Diurnal Variability of Tropical Cyclone Tornadoes Strengthens with Increasing Distance from the Coast

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Ivan Sloan[3], Matthew Brown[2], James Ruppert[1], Roger Edwards[4], and Sean Waugh[2]

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36th AMS Conference on Hurricanes and Tropical Meteorology

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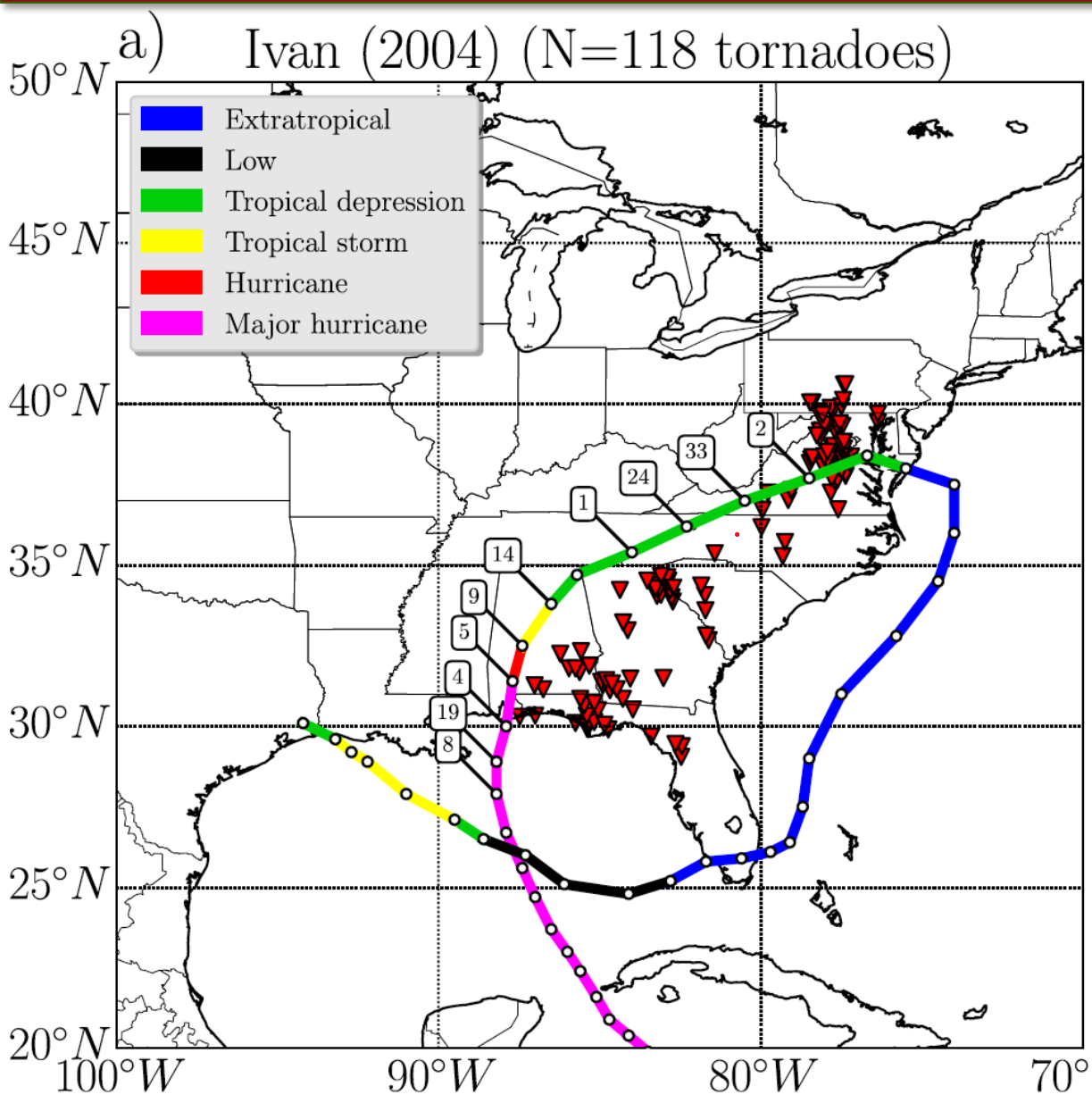
Funding from NSF AGS-2028151

Example of Diurnal Variability in TC Tornadoes



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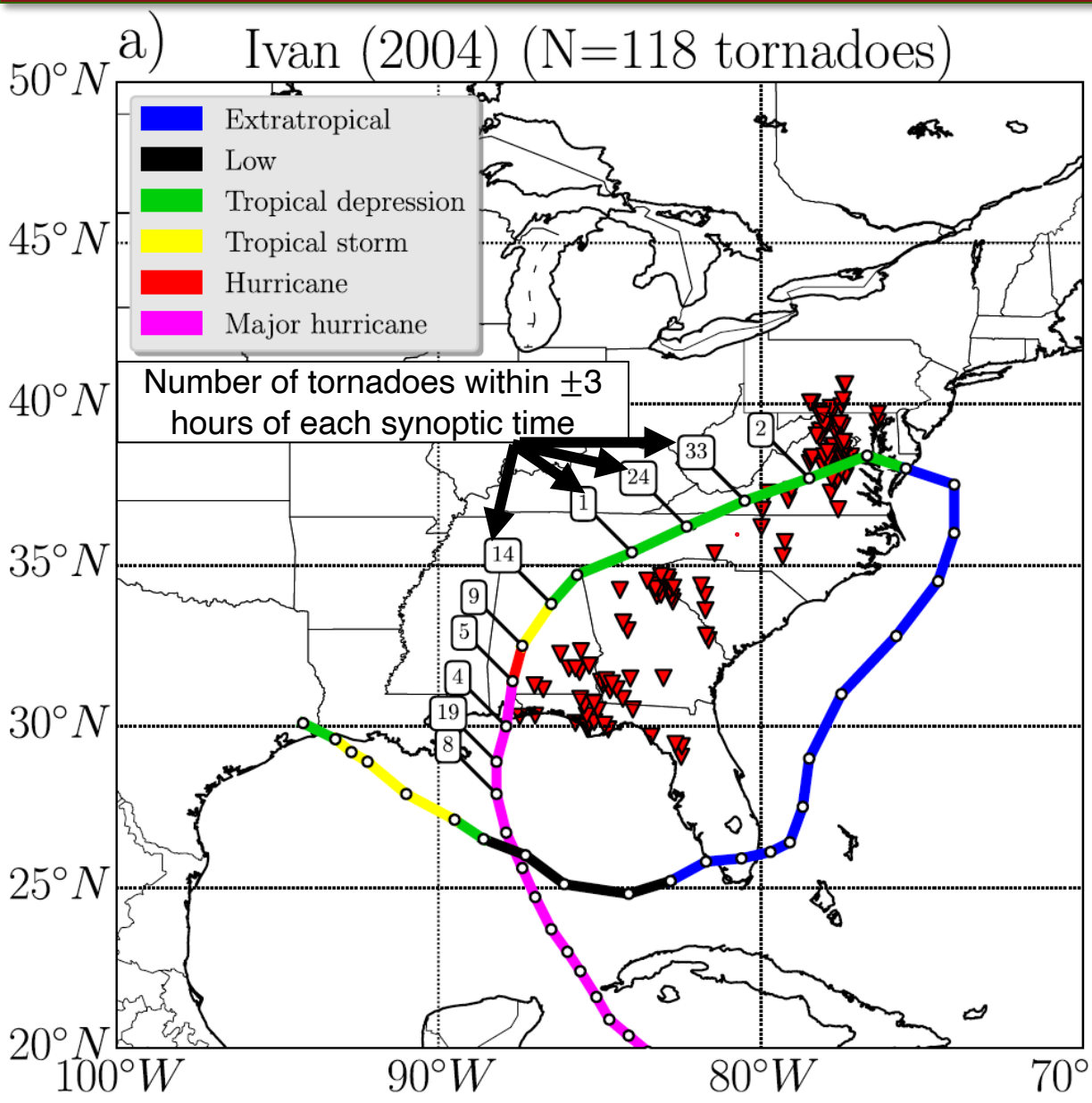

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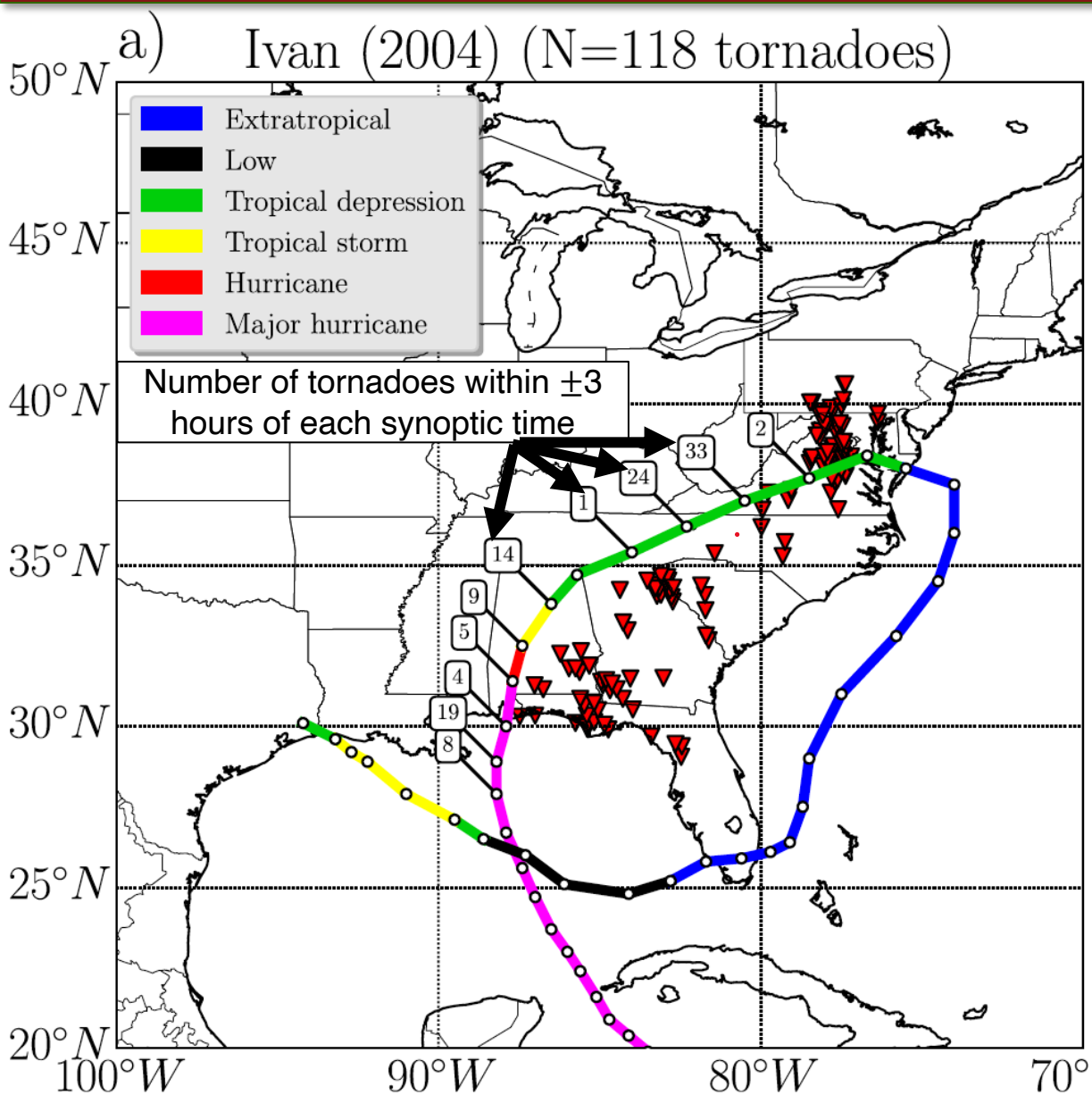

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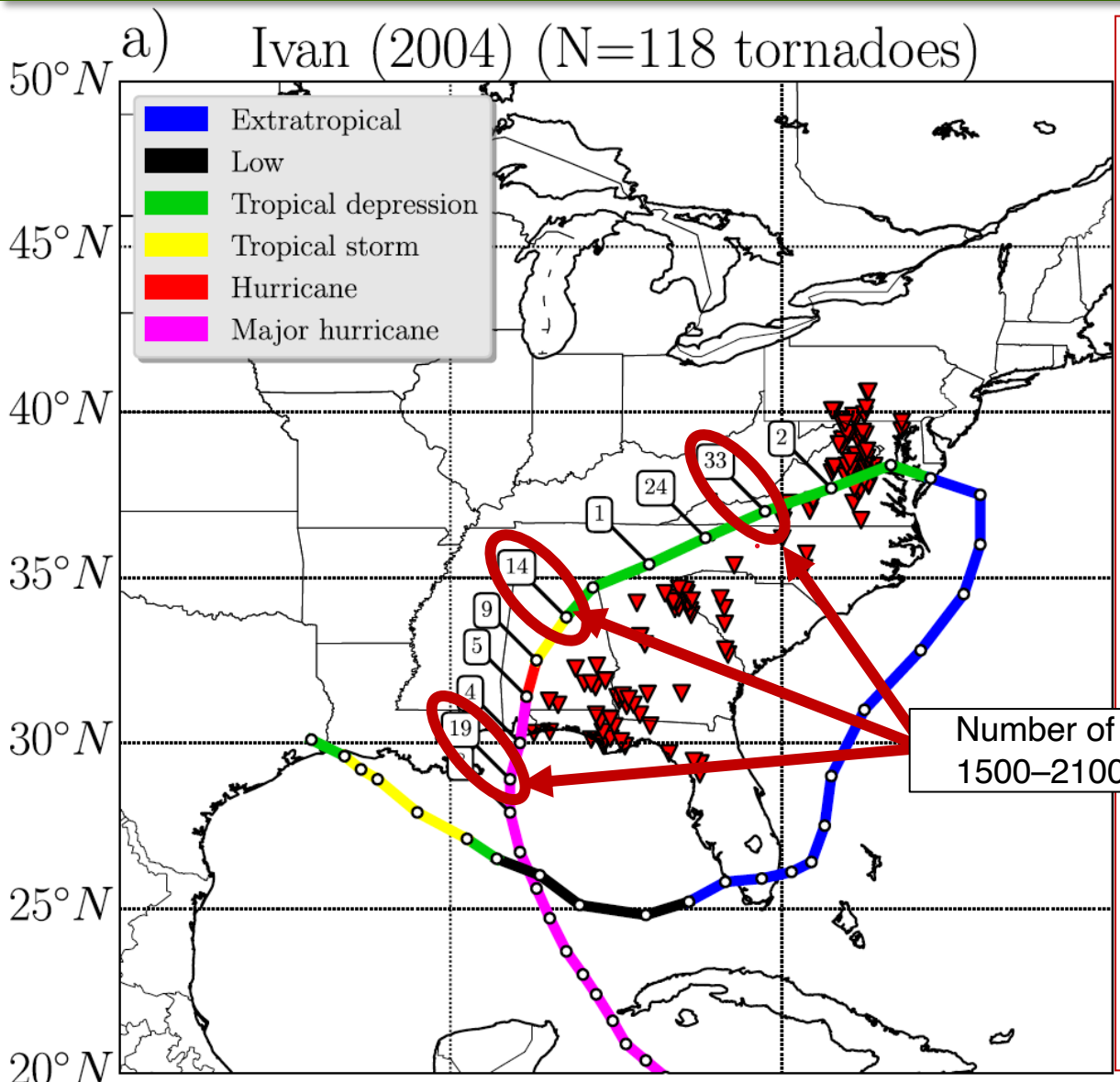

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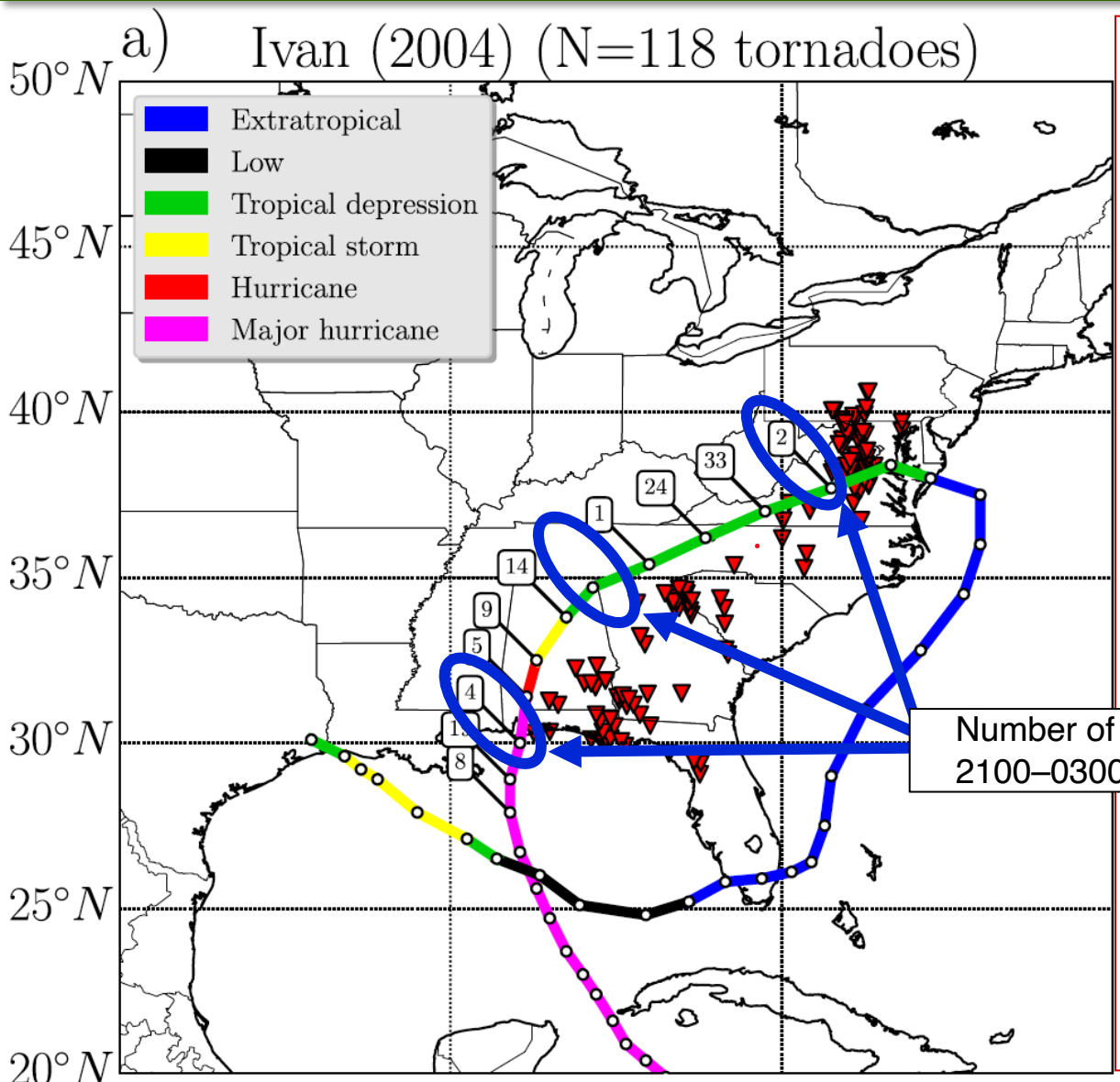

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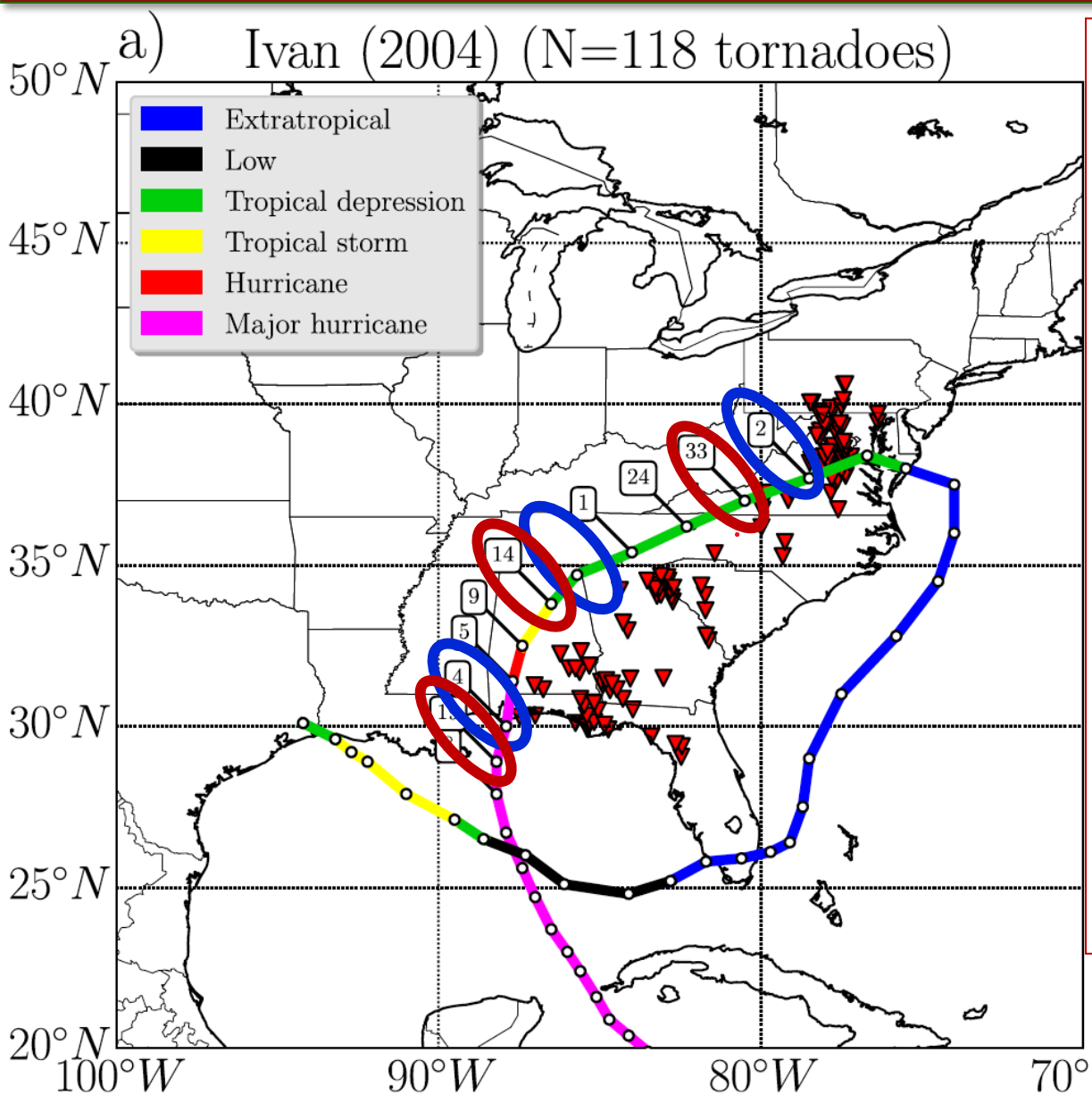

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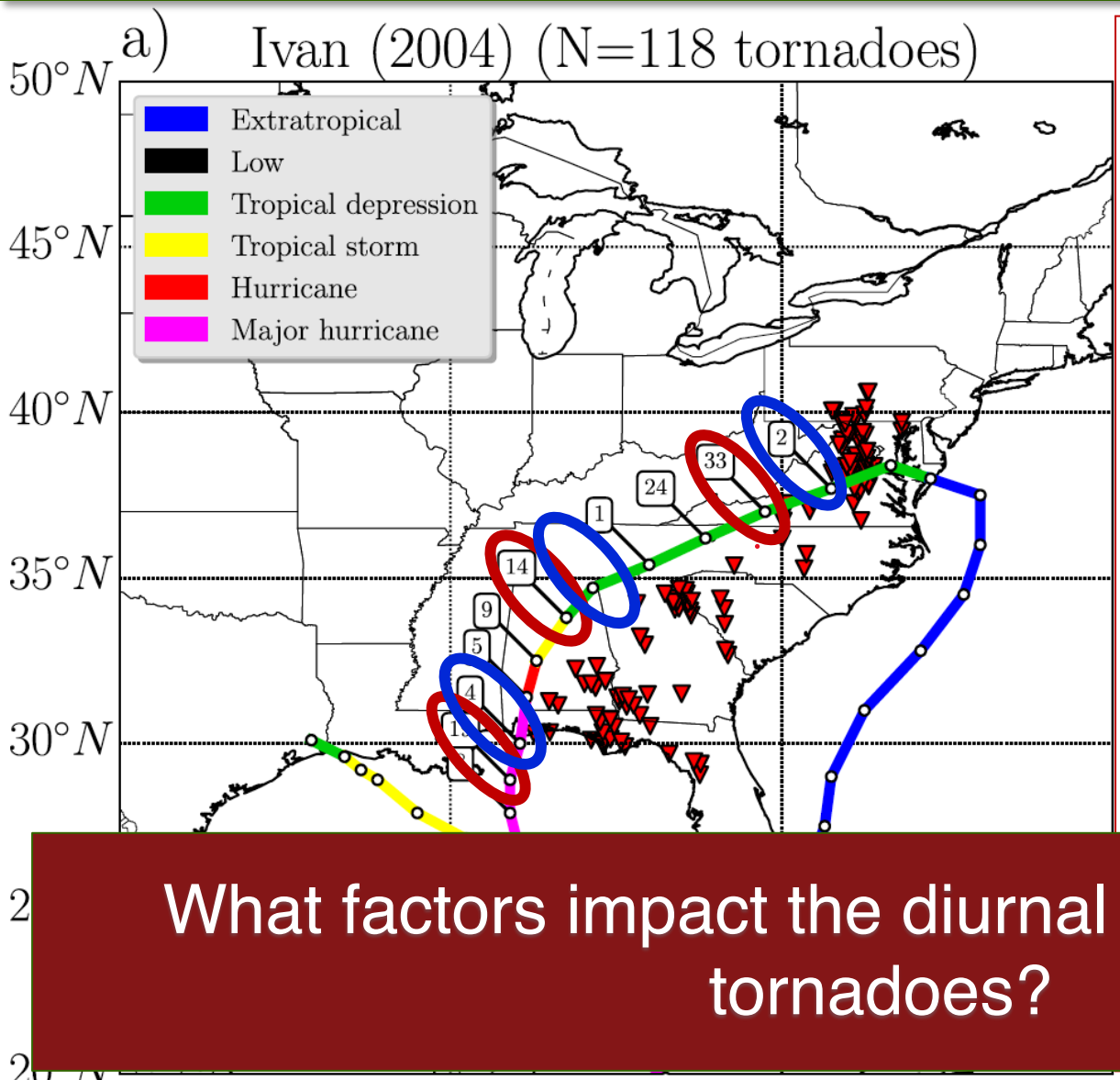

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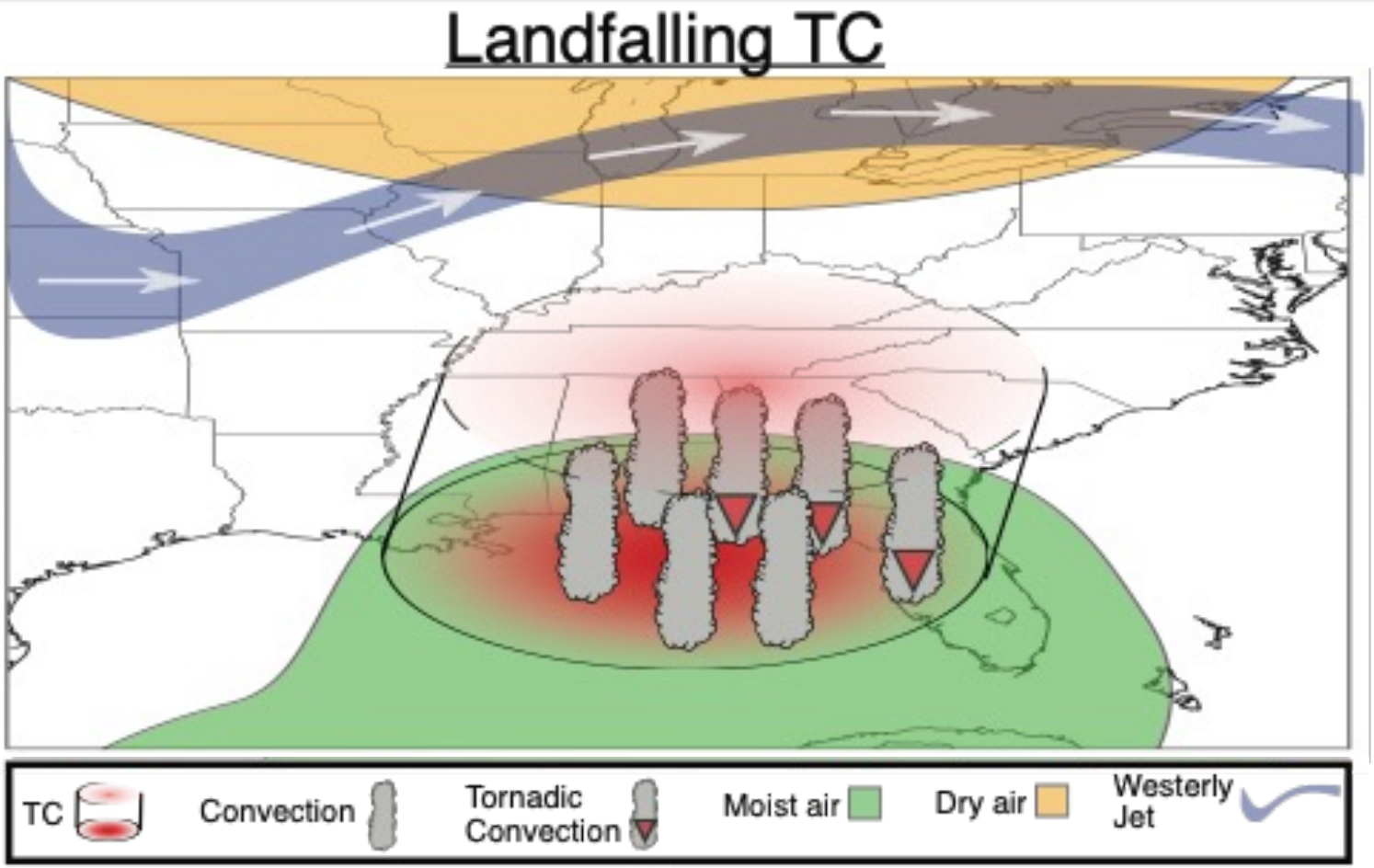

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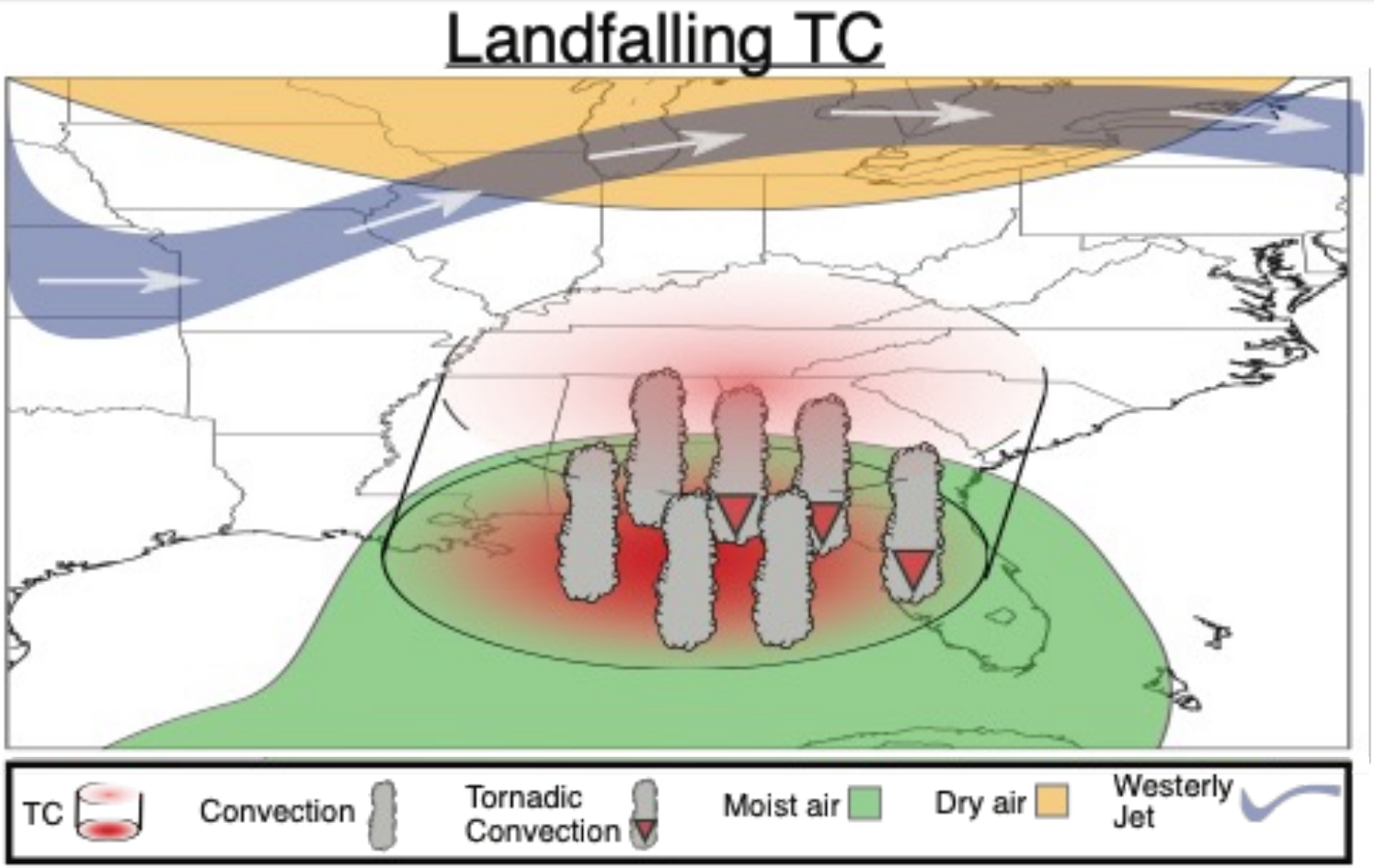

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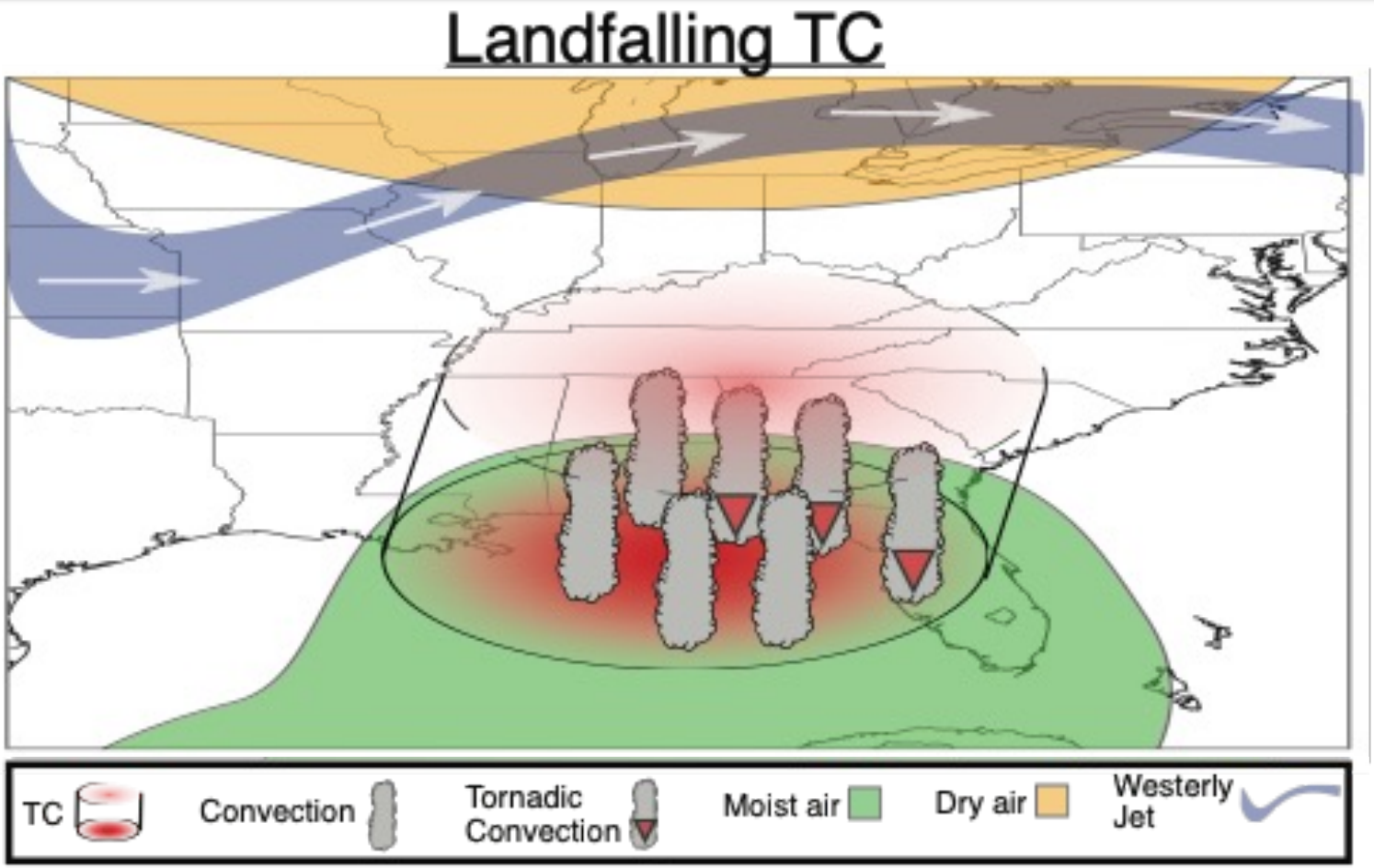

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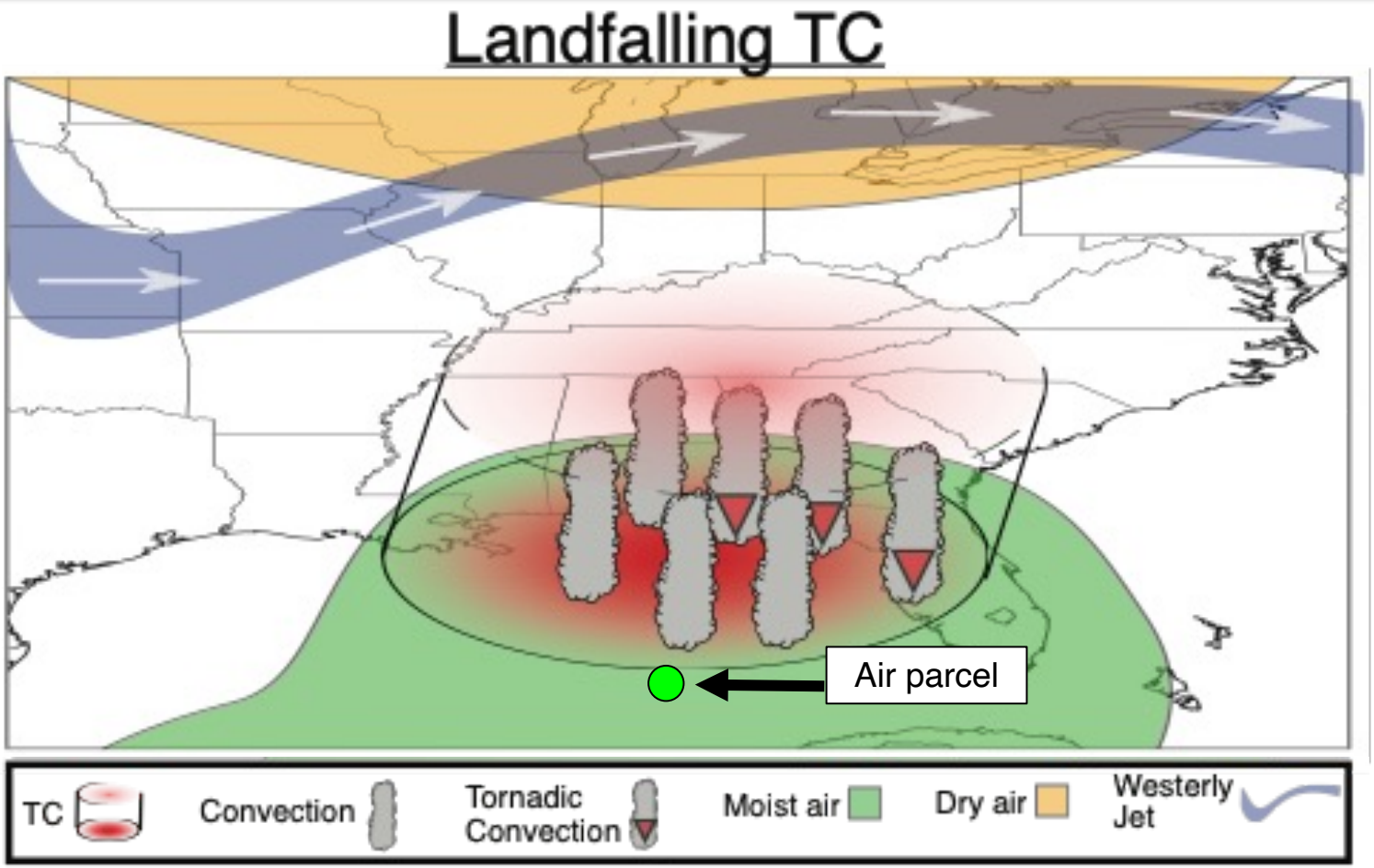

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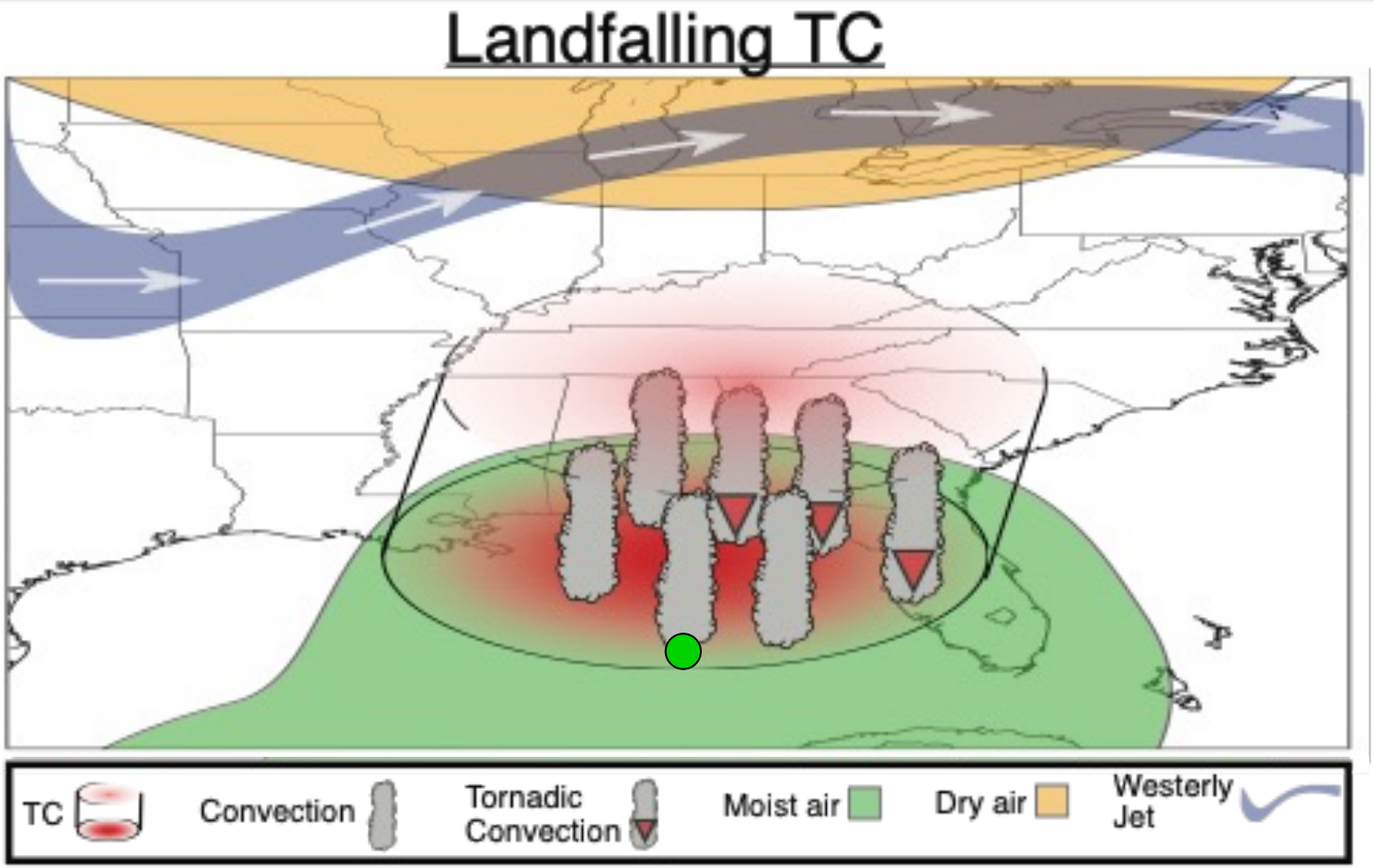

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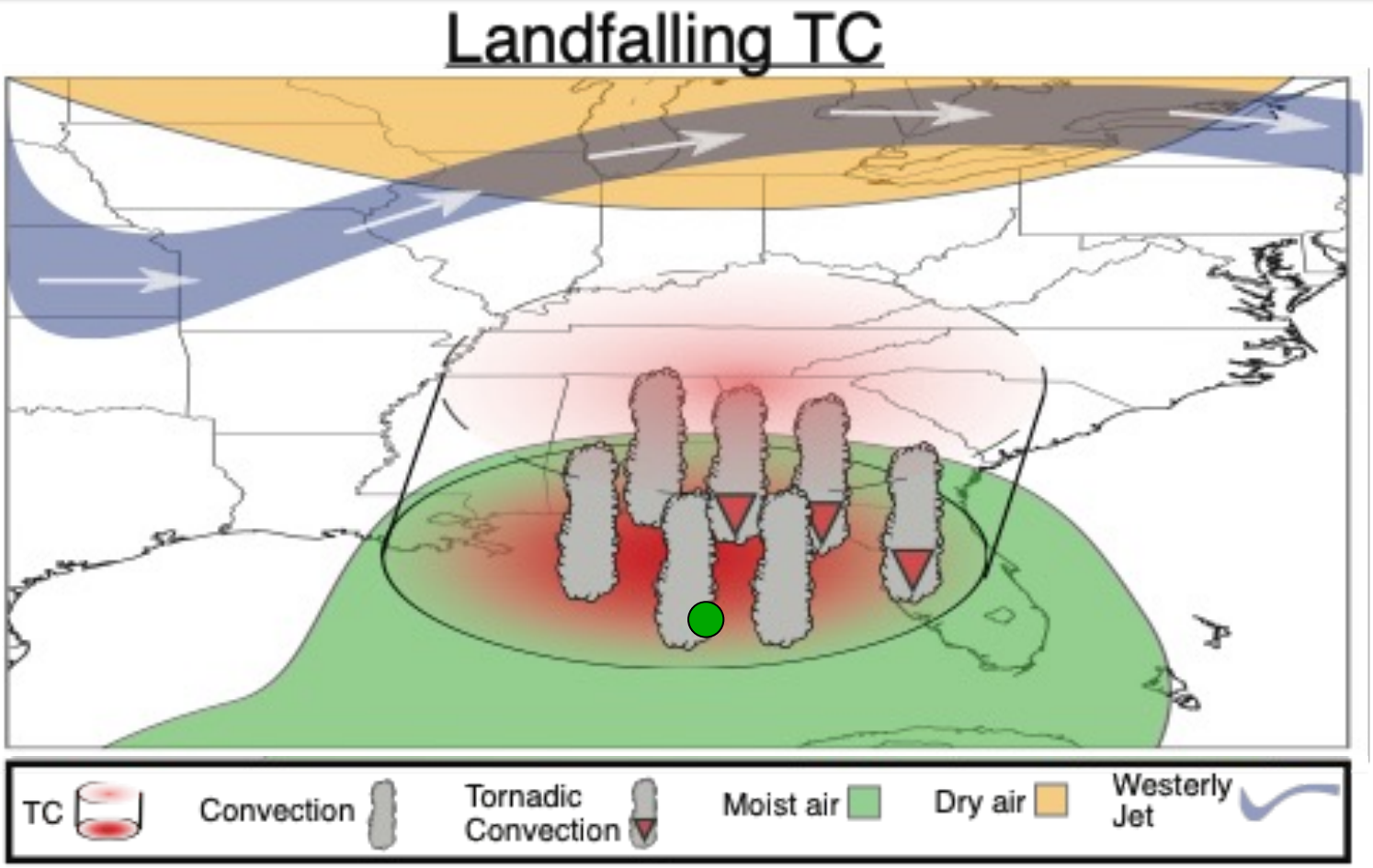

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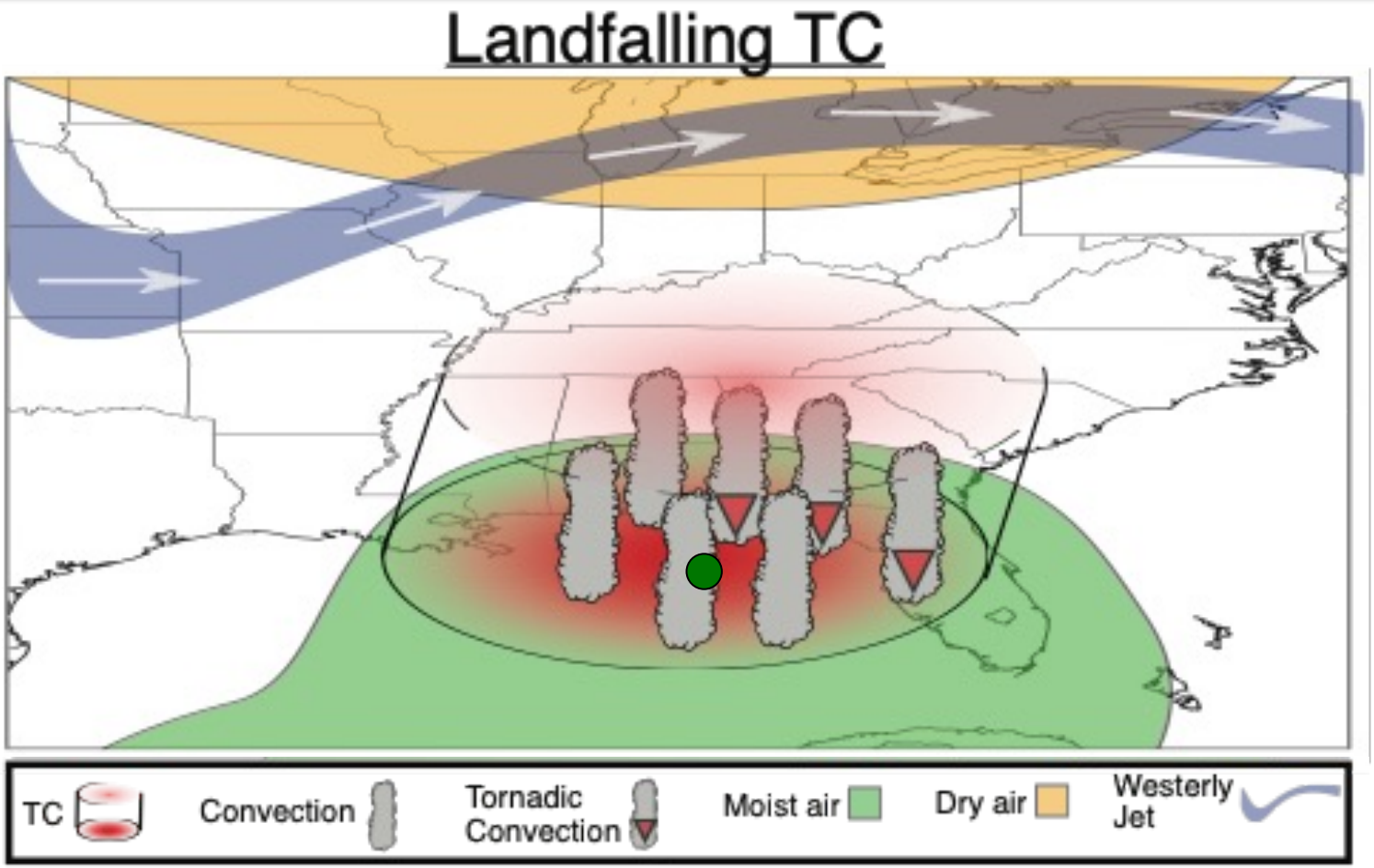

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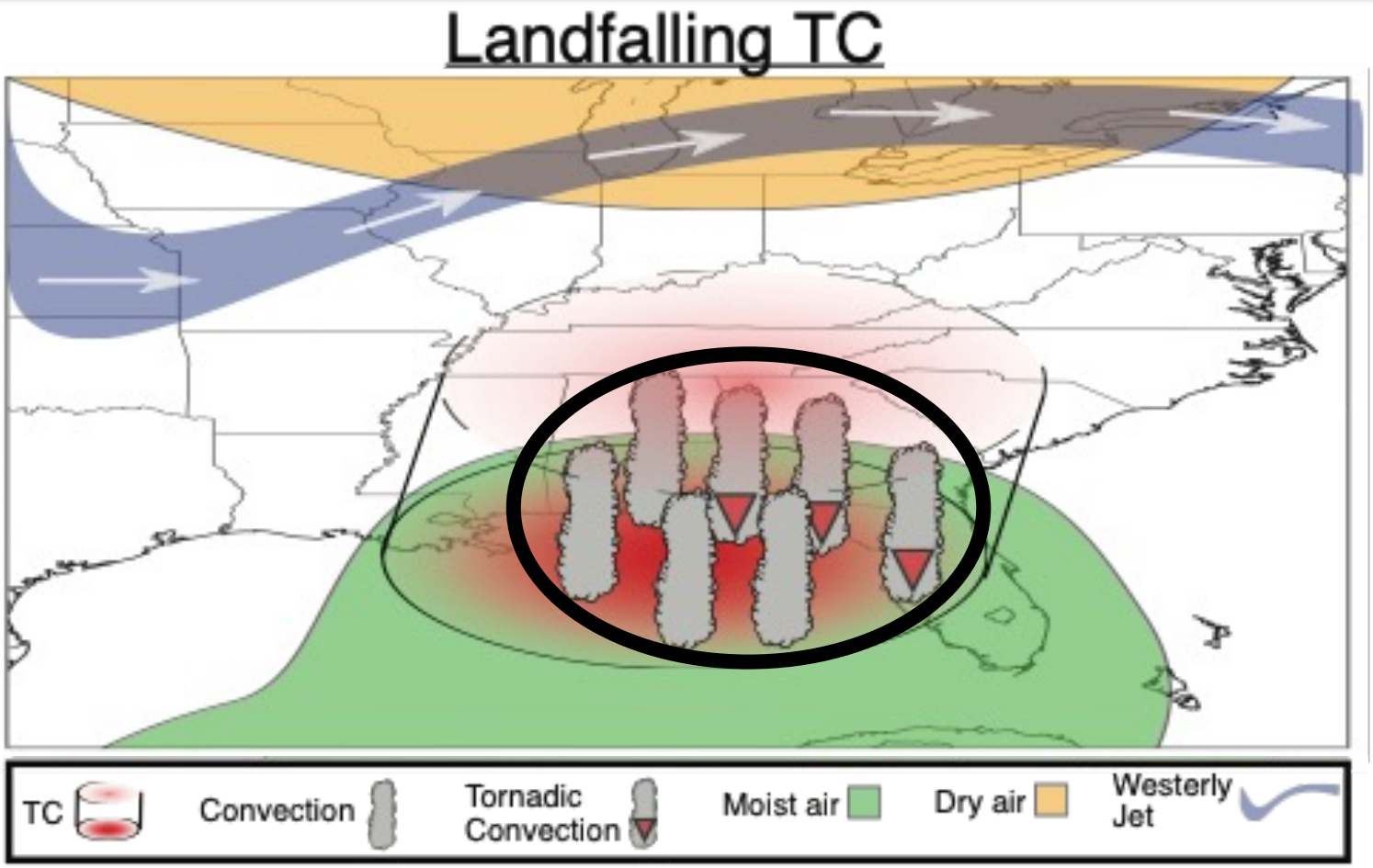

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- Weak diurnal variability of coastal tornadoes due to:
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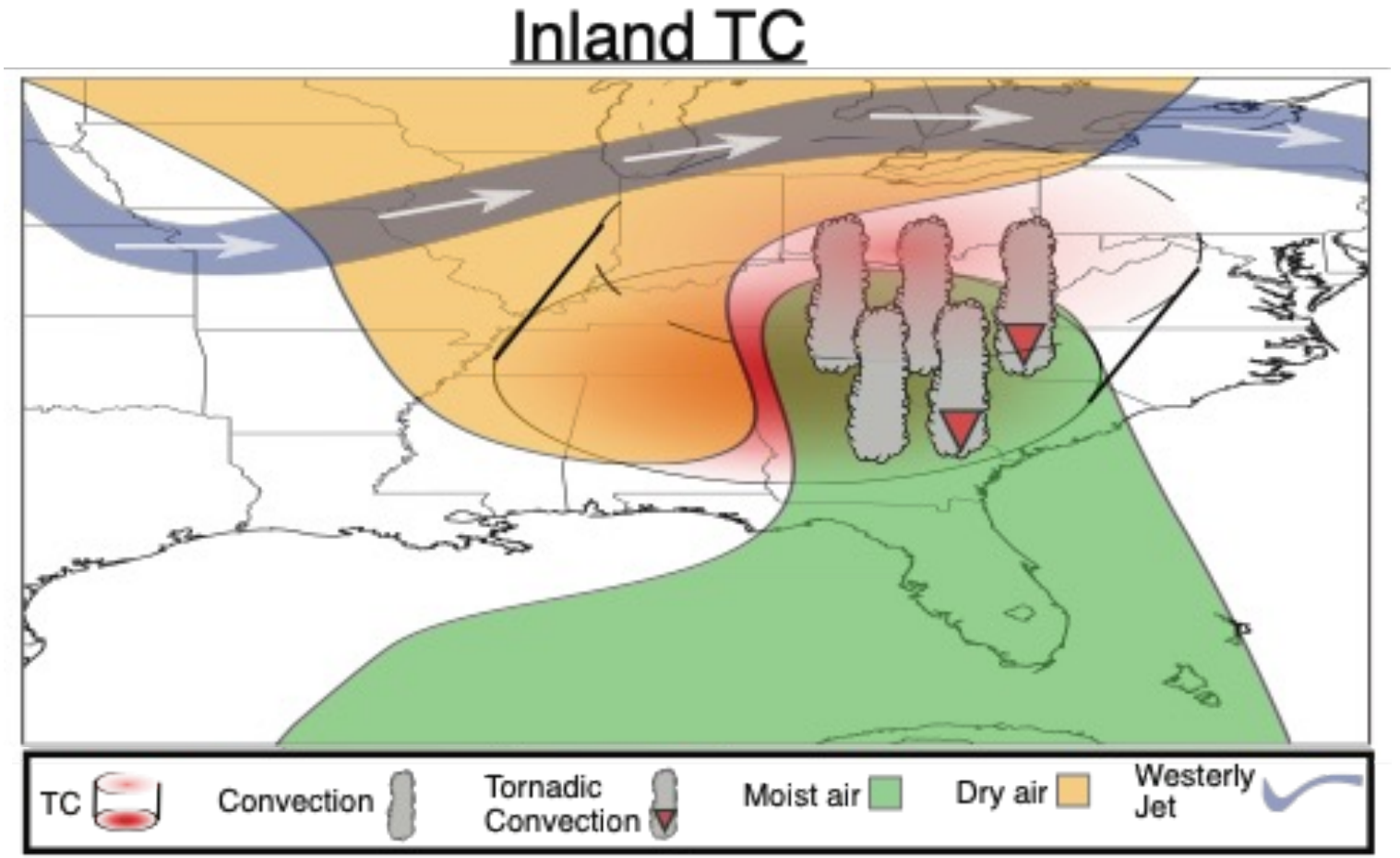

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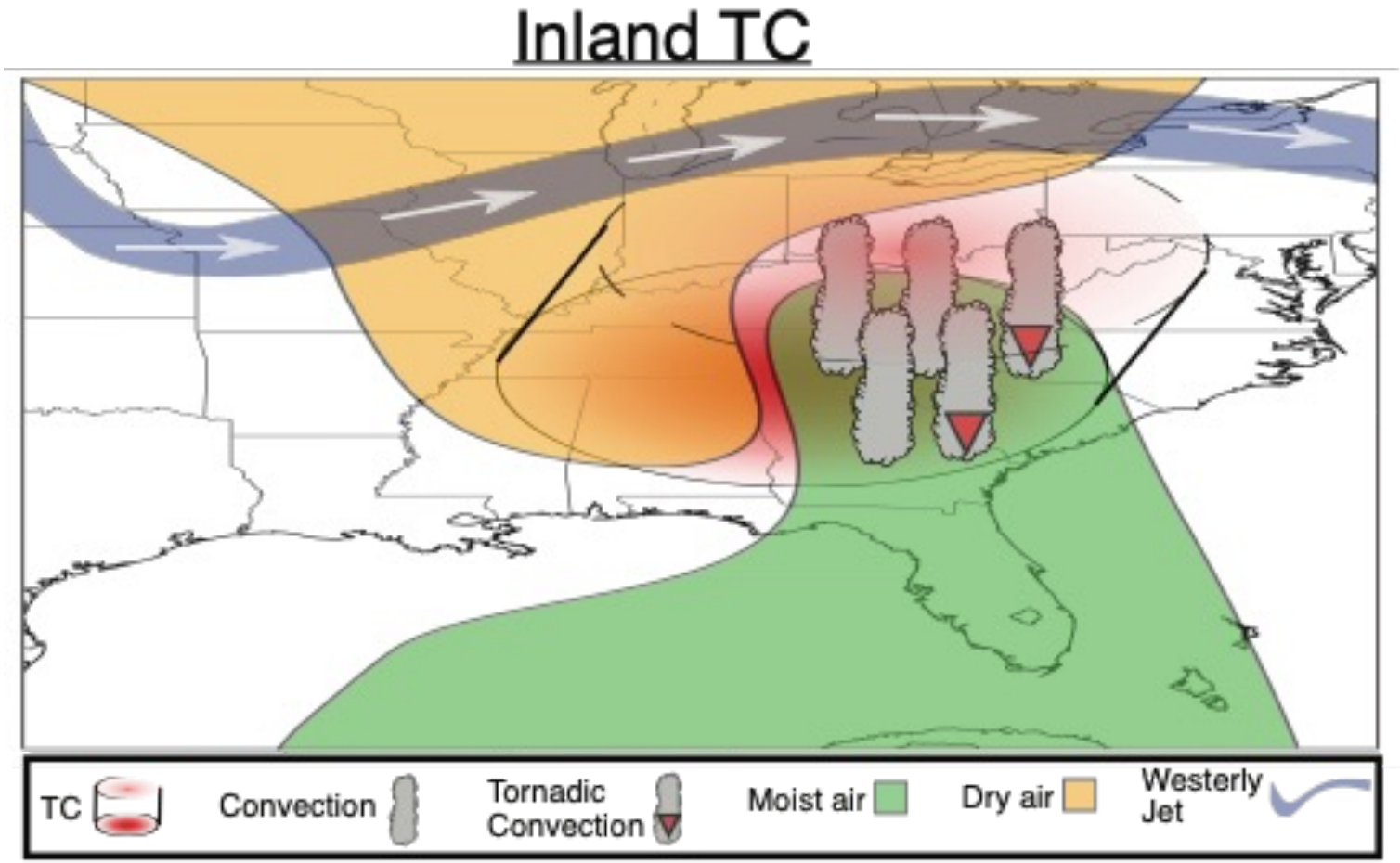

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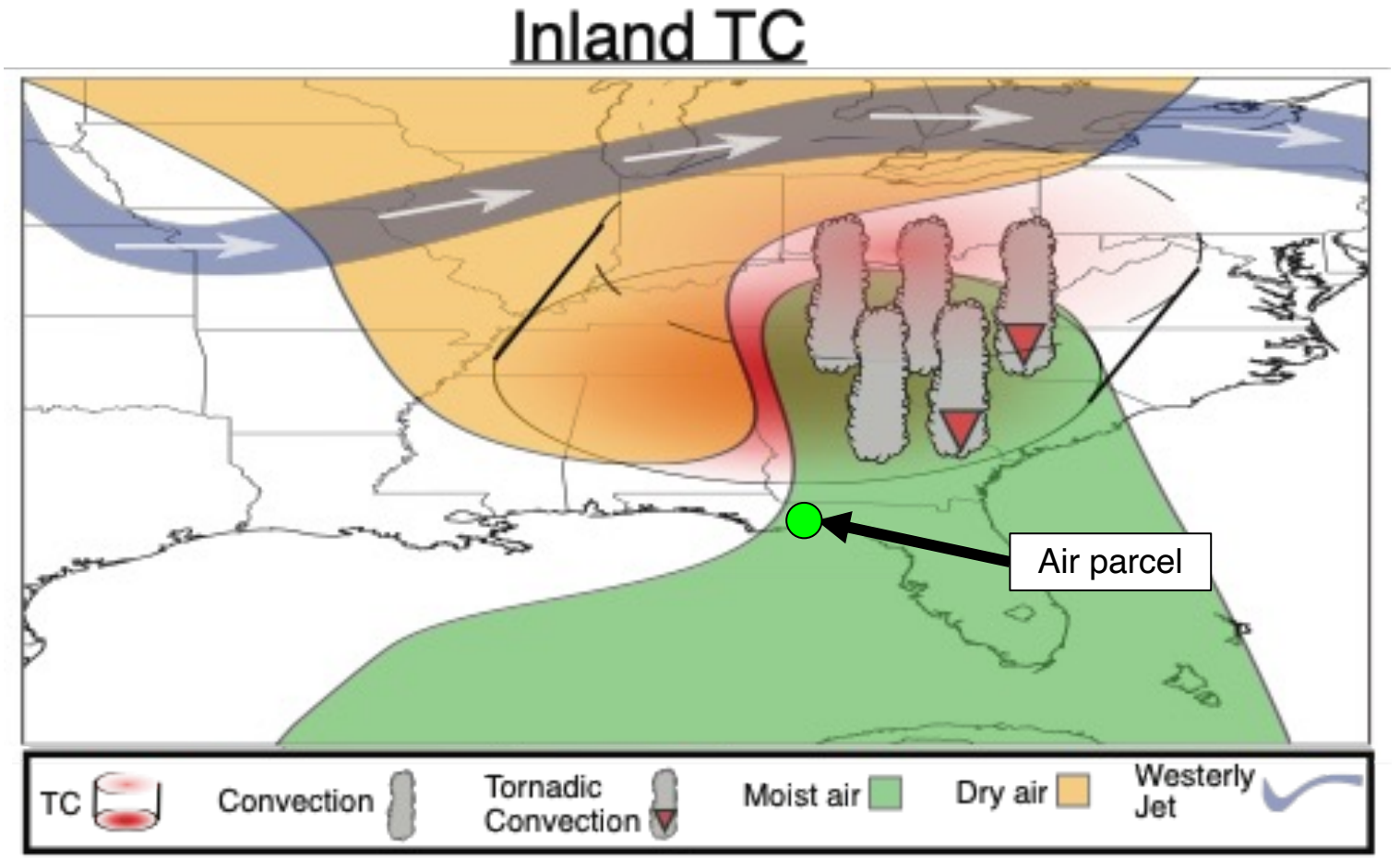

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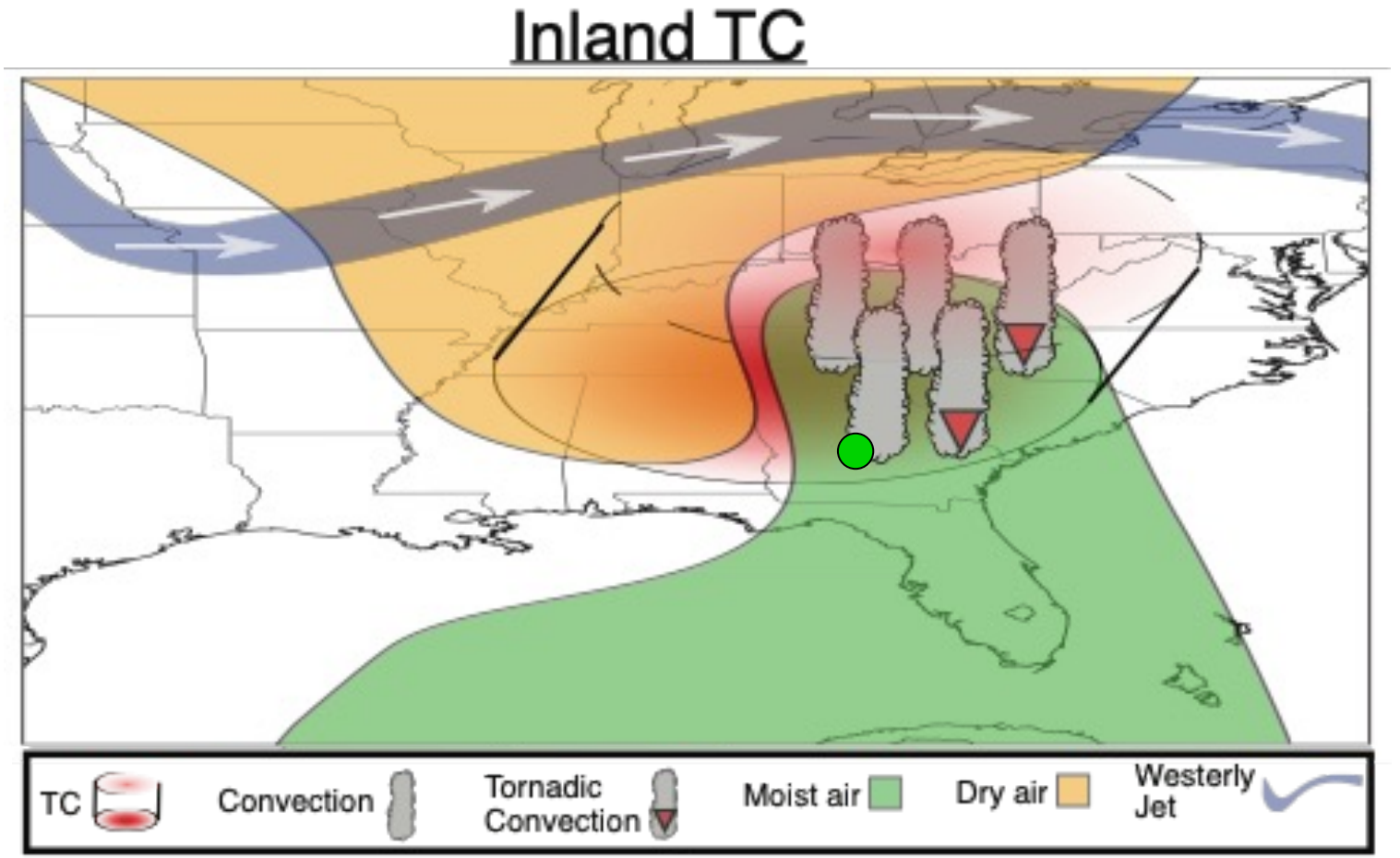

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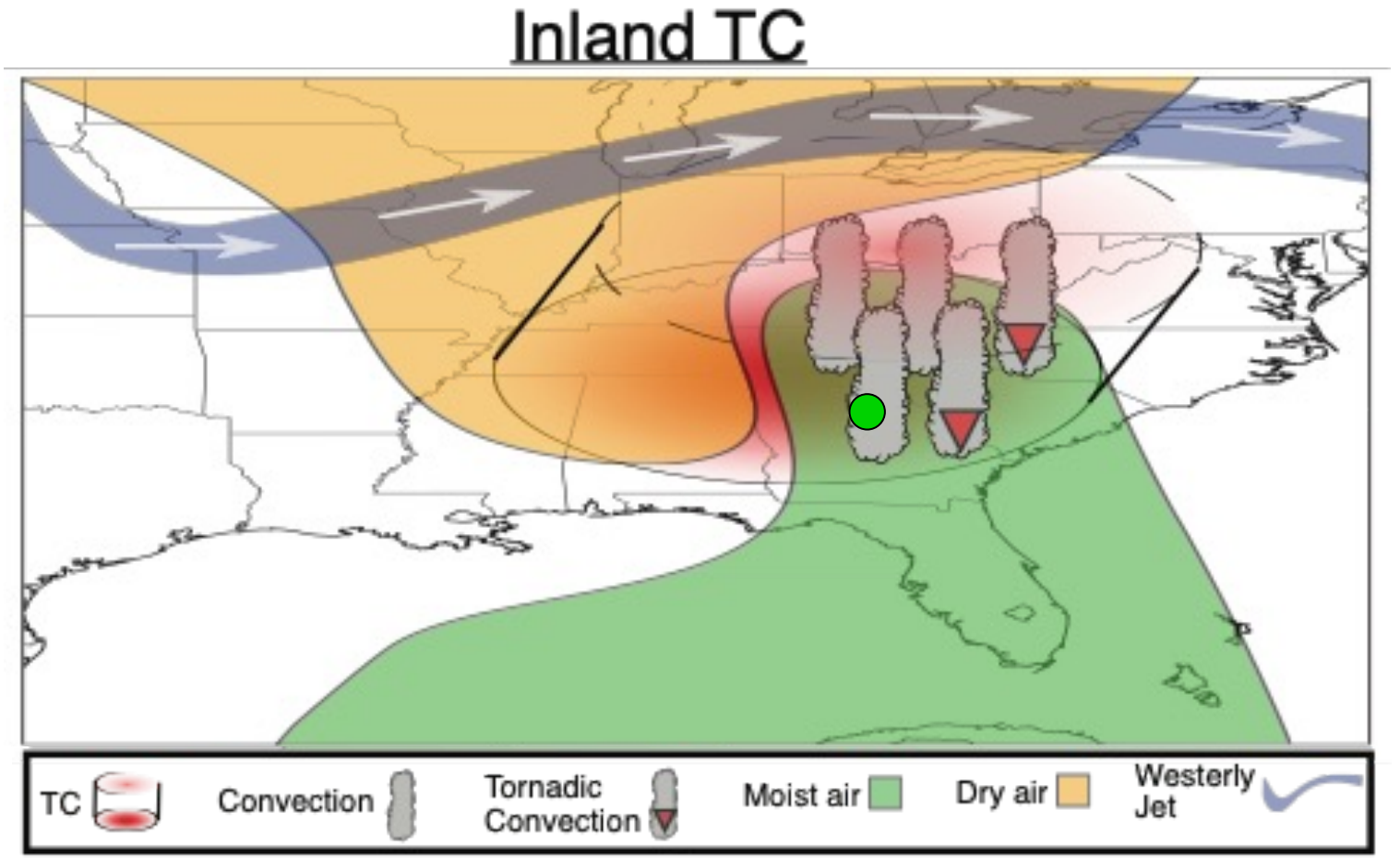

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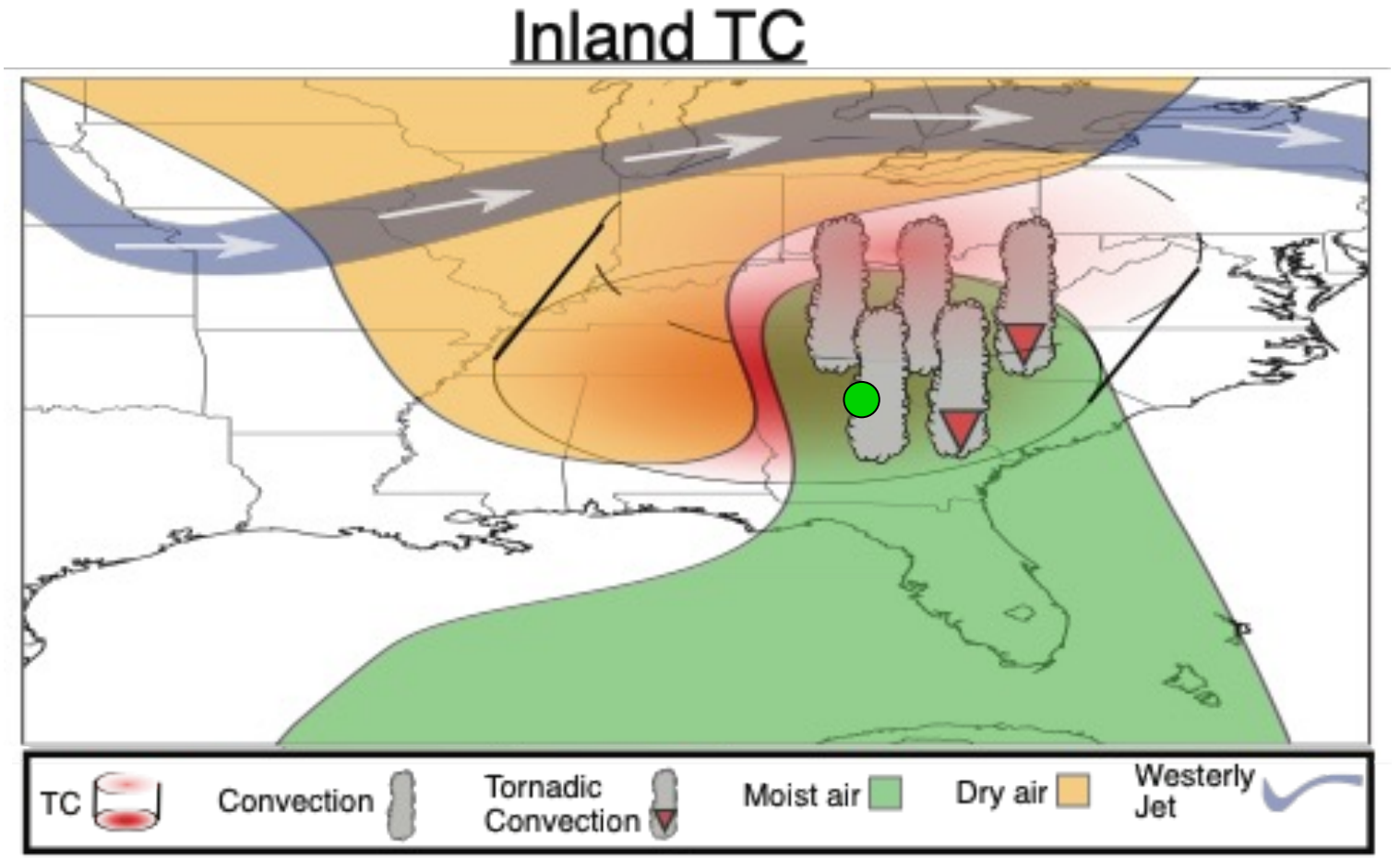

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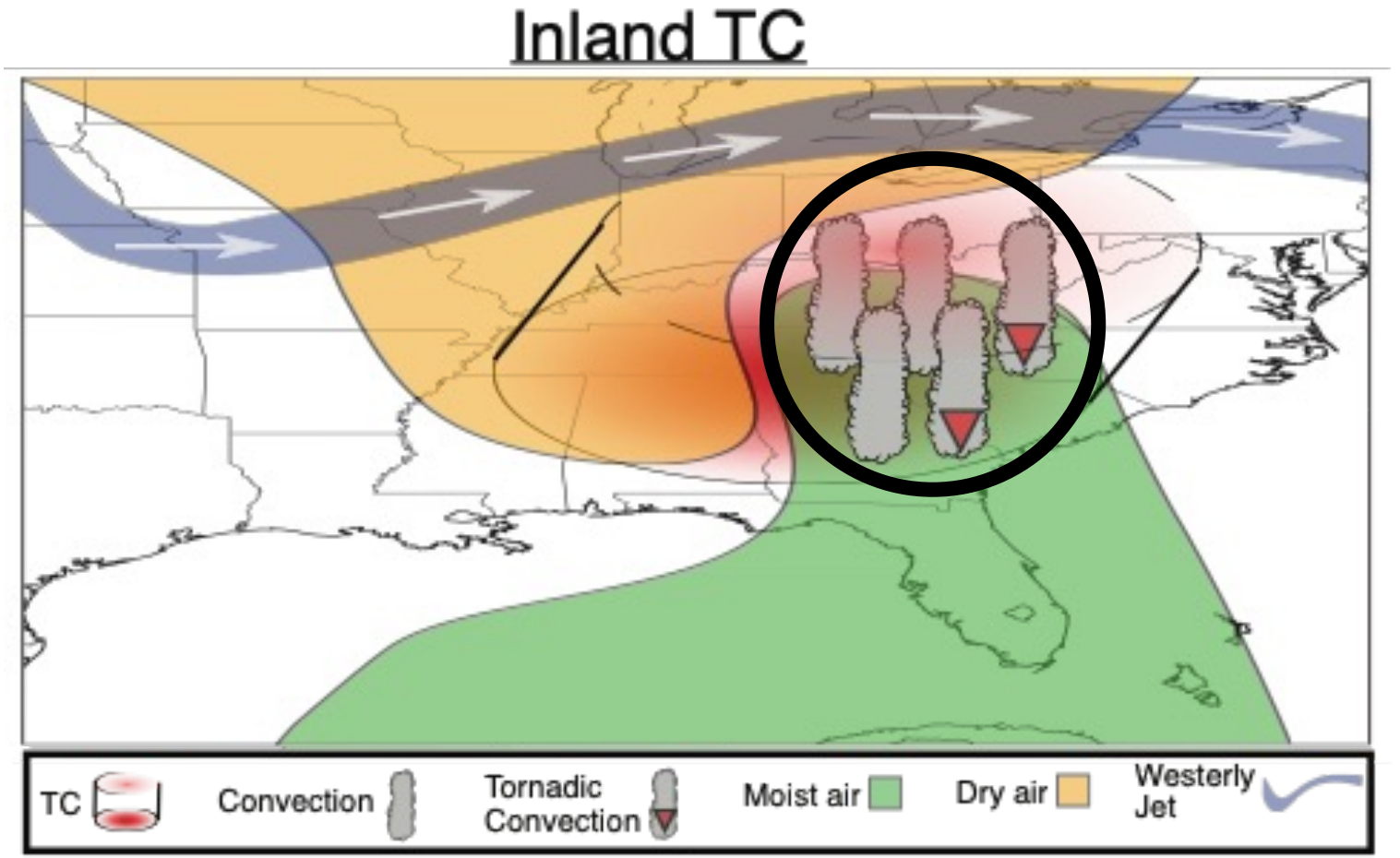

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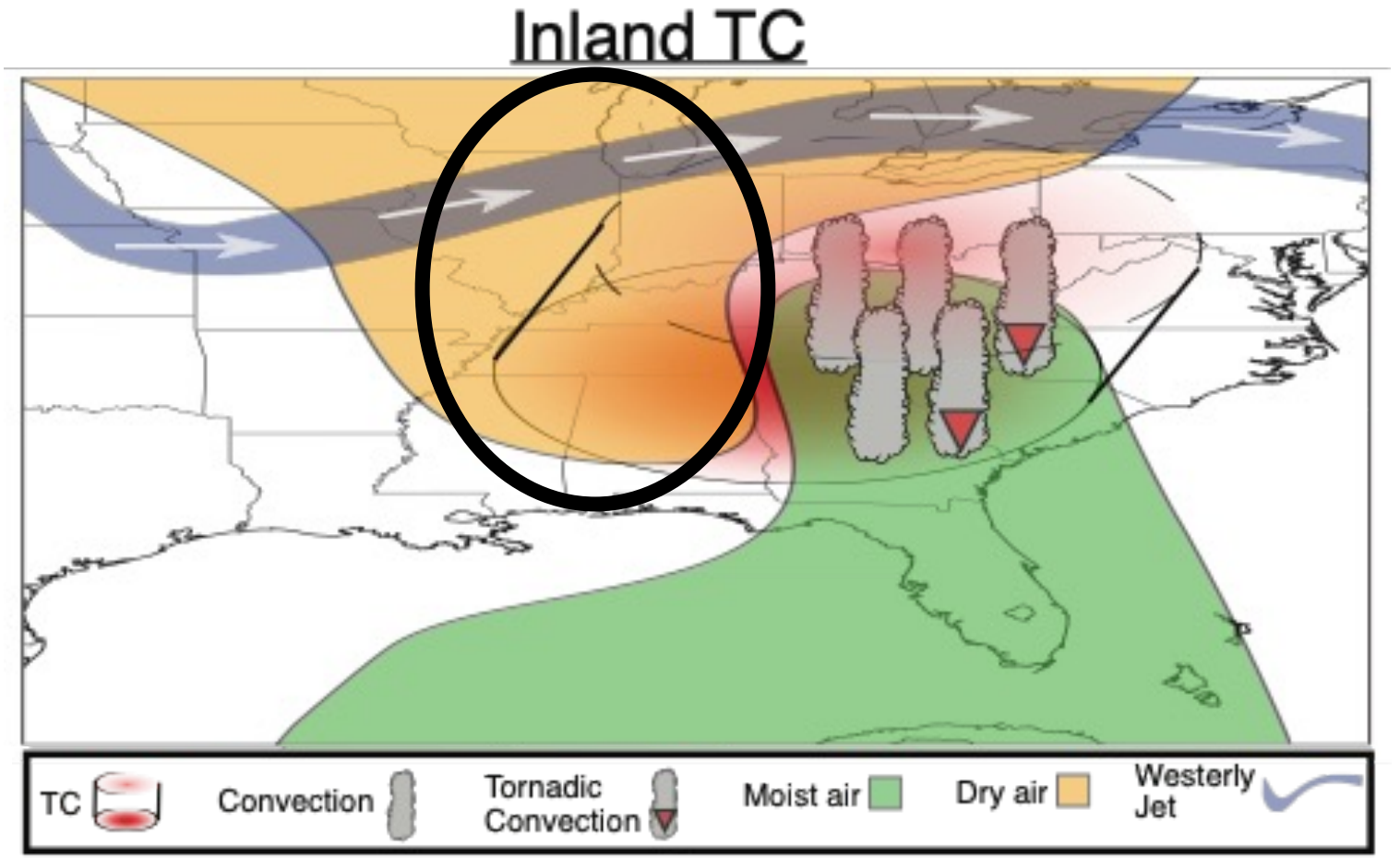

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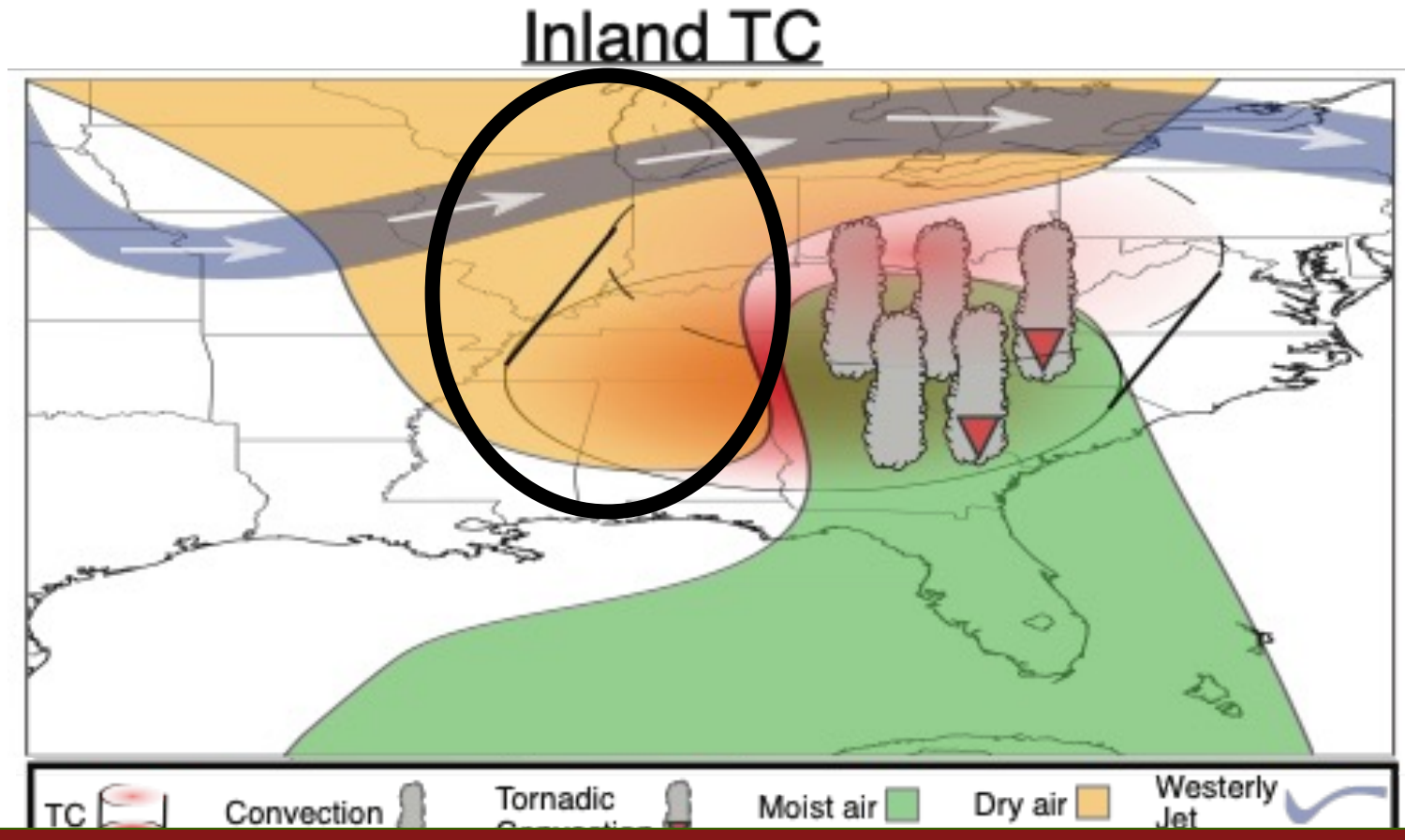

- How does the diurnal variability of tornadoes change as TCs move inland?

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- **TC tornado environments:** Examined composite differences in median temperature, dewpoint, and mixed-layer CAPE;
  - NOAA Integrated Global Radiosonde Archive version 2 and NSSL sondes within 75–750 km of TC center from 1995–2020 (N=5786 sondes, 259 TCs; Durre et al. 2006; Fernández-Cabán et al. 2019).

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- Analyze changes in the timing of tornadoes along with their convective-scale environments for inland, transition, and coastal regimes **relative to local sunset.**

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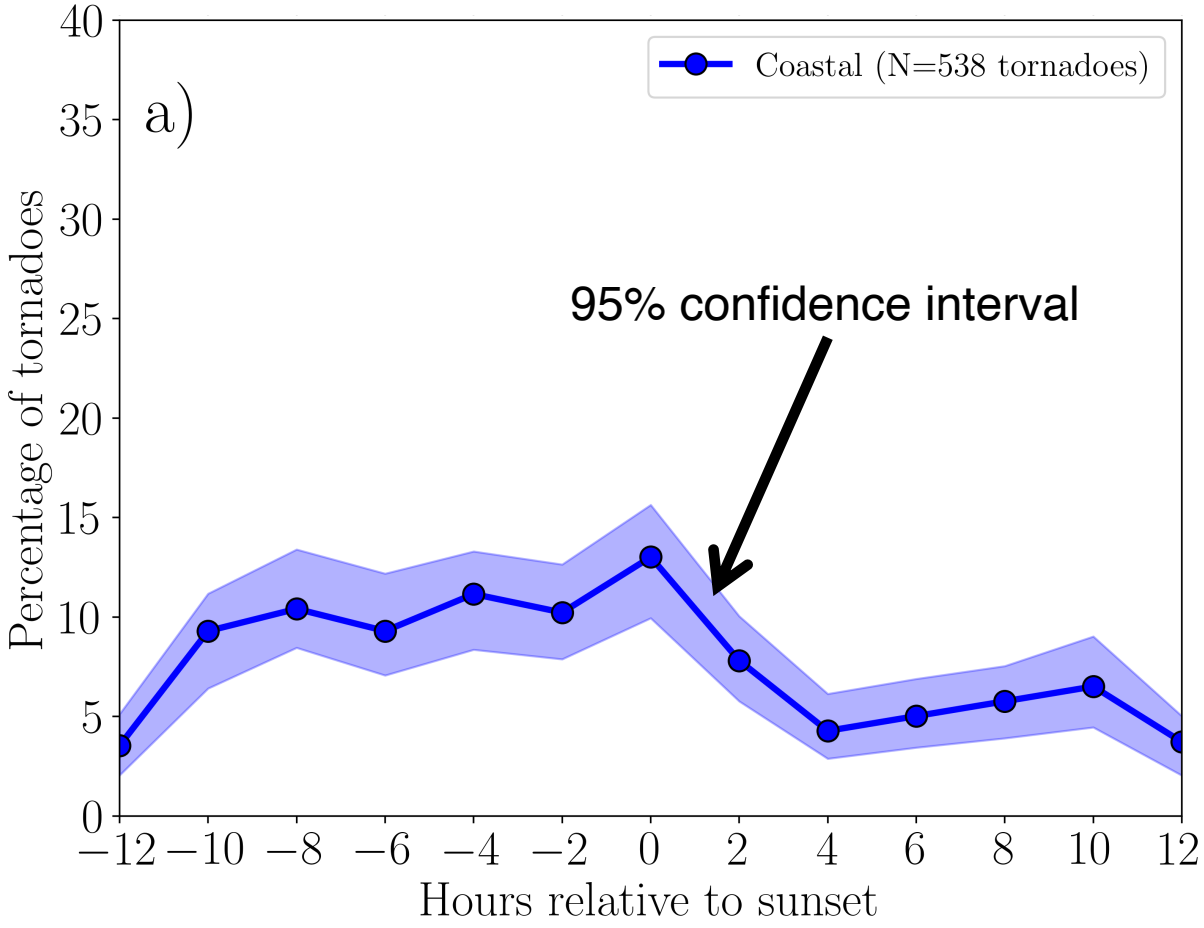

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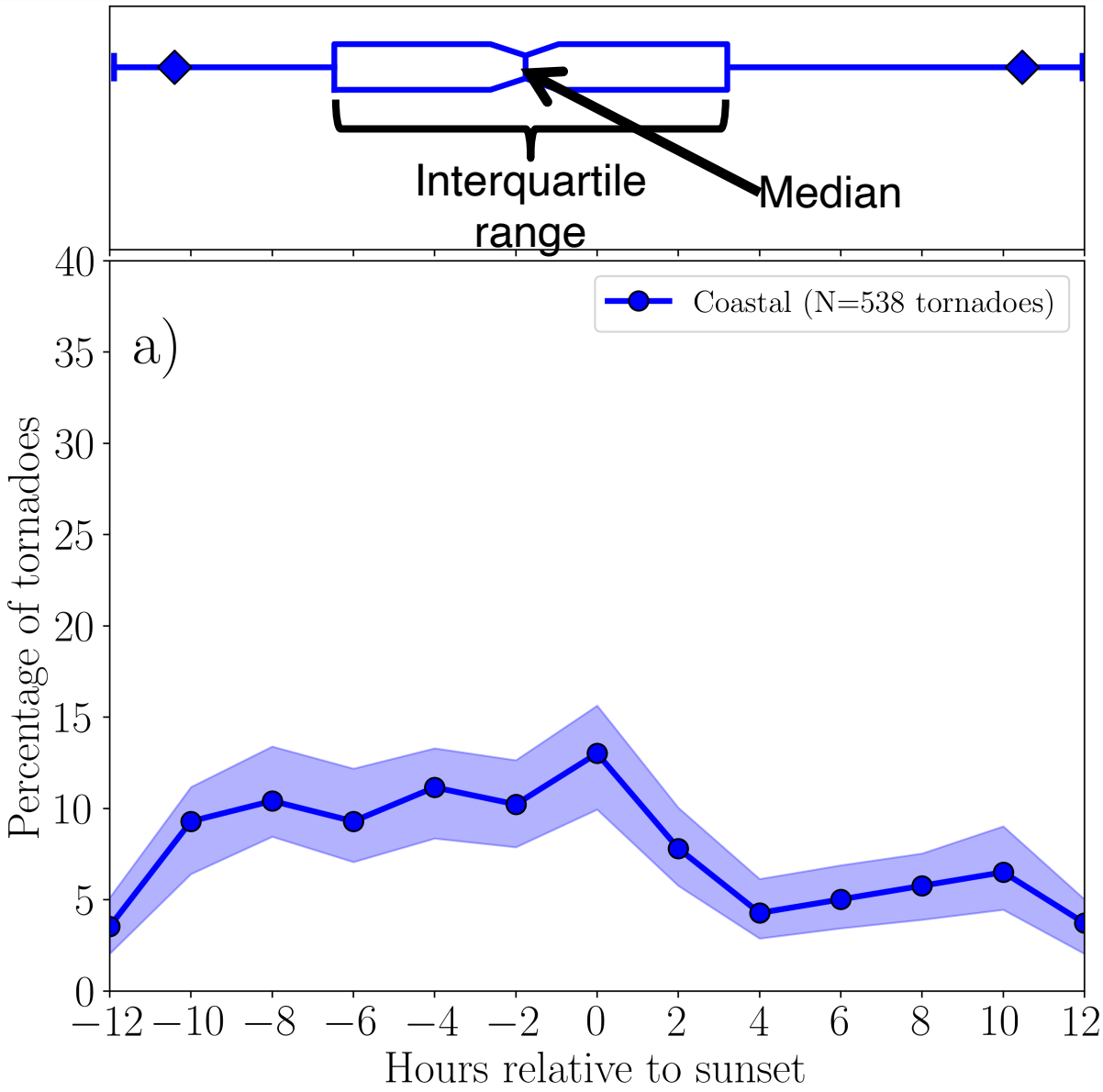

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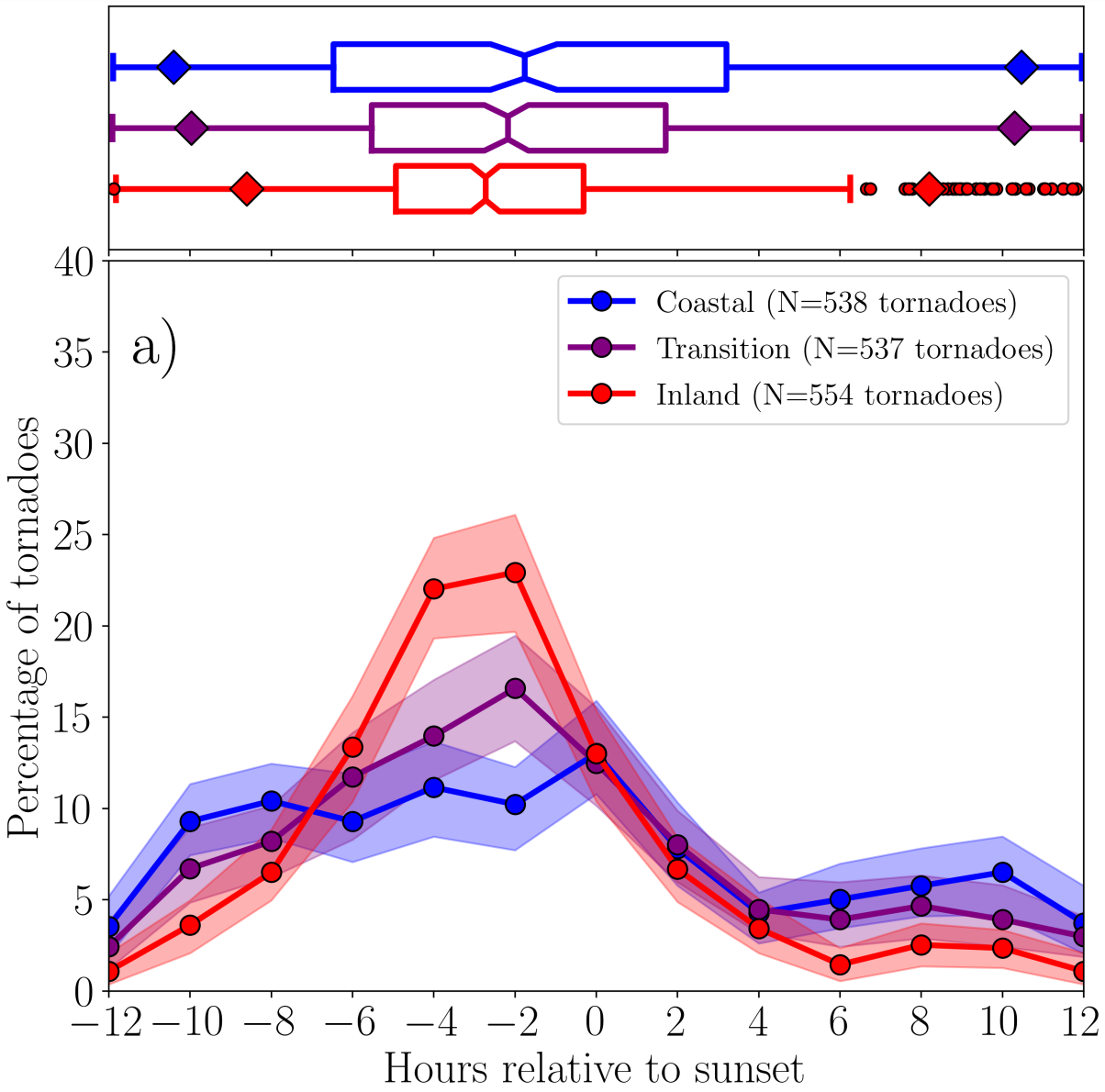

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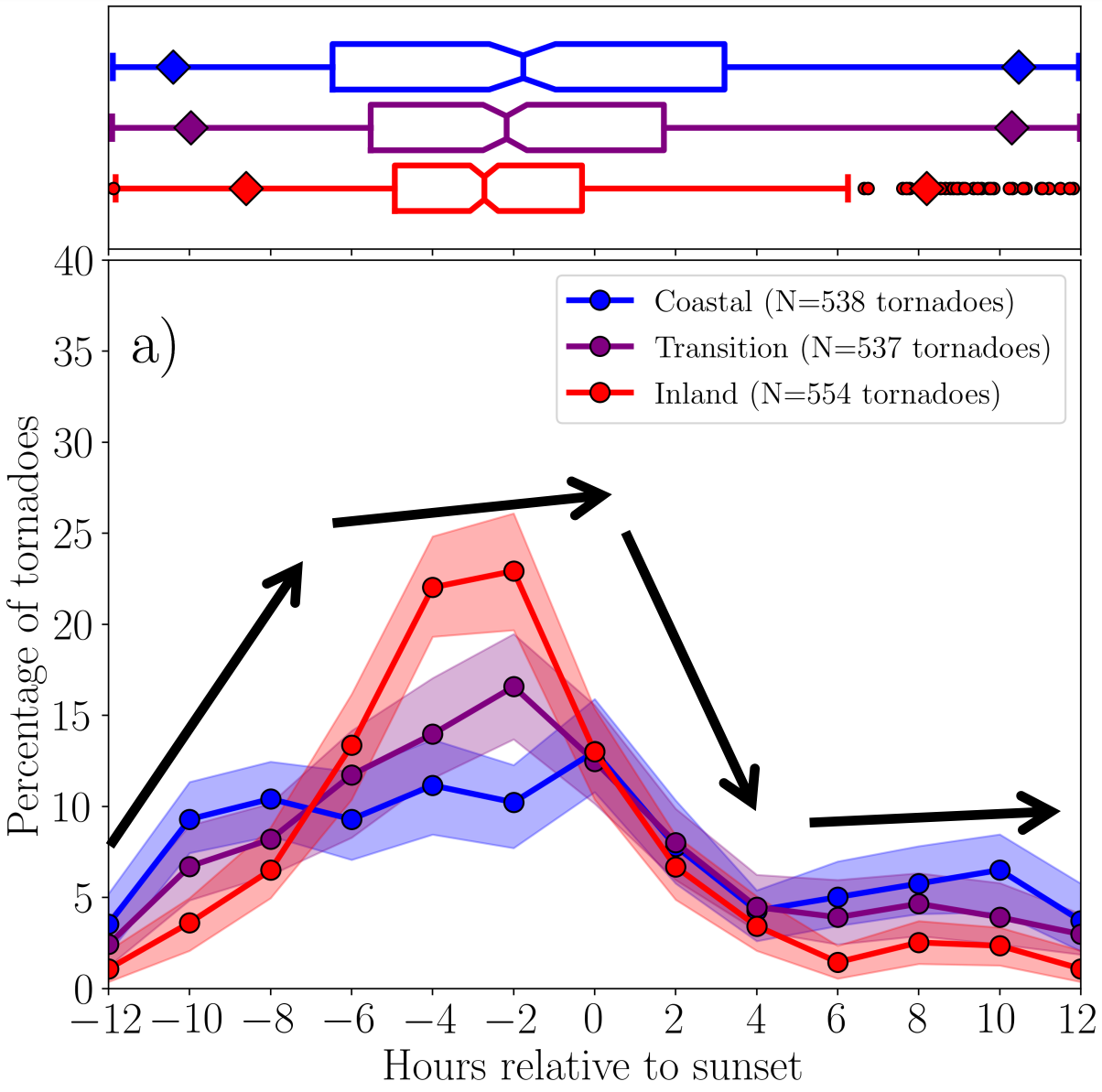

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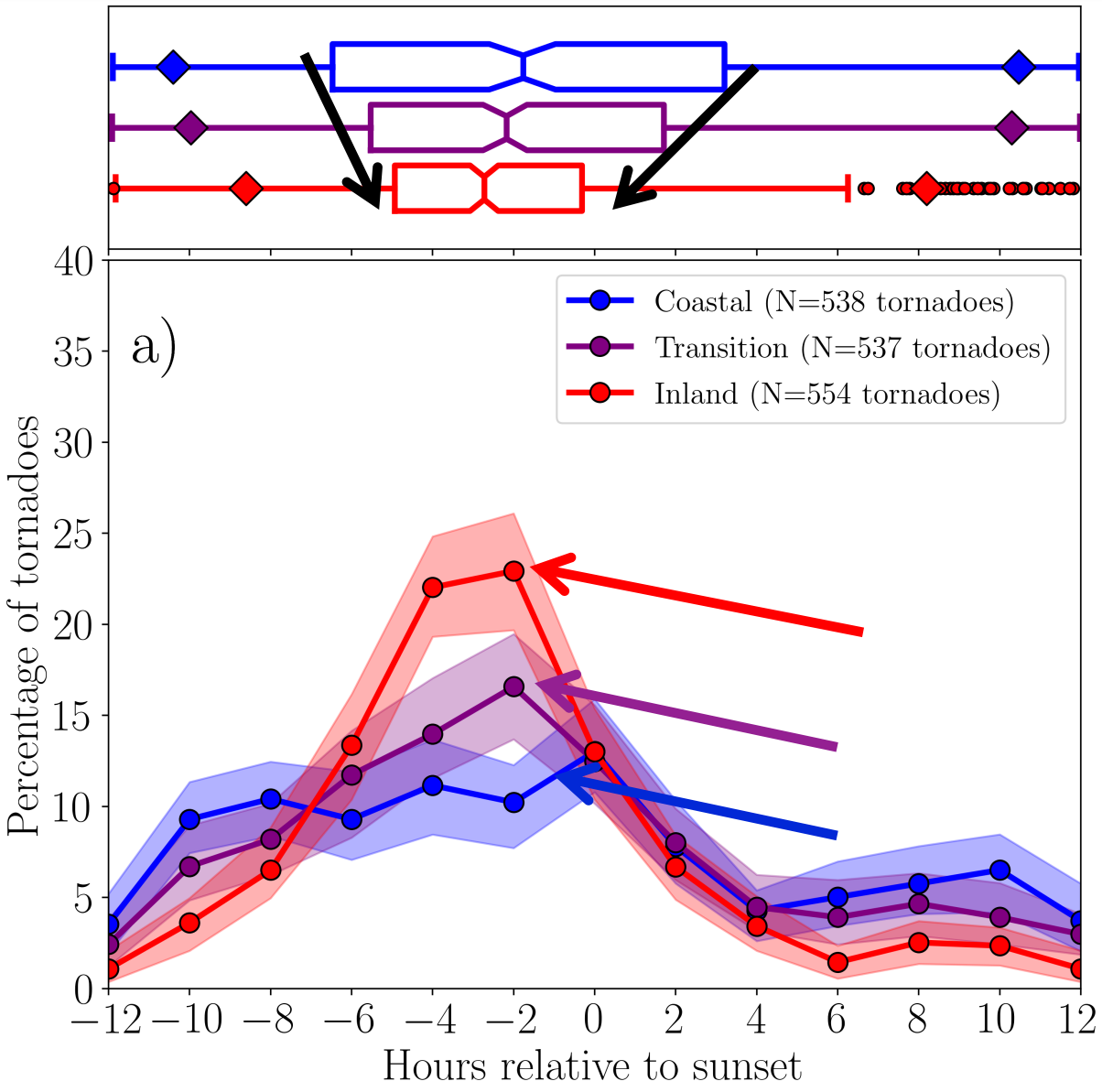

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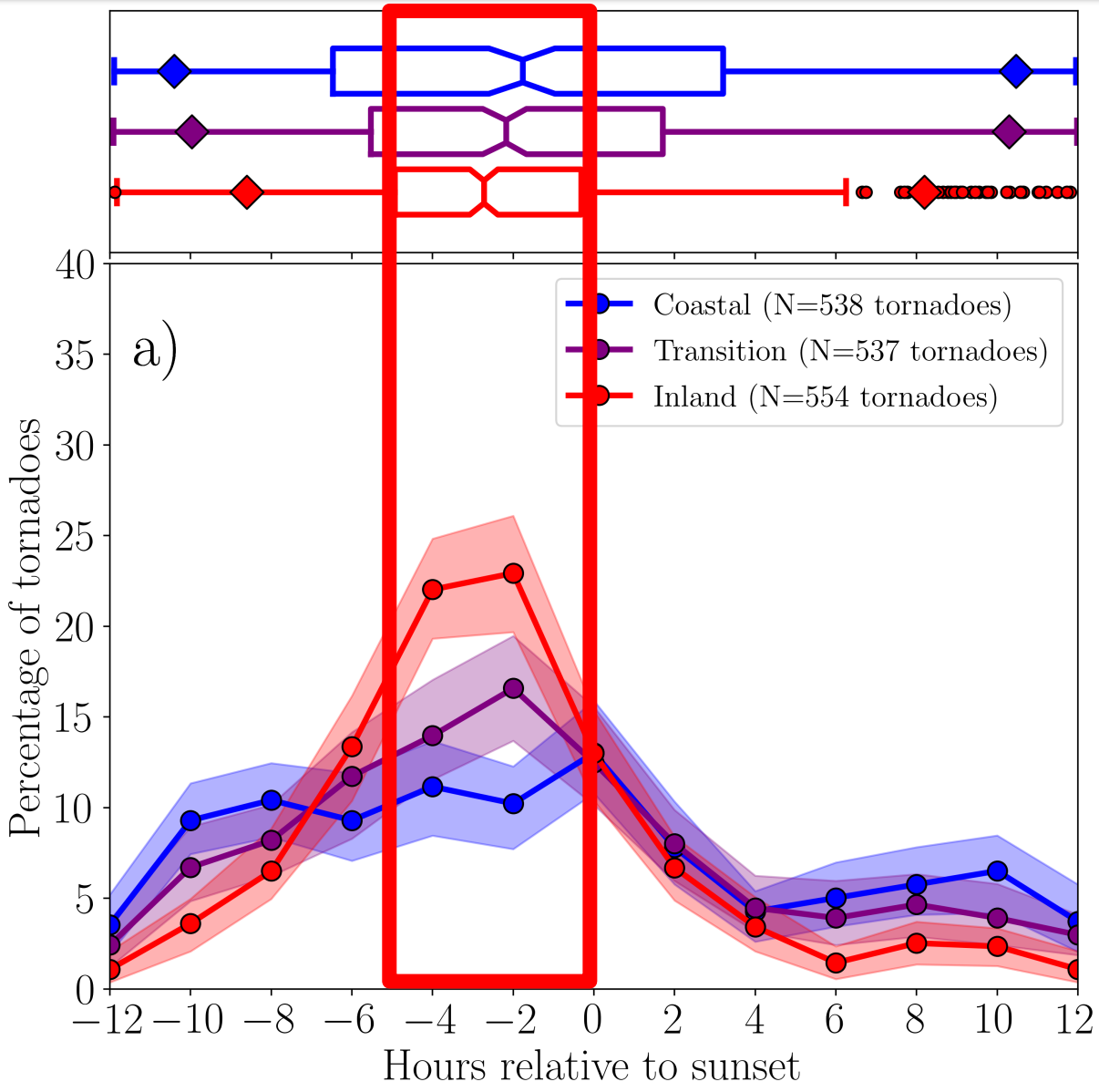

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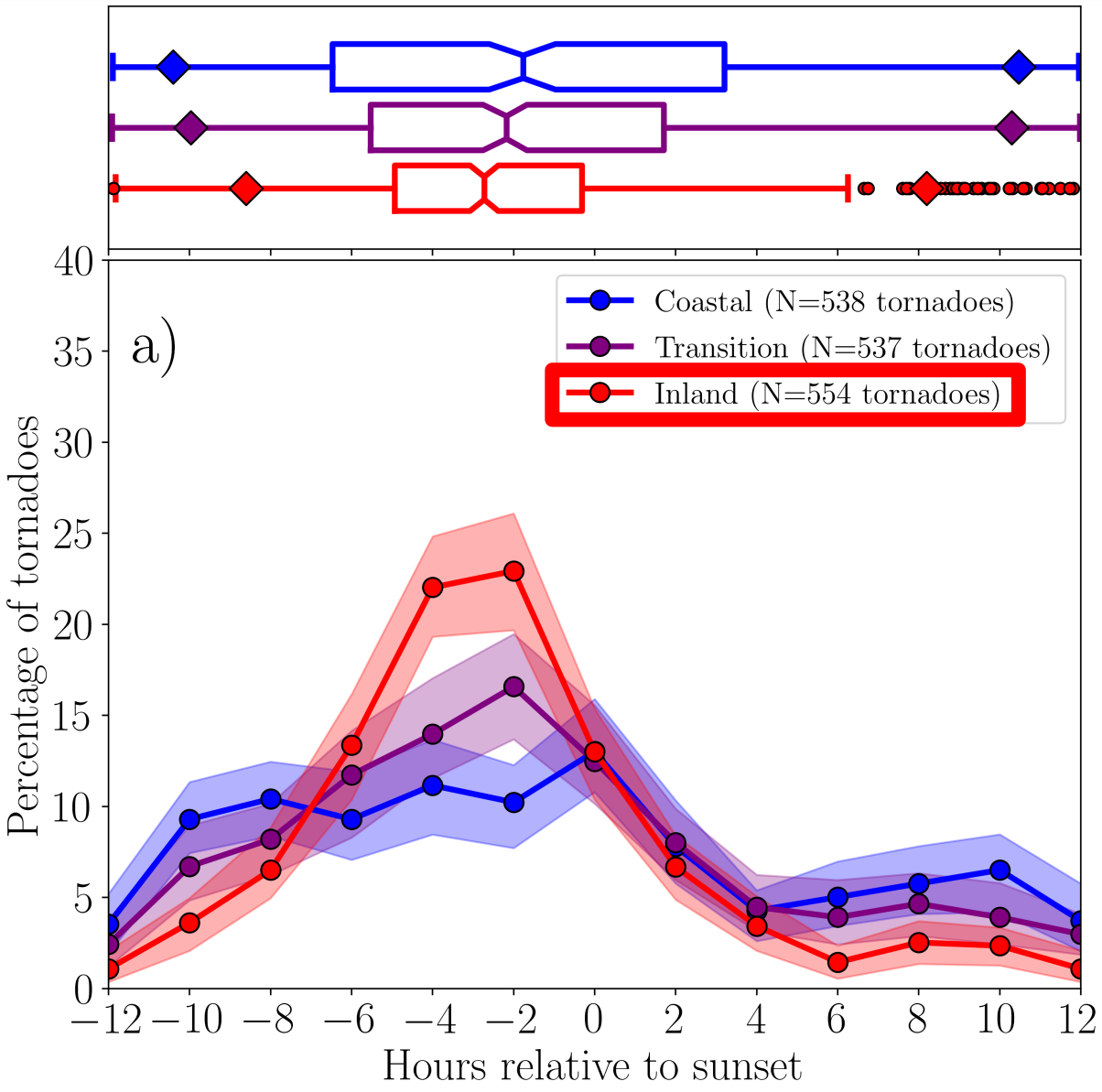

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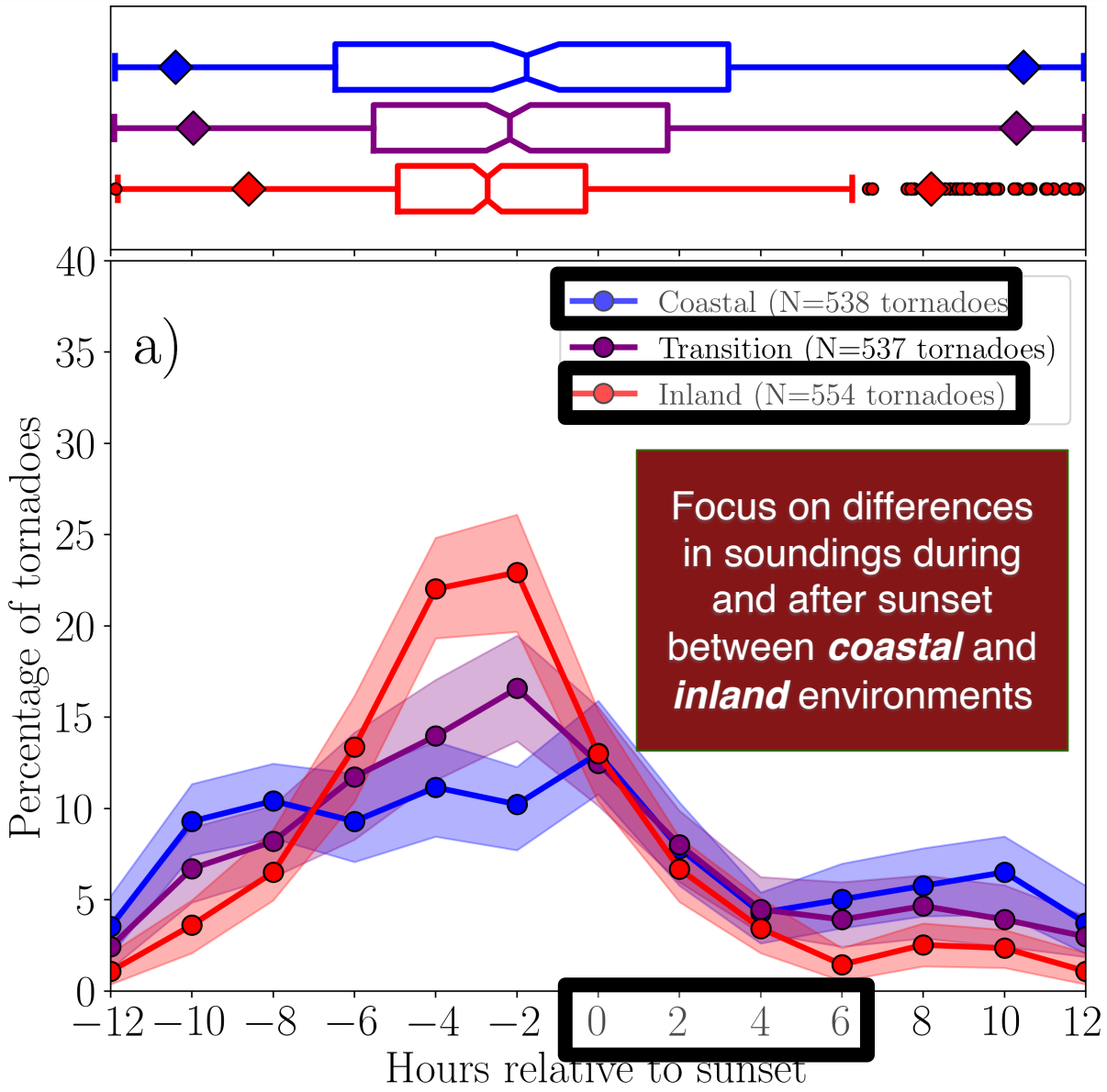

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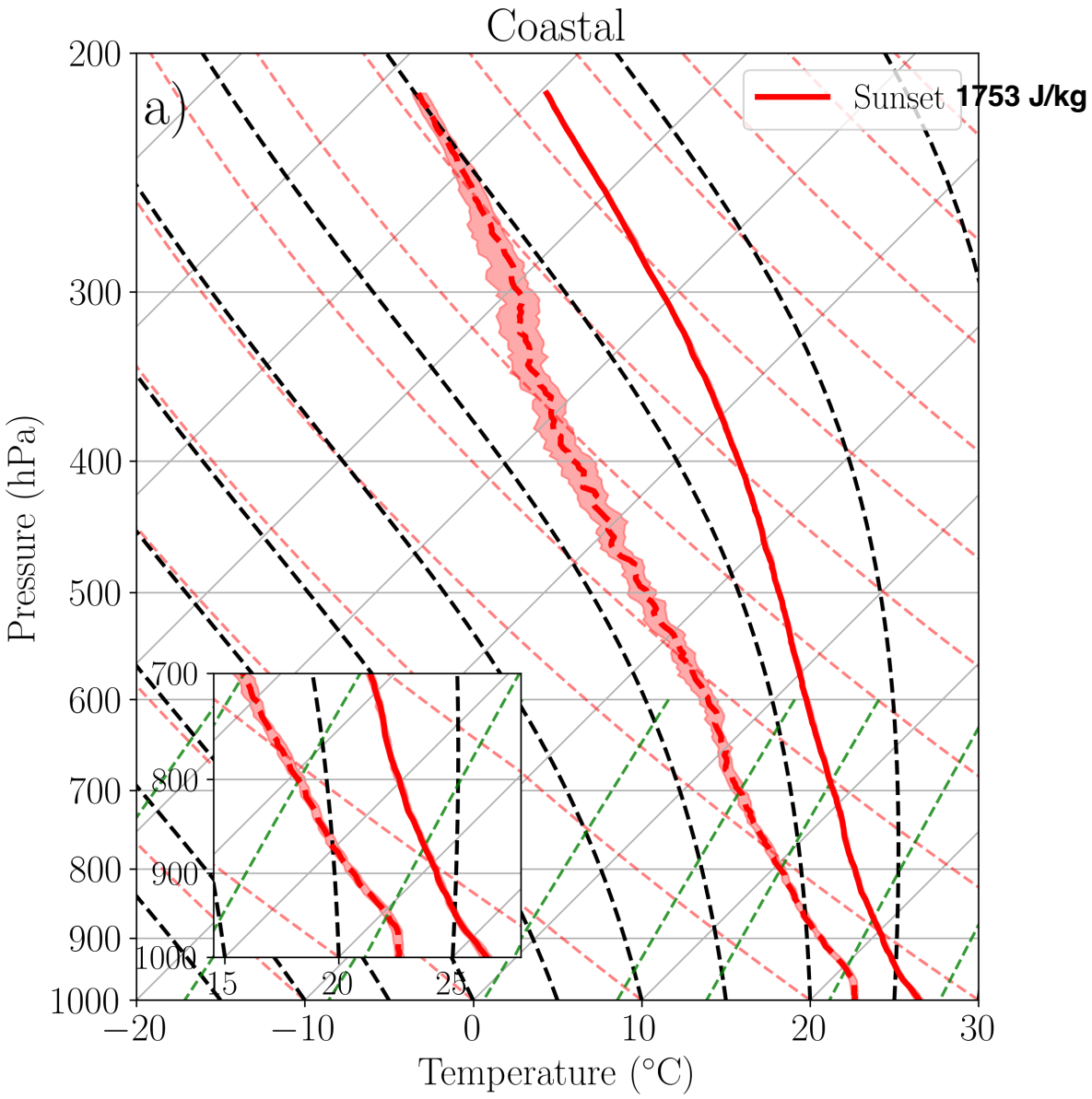
- Do convective-scale environments in TCs show similar diurnal variability?

Diurnal Variability of Soundings Versus Coastal Distance



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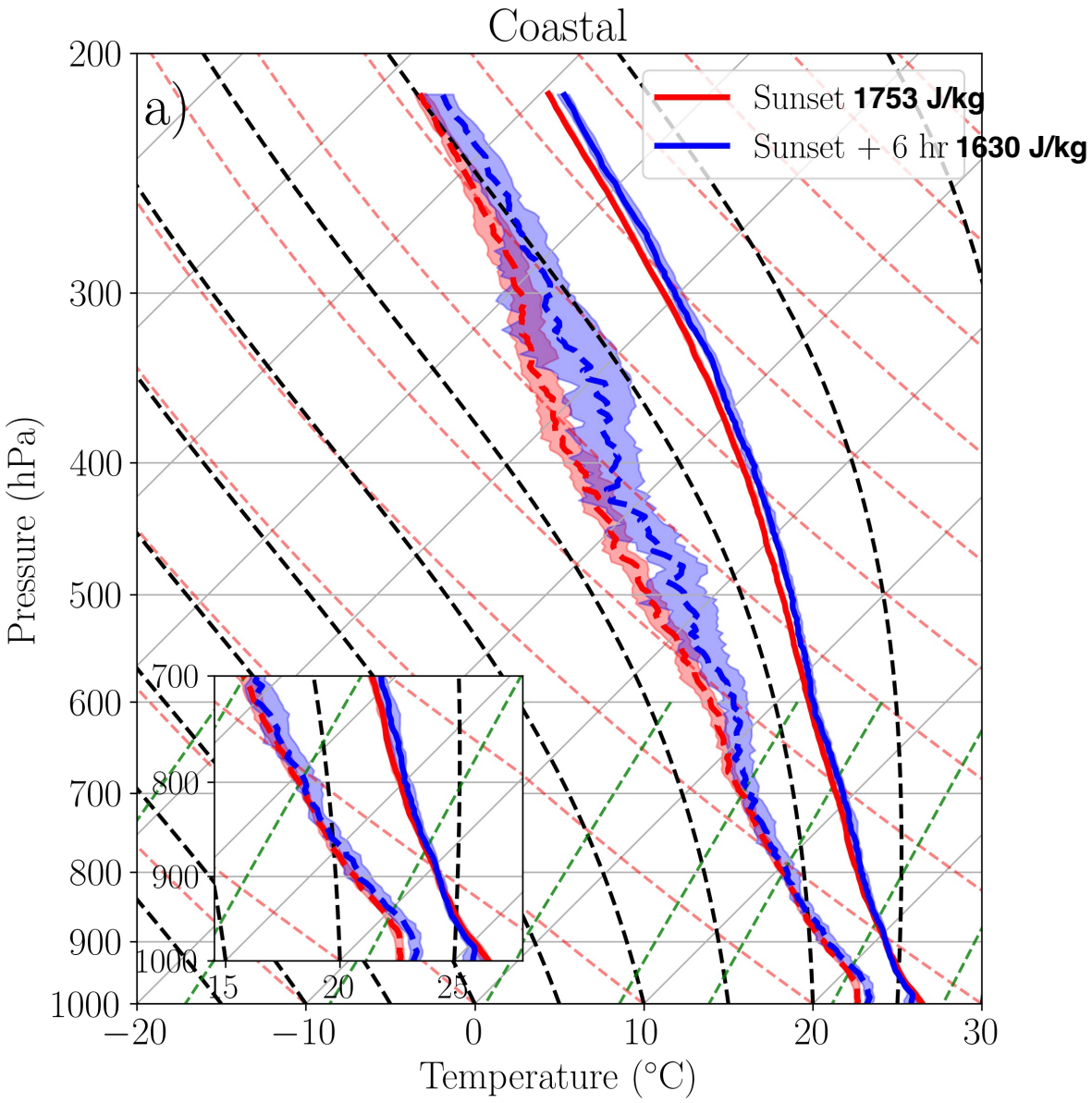

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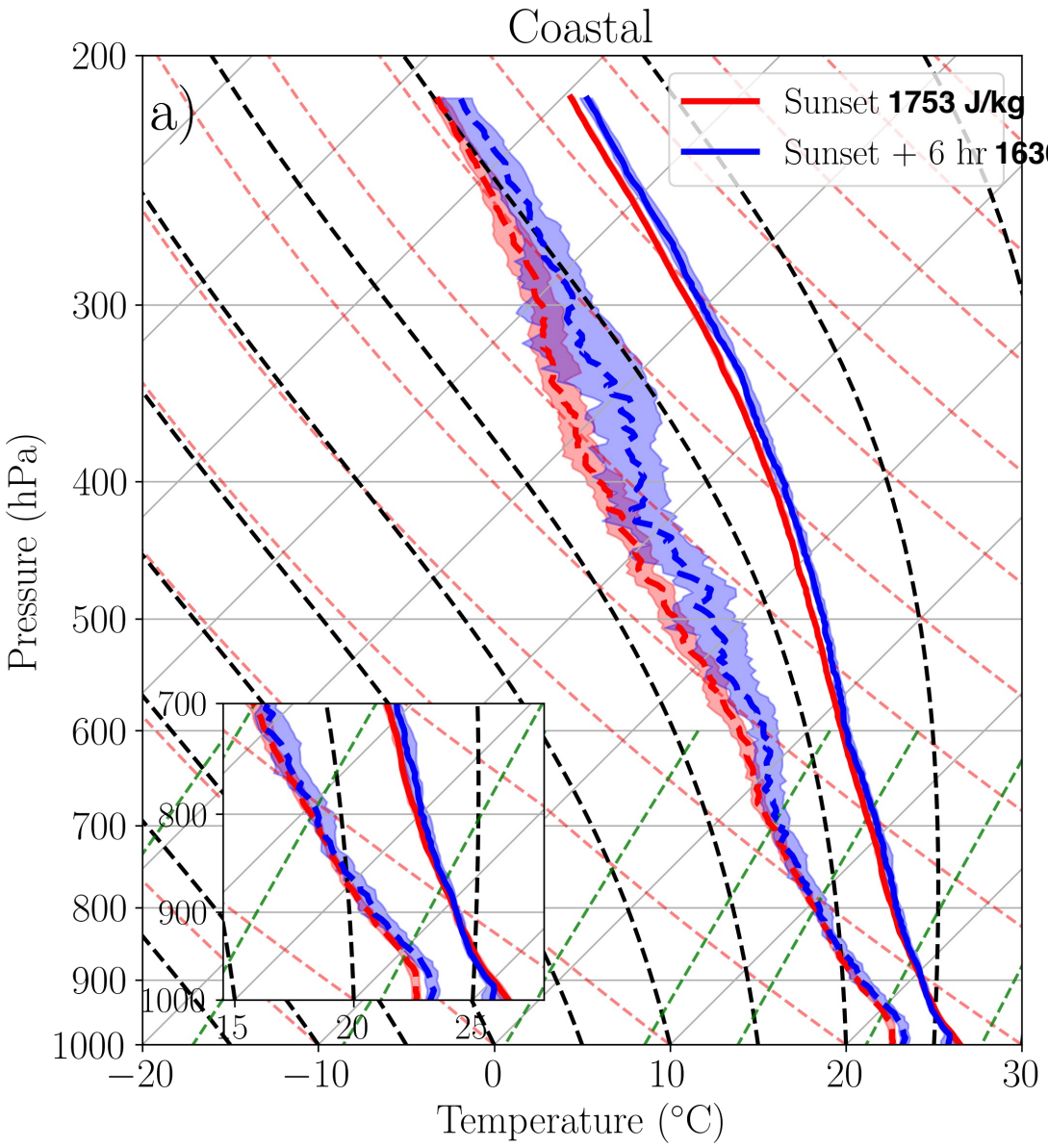

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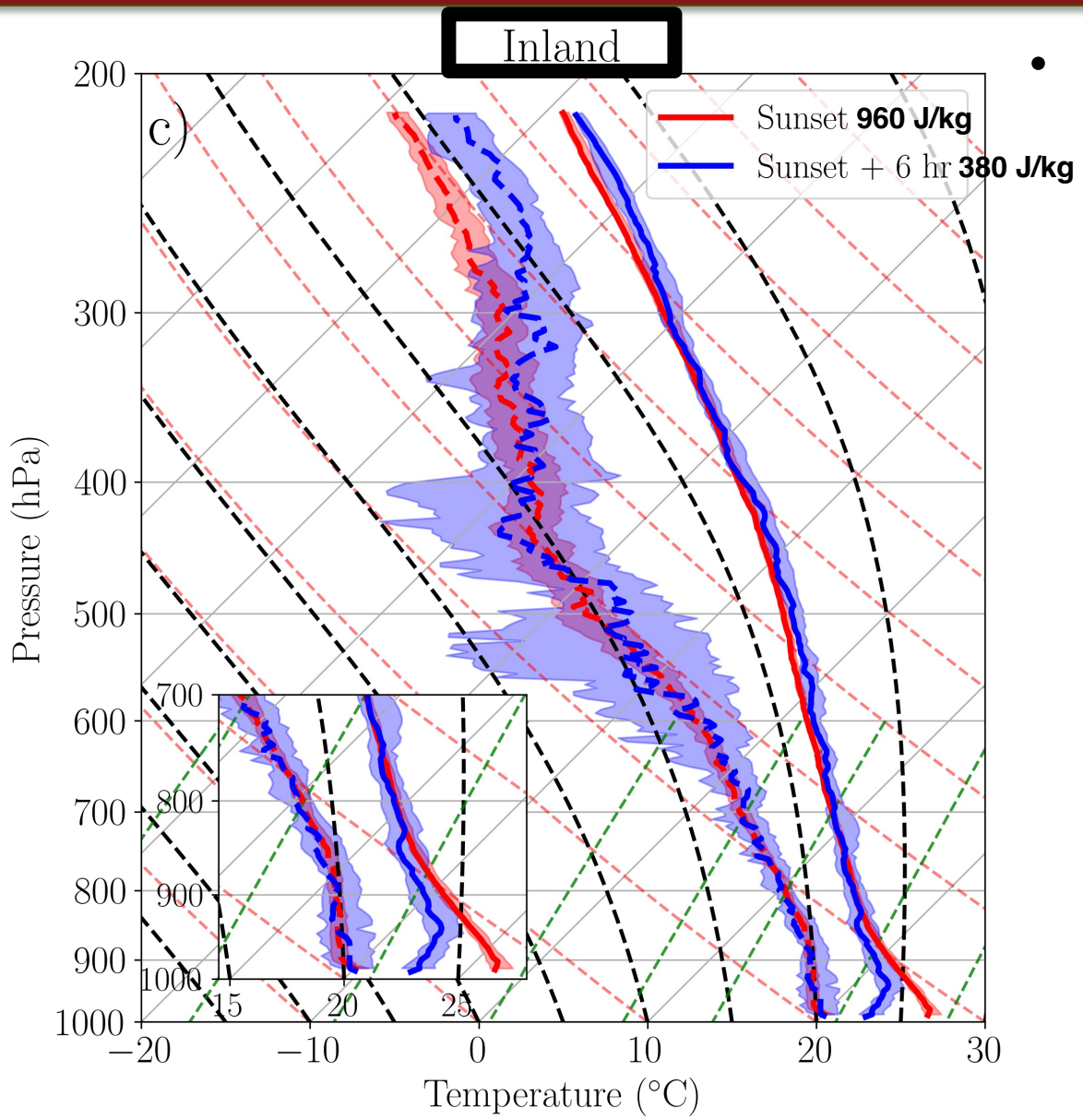

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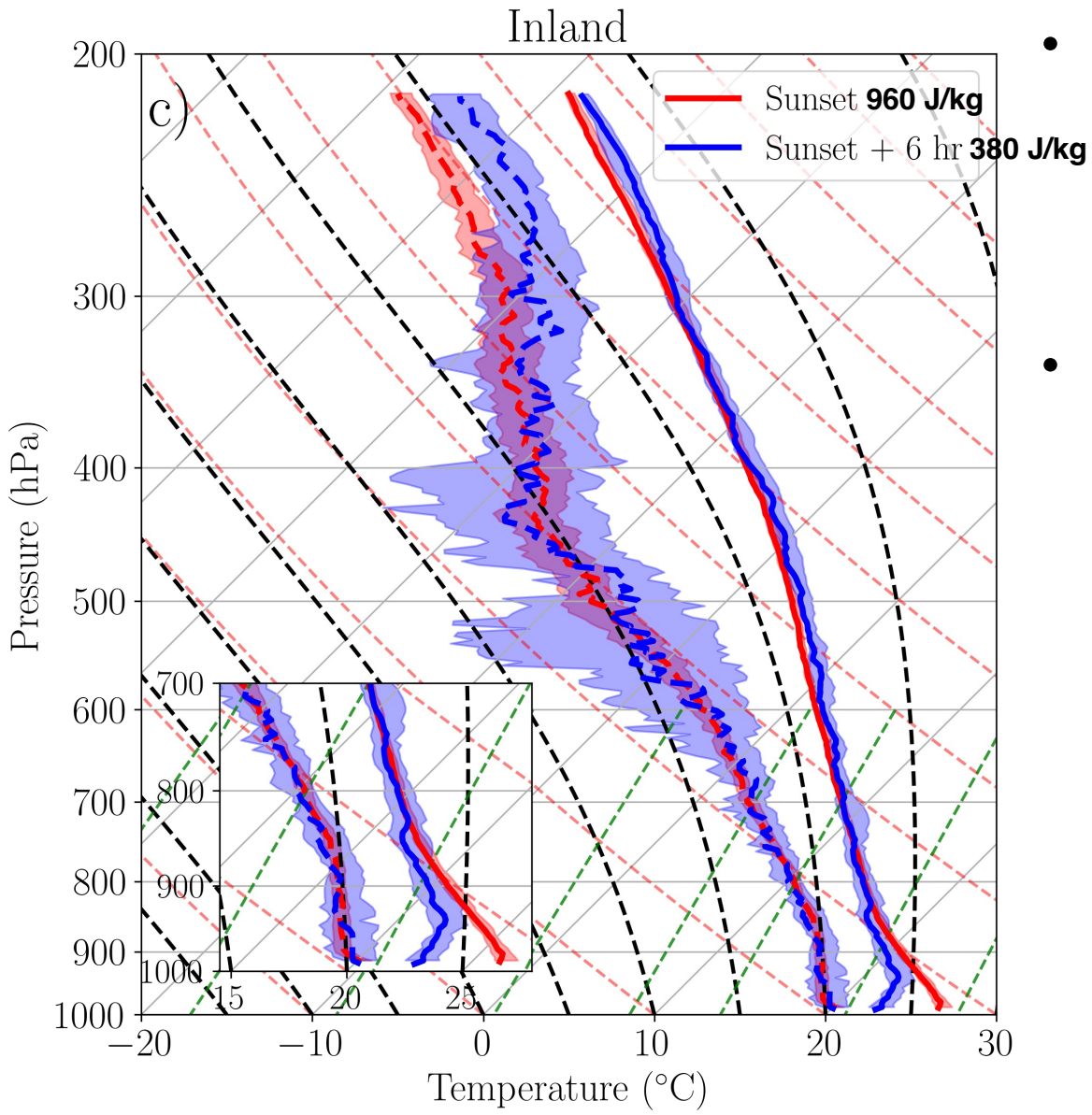

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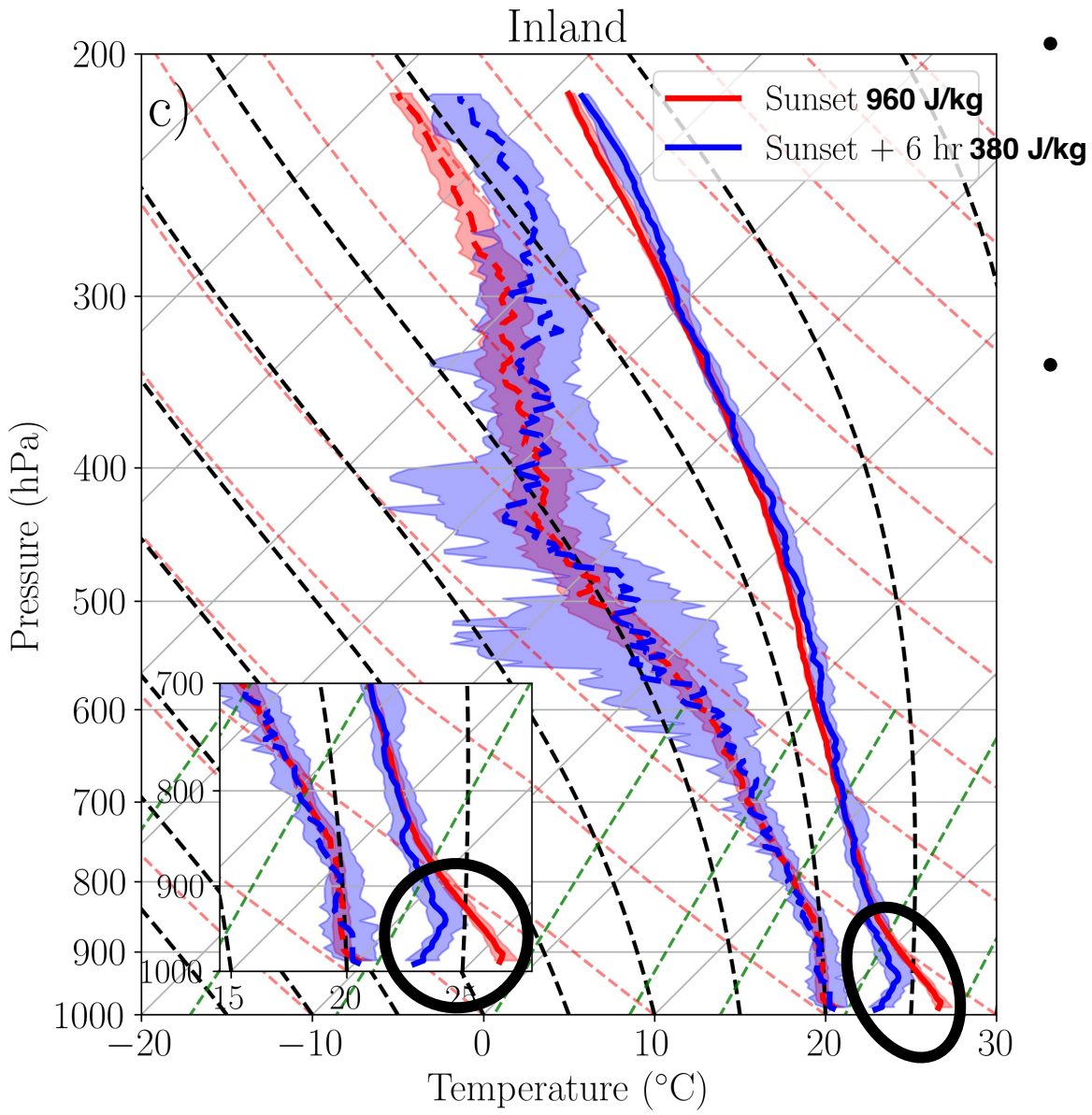

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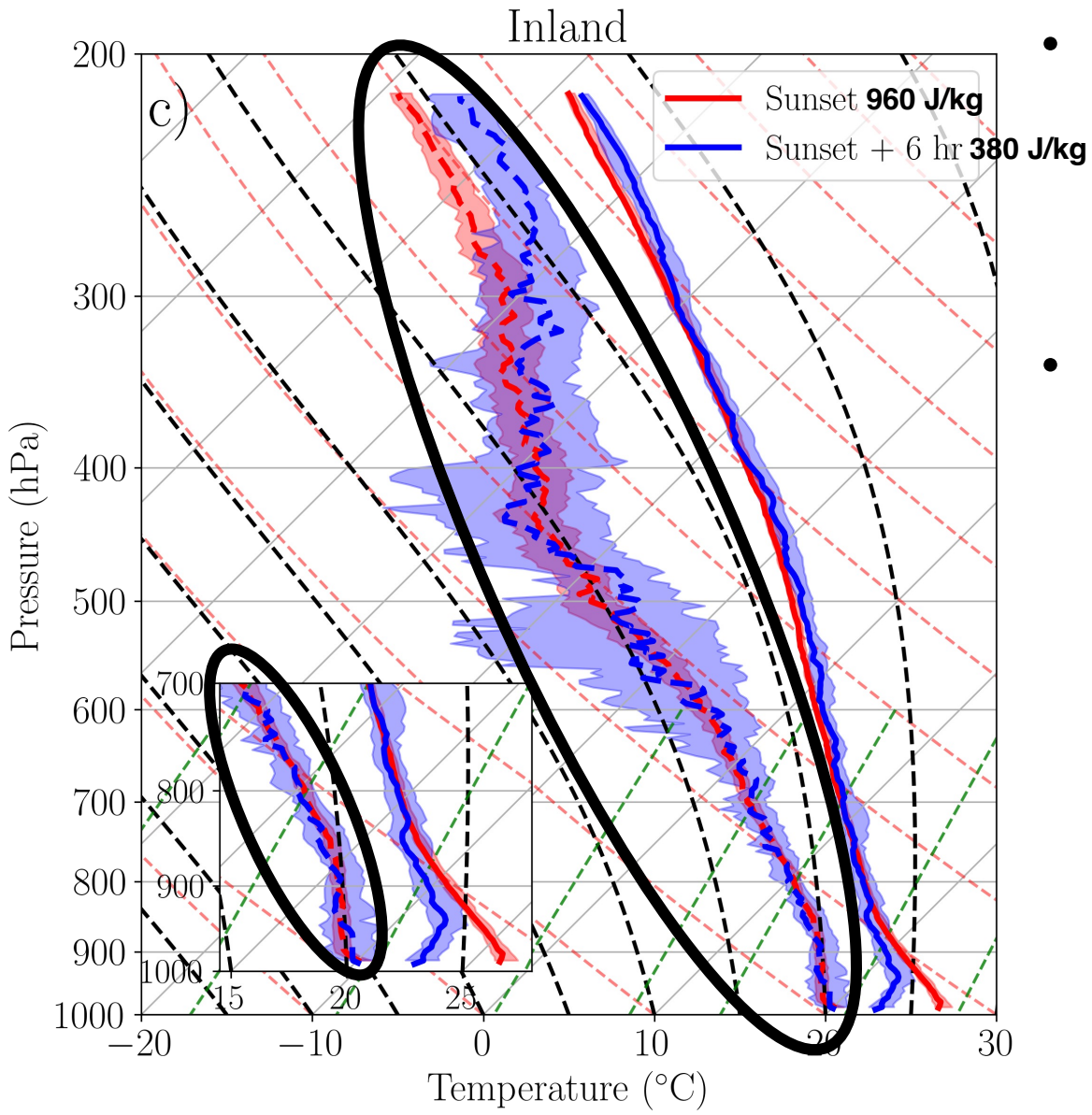

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Summary and Discussion

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- Which processes are key to creating stronger diurnal variability in inland environments?