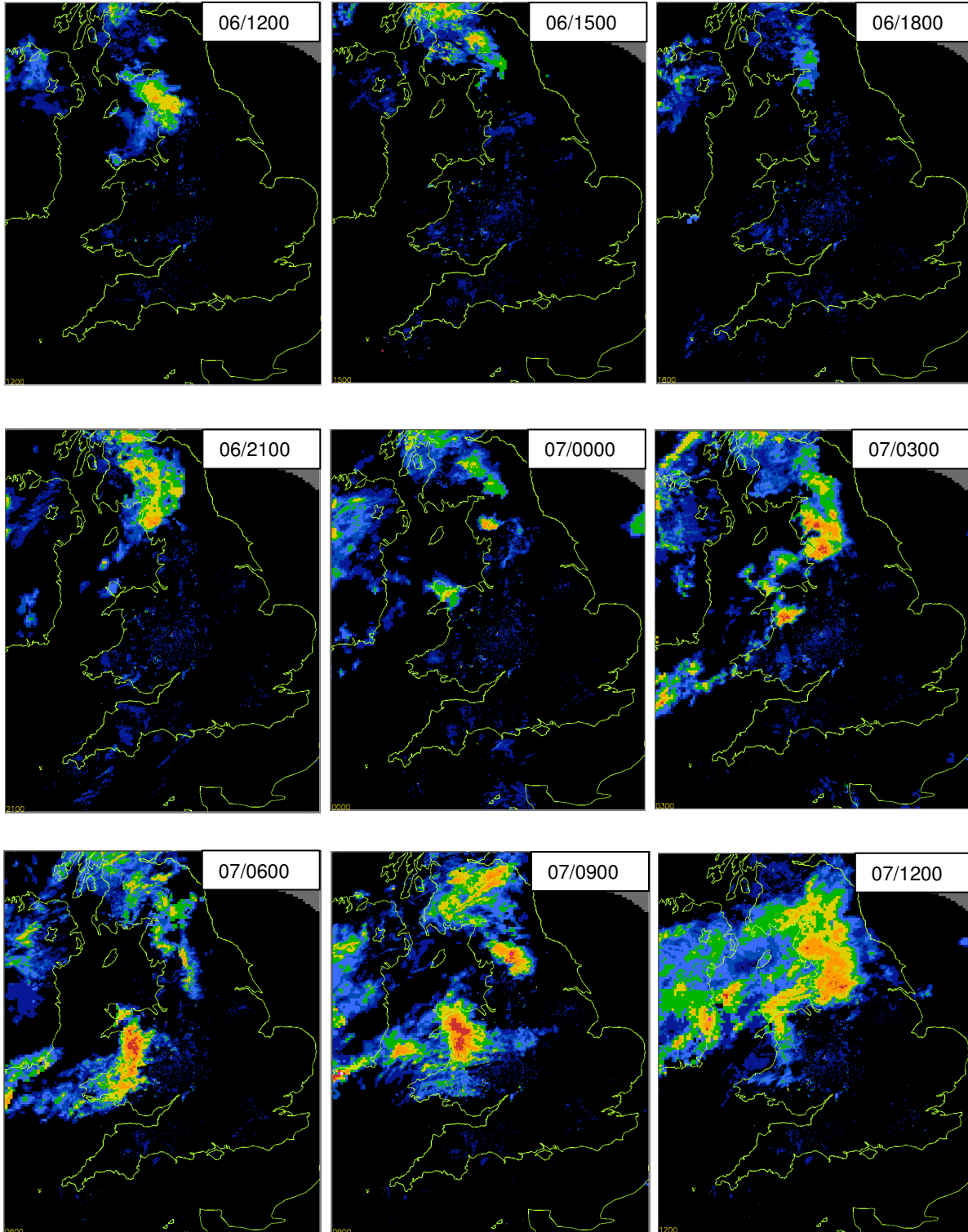
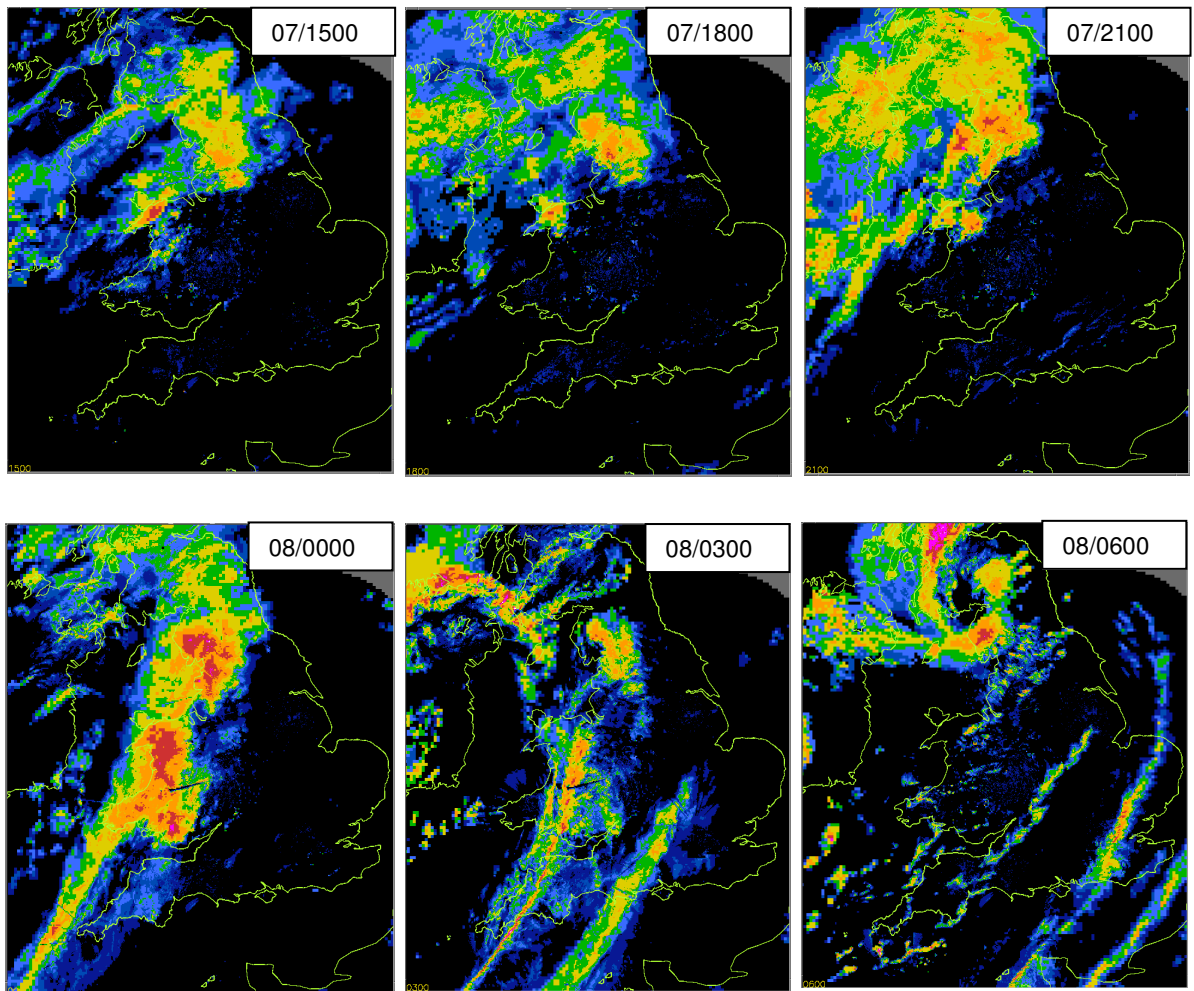


Figure 3-17: Met Office radar rainfall rates shown at three hourly intervals from 1200 UTC 6 to 0600 UTC 8 January. Displays are colour coded such that blue represents rainfall rates <1 mm/h, green 1-2mm/h, yellow 2-4mm/h, orange 4-8mm/h, red 8-16mm/h and magenta 16-32mm/h. Each image is a quality controlled composite from several radars designed to show returns at 1km resolution close to radar sites decreasing to 2km and 5km with increasing distance from the radars.





Between 1200 and 1800 UTC on 6 January the wet-bulb temperature in the western Irish Sea had increased by over five degrees. As this warmer air was lifted over the Cumbrian fells by the strengthening south-westerly wind that evening it produced an increase in low cloud cover (see Table 3-4) and heavy rain. Another pulse of warmer air came through just after midnight, however by 0600 UTC, air with a lower wet-bulb temperature, but still saturated with extensive low cloud, was advecting into the region and decreasing the rainfall intensity as shown by the radar comparing the 0300 and 0600 UTC images. However, at 0600 UTC wet-bulb temperatures were already rising again in the south-eastern Irish Sea and by 0900 UTC this warm and saturated air (moving northeast at about 70 knots) was causing heavy rain over the high Pennine region. By 1200 UTC 7 January the waving cold front had moved south to lie less than 100km from Cumbria. The location of the cold front is quite noticeable on the 1200 UTC wet-bulb temperature chart lying in a region of strong gradient with cold air to the north. The cold front rain can be seen in the radar pictures over Northern Ireland from 1800 UTC 6 January to 0900 UTC 7 January. By 0900 UTC the frontal rain was starting to get heavier and by 1200 UTC there were large areas of frontal rainfall greater than 0.5mm/hr moving into Cumbria with the seeder/feeder mechanism in full swing by this time. Very heavy rain then persisted all afternoon and evening in association with the waving cold front and feeder/seeder processes. Around 0000 UTC the cold front began to push through and the wind swung round to the west as the colder polar air (shown as blue and white in the wet-bulb temperature maps) began to push in.