UAS in VORTEX 2 Update

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VORTEX 2 PI Meeting
Pennsylvania State University
11-12 November 2009

CU-NU-OU-RAS Team

University of Colorado
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Rasmussen Systems
Erik Rasmussen

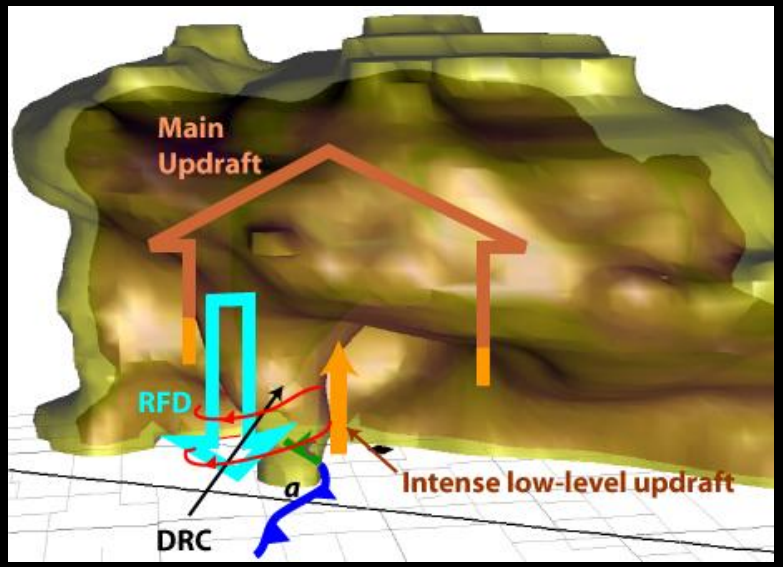
UAS Team
Science and Engineering Objectives

Engineering Objectives

- Demonstrate low-cost, robust UAS deployments
- Develop accurate UAS simulations in weather
- Acquire high-impact data with manageable risk

Science Objectives

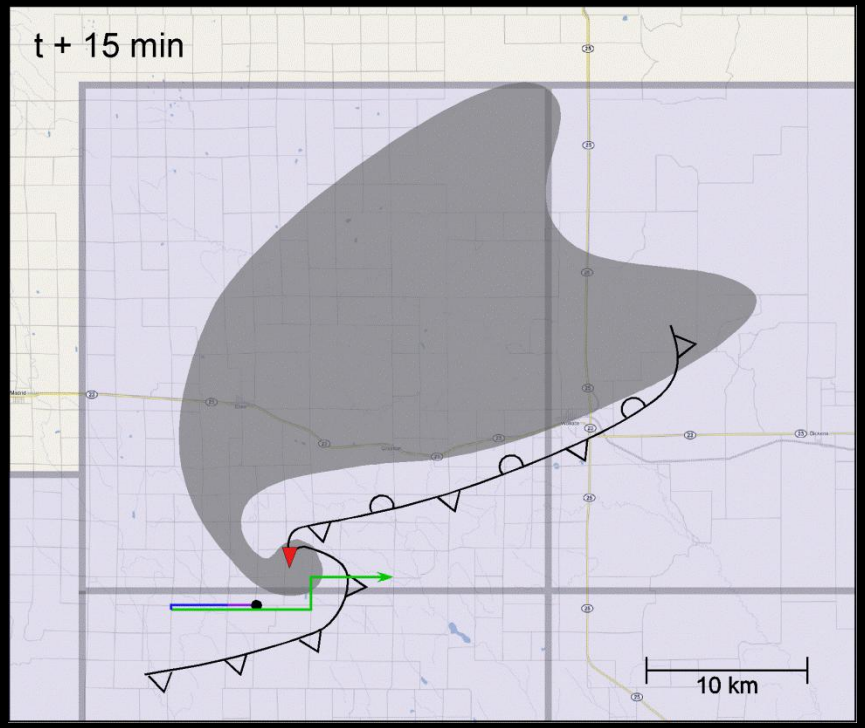
- (P, T, RH, **V**) for air mass boundaries, supercell rear-flank downdraft(s)

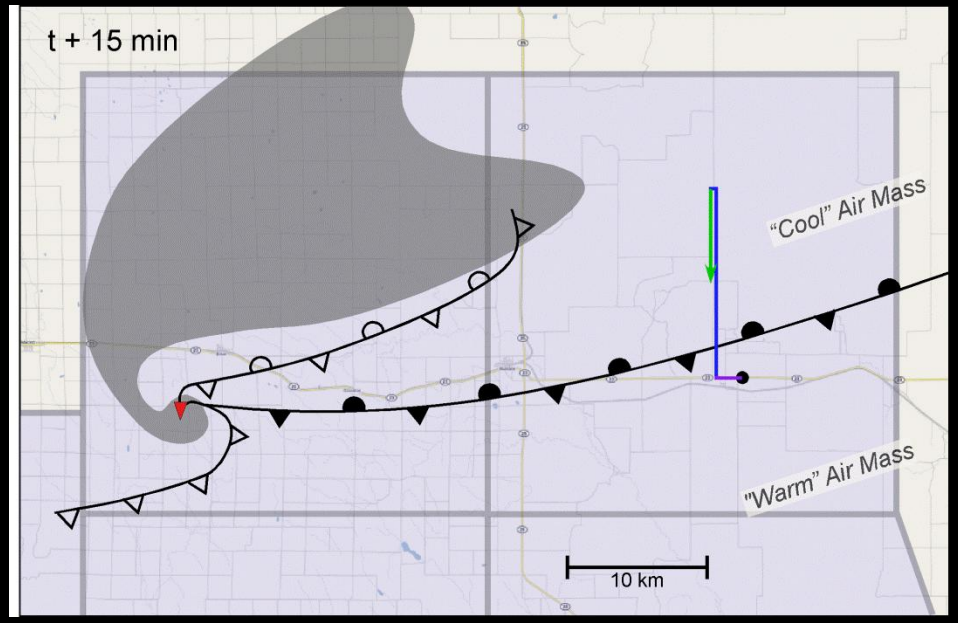


UAS Team

- Ground Station
  - Commander/SO: *Argrow*
  - Meteorologist: *Houston*
  - Pilot in Command: *Aune*
  - Pilot at Controls: *Elston*
- Tracker Vehicle
  - Driver: *Frew*
  - Meteorologist: *Lahowetz*
  - UA Observer: CU team member
  - Mobile Operator: *Roadman*
- Scout
  - Driver: CU/NU team member
  - Meteorologist: NU team member

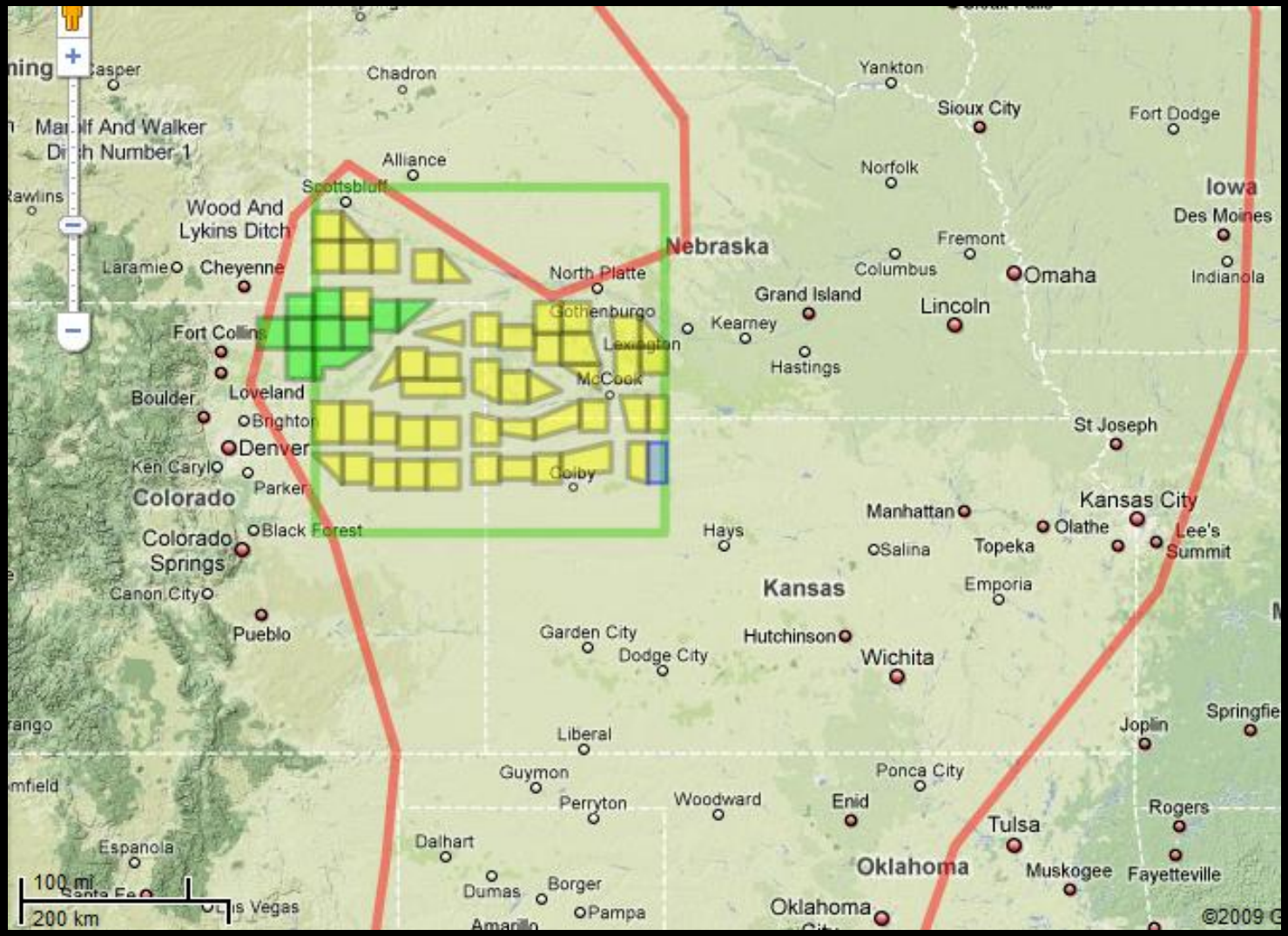
Strategy Overview



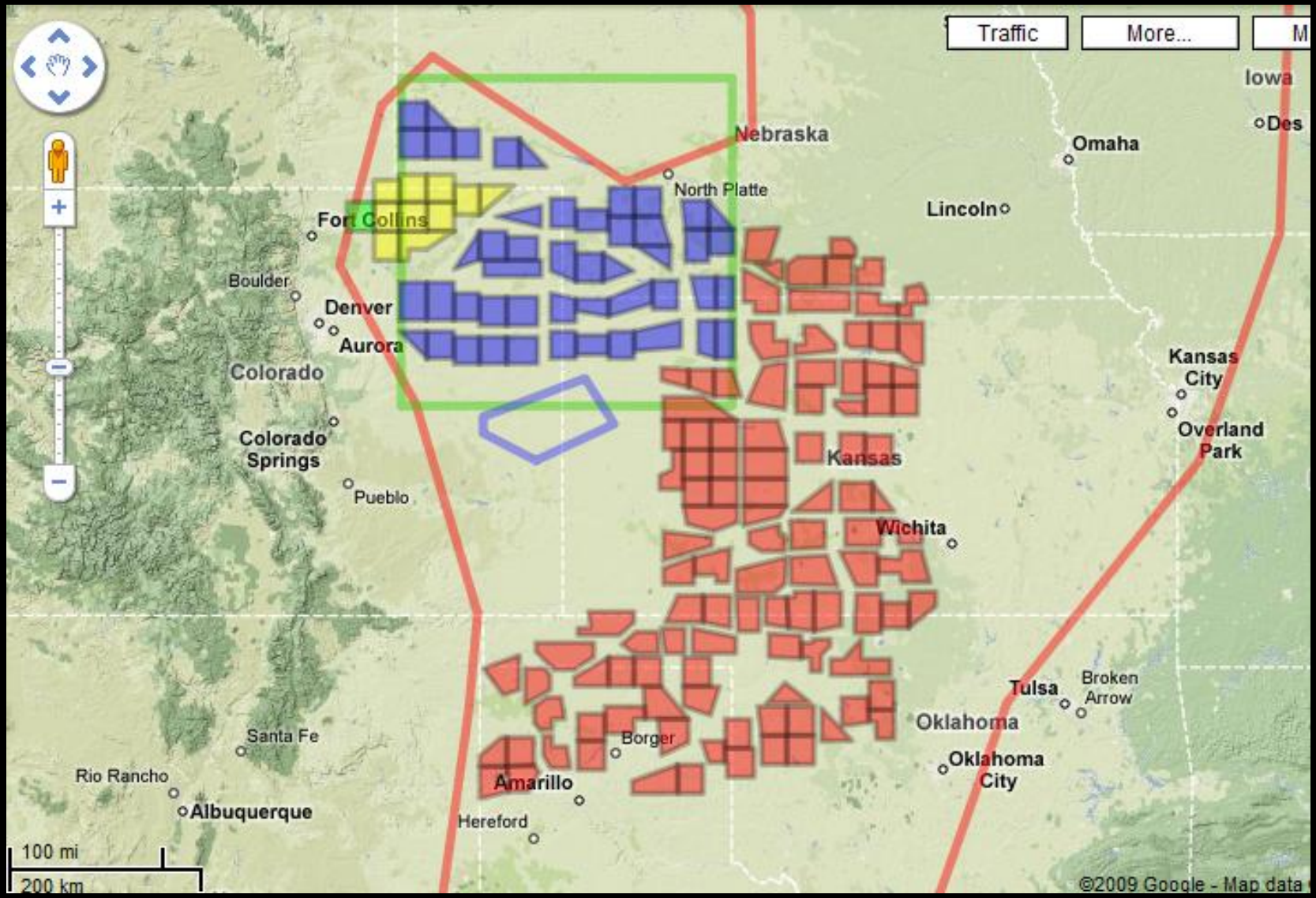


V2 COA Update

Blue: Committed **Yellow: Validated** **Green: Active**



Expanded COA Region



Tempest UAS
Prep for 2010

- Issues Resolved
  - Airframe internal cooling
  - Tracking/offset algorithm
  - LOS UAS communication
  - Voice communications
  - COA approvals

- In-Progress Enhancements
  - GS van to replace trailer
  - Autopilot upgrade
  - UA launch mechanism
  - Improved wind measurement

2009 UAS Mock Deployments
Lessons Learned

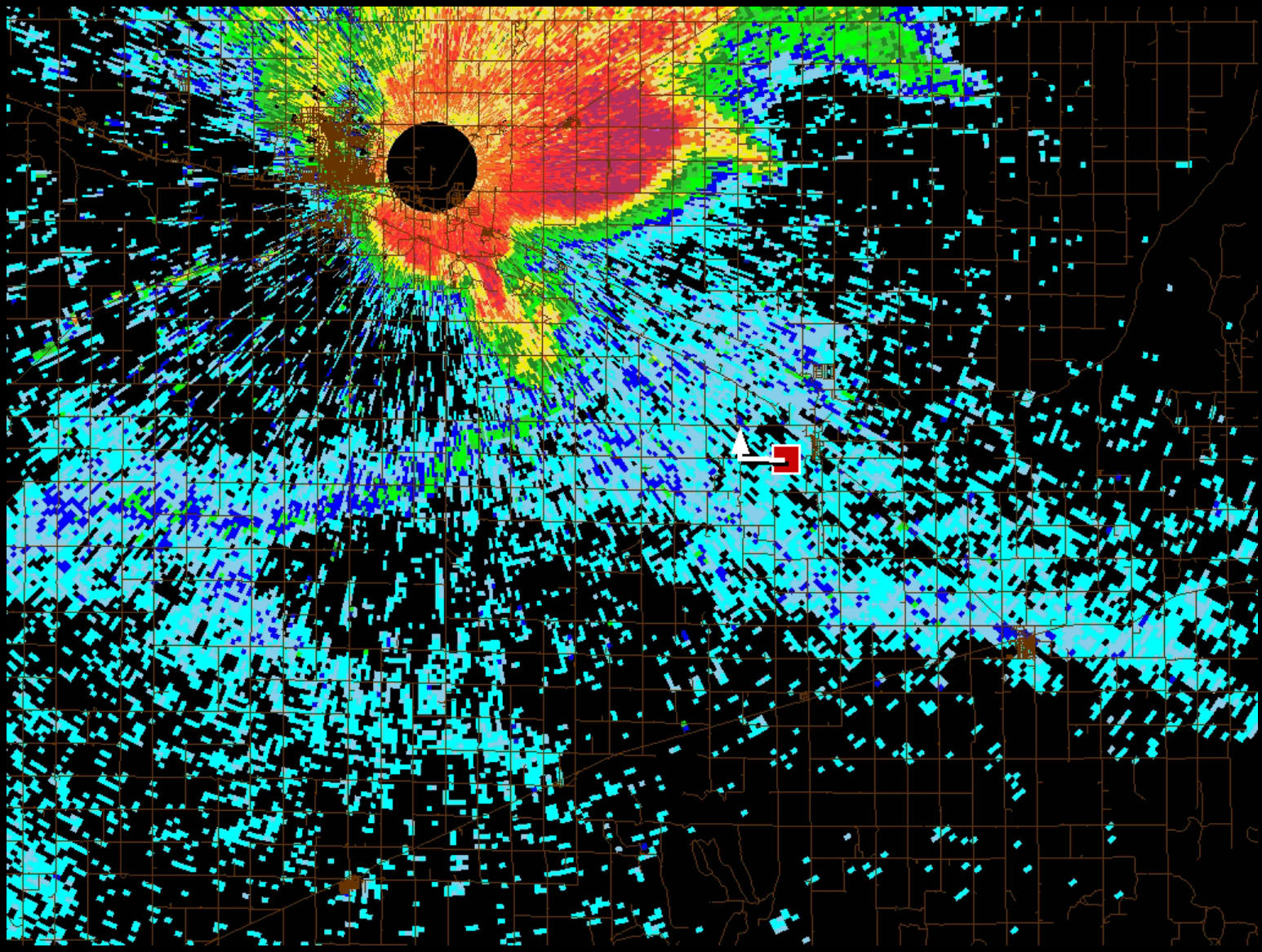
6 June
NW Nebraska

8 June
NW Missouri

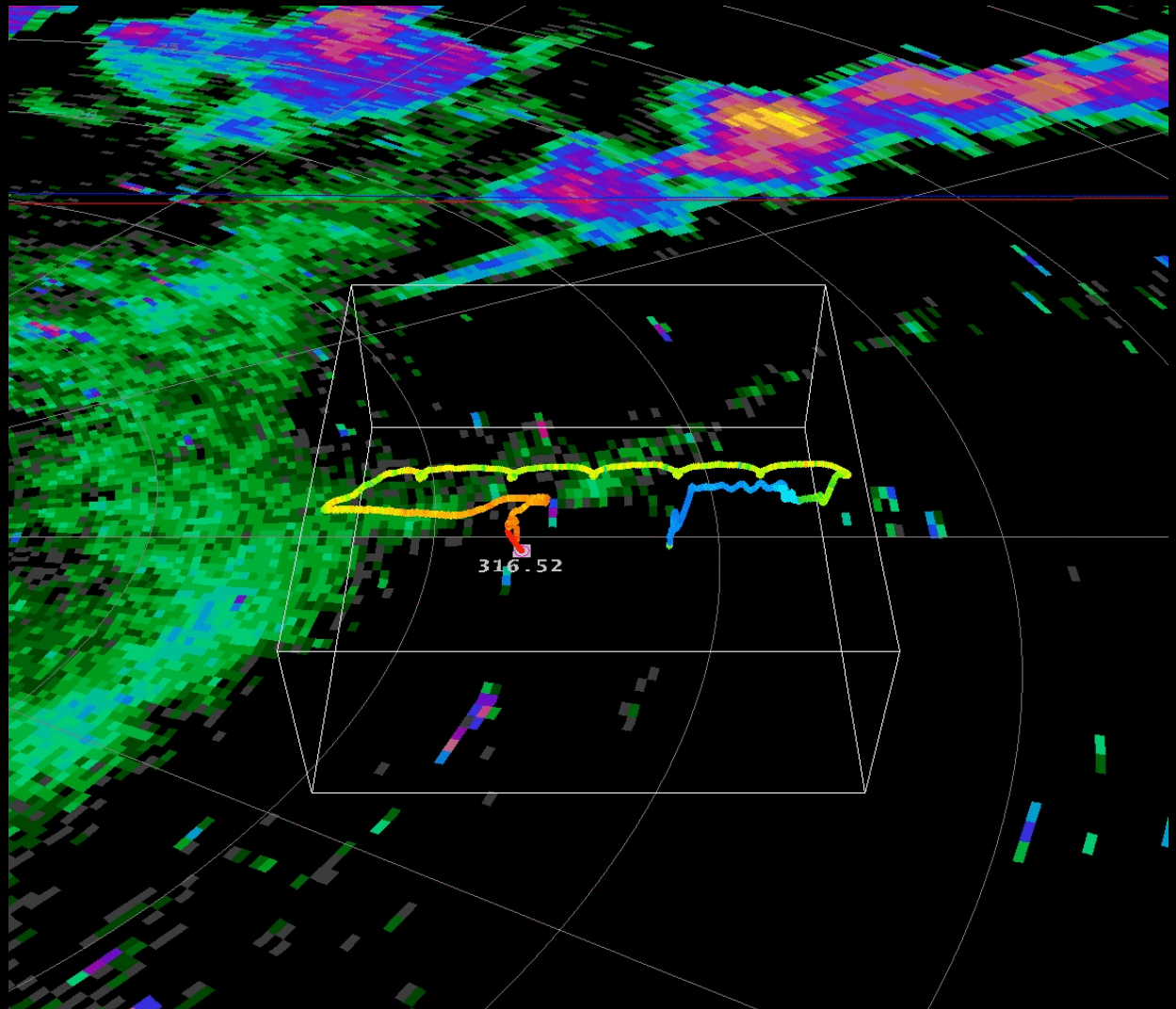
9 June
SW Kansas

UAS Team Deployment Lessons Learned

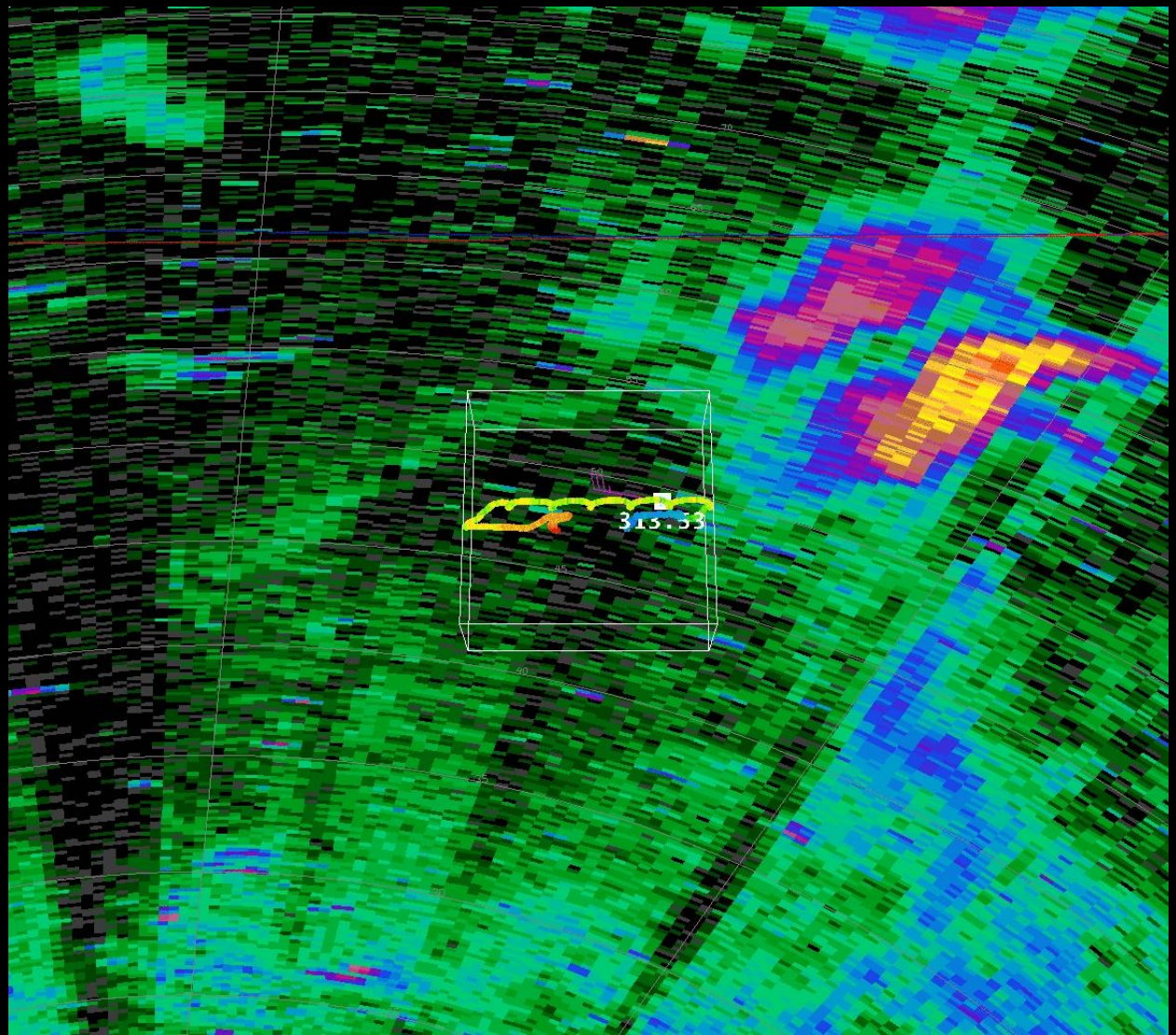
9 June SW Kansas (23:05-23:34)



Colorado-Nebraska Collaborative UAS Experiment

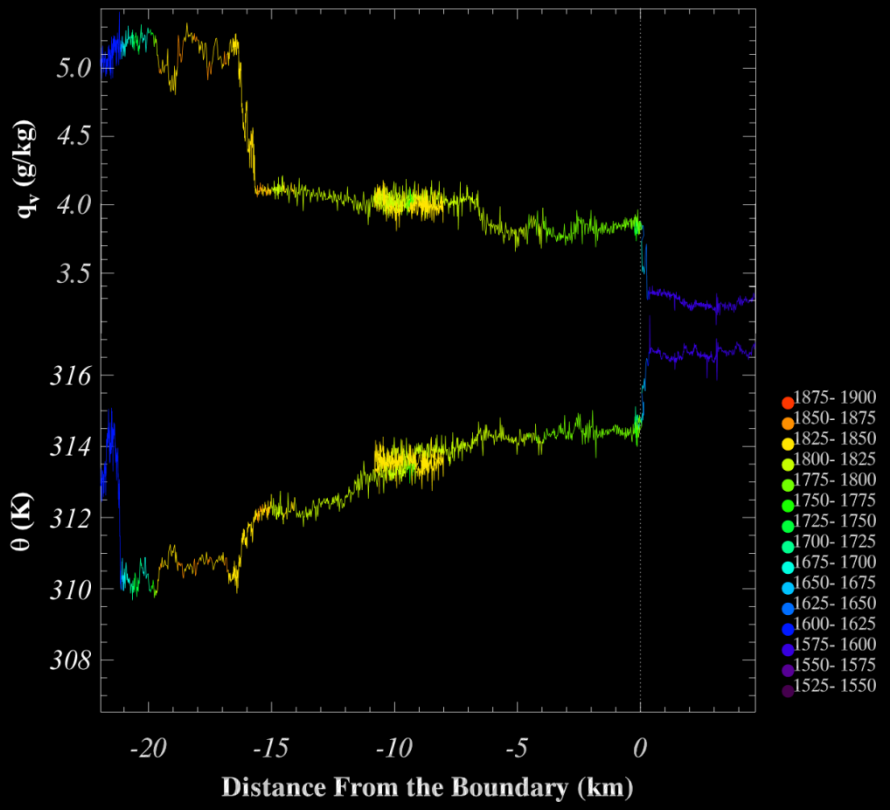


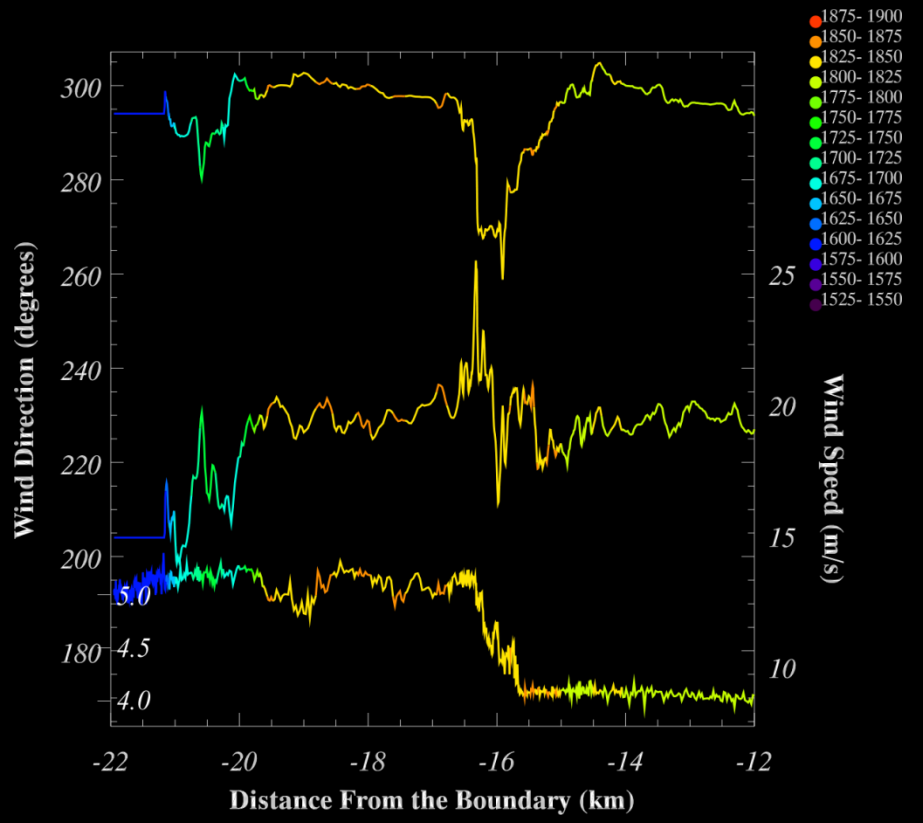
Colorado-Nebraska Collaborative UAS Experiment



Results from CoCoNUE

Colorado-Nebraska Collaborative UAS Experiment





Data Needs for 2010

- Mobile mesonet shadowing
  - Bias correction prior to launch
  - Juxtaposed surface measurements
- Soundings for airmass boundary intercepts

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