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Supplement of

Numerical simulation of a rapidly developing bow echo over northeastern Poland on 21nAugust 2007 using near-grid-scale stochastic convection initiation

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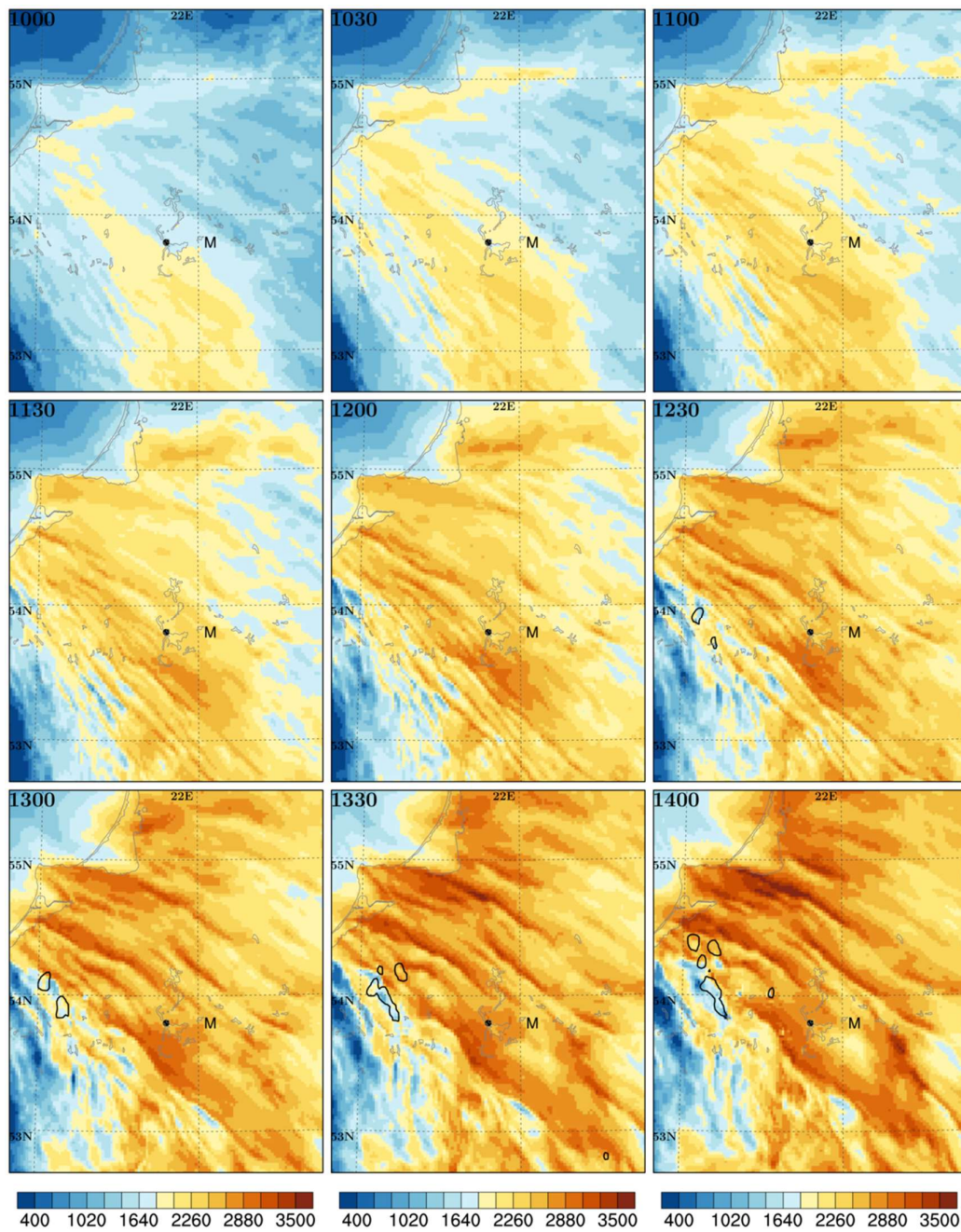


Figure S1: EX forecast of MCAPE (color, J kg^{-1}) in the vicinity of northeastern Poland on 21 August 2007; black contour shows pseudo-reflectivity of 30 dBZ at altitude of 3000 m, black dot shows the position of Mikolajki (M). UTC hour in upper-left corner of every plate.

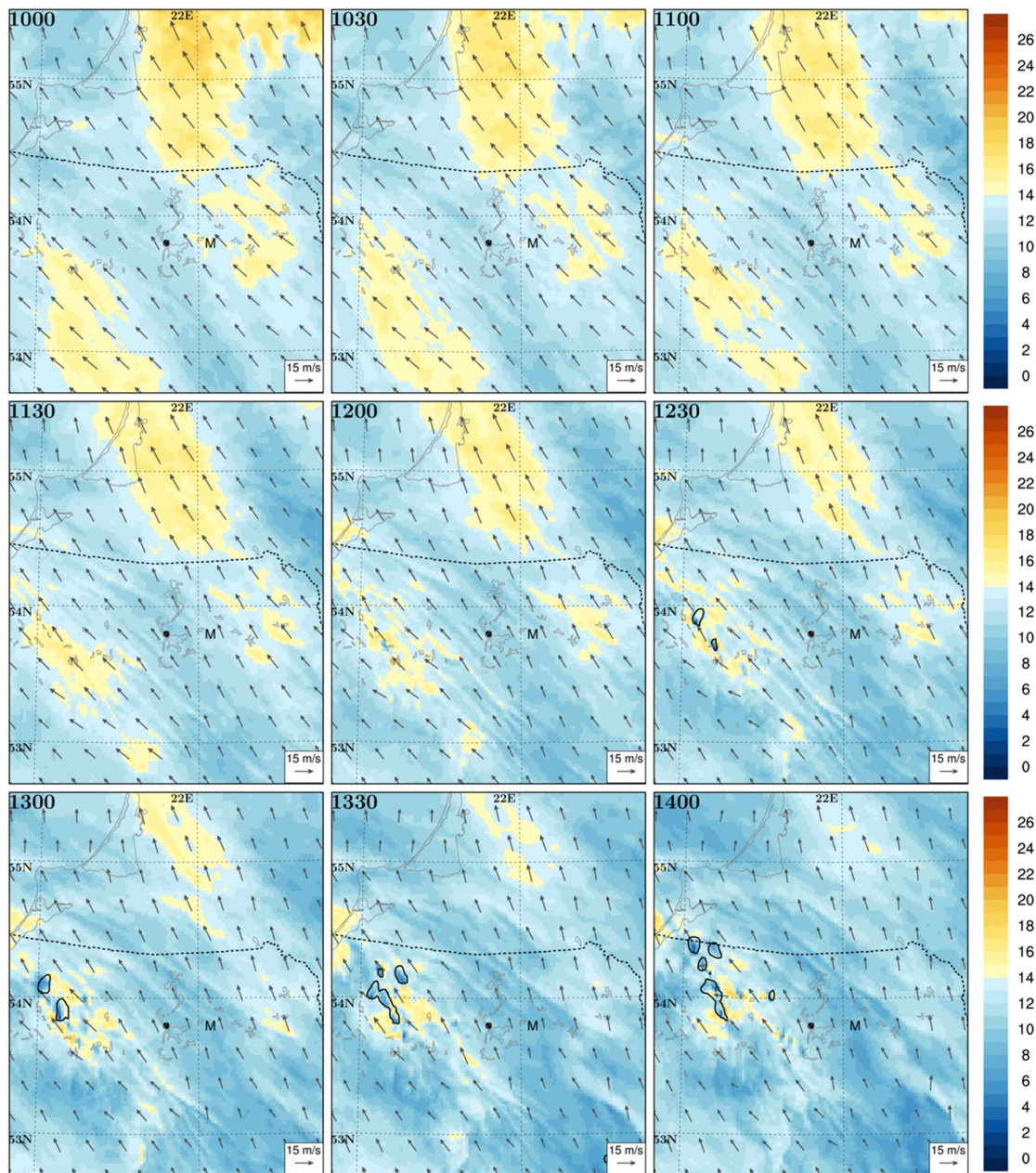
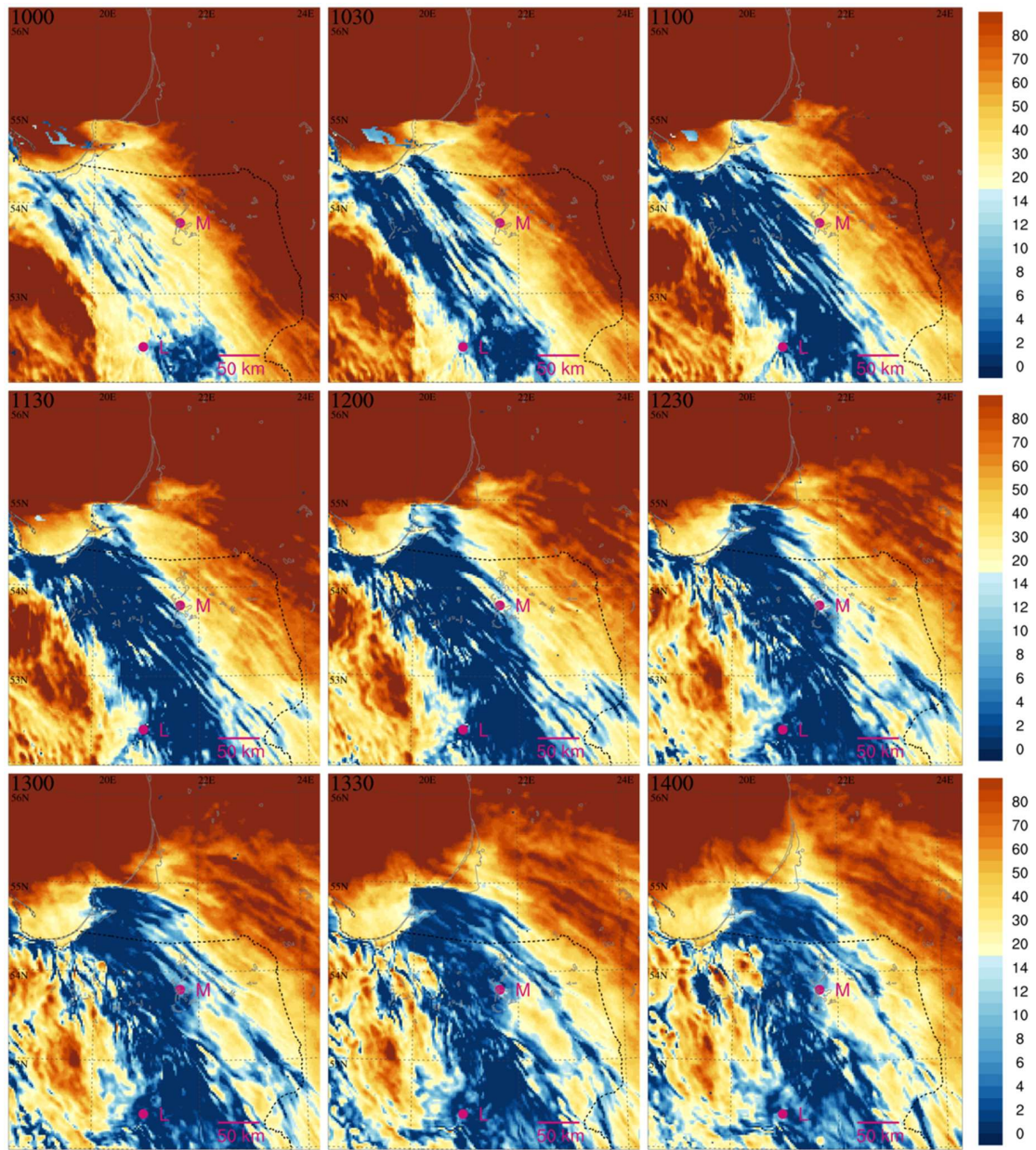


Figure S2: EX forecast of vertical shear between 100 and 3000 m a.g.l. (color, m s^{-1}) in the vicinity of northeastern Poland on 21 August 2007; black contour: pseudo-reflectivity of 30 dBZ at altitude of 3000 m, black dot shows the position of Mikołajki (M). UTC hour in upper-left corner of every plate.



10 Figure S3: EX forecast of MCIN (color, J kg^{-1}) in the vicinity of northeastern Poland on 21 August 2007; magenta dots show the positions of Mikolajki (M) and Legionowo (L). UTC hour in upper-left corner of every plate.

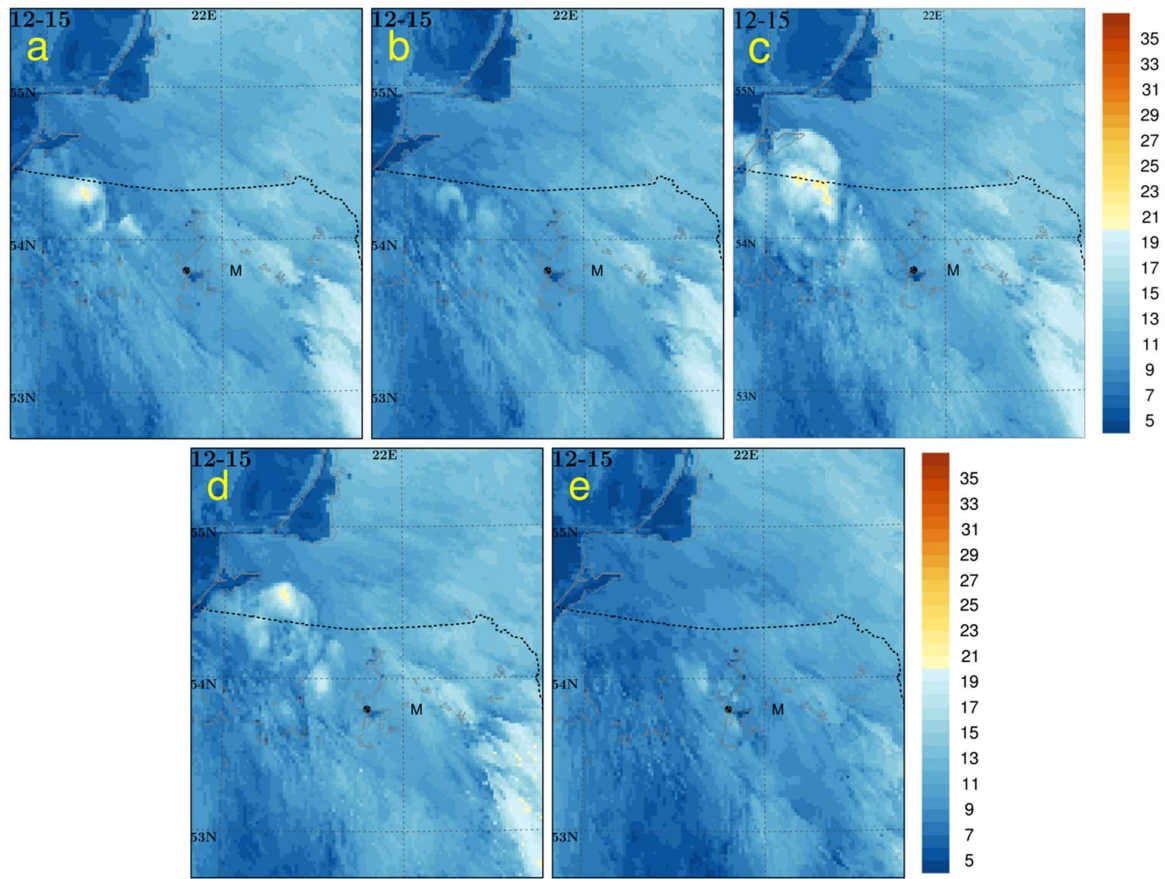


Figure S4: Maximum wind gusts between 12:00 and 15:00, 21 August 2007 (color scale in m s^{-1}) for: (a) EX-forecast (no CI); (b) EX with shallow convection parametrization (no CI); (c) EX with $\text{tur_len} = 75 \text{ m}$ (no CI), (d) EX with CI like in EX0-forecast but for single-column CI perturbations (section 4.2); (e) EM-forecast (no CI, section 5.2); black dot for the position of Mikolajki (M).

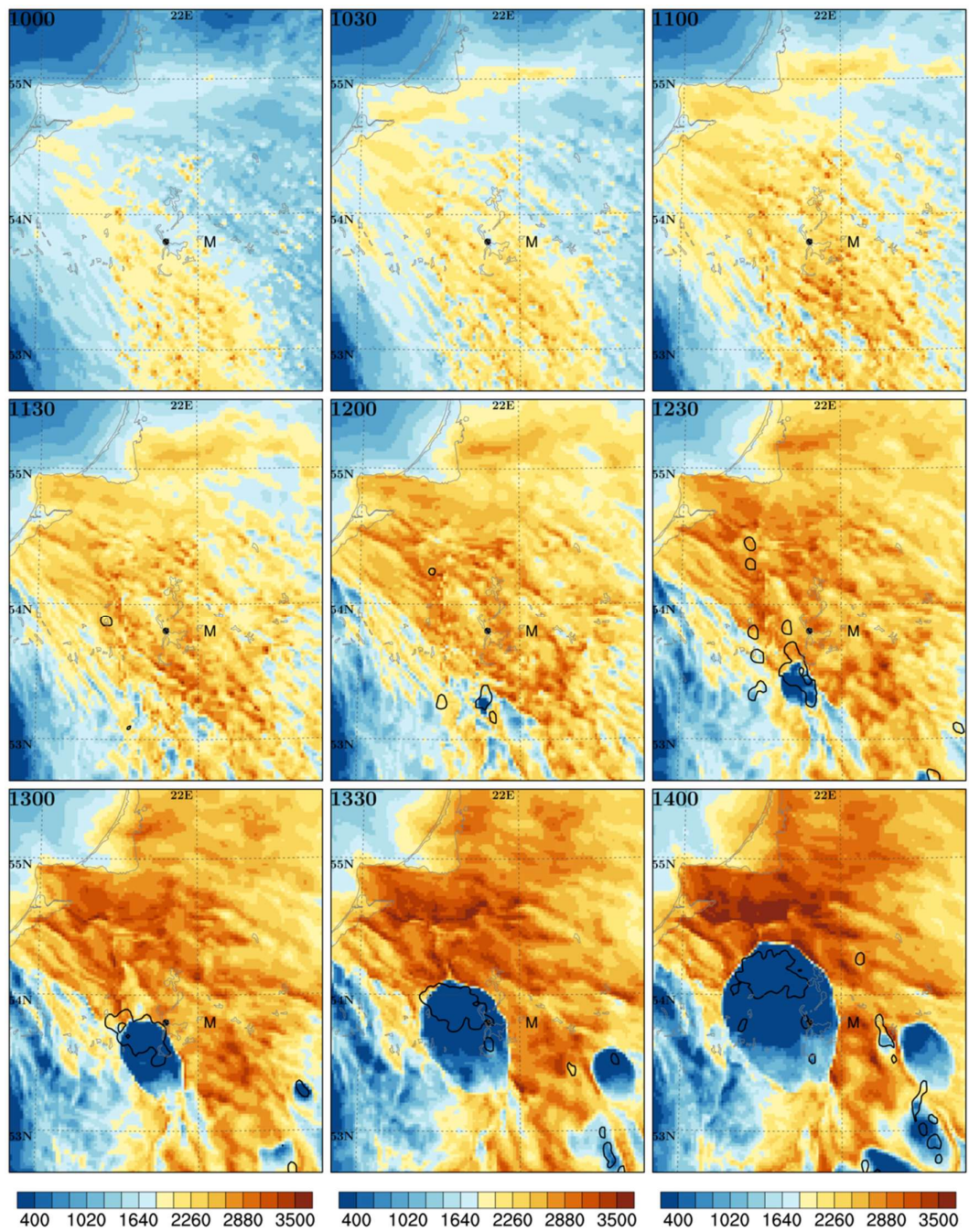
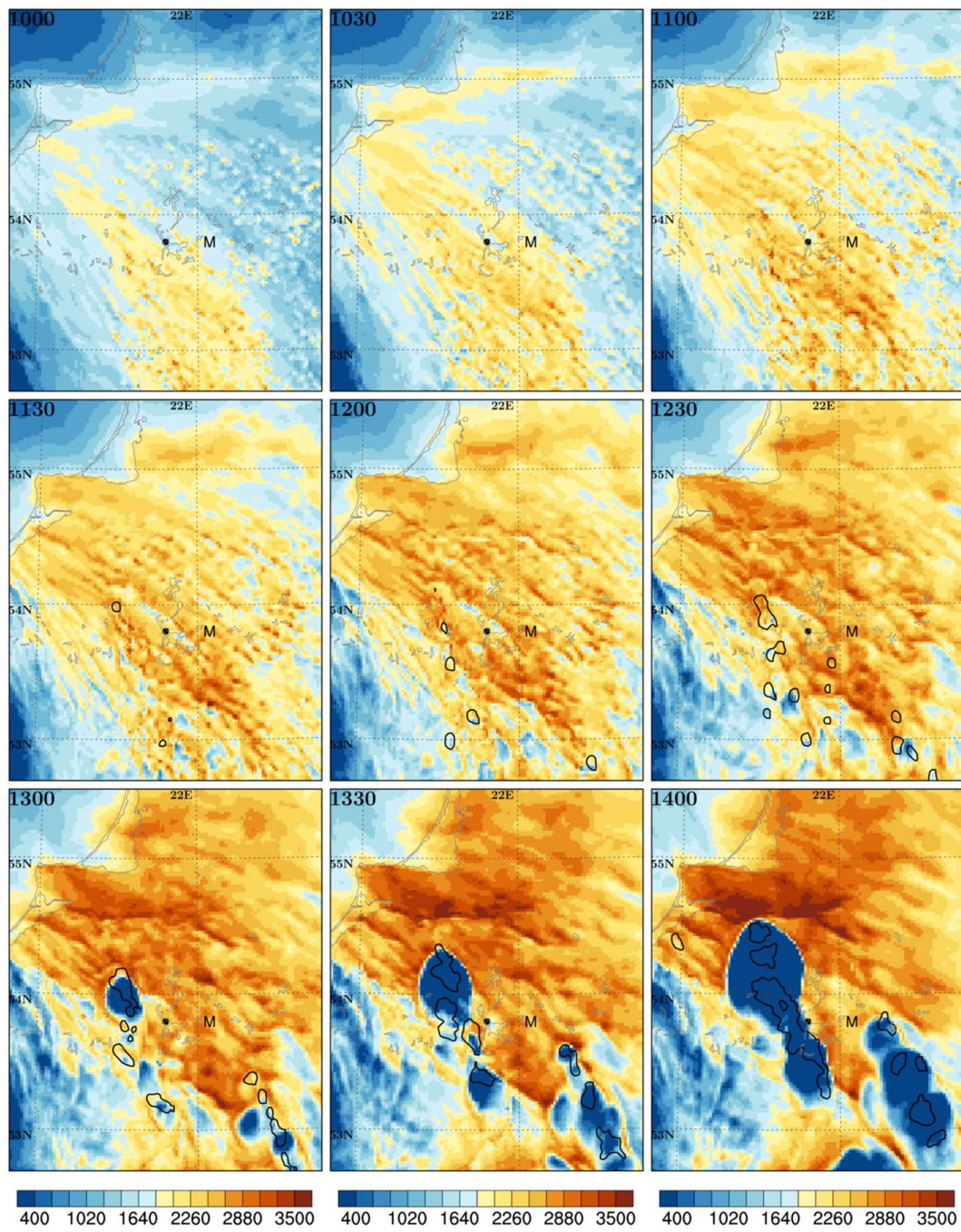


Figure S5: As Figure S1 but for EX0 ensemble member.



20 Figure S6: As Figure S1 but for EX3 ensemble member.

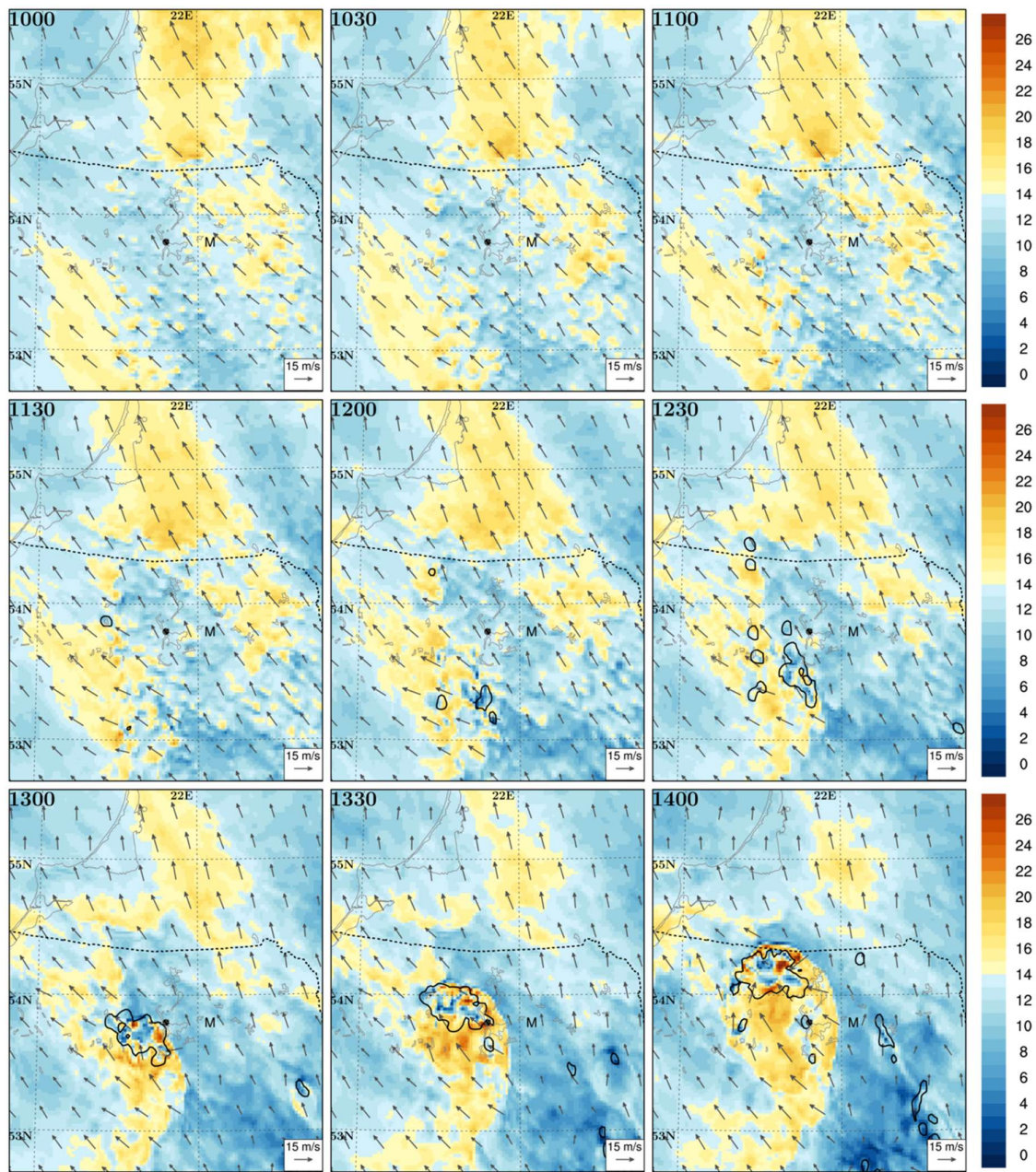


Figure S7: As Figure S2 but for EX0 ensemble member.

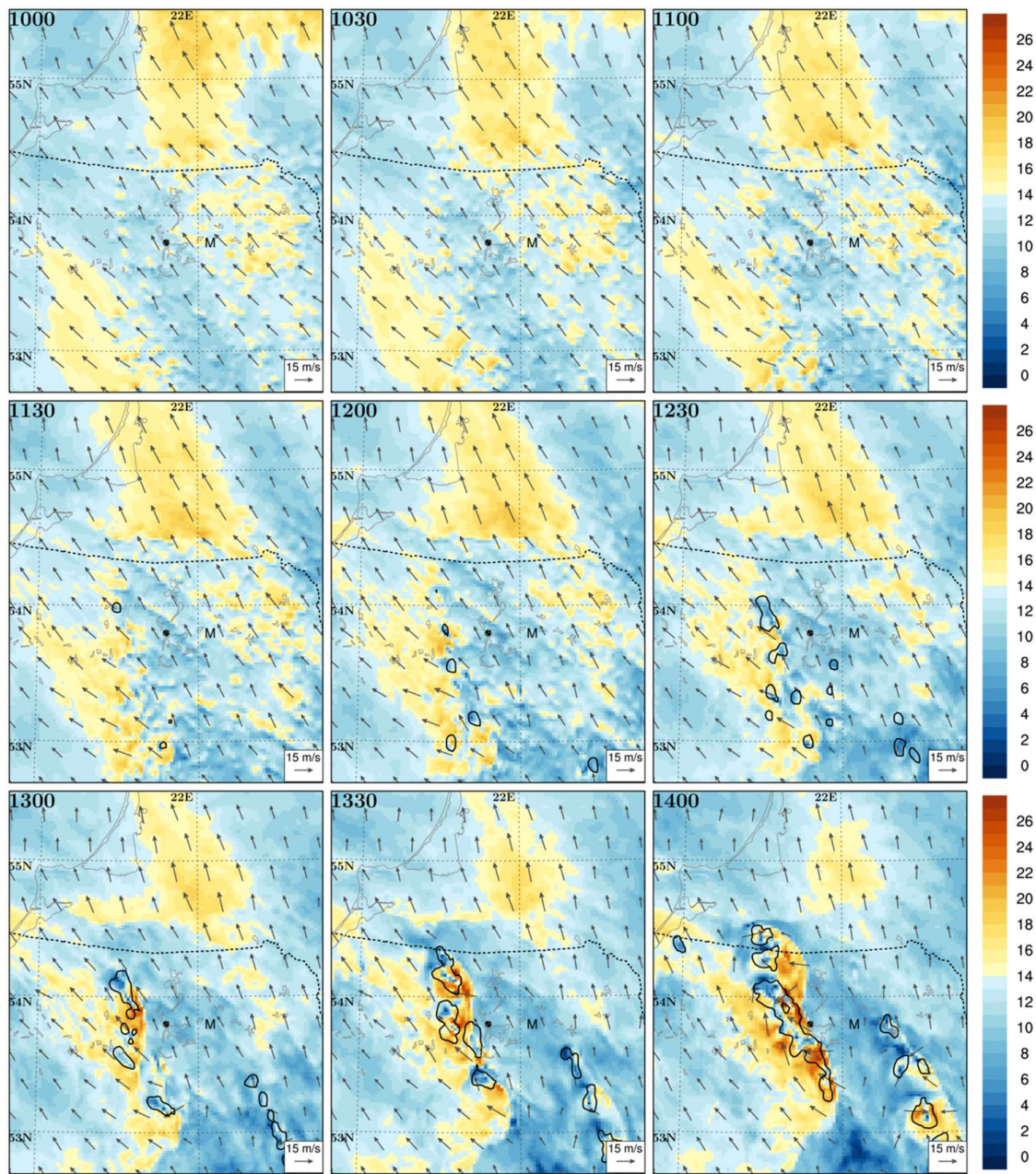


Figure S8: As Figure S2 but for EX3 ensemble member.

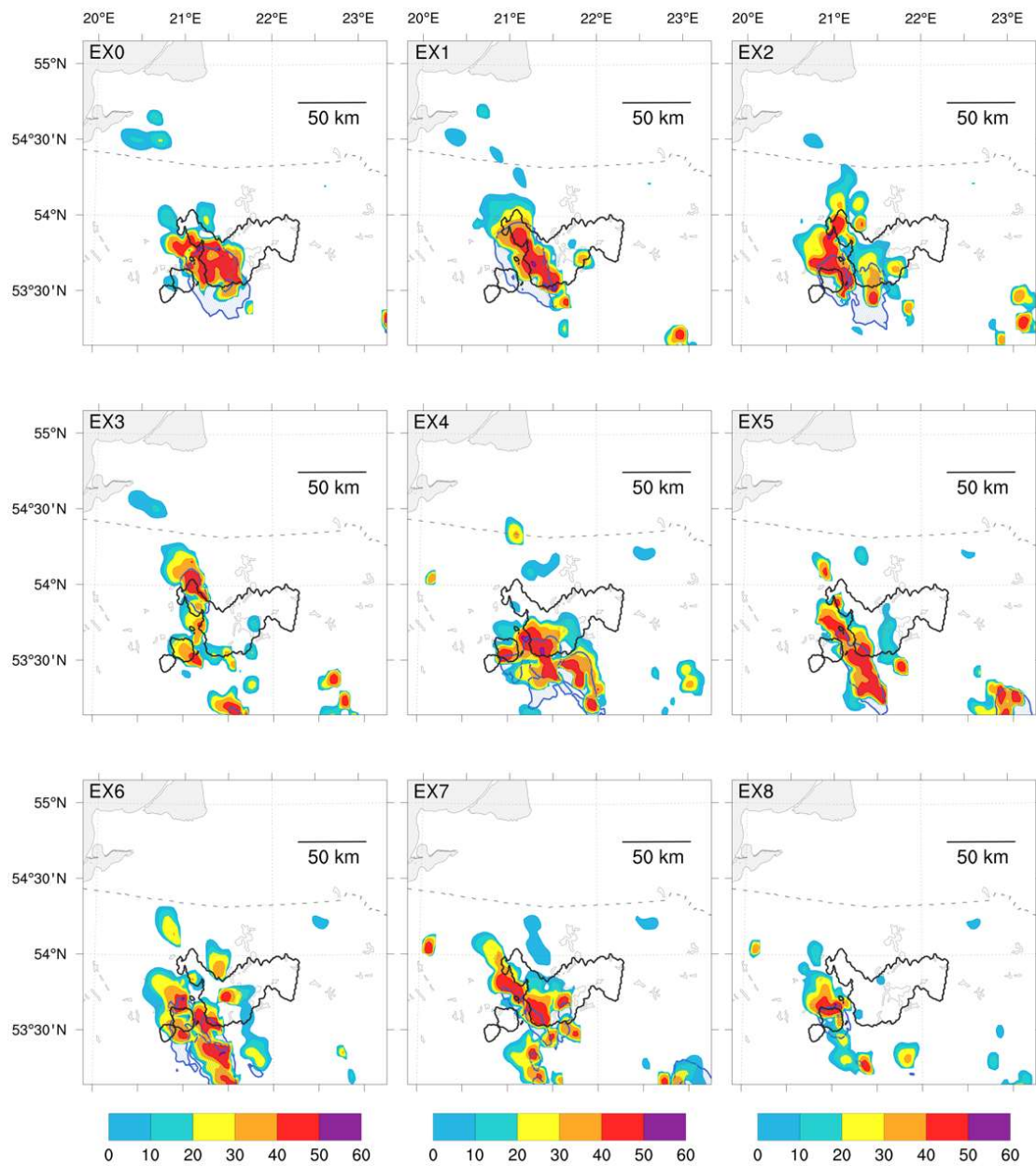
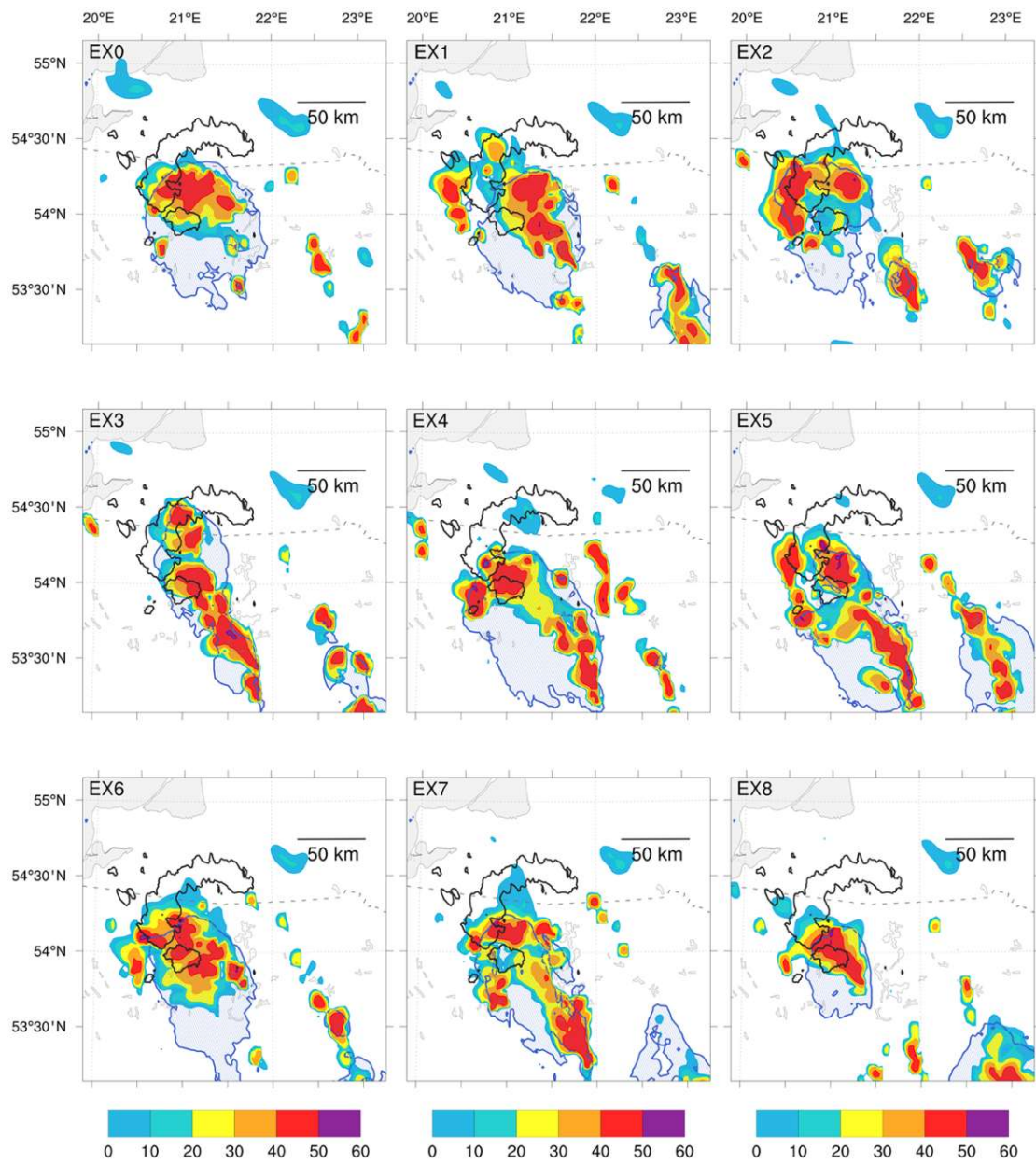


Figure S9: Simulated pseudo-reflectivity (dBZ, color scale) and cold pool extent (blue shading) for all EX-ensemble members at 13:00 (their numbers shown in upper-left corners) with area of the 30 dBZ reflectivity (black contour) of the observed system.



30 Figure S10: As Figure S9 but at 14:00.

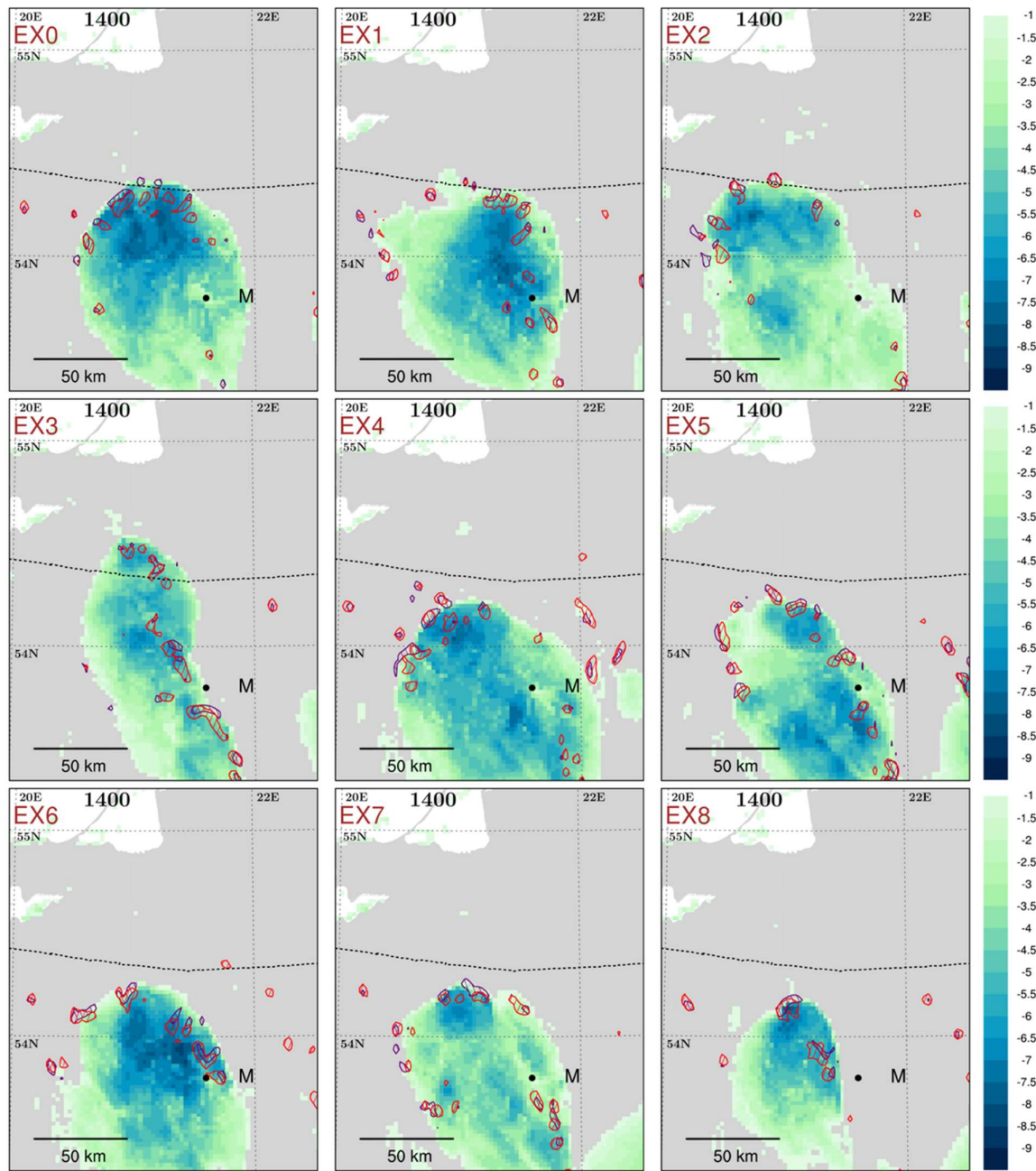


Figure S11: 2 m temperature depression (color, °C; see text for definition) and the isolines of 5 m s⁻¹ vertical wind at an altitude of 3 km a.m.s.l. (violet hatching) and 6 km a.m.s.l. (red hatching) for all EX-ensemble members (numbers in upper-left corners) at 14:00; black dot for the position of Mikolajki (M).

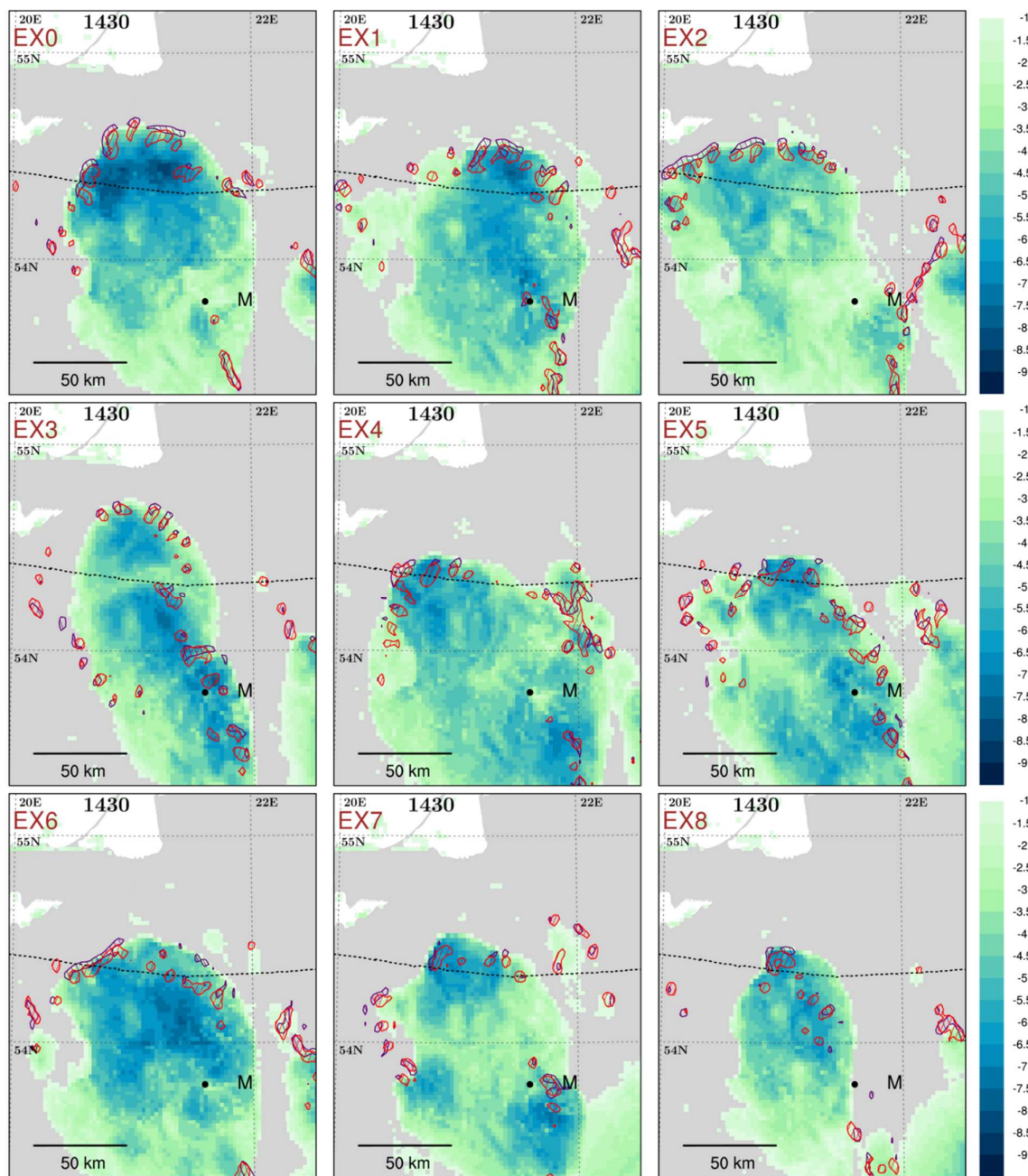


Figure S12: As Figure S11 but at 14:30.

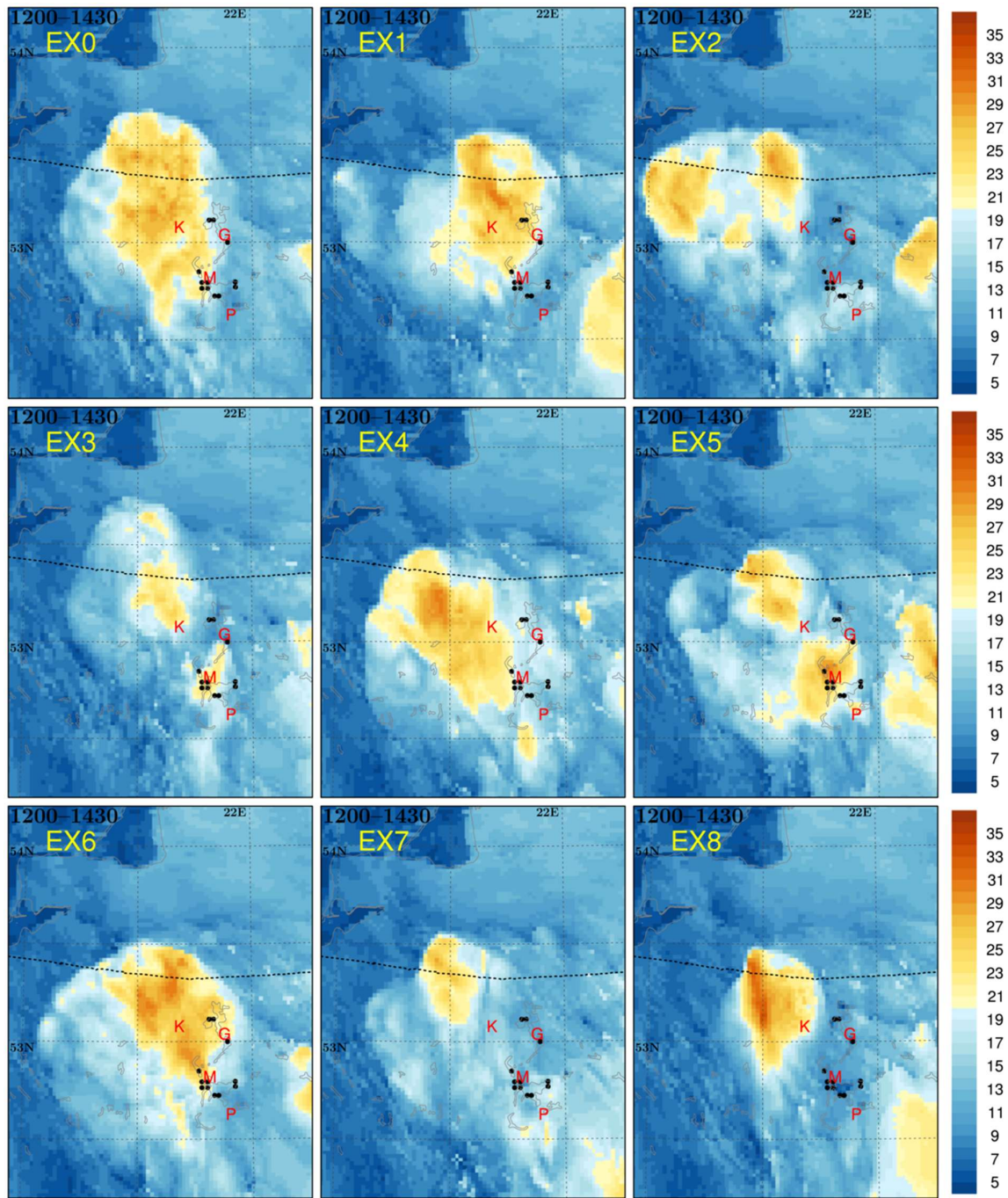


Figure S13: Spatial distribution of maximum 10 m wind gusts (m s^{-1}) in the period between 12:00 and 14:30 for all members of EX-ensemble with positions of towns with damaging winds reports (based on press releases) marked by red capital letters and positions of death reports marked by black dots.

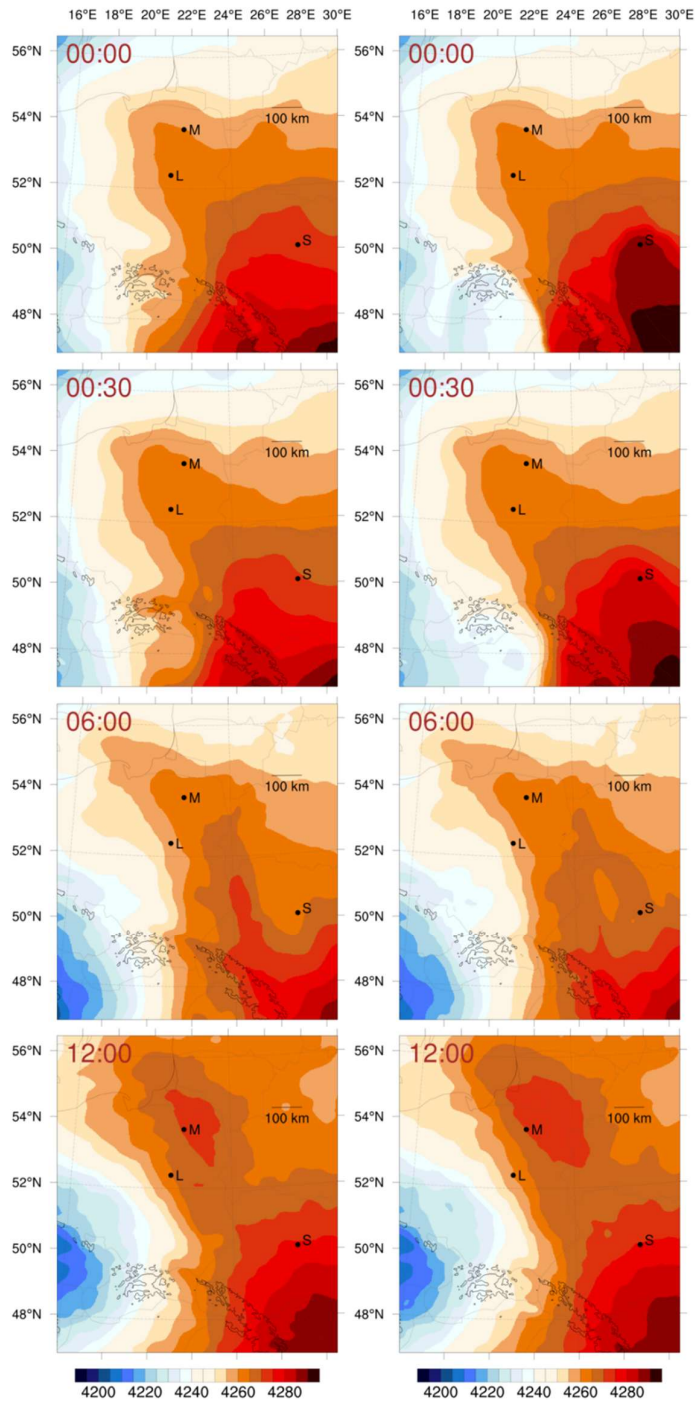


Figure S14: Evolution of 850-500 hPa thickness (colors, m) for E7-C forecast (left column) and E7-M forecast (right column). UTC hour in upper-left corner of every plate, black dots show positions of Mikolajki (M), Legionowo (L) and Shepetivka (S).

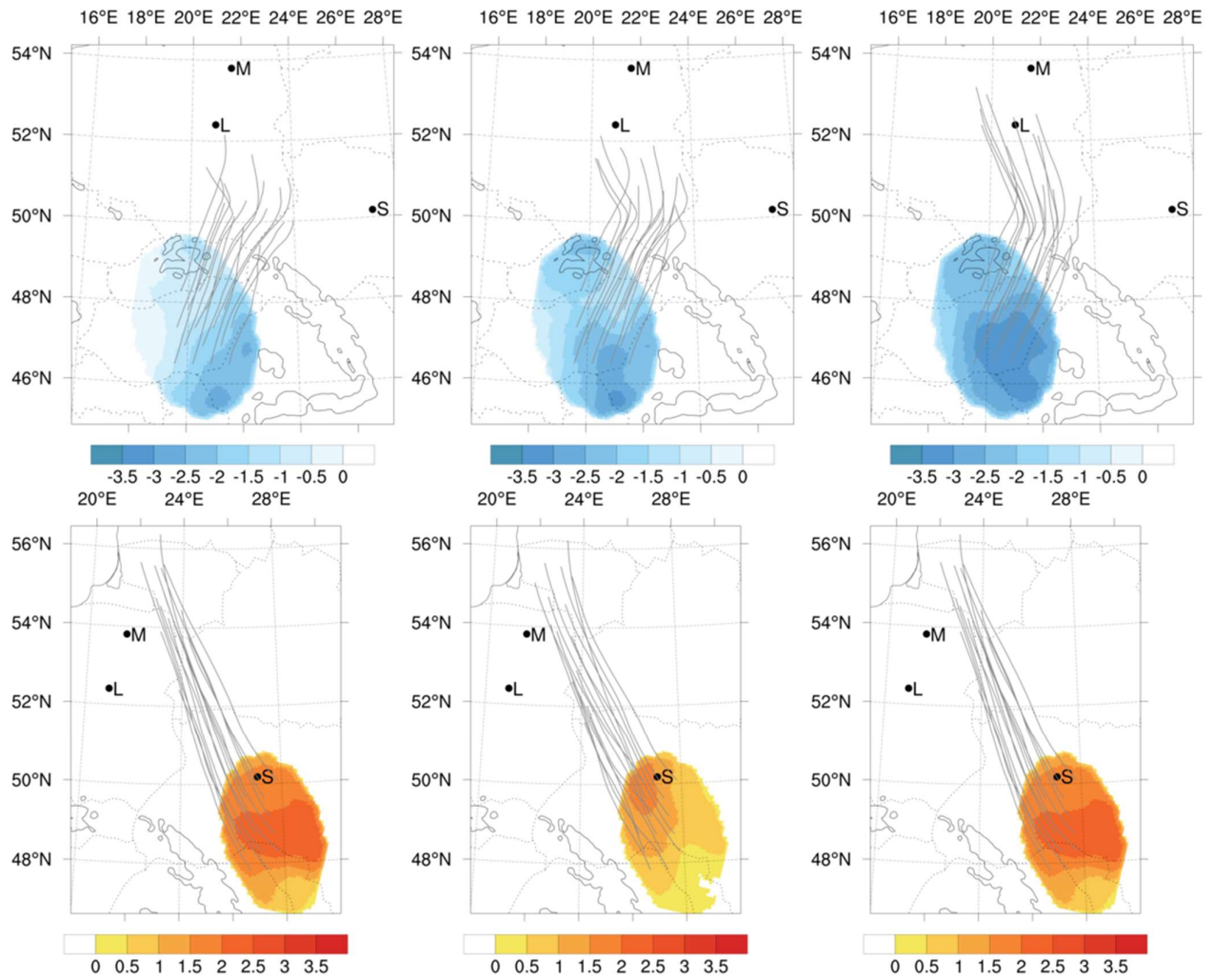


Figure S15: The areas of temperature modification and its value (°C, color) together with forward parcel trajectories between 00:00 and 12:00 of 21 August 2007 for negative temperature modification (top row) at 750 (left), 700 (center) and 650 hPa (right), and for positive temperature modification (bottom row) at 750 (left), 700 (center) and 650 hPa (right). M, L and S mark locations of Mikołajki, Legionowo and Shepetivka.

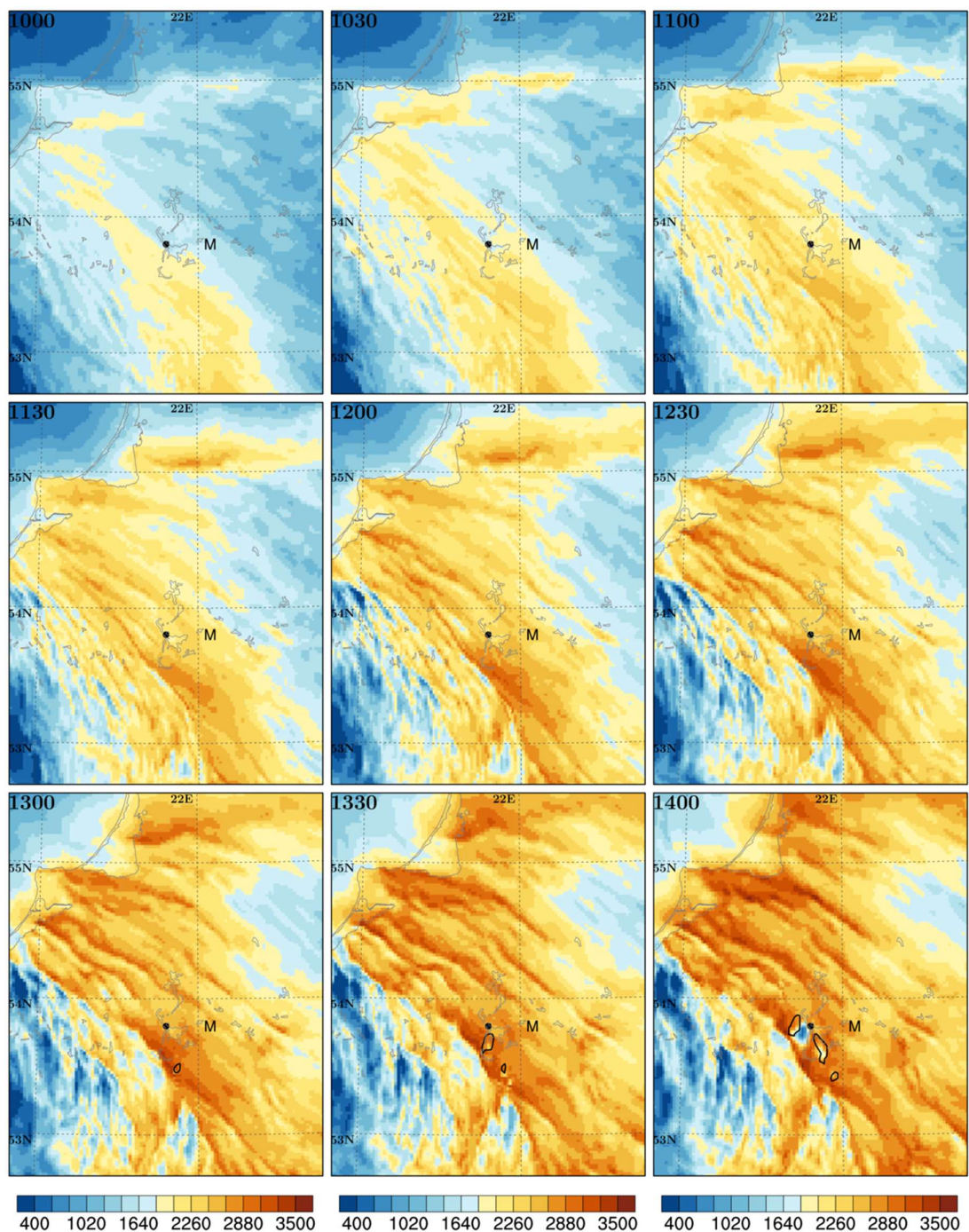


Figure S16: As Figure S1 but for EM forecast.

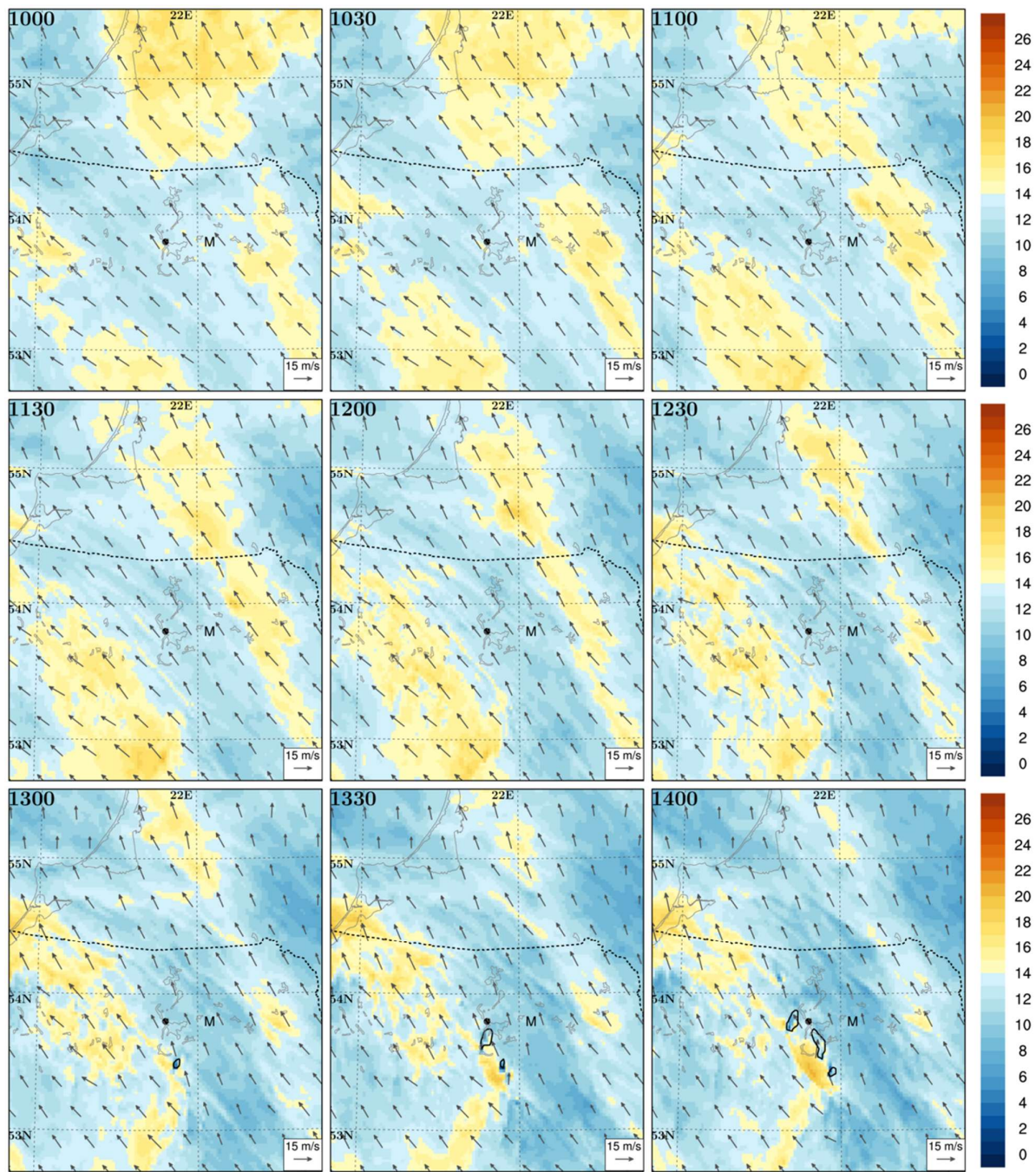
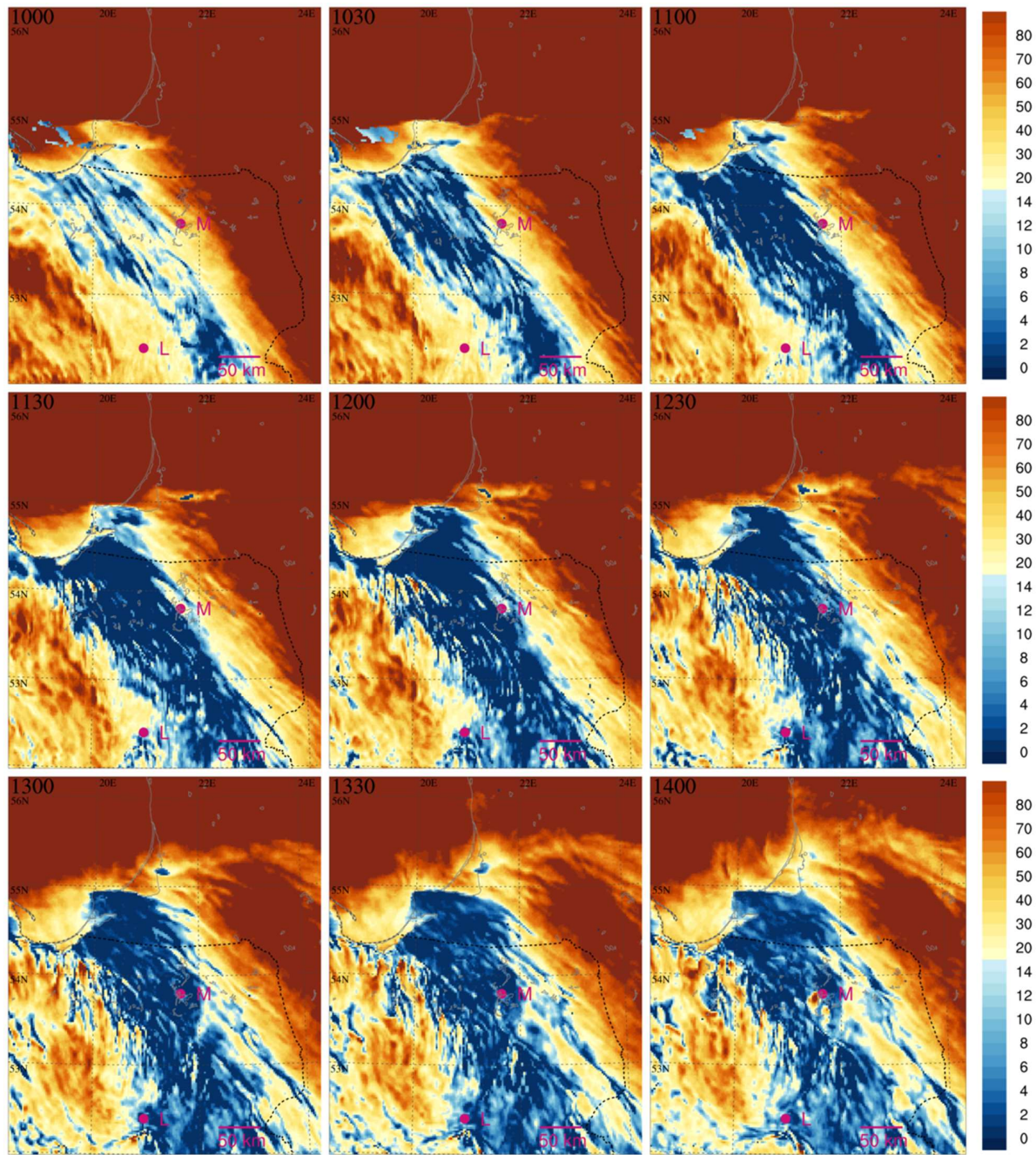


Figure S17: As Figure S2 but for EM forecast.



55 **Figure S18:** As Figure S3 but for EM forecast.

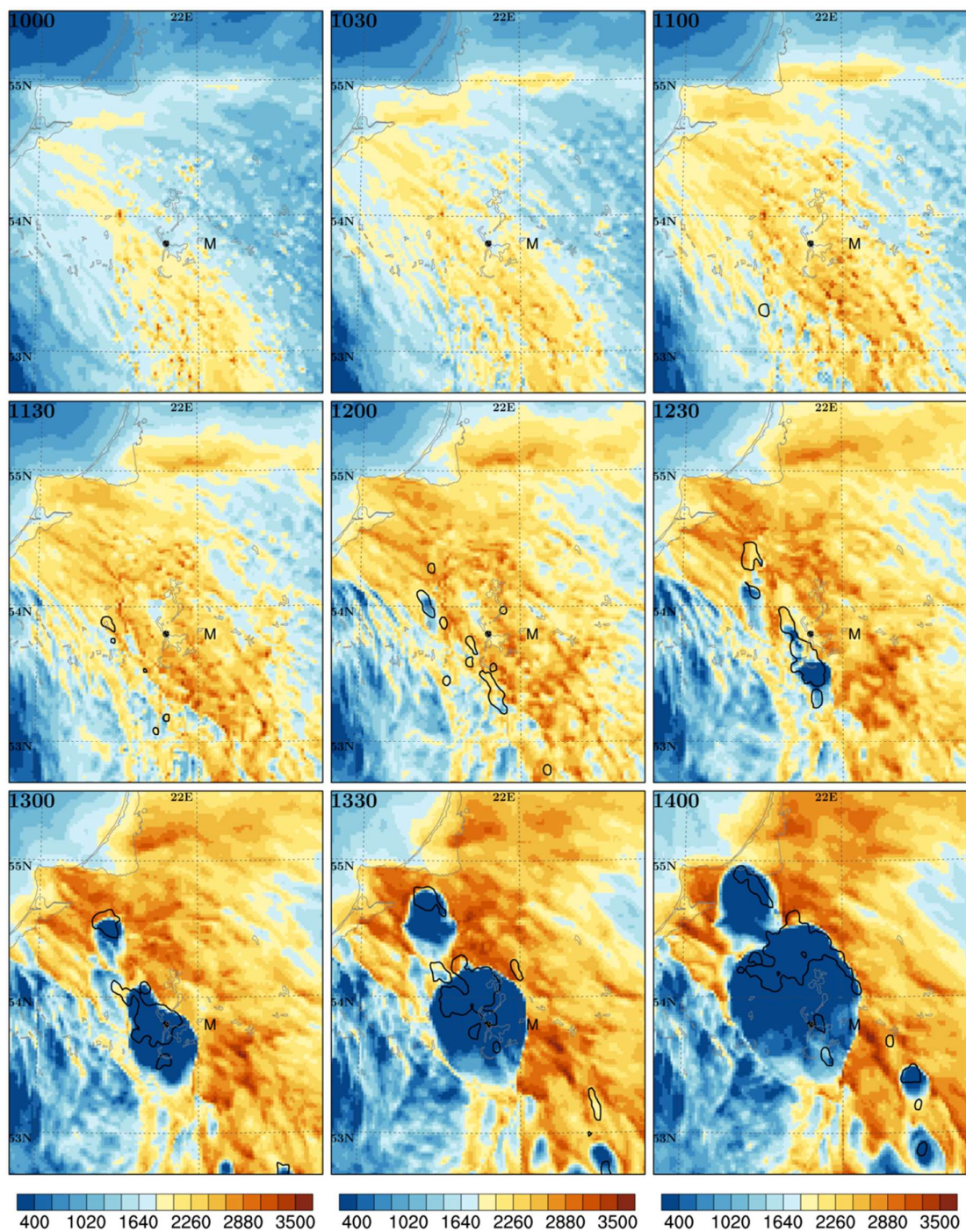


Figure S19: As Figure S1 but for EM0 forecast.

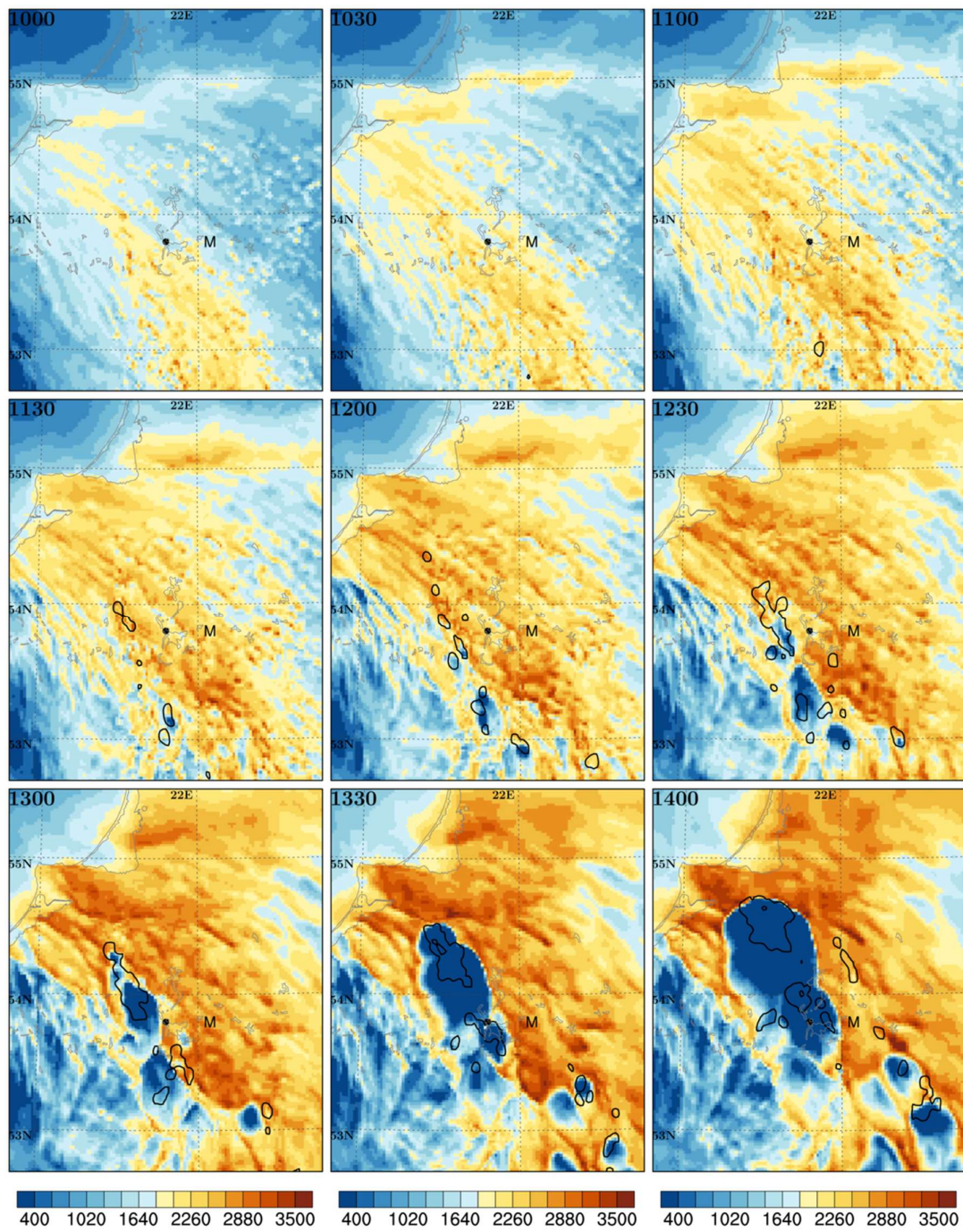


Figure S20: As Figure S1 but for EM3 forecast.

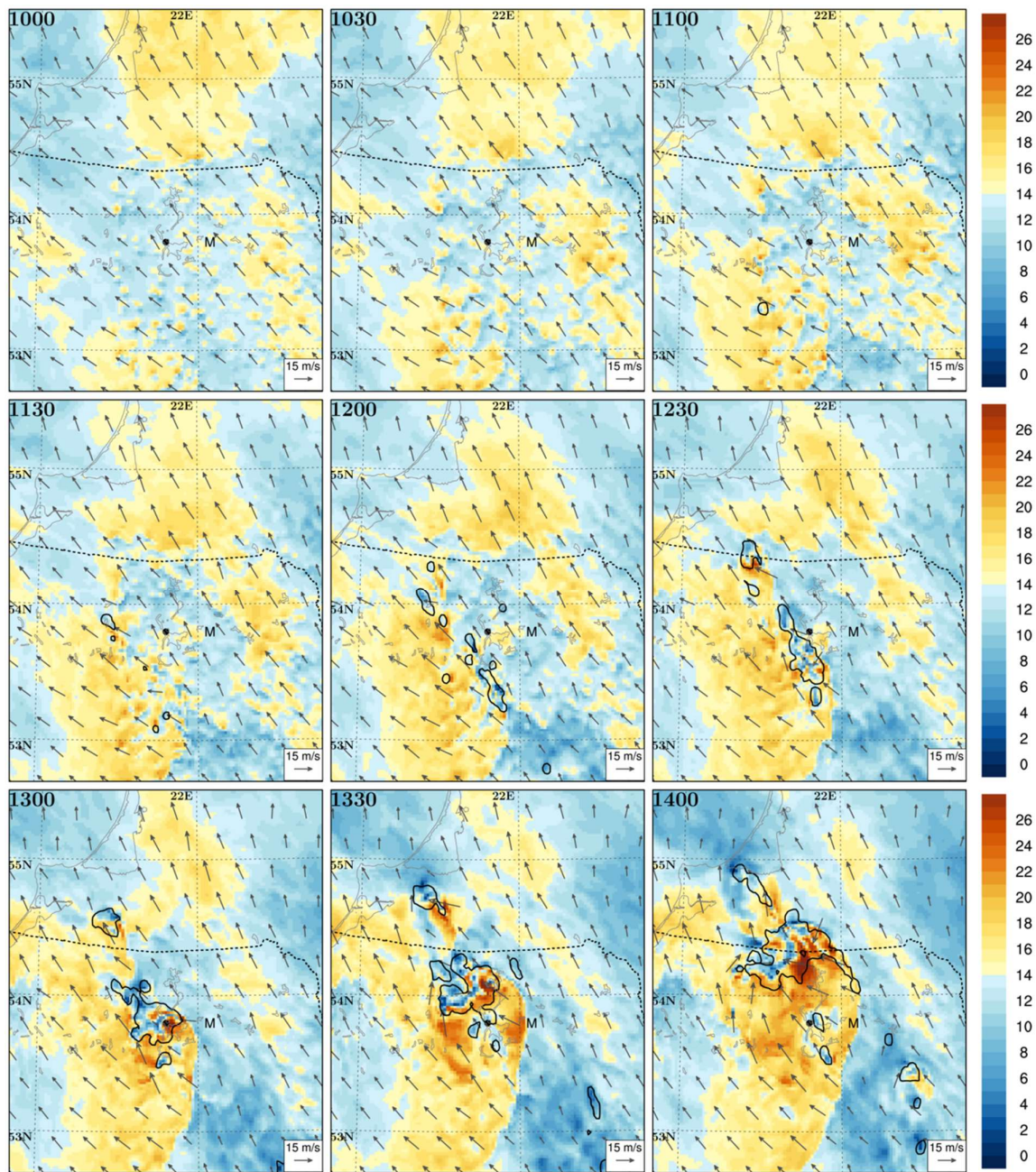


Figure S21: As Figure S2 but for EM0 forecast.

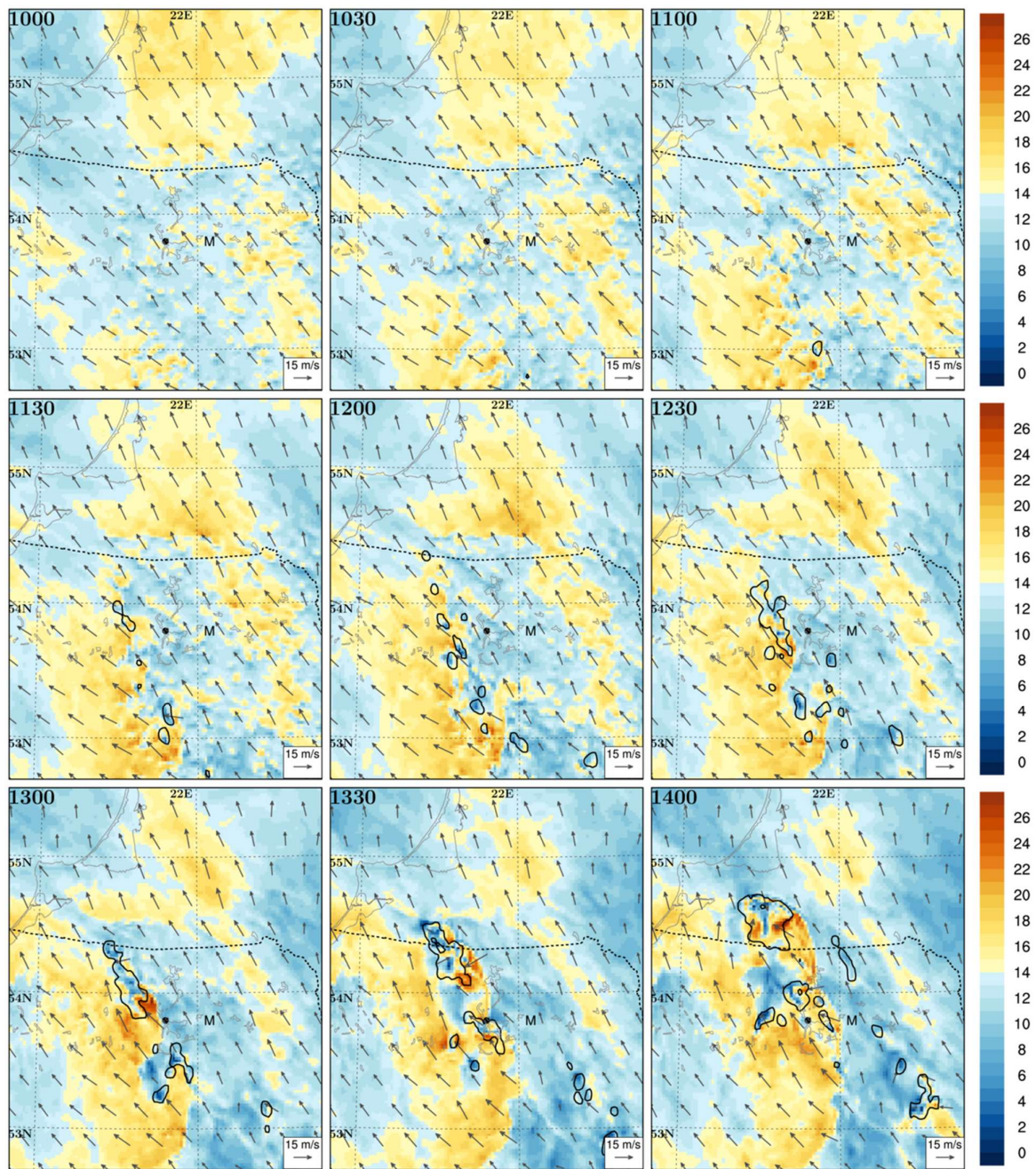
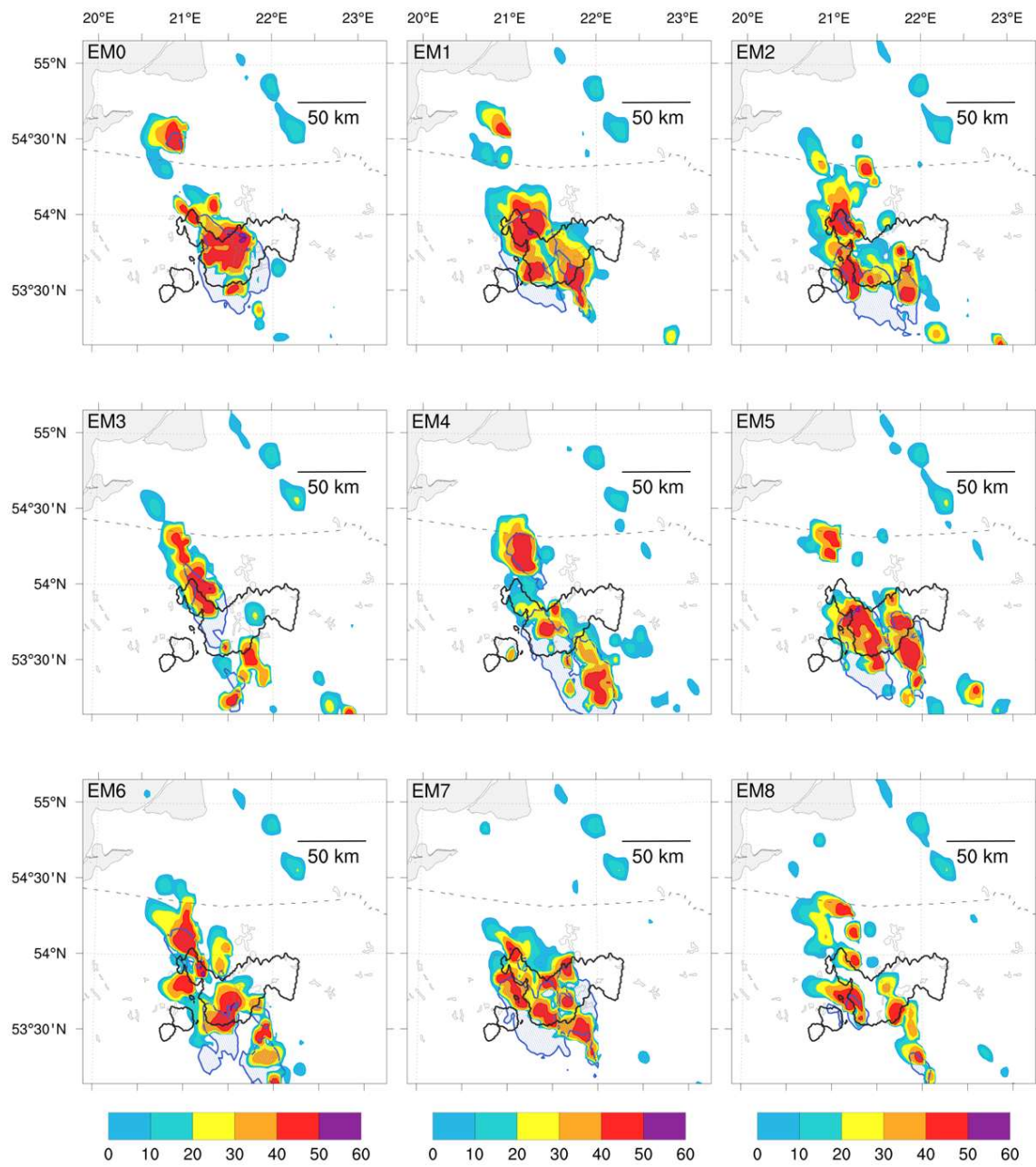


Figure S22: As Figure S2 but for EM3 forecast.



65 **Figure S23:** As Fig. S9 but for the EM ensemble.

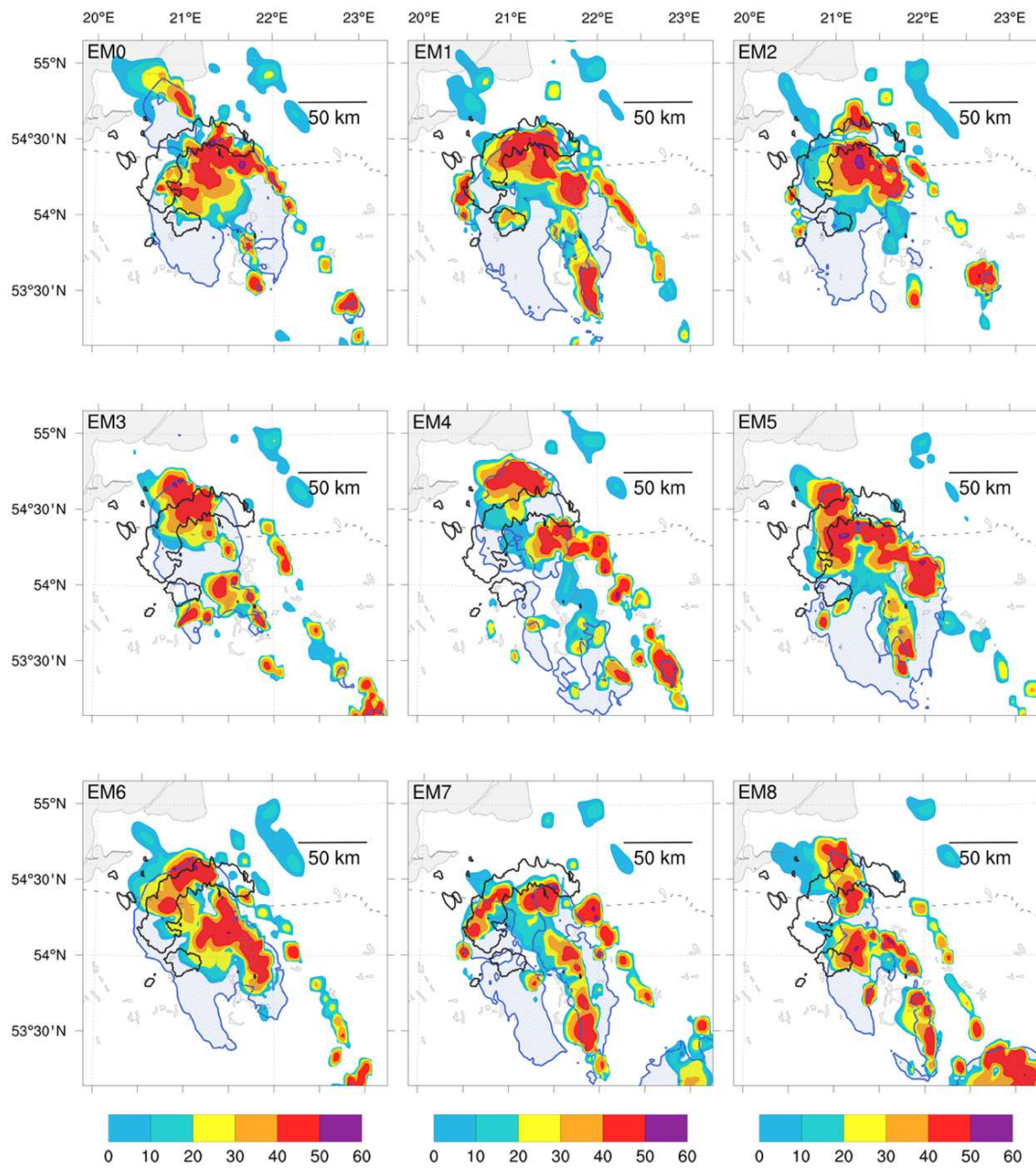
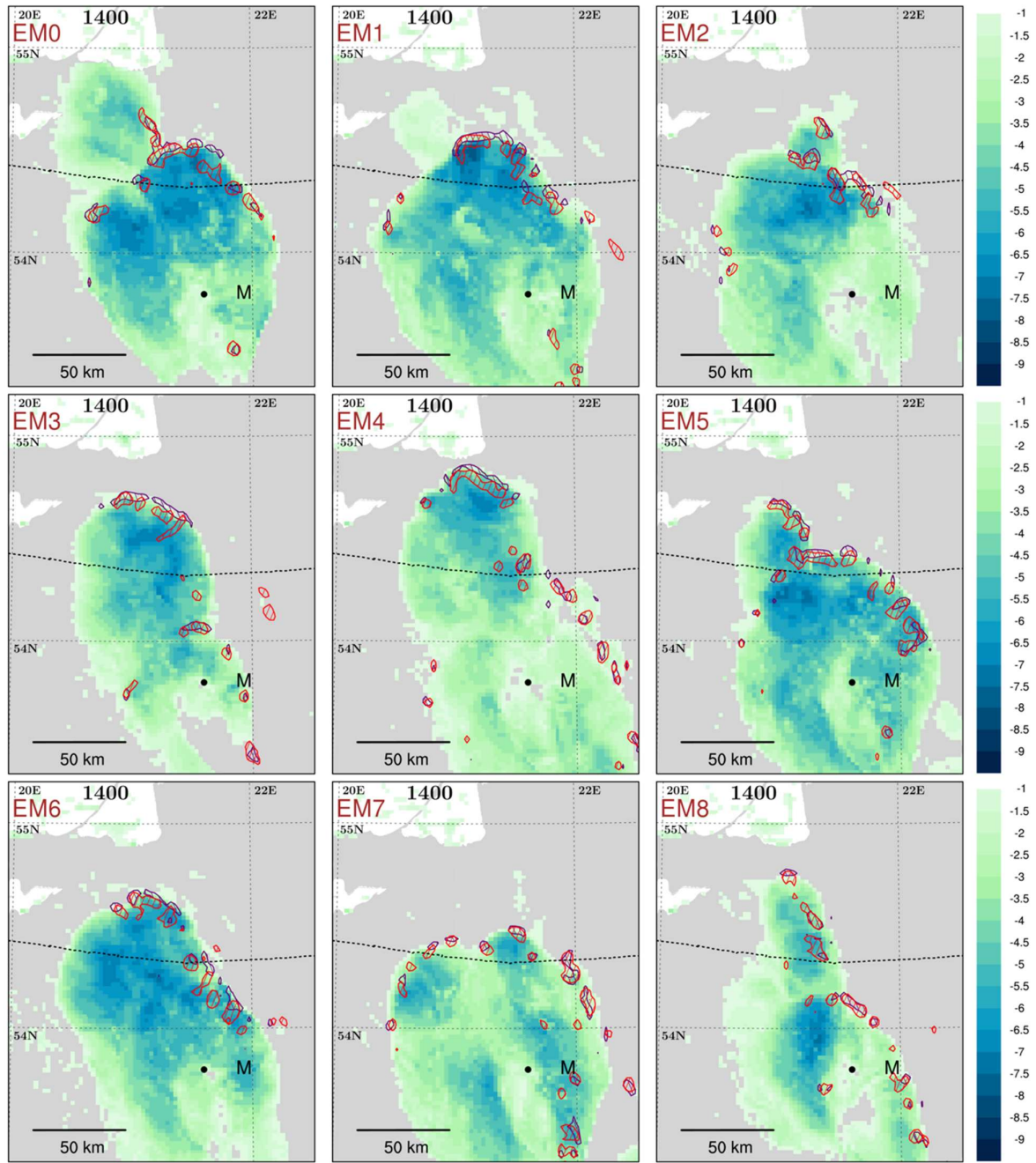


Figure S24: As Fig. S10 but for the EM ensemble.



70 Figure S25: As Fig. S11 but for the EM ensemble.

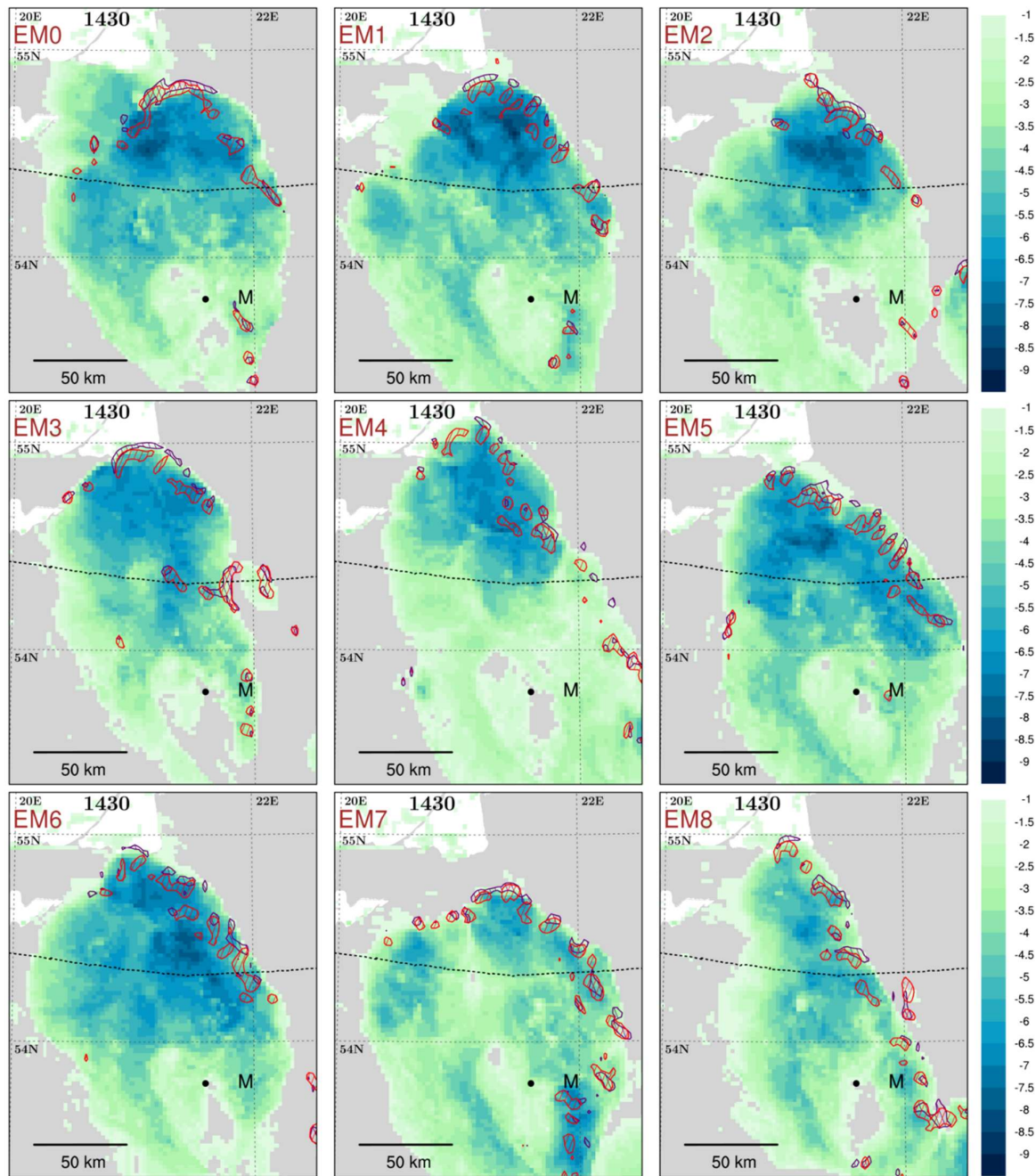
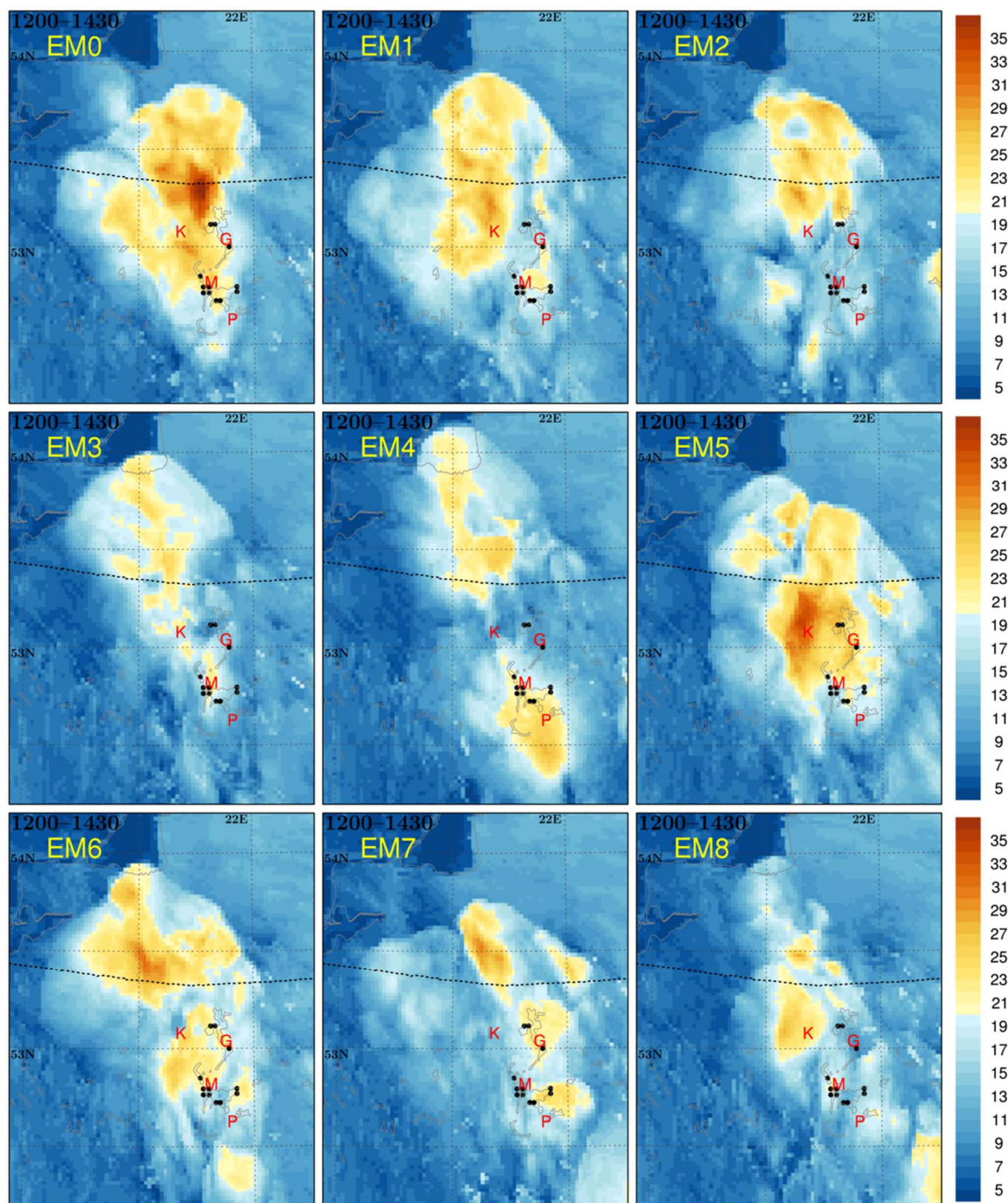


Figure S26: As Figure S12 but for EM-ensemble.



75 Figure S27: As Fig. S13 but for increased shear ensemble EM.