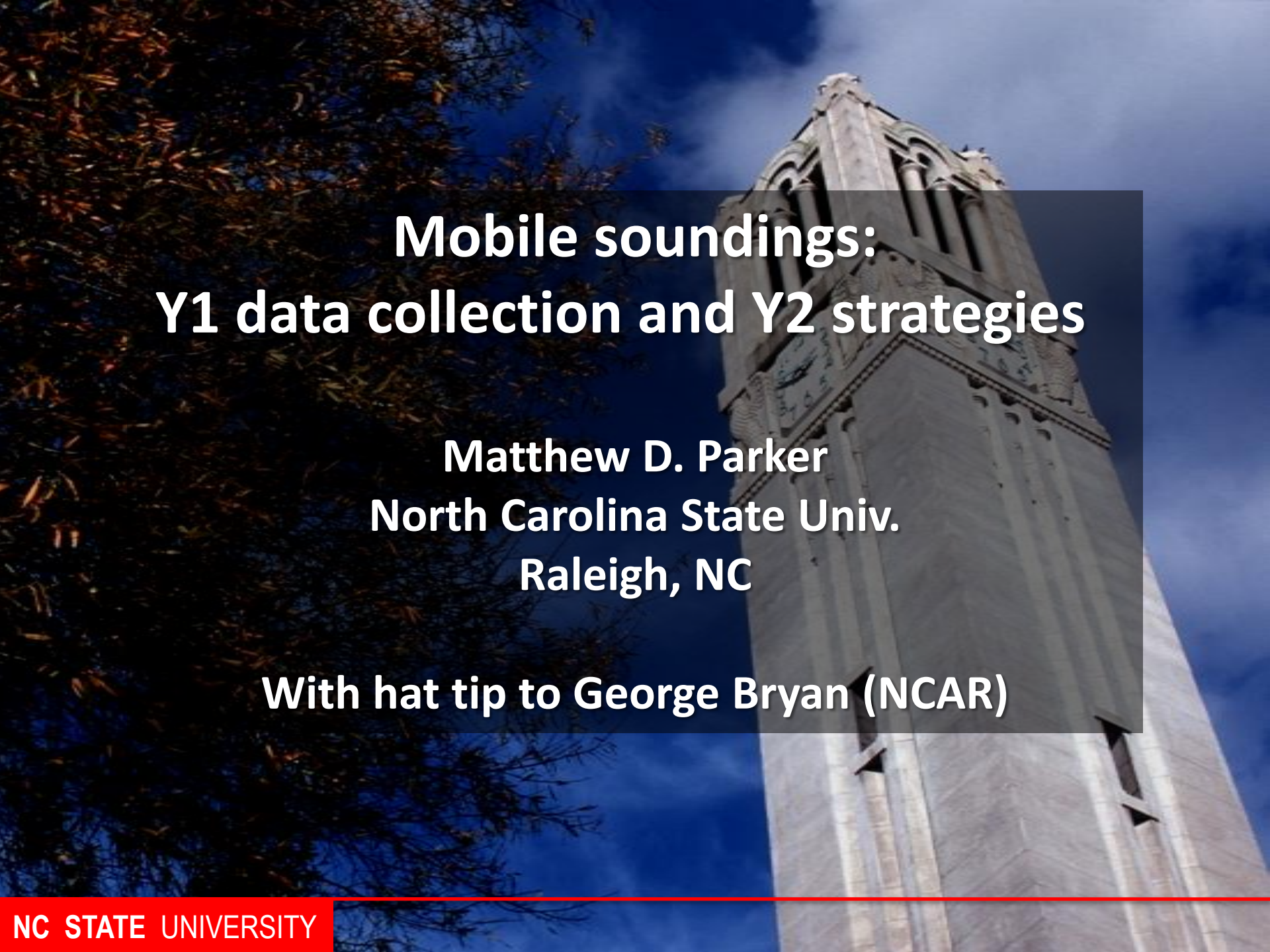

Mobile soundings: Y1 data collection and Y2 strategies

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With hat tip to George Bryan (NCAR)

Y1 data inventory

date	region	case summary	# pre-storm	# near-storm	special notes
5/12/2009	TX panhandle	multicells, outflow-dominated supercell	4	2	largely in "shakedown" mode
5/13/2009	N.W. OK	numerous cells → a couple dominant supercells	6	8	significant backbuilding hindered ops
5/15/2009	N. OK	squall line	2	9	serial launches as squall line passed
5/19/2009	S.W. NE & N.E. CO	weak multicell	2	5	primarily a "rehearsal" deployment
5/20/2009	NE panhandle	messy supercells with strong outflow	8	7	near-storm "picket fence" deployment
5/22/2009	S.W. SD	no long-lived storms	14	0	sampled PBL evolution over high terrain
5/23/2009	S.W. NE	multicells with weak rotation	0	10	late to target, non-standard deployment
5/25/2009	N.W. TX & W. OK	short-lived rotating storms	3	5	each cell died before being well observed
5/26/2009	N.C. TX	left-moving supercell	2	6	large gradients in hodograph observed
5/29/2009	C. NE	high-based, short-lived supercells	0	6	cells died before being well observed
5/31/2009	S.E. NE & S.W. IA	severe multicells, decay as CIN increased late	1	5	large gradient in CAPE/CIN observed
6/1/2009	S. NE & N. KS	rapid upscale growth weak supercells → MCS	4	4	cells everywhere, non-standard deployment
6/4/2009	N. CO & S.E. WY	supercells moving off of high terrain	2	9	near-storm "picket fence" deployment
6/5/2009	S.E. WY & NE panhandle	tornadic supercell	3	16	large gradient in CIN observed
6/6/2009	C. NE	supercells, decay as CIN increased late	2	10	measurements continued until demise
6/7/2009	S.E. NE and N.W. MO	non-tornadic supercells with significant hail	3	10	near-storm "box" deployment
6/9/2009	S.W. KS	supercell, decay as CIN increased late	3	9	measurements continued until demise
6/10/2009	S.W. KS	severe multicells	1	8	near-storm "box" deployment
6/11/2009	S.E. CO	supercells	1	13	forward flank obs during storm merger
6/12/2009	TX panhandle	no long-lived storms	1	0	pre-storm sonde w/ insurmountable cap
6/13/2009	TX panhandle	supercells with numerous splits and mergers	7	6	significant cap removal observed
			69	148	

overall sonde consumption: 69 pre-storm + 148 near-storm + 19 bad sondes/launches + 2 for training = **238 total**

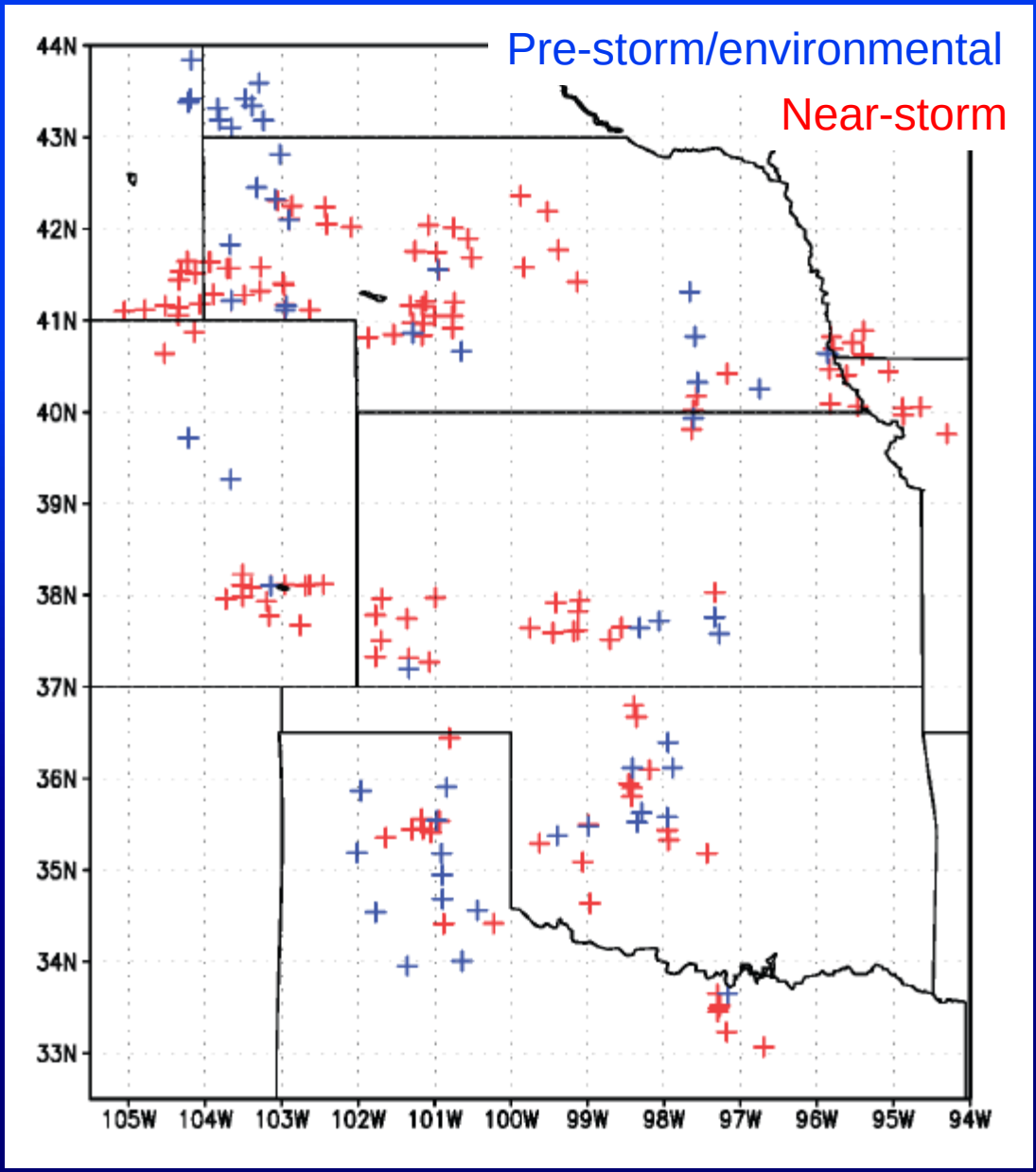
(original allocation was 265 sondes)

Y1 data status

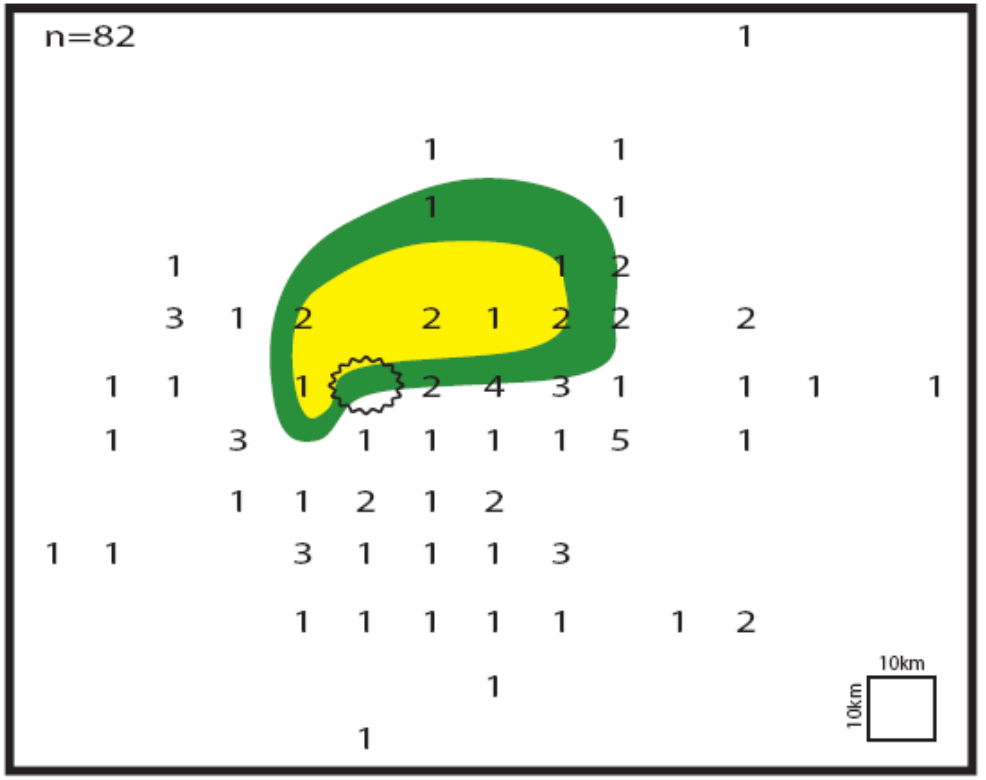
- Raw data skew-T diagrams are on field catalog (most, if not all)

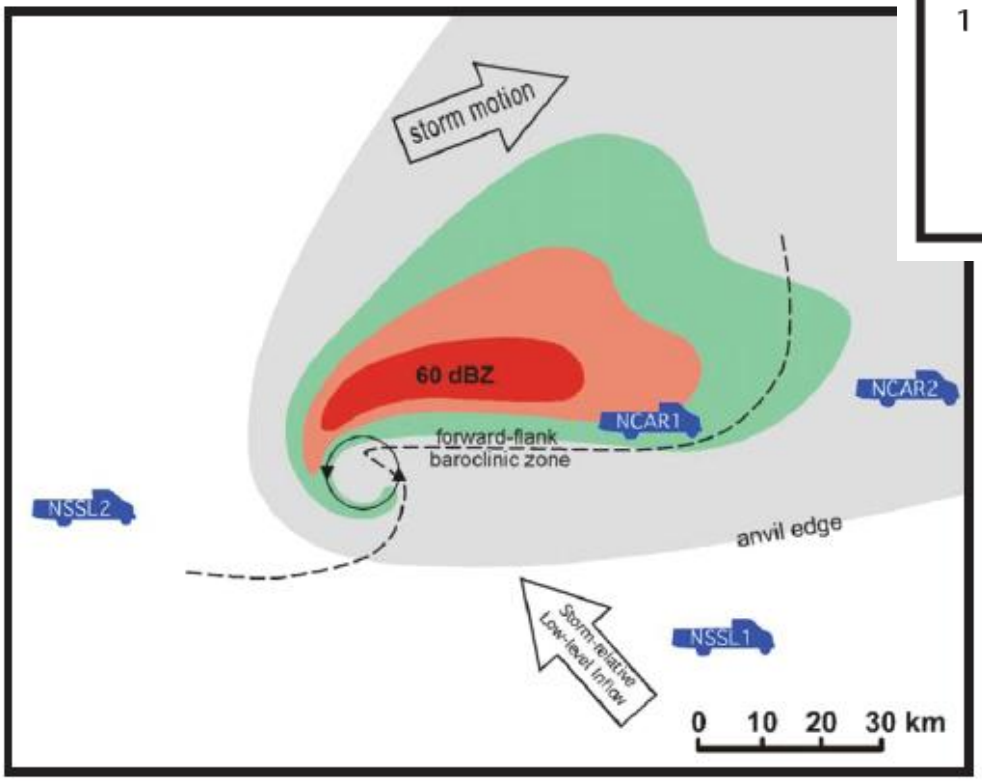
- EOL is currently QC'ing all soundings

- QC'ed data will be available during winter, we expect ("early December" ---EOL)… plan is for the sounding data to be made available to all (not restricted)

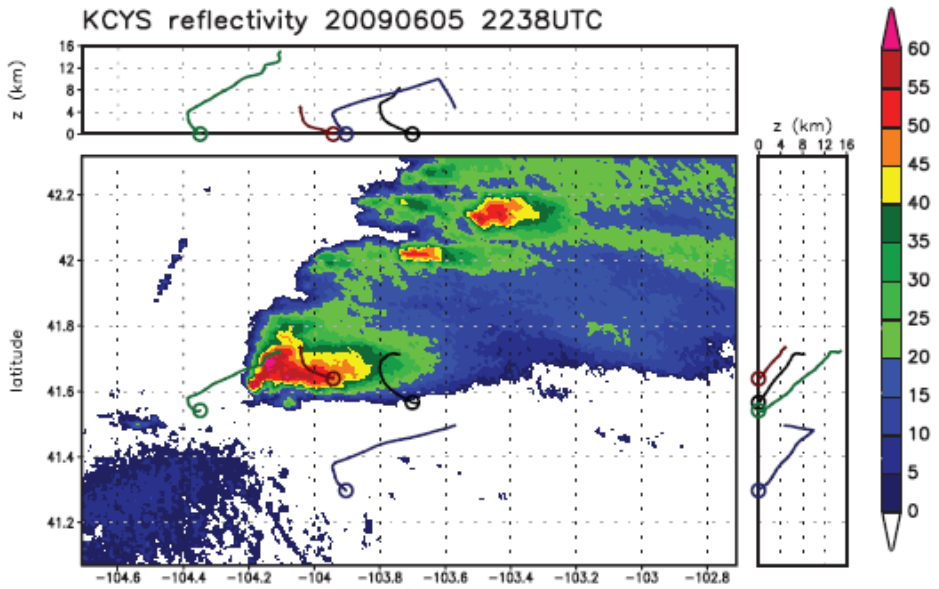

Pre-storm/environmental
Near-storm
44N
43N
42N
41N
40N
39N
38N
37N
36N
35N
34N
33N
105W
104W
103W
102W
101W
100W
99W
98W
97W
96W
95W
94W

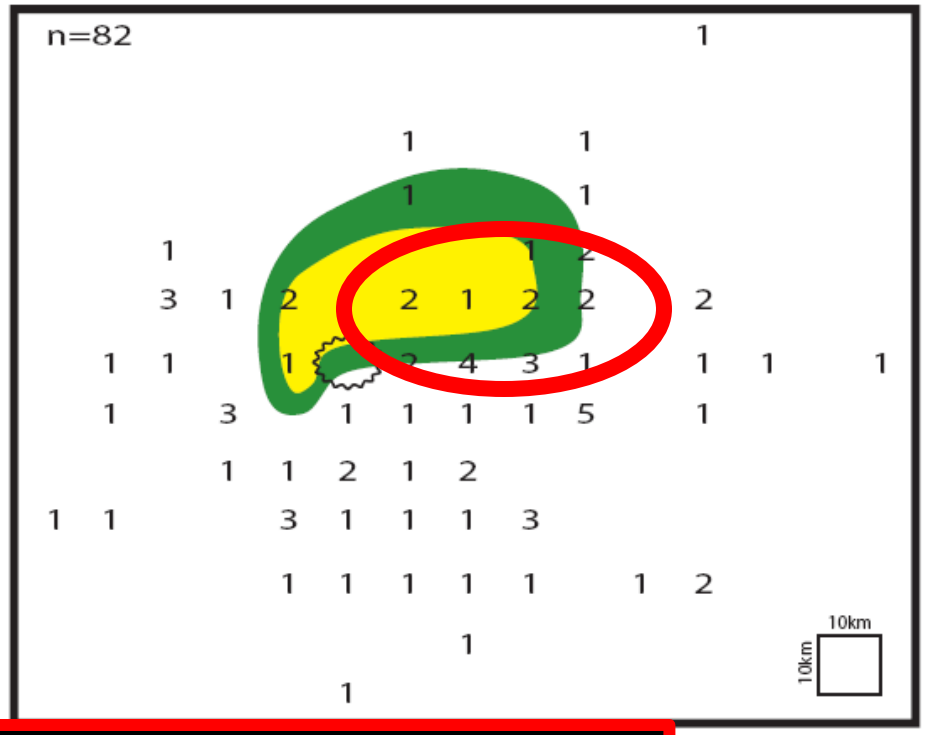
Slow-moving/storm-scale missions





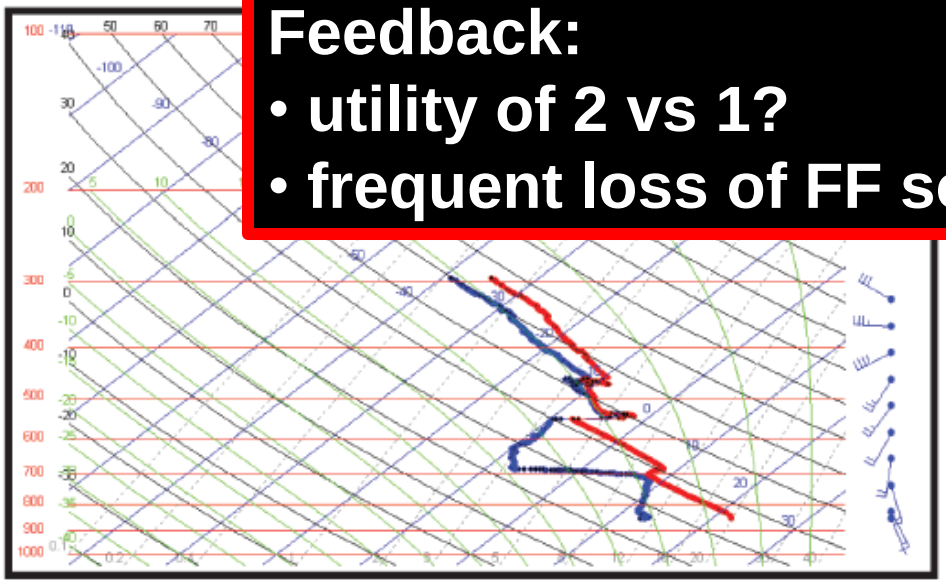
Slow-moving/storm-scale missions

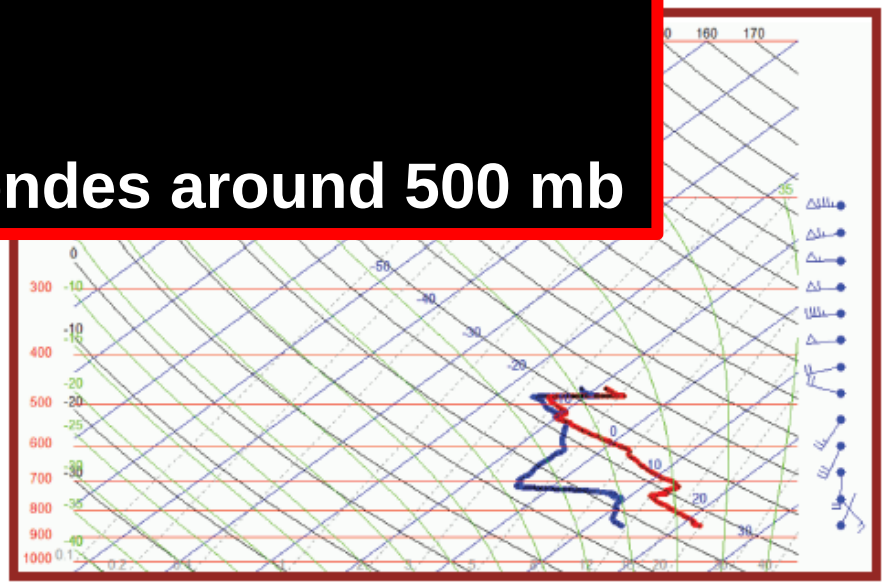




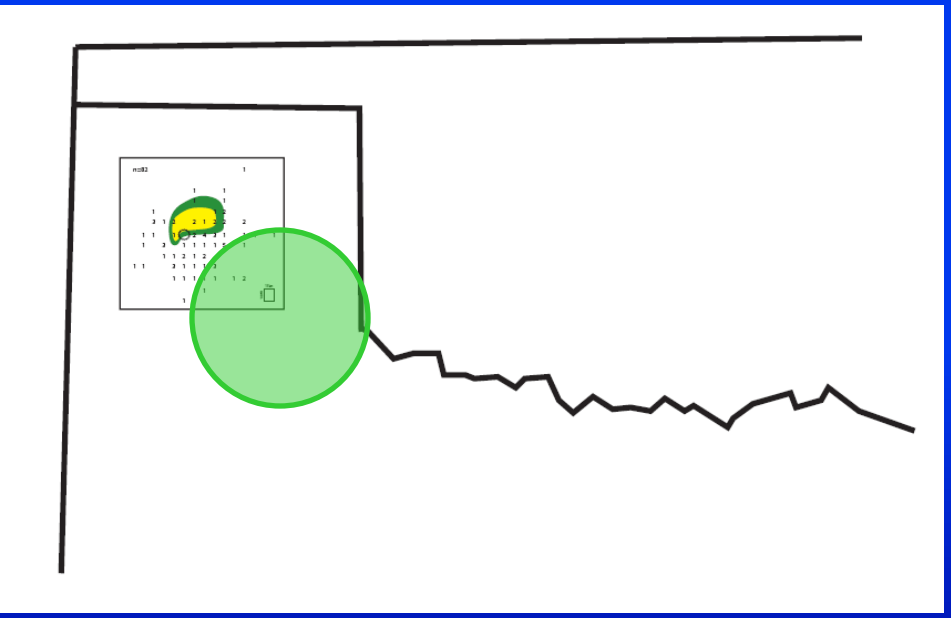
Feedback:

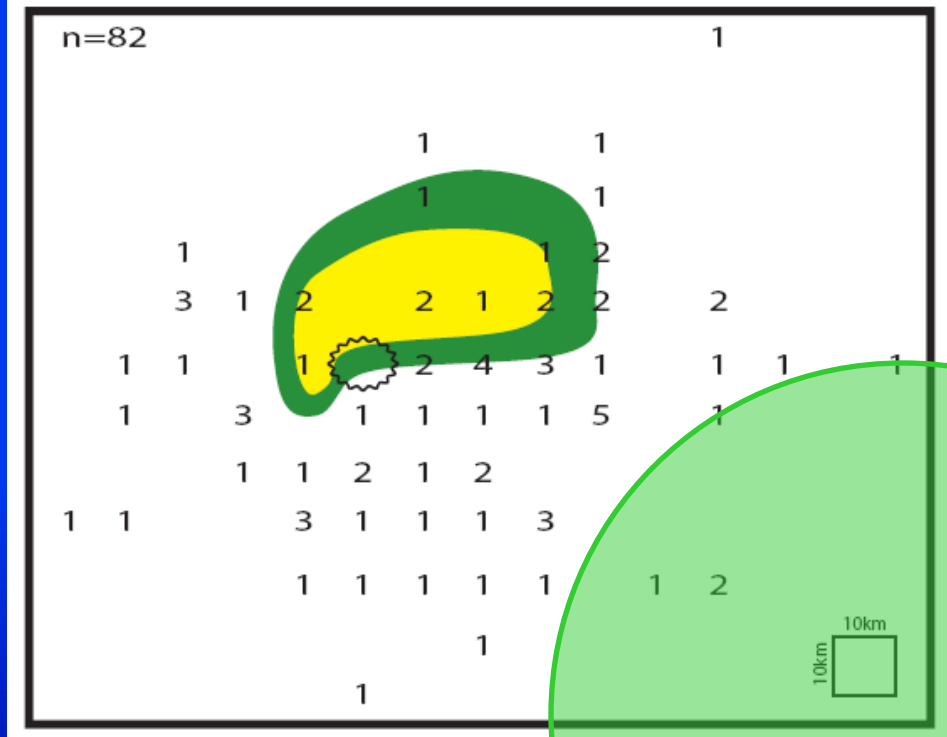
- **utility of 2 vs 1?**
- **frequent loss of FF sondes around 500 mb**





Slow-moving/storm-scale missions





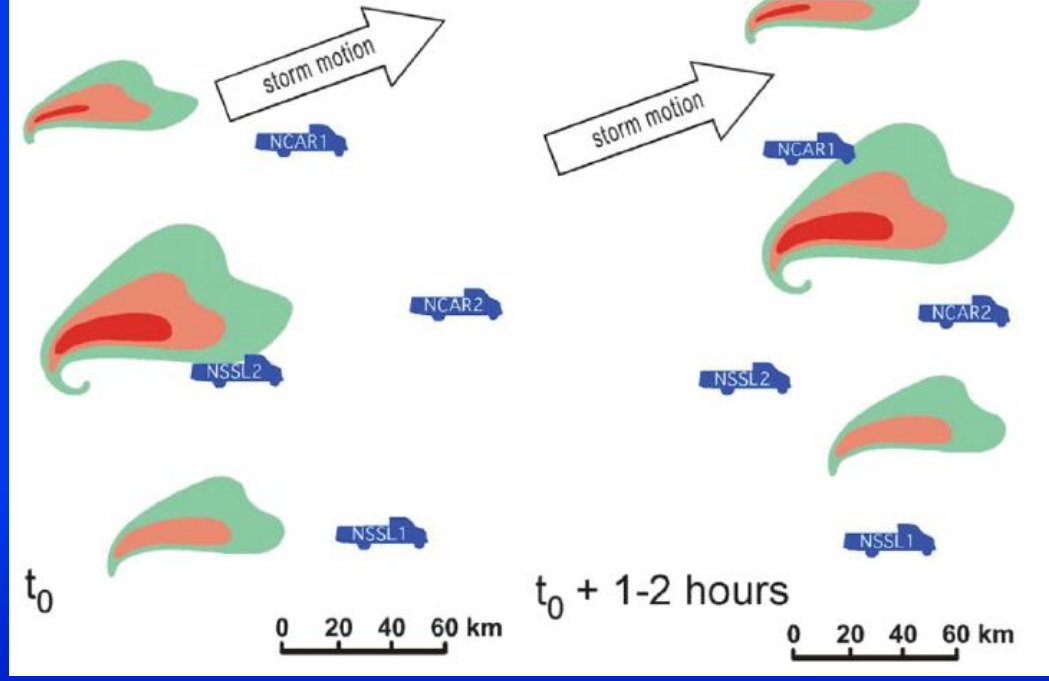
Feedback: PI preferences for trying (in vain?) to sample storm-scale baroclinity vs trying to get a better depiction of mesoscale environmental heterogeneity?

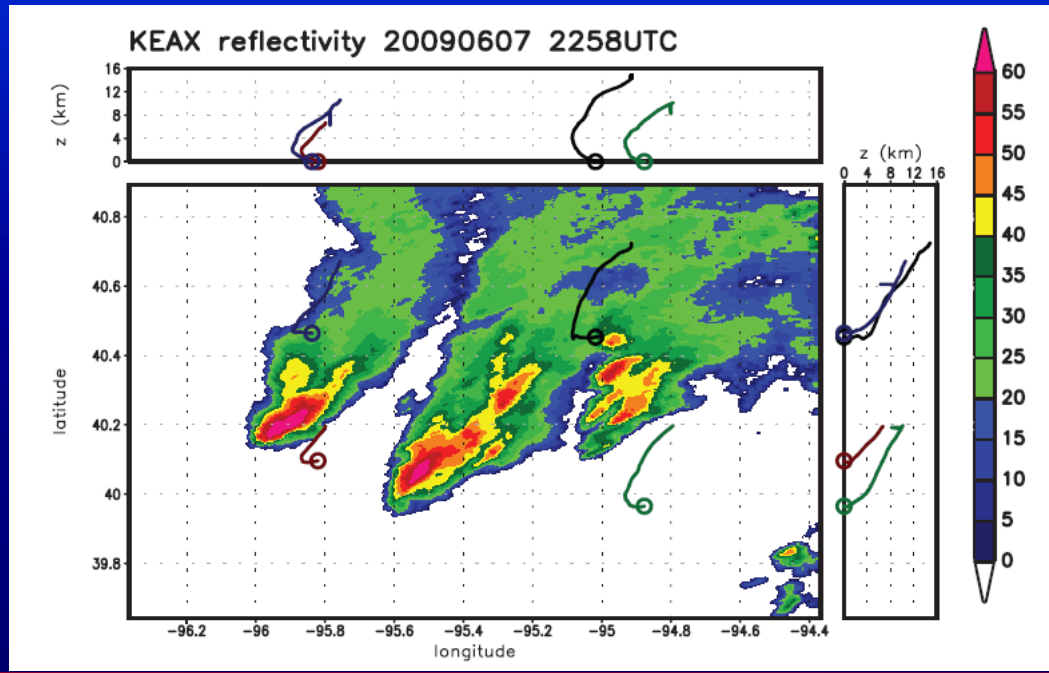
Fast-moving/difficult missions

Issues/modifications for Y2

• Did not work very well because the armada rarely commits to a target storm long enough to make the large vehicle spacing pay off. But, we learned that we are quite adept at getting into the "slow-mover" positions and launching at regular intervals.

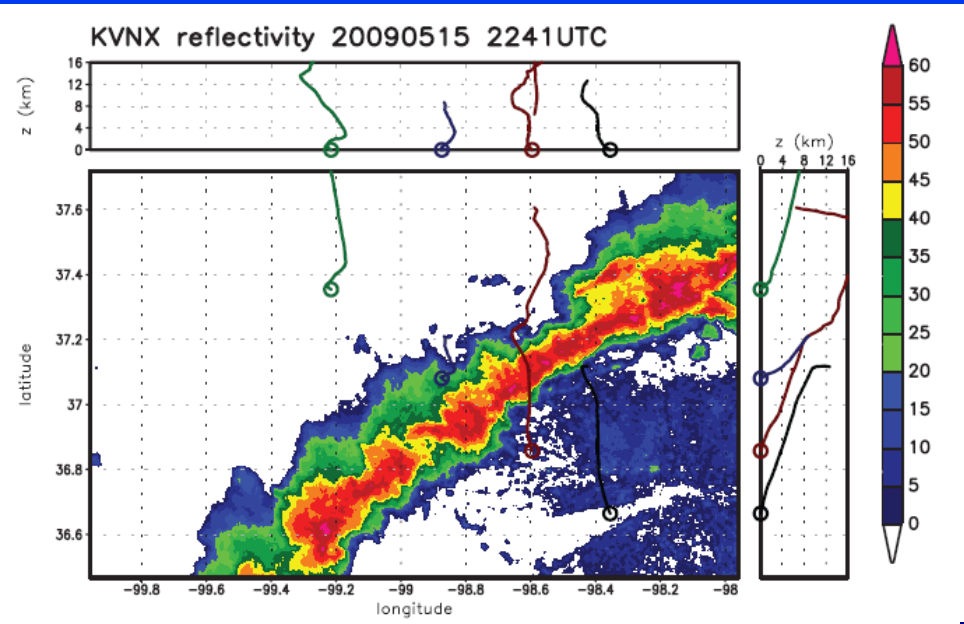
Feedback: is this pattern something that a significant # of PIs *want*?



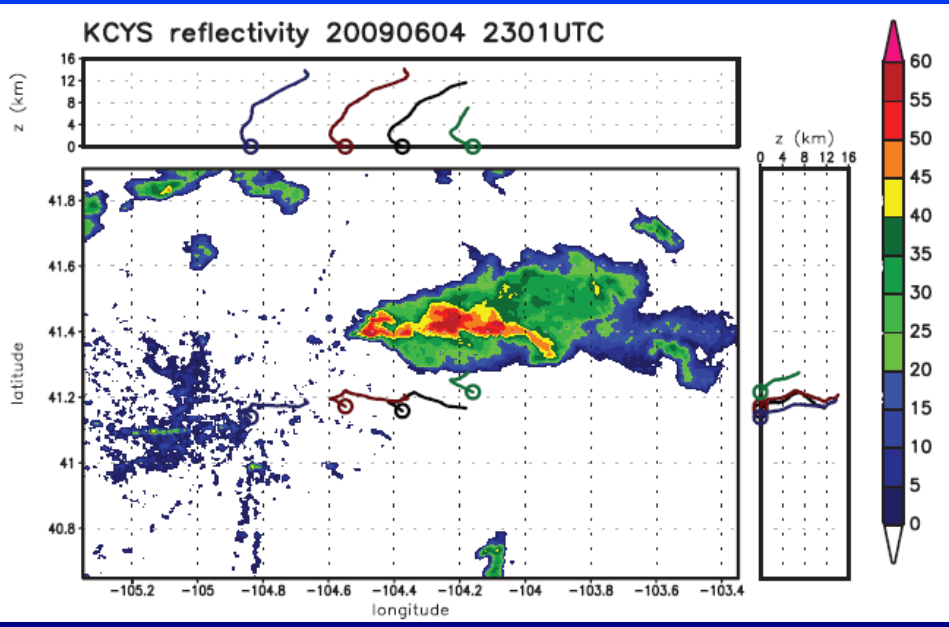


Ad hoc deployments

Serial ascents from multiple vehicles at one site



“Picket fence” deployment



Feedback: Any champions for more of these patterns?

Issues/modifications for Y2

• We need a way to communicate graphical sounding data to FC in real time, preferably on a skew-T. George Bryan is working with EOL on this.

- ✓ data currently come in on an x-y value vs. height plot
- ✓ data currently cannot be plotted on a thermodynamic diagram until user has closed the sounding file (for good)

Issues/modifications for Y2

• In Y1, Parker and Bryan as a duo were driving (no chauffeur!), navigating, coordinating the MGAUS teams, launching soundings, and trying to monitor the meteorological situation (often our teams are in positions that make it hard to "go visual"). ***For Y2, we are planning to have either Parker or Bryan (alternating) as a fixed-site coordinator***, with the counterpart as the "eyes in the field" deputy.

- ✓ solid comms and no "time out of truck" when teams need input
- ✓ more time for assessing the meteorology

- ✓ deputy coordinator will attend AM PI's briefing, fixed-site coordinator will dial in and listen; then the two will have a short phone call after the meeting to establish the day's plan
- ✓ deputy coordinator will handle early activities (initial pre-storm soundings and routing), with full "handover" to the fixed-site coordinator around the time of expected initiation
- ✓ deputy coordinator conveys first-hand idea of the operating conditions and radio chatter

Feedback: Unintended consequences?

Issues/modifications for Y2

• It is almost always easiest to begin storm-scale operations if most/all MGAUS teams stay with the armada. This impacts the way pre-storm environmental soundings should be conducted; it seems best to avoid repeated, broad regional sampling in many cases. Instead, ***it is better to perform serial launches from the armada position***, perhaps sending out one "scout" team to a desired second location if needed (and then calling them back to the armada).

- ✓ we have found the serial soundings to be very useful so far
- ✓ helps guard against using too many sondes on bust days

Feedback: We are leaning toward focusing sounding resources on the pre-convective environment *at the armada's location* and then on storm-scale operations (i.e. the things that are novel aspects of V2). How many PIs *want* widely spaced soundings from before initiation?