



Synoptic Analysis: Thursday 22 September 2016

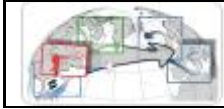
- A large-scale upper-level trough persists over Greenland and Iceland.
- Below the upper-level trough cyclone “Ursula” has reached its mature stage and became quasi-stationary, with its center over Iceland.
- A new frontal wave develops north of Newfoundland, fed by ongoing warm-air advection from the subtropics.

Forecast Day 1 for Friday 23 September 2016: planned mission

- The Newfoundland cyclone rapidly intensifies while moving eastward along the baroclinic zone. At noon it is located west of the UK, and minimum SLP amounts to about 980 hPa.
- A strong WCB is associated with the cyclone, with the inflow west of Portugal and the Bay of Biscay, a pronounced ascent region west of the UK, and the outflow centered to the south of Iceland.
- Planned mission: With HALO measure WCB ascent (coordinated leg with FAAM aircraft) west of the UK, and with HALO and Falcon the WCB outflow between Iceland and the UK.

Forecast Outlook

- On Saturday and Sunday 24-25 September the cyclone observed on Friday becomes again stationary near Iceland and replaces cyclone “Ursula”. Strong moisture transport in the wake of the cyclone results in heavy precipitation over the UK and Northern Europe between Saturday and Monday.
- A new cyclone forms near Newfoundland (“downstream cyclone”) on the continuously strong baroclinic zone and propagates eastward. In the subtropical North Atlantic tropical storm Karl intensifies, recurves and starts moving toward the midlatitudes. Between the two systems, an extremely strong jet with 300-hPa winds potentially exceeding 90 m s^{-1} is predicted to develop on Monday.
- The evolution of Karl and the downstream cyclone, and the large-scale flow they are embedded in, are very uncertain, with different scenarios:
 - (i) BT21/00 UTC: On Monday 26 September the DS cyclone is associated with an LC2-type upper-level wave (due to a strong cyclonic branch of the WCB outflow), and further downstream an elongated PV streamer over western Europe leads to heavy precipitation in the Alpine region. Subsequently the DS cyclone and Karl both intensify and move toward Iceland/Norway.
 - (ii) BT21/12 UTC: On Monday 26 September the flow associated with the DS cyclone is more zonal, Karl slower, and the PV streamer over western Europe less pronounced. TC Karl later merges with another tropical system, TC Lisa, propagates relatively slowly over the North Atlantic, explosively intensifies over the North Sea and becomes a severe winter storm that affects the North Sea and Baltic Sea region on Wednesday, 28 September.
 - (iii) BT22/00 UTC: On Monday 26 September the flow over the western and central North Atlantic is even more zonal than in the BT21/12 run, Karl weaker, and the PV streamer over western Europe even less pronounced. Karl subsequently overtakes Lisa



NAWDEX 2016
Weather summary

Date: 22. September 2016
Author: H. Binder/H. Wernli

and rapidly propagates northeastward along the straight jet as a diabatic Rossby Wave. It explosively intensifies over the Norwegian Sea and becomes a severe winter storm that affects Norway on Tuesday-Wednesday 27-28 September.

- Although the synoptic evolution next week is uncertain, both TC Karl and the downstream cyclone are associated with a pronounced WCB, with strong diabatic ridge amplification by the WCB outflow consistently predicted south of Iceland, reaching high isentropic levels (340 K).

Scientific discussion

- Today the meeting was short due to a quicklook meeting starting at 16.30 UTC.