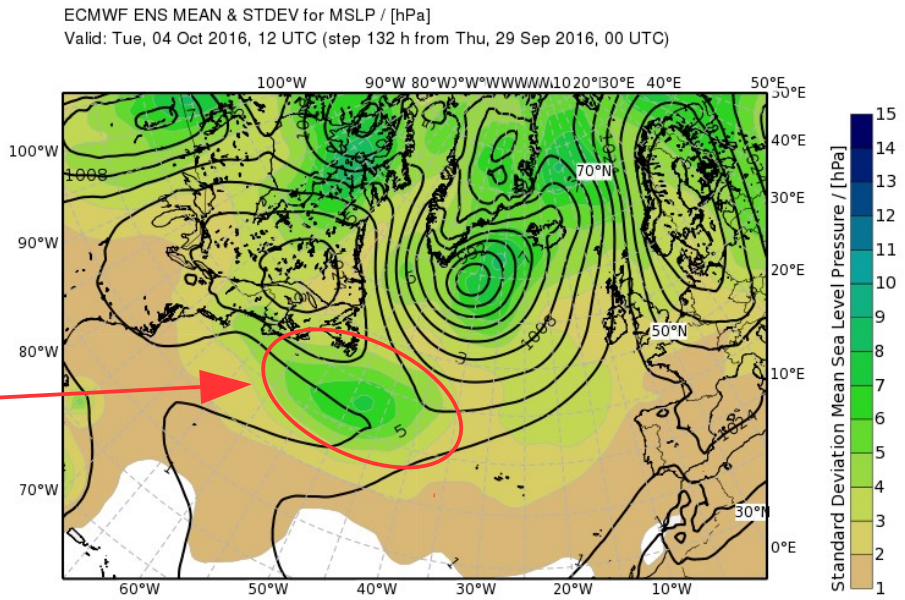




Outlook Sat 01/12Z to Thu 06/12Z : 2PVU@320K, MEAN & STDEV MLSP (based EC Ens 29/00Z)

Tue 04/12Z

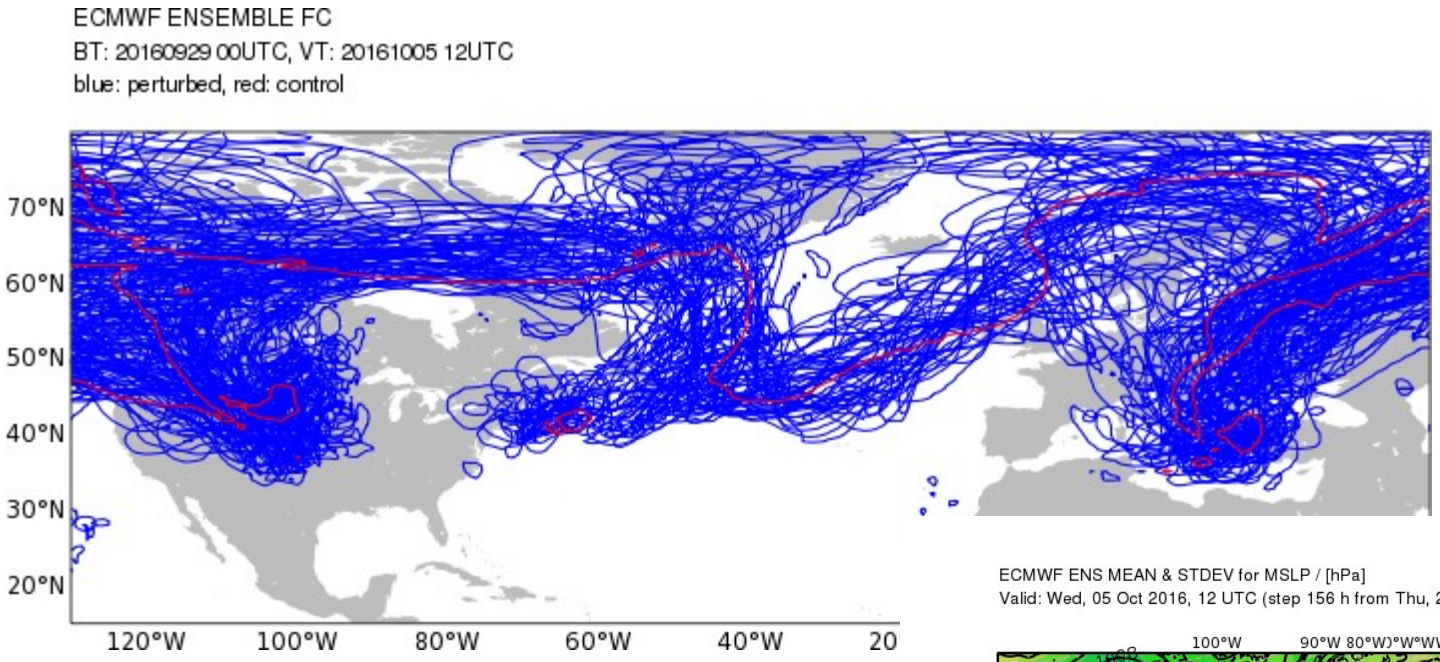


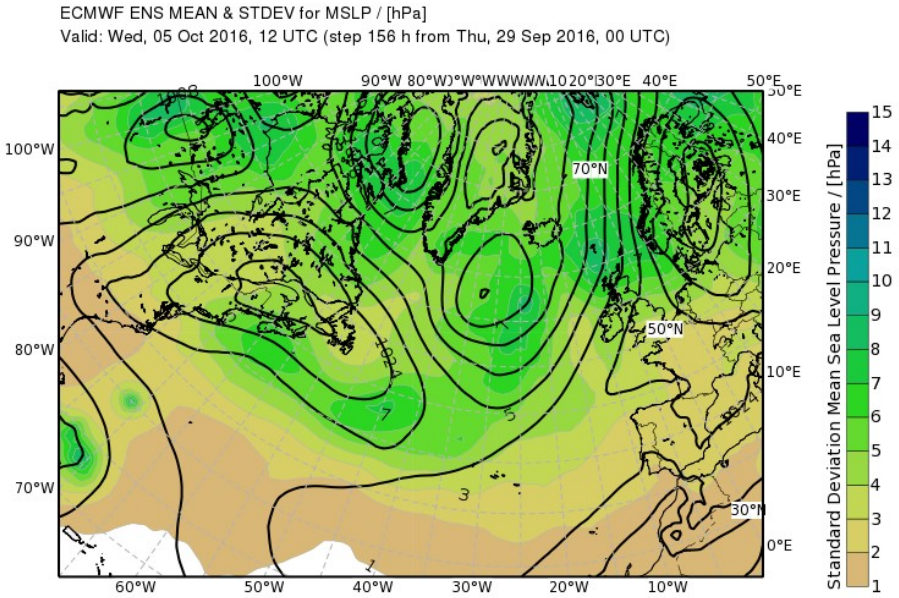


New cyclone development

Outlook Sat 01/12Z to Thu 06/12Z : 2PVU@320K, MEAN & STDEV MLSP (based EC Ens 29/00Z)

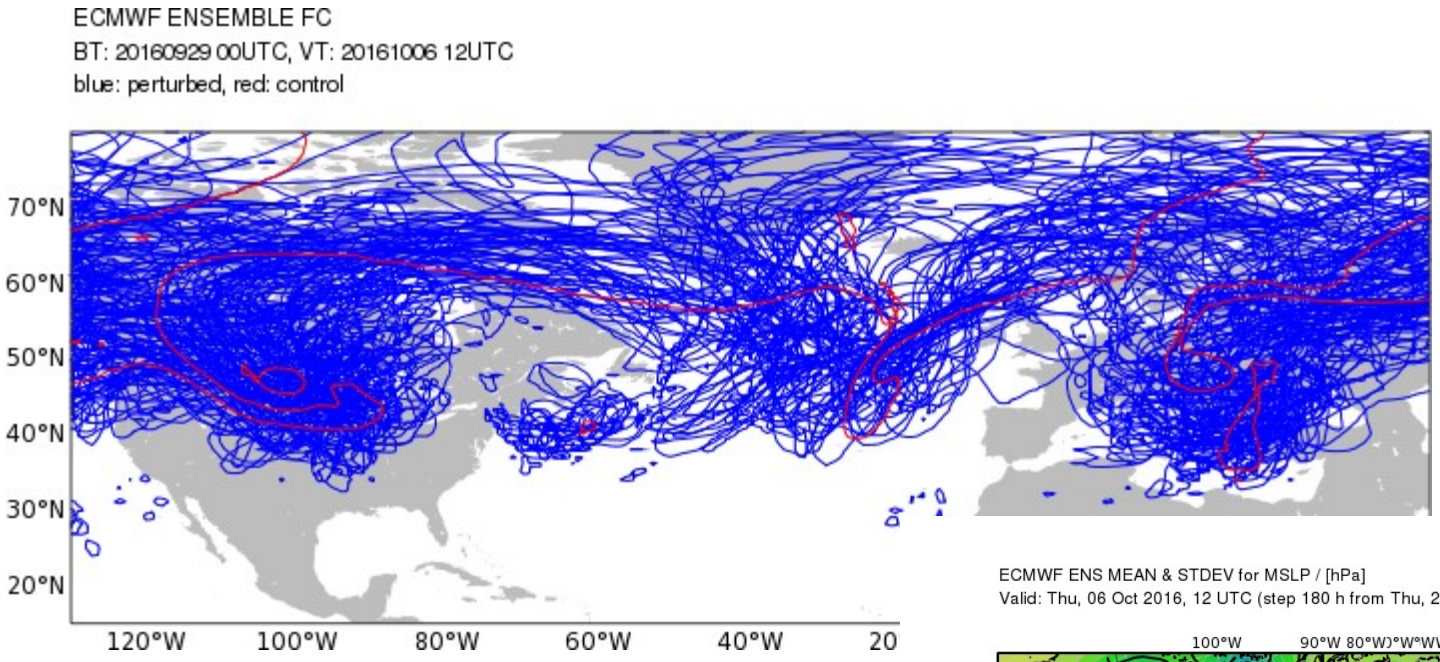
Wed 05/12Z

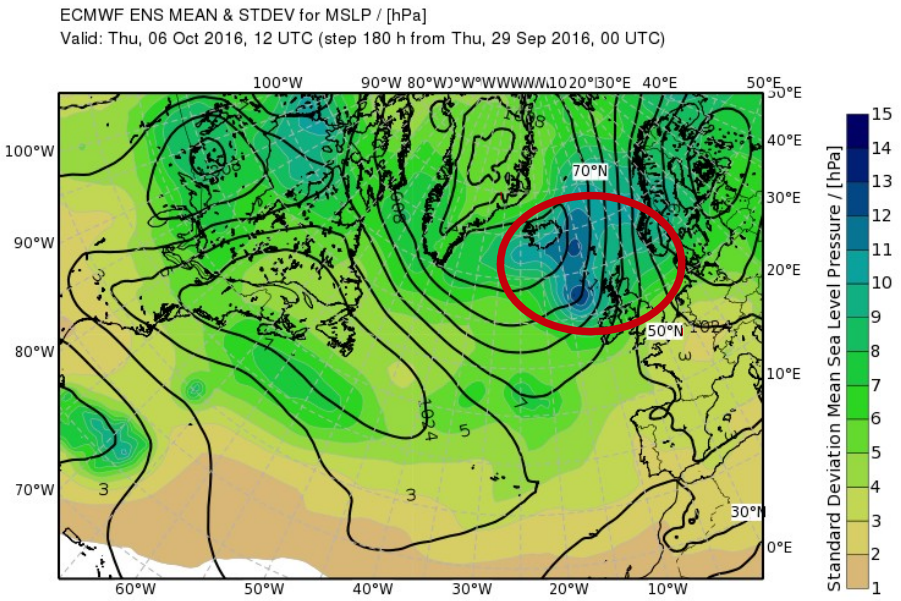




Outlook Sat 01/12Z to Thu 06/12Z : 2PVU@320K, MEAN & STDEV MLSP (based EC Ens 29/00Z)

Thu 06/12Z



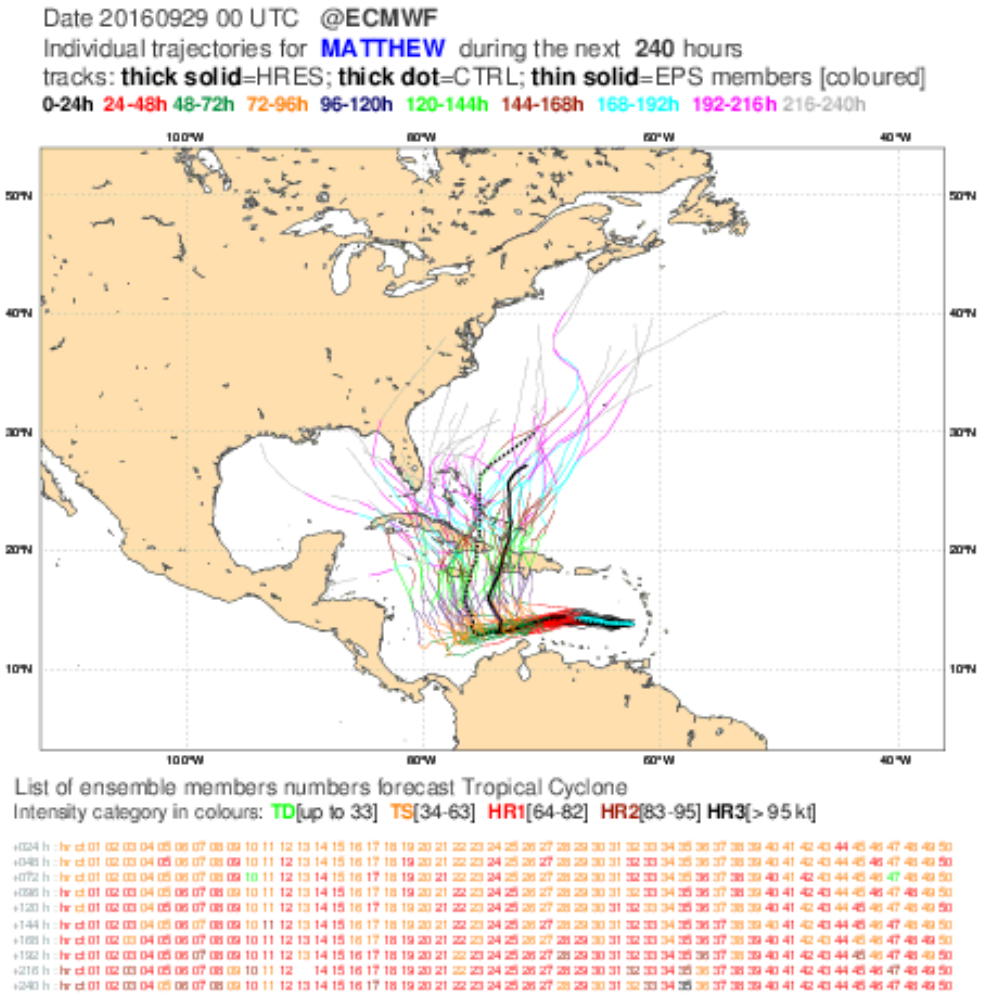


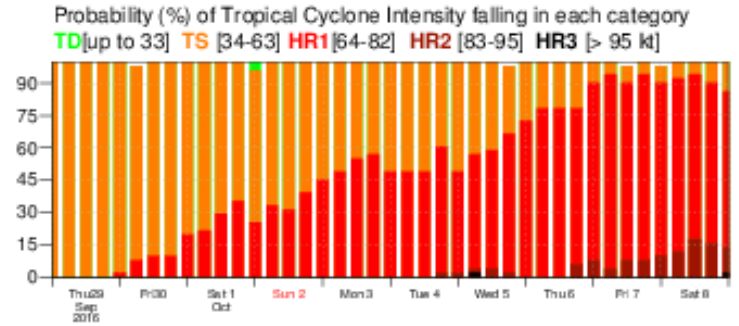
About 50% of members of both EC and GFS show strong cyclone development near Iceland on Wed-Thu

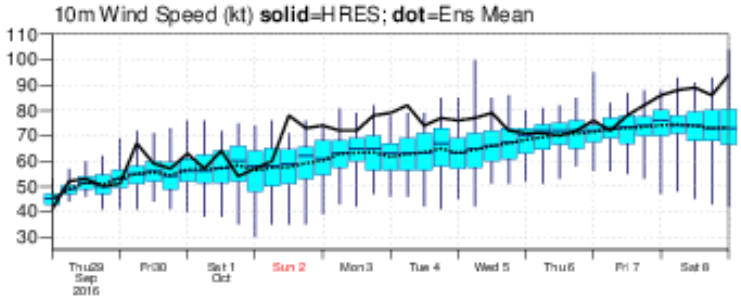
Summary

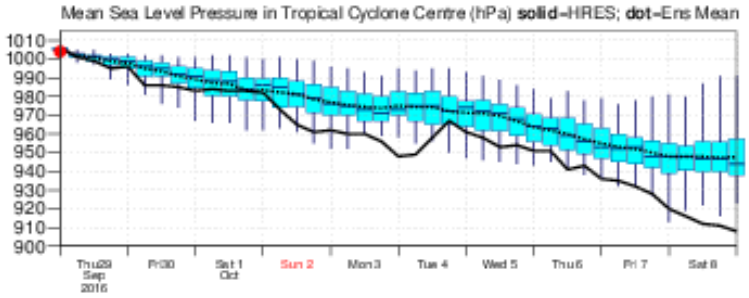
- HALO flight on Saturday, take-off 9:30 UTC
- HALO/Falcon flights on Sunday, take-off tbd

TC Matthew track forecast BT 29/00Z









BT29/00Z