

COPS Weather Summary

13 August 2007

Issued: Monday 13 August 09:00 UTC

Valid: Monday 13 August 09:00 UTC to Saturday 17 August 00:00 UTC

Forecasters: Johannes Dahl

Synoptic Overview

An upper trough currently south of Greenland is progressing eastward and will merge with the deep large-scale upper low that is centered over the northern British Isles. This Atlantic trough will intensify as it tracks along the southern periphery of the British large-scale low and maintain vigorous surface cyclogenesis. Another vorticity maximum will round the base of the large-scale low early on Wednesday, resulting in one large and unseasonably intense upper trough over western Europe by Wednesday afternoon. The surface low mentioned above will move into the northern North Sea with a well-defined cold front trailing southwards roughly along the continental-European northwest coast into northern Iberia on Wednesday 12 UTC, per GFS 00UTC. Should the warm sector air mass ahead of this front destabilize sufficiently, an active severe convective weather day could occur over portions of western Europe, including the COPS domain, on Wednesday evening and night.

Analysis and Forecast of Synoptic Controls in the COPS Region

Monday 13 August

The mesoscale details over the COPS region are somewhat complicated. The satellite loop reveals two cloud bands, one of which is associated with the storms that occurred during the past night. This cloud band appears to have been associated with a vorticity maximum which is currently entering western Germany. The upstream cloud band is correlated with a frontogenesis signal in the latest GFS analyses, which is tied to a weak cold front curving from central France into western Germany.

Though the COPS region appears to remain in the weakly unstable pre-frontal air mass today, subsidence in the wake of the vorticity maximum moving into Germany should reduce the depth of the convective clouds after around midday/early afternoon. The mesoscale model suite indicates a complete ceasing of convective precipitation, while the GFS maintains rain showers throughout the day. However, the previous GFS runs have not been too stable with respect to the precip amounts for Monday, so the (rather stable) mesoscale models are trusted more for today. Still, isolated thunderstorms or two could develop over the mountains in the late afternoon and evening hours, when large-scale vertical motion will become more upward again. This activity could even last into the night.

Tuesday 14 August

A weak large-scale ridge will overspread the COPS area during the day and should limit the potential for deep convection. Expect shallow boundary-layer convection and increasing mid/upper level cloudiness in response to onsetting warm-air advection.

Wednesday 15 August

Warm advection will be in full progress early in the day, and it should be accompanied by mid/upper level cloudiness, partly of convective nature. The latest GFS run (00 UTC) places most of the precipitation and cloudiness north of the COPS area now, allowing for nearly unimpeded insolation and strong surface heating over the COPS domain. This will result in moderate CAPE in the late afternoon and evening hours, aided by mid-level cooling owing to large-scale ascent. In this simulation, thunderstorms initiate over the COPS area in the late afternoon/early evening ahead of the cold front. Deep-layer and low-level shear would be more than adequate for rapid severe evolution, including upscale growth into a linear, severe-wind gusts producing MCS. Vigorous low-level shear, large storm-relative helicity and low cloud bases would be supportive of low-level rotation with any isolated cell that forms. However, this simulation is the most aggressive one amongst the past few runs, and an increase of warm-sector cloudiness/precipitation would drastically reduce the convective threat.

Thursday 16 August

With the passage of the cold front on Thursday morning, mainly stratiform rain, partly augmented convectively, will likely set in and last through most of the day and possibly through the night. Additional elevated/imbedded thunderstorms may occur.

Friday 17 August

The rain should cease in the early morning hours. The polar air appears to remain rather shallow, but could be mixed deeply enough with insolation to allow for the development of rain showers.

Extended Outlook

It seems that the COPS domain will remain close to the front which will have stalled along the Alps. This suggests that COPS will neither be affected by the warm/moist unstable air mass to the south of the front, nor by deep polar air farther to the northwest. GFS predicts some precipitation, which is due partly to comparatively shallow showers in the cool air, and also to precipitation generated in the warm air which is residing atop the shallow polar air. Neither of these scenarios seem to be very interesting for COPS.

Today, Monday 13 August

Time/location of first convective cloud development	Shallow Cu's have developed already and should continue to increase in depth during the next few hours.
Time/location of convective storm initiation	Isolated convective storms developing around midday or early afternoon, most likely over the mountains.
Mode/coverage/evolution	Singular cells or small, disorganized clusters.
Cloud base	Around 1000 m.
Storm motion	Northeastward at 5-10 m/s
Maximum temperature	Around 24 °C in the Rhine Valley.
Precipitation	Locally up to 20 mm
Severe weather threat	Low.

Tuesday 14 August

Time/location of first convective cloud development	Convective temperature should be reached in the late morning hours, after shallow fog layers have mixed out, resulting in scattered boundary-layer cumuli.
Time/location of convective storm initiation	-
Mode/coverage/evolution	-
Convective cloud base	1000 – 1250 m.
Storm motion	-
Maximum temperature	Up to 26 °C.
Precipitation	-
Severe weather threat	Low.

Wednesday 15 August

Time/location of first convective cloud development	Some cumulus clouds developing during the morning hours in addition to mid-/high-level cloudiness.
Time/location of convective storm initiation	If CAPE is to develop, surface-based storms would probably initiate late in the afternoon/evening.
Mode/coverage/evolution	If storms develop, rapid evolution into a linear system, including bow echoes, is possible. Those cells that remain isolated have potential of becoming supercellular.
Convective cloud base	Ca. 750 m
Storm motion	To the northeast, 15 – 20 m/s; bow echoes and supercells – if they are to develop – may be faster and exhibit deviant motion.
Maximum temperature	24 to 30 °C in the Rhine Valley, depending on the cloudiness (see text above).
Precipitation	Up to 30 mm locally
Severe weather threat	Potentially quite high, due mainly to severe wind gusts. Supercells

would pose an additional threat mainly for large hail.

Thursday 16 August

Time/location of convective storm initiation, Mode/coverage, Evolution	-
Maximum temperature	18°C
Precipitation	30 to 40 mm
Severe weather threat	Low.

Friday 16 August

Time/location of convective storm initiation, Mode/coverage, Evolution	Decreasing stratiform cloudiness and rain in the early morning. Subsequent development of small and medium-sized convective clouds which may produce showers, especially during the second half of the day.
Maximum temperature	Up to 19 °C in the Rhine Valley.
Precipitation	5-10 mm.
Severe weather threat	Low.

Suggestions for IOP's and down days

The lack of deep convection on Tuesday does not make it a very interesting candidate for an IOP. Though Wednesday is still plagued with several uncertainties, chance of widespread, possibly severe convective storms exists and an IOP is advised. Thursday and Friday will likely not be interesting for COPS as no deep convection is anticipated any more.