StickNet:
Strategies and Issues for VORTEX2

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StickNet Instrumentation

- Flux gate compass
- GPS antenna / receiver
- Internal Lithium battery (18 hours)
- Voltage regulator
- Ethernet output port
- External power input

"A" probes (14)

- State variables sensed with individual instruments
- Adjustable 1/10 Hz sampling

"B" probes (10)

- Vaisala "all-in-one" WXT510
- Precipitation, hail recorded (acoustic)

24 probes available for 2009 field phase

Science Objectives

- Baroclinity and low-level mesocyclogenesis
  (resolving thermodynamic/kinematic discontinuities in the forward flank)
  Needs: StickNet, storm- and meso-scale radar (esp. dual Doppler)

- Multiple-storm interaction / tornadogenesis
  Needs: StickNet, MM, storm- and meso-scale radar, sounding, UAS

- Impacts of near-tornado thermodynamic setting on tornado maintenance
  Needs: StickNet, pods, tornado-scale radar

- Temperature retrieval
  Needs: StickNet, MM, storm- and meso-scale radar (dual Doppler)

- Storm-scale data assimilation / NWP verification
  Needs: StickNet, MM, storm- and meso-scale radar (including pol),
  UAS, particle probe

StickNet Deployments - Highlights

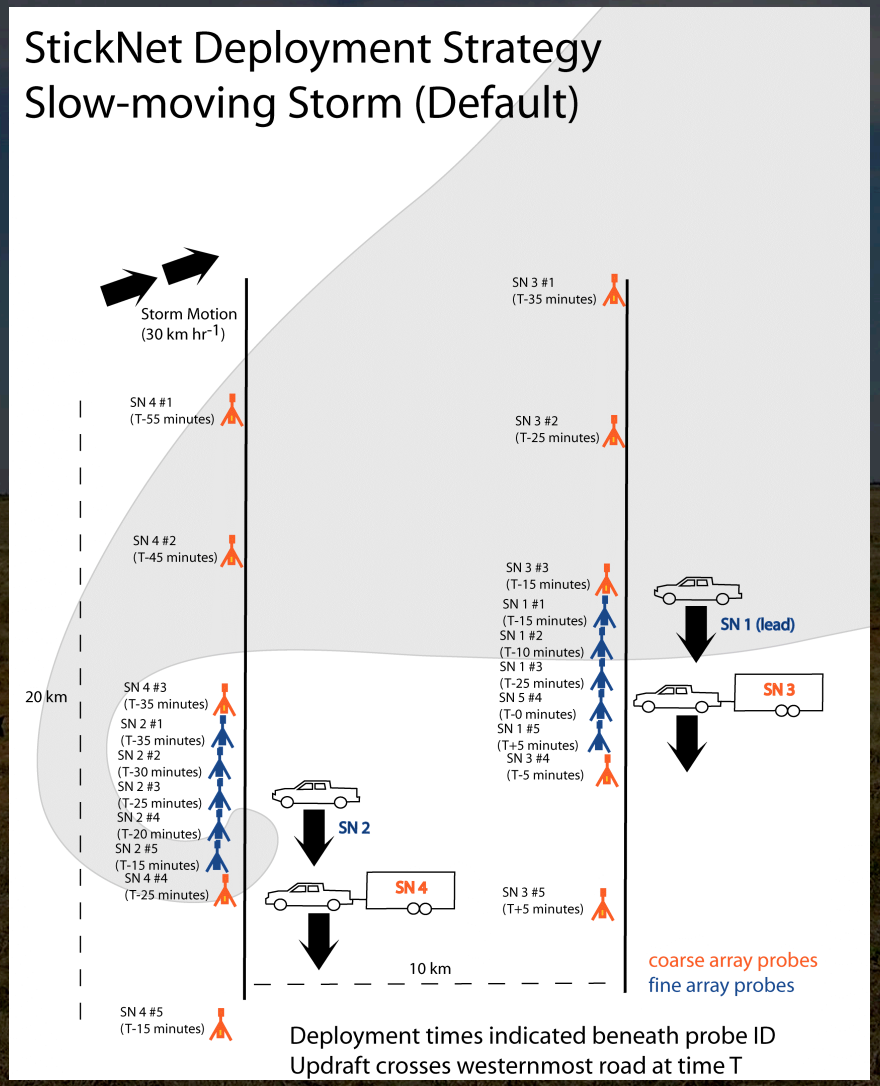
- Four vehicles involved in StickNet drops, **two towing trailers**
- Vehicles with trailers deploy coarse array (~5 km spacing)
- Vehicles without trailers deploy fine array (~1 km spacing)

- 2-3 man teams involved in deployment, one in vehicle
- Deployment time: 2-3 minutes

- LEAD TIME OF 50-55 MINUTES NEEDED
- Center position of deployment expected to vary some

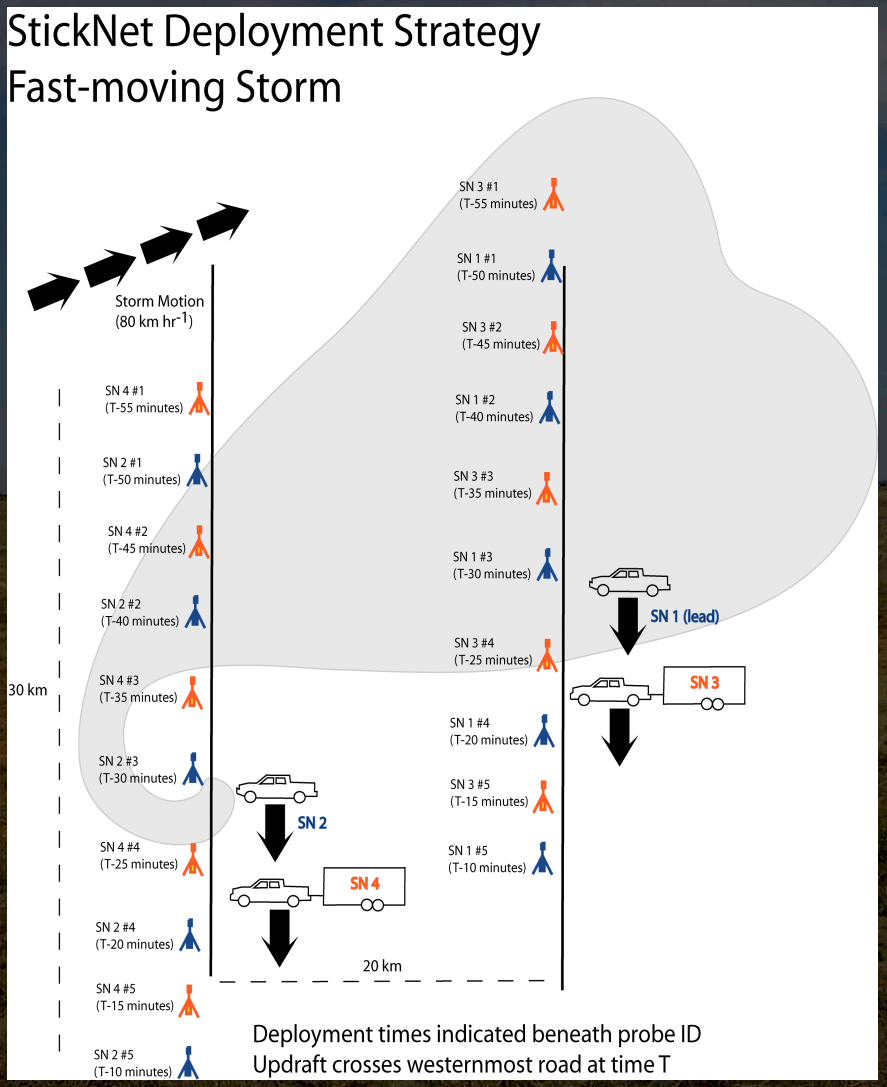
StickNet Deployments – Slow-moving Storms

- Deployment follows a nested grid (5 km / 1 km)
- Coarse array is first to deploy (~55 minute lead time) when target road is identified
- Fine array is deployed on a shorter fuse, ~30 minute lead time
- Probe deployment proceeds from north to south; must minimize u-turns for trailers
- In multiple-road scenario, prefer to keep roads within 10 km (VHF radio limit)
- Planning is necessary to ensure that dual-Doppler lobes are over the StickNet array
- Four extra probes



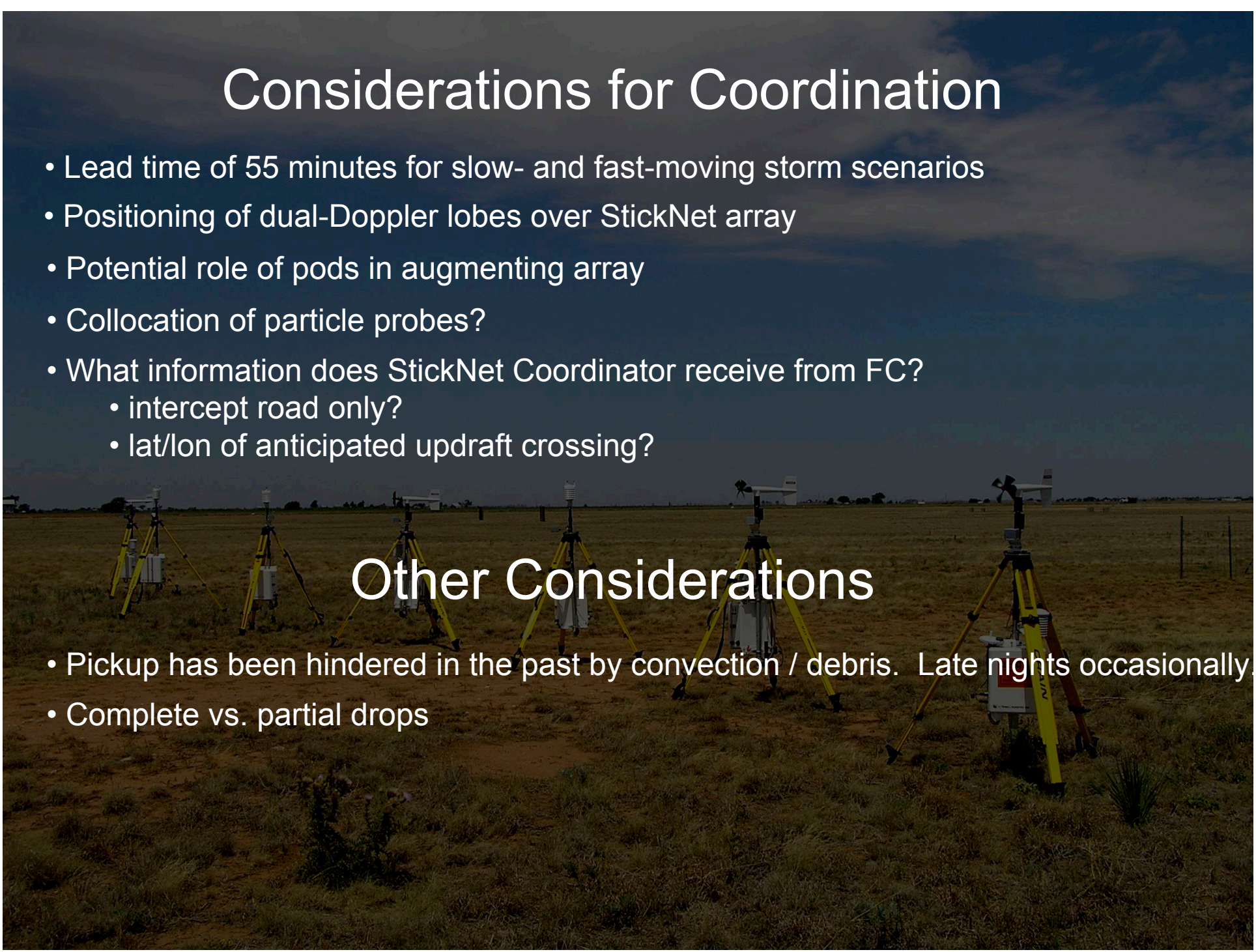
StickNet Deployments – Fast-moving Storms

- No nesting
- Probes are deployed in a leapfrog fashion from north to south



Considerations for Coordination

- Lead time of 55 minutes for slow- and fast-moving storm scenarios
- Positioning of dual-Doppler lobes over StickNet array
- Potential role of pods in augmenting array
- Collocation of particle probes?
- What information does StickNet Coordinator receive from FC?
    - intercept road only?
    - lat/lon of anticipated updraft crossing?



Other Considerations

- Pickup has been hindered in the past by convection / debris. Late nights occasionally.
- Complete vs. partial drops