

1 **Supplementary Materials: Challenges and Opportunities**
2 **with New Generation Geostationary Meteorological**
3 **Satellite Datasets for Analyses and Initial Conditions**
4 **for Forecasting Hurricane Irma (2017) Rapid**
5 **Intensification Event**

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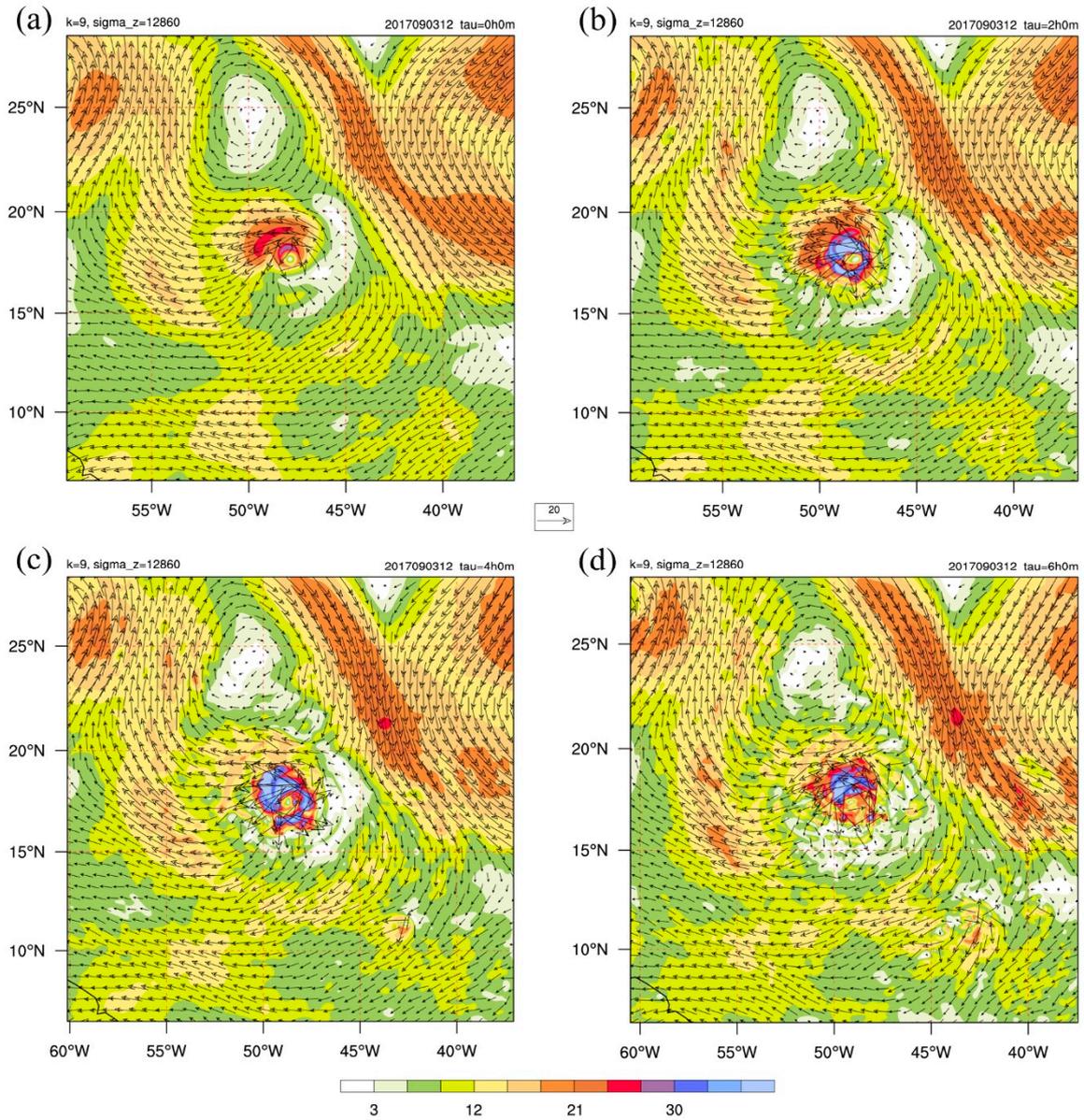
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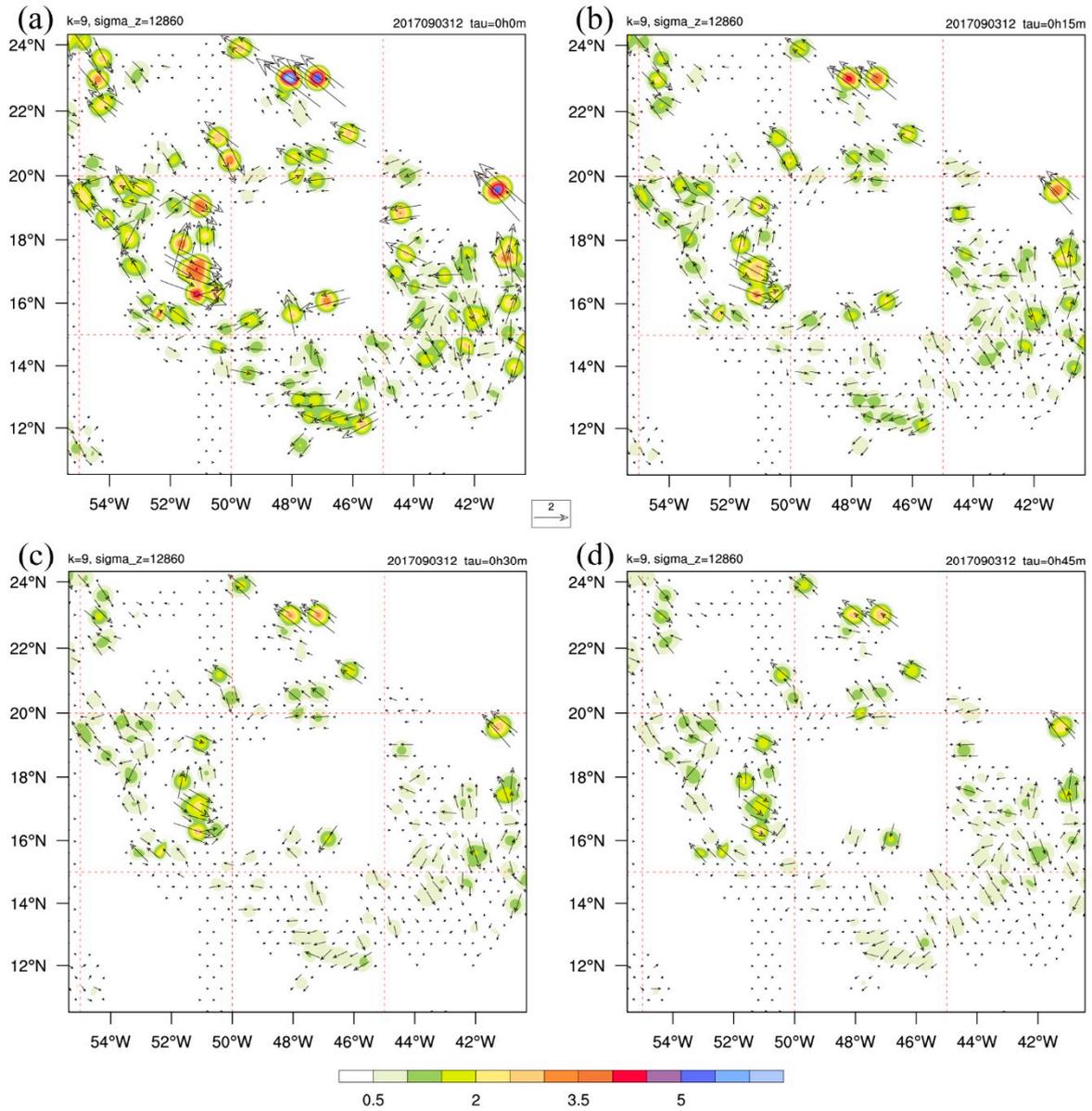
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Figure S1. As in Figure 6, except here with the CIMSS hourly GOES-13 AMVs rather than the GOES-16 AMVs illustrating the Domain 3 FCDI analyses of the $z = 12,860$ m wind vectors (m s^{-1} ; color bar at bottom and 20 m s^{-1} length indicated by arrow in middle) starting from cold-start COAMPS-TC wind vectors in panel (a) and then hourly AMV-based FCDI analyses at (b) $\tau = 2$ hours, (c) $\tau = 4$ hours, and (d) $\tau = 6$ hours.

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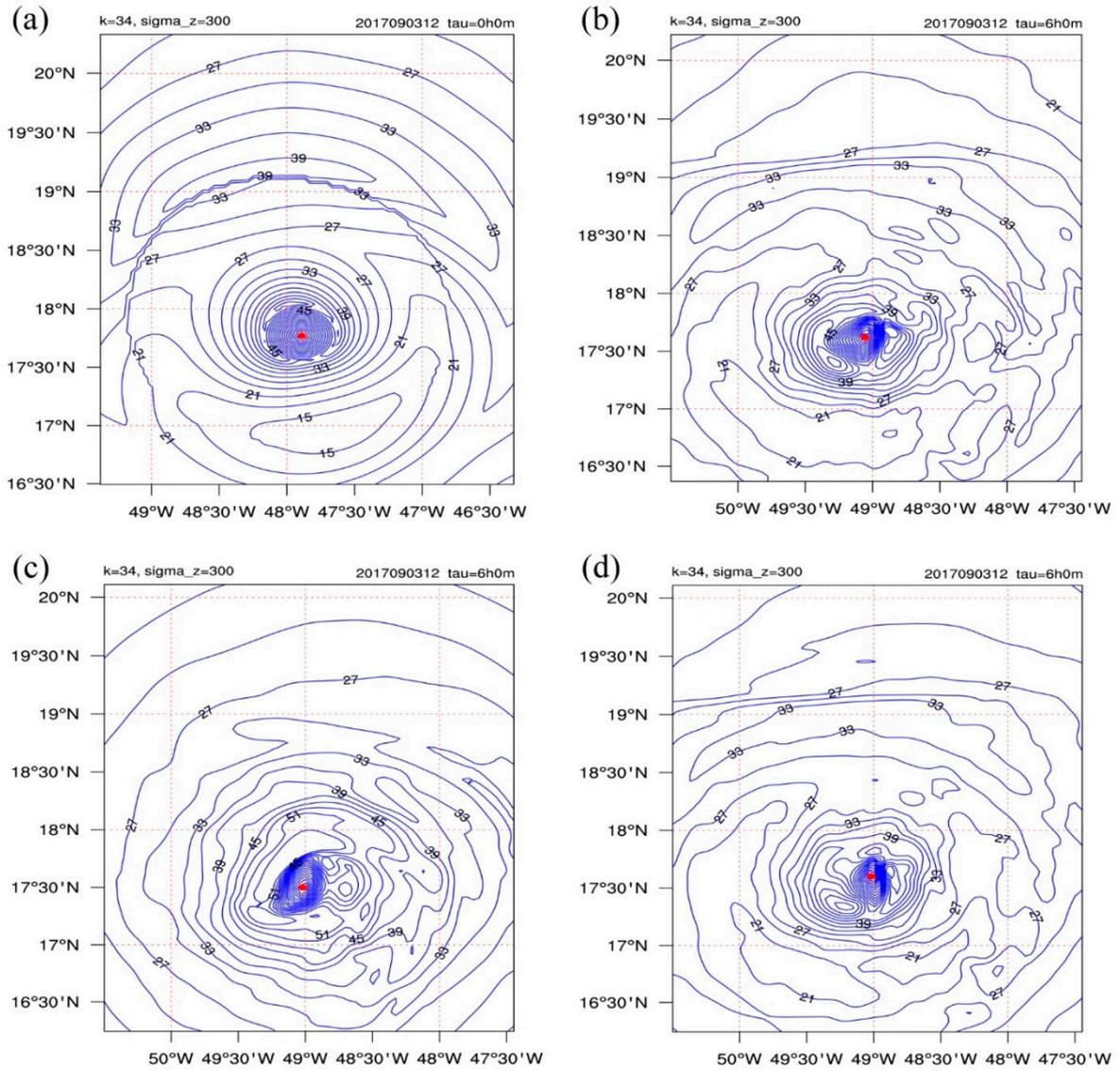
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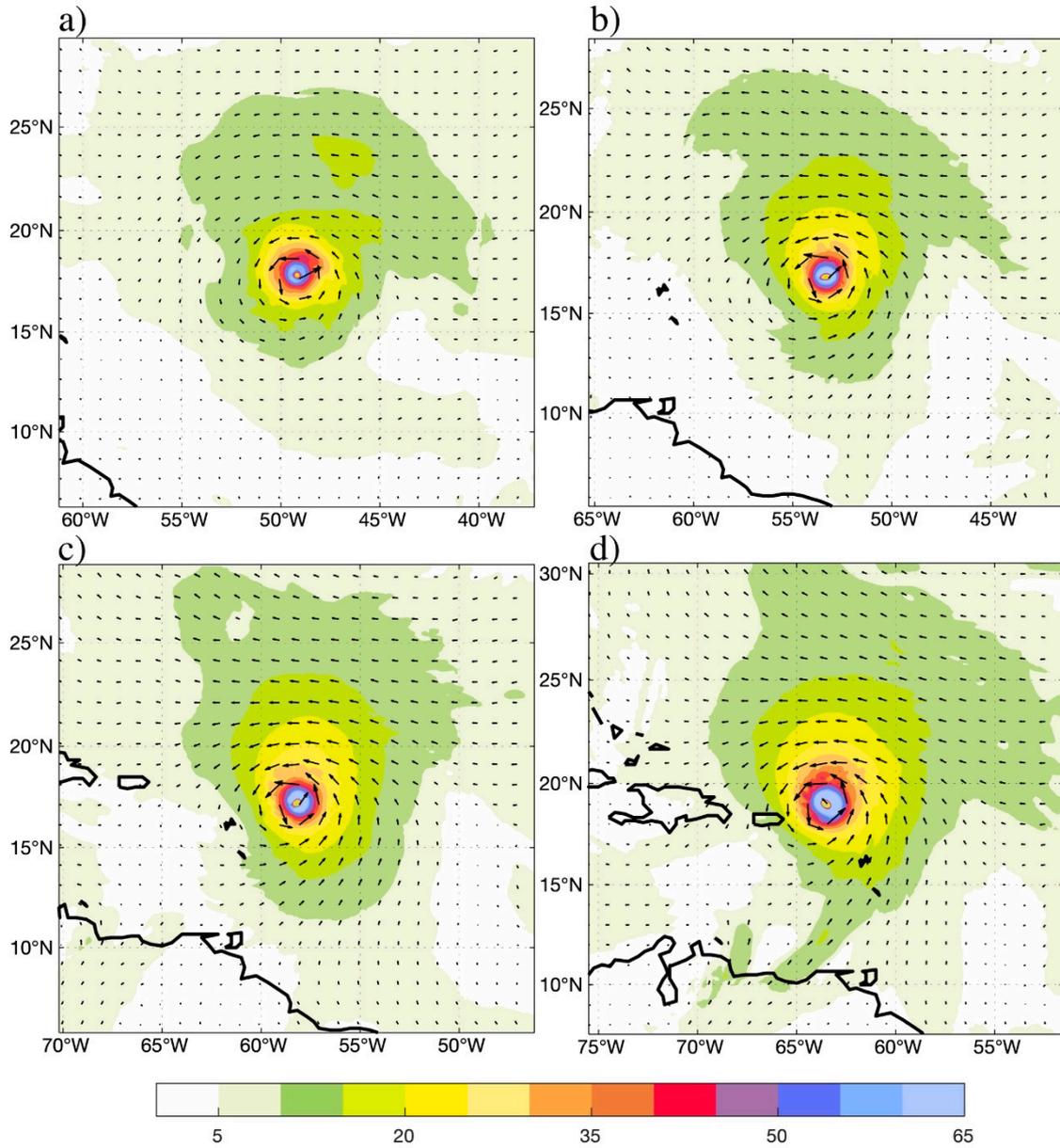
Figure S2. As in Figure 7, except here for the hourly GOES-13AMV-based FCDI $z = 12,860$ m wind increments (m s^{-1} ; color bar at bottom and 2 m s^{-1} vector length indicated by arrow in middle) at (a) $\tau = 0$ hours, (b) $\tau = 15$ minutes, (c) 30 minutes, and (d) 45 minutes.

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Figure S3. As in Figure 9 for inner-region Domain 3 $z = 300$ m isotachs at 3 m s^{-1} interval, from 3 m s^{-1} to 54 m s^{-1} for (a) cold-start COAMPS-TC initial conditions at 12 UTC 3 September, and at 18 UTC 3 September (b) 15-minute AMV FCDI analysis (c) six hour COAMPS-TC forecast, and (d) hourly AMV FCDI analysis.



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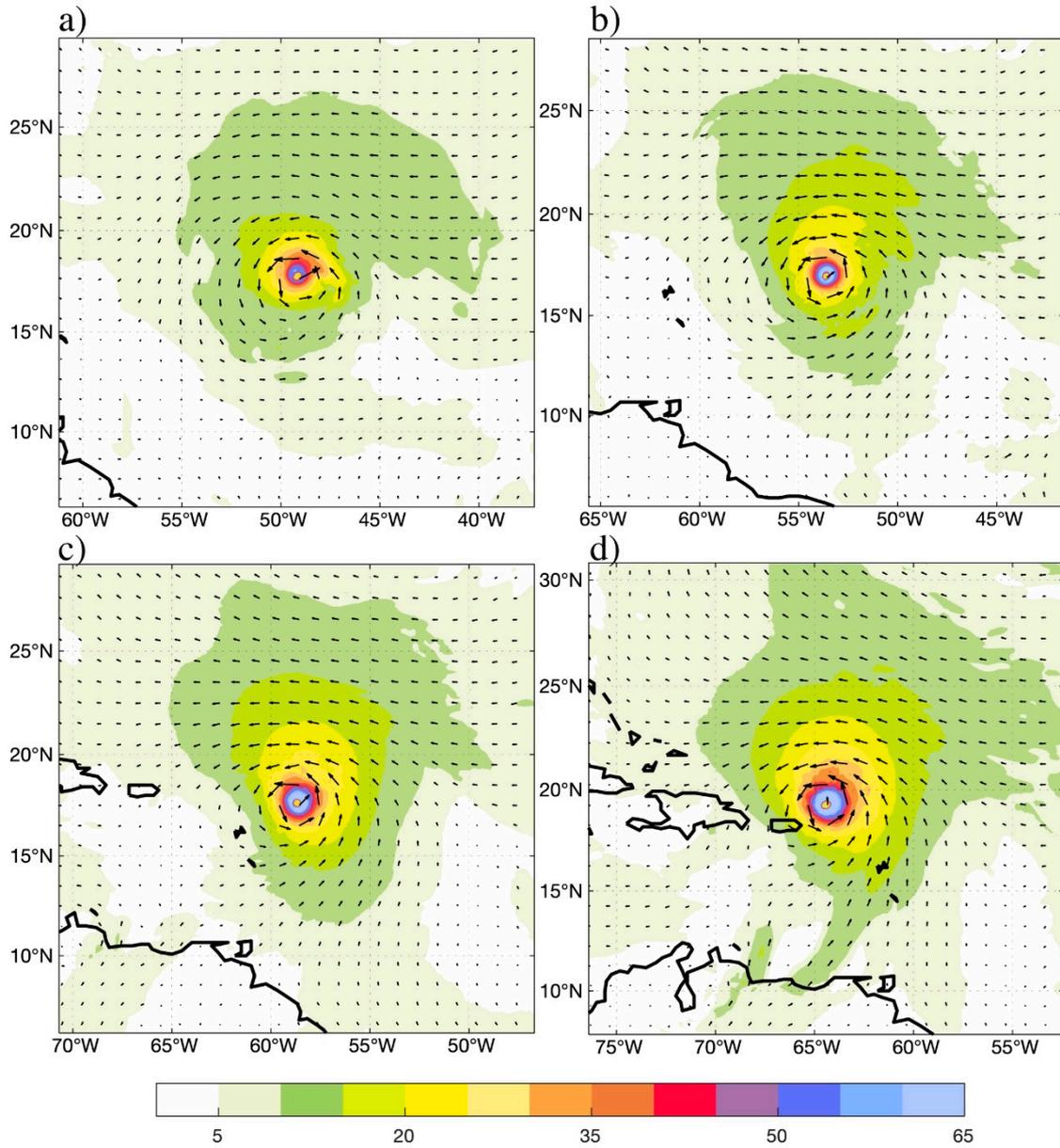
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Figure S4. CIMSS Control HWRF (a) Initialization for the $z = 250$ m wind vectors ($m s^{-1}$ color bar at bottom) at 18 UTC 3 September, and then the HWRF model forecasts at (b) $\tau + 24$ h, (c) $\tau + 48$ h, and (d) $\tau + 72$ h (provided by William E. Lewis, CIMSS).

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Figure S5. As in Figure S4, except with (a) the CIMSS high-density AMV dataset included in the HWRf vortex initialization, and then the HWRf forecasts at (b) tau + 24 h, (c) tau + 48 h, and (d) tau + 72 h (provided by William E. Lewis, CIMSS).