Plains Elevated Convection at Night

Radiosonde Sounding Systems

Timothy Lim

Frequency management

Logistics coordination

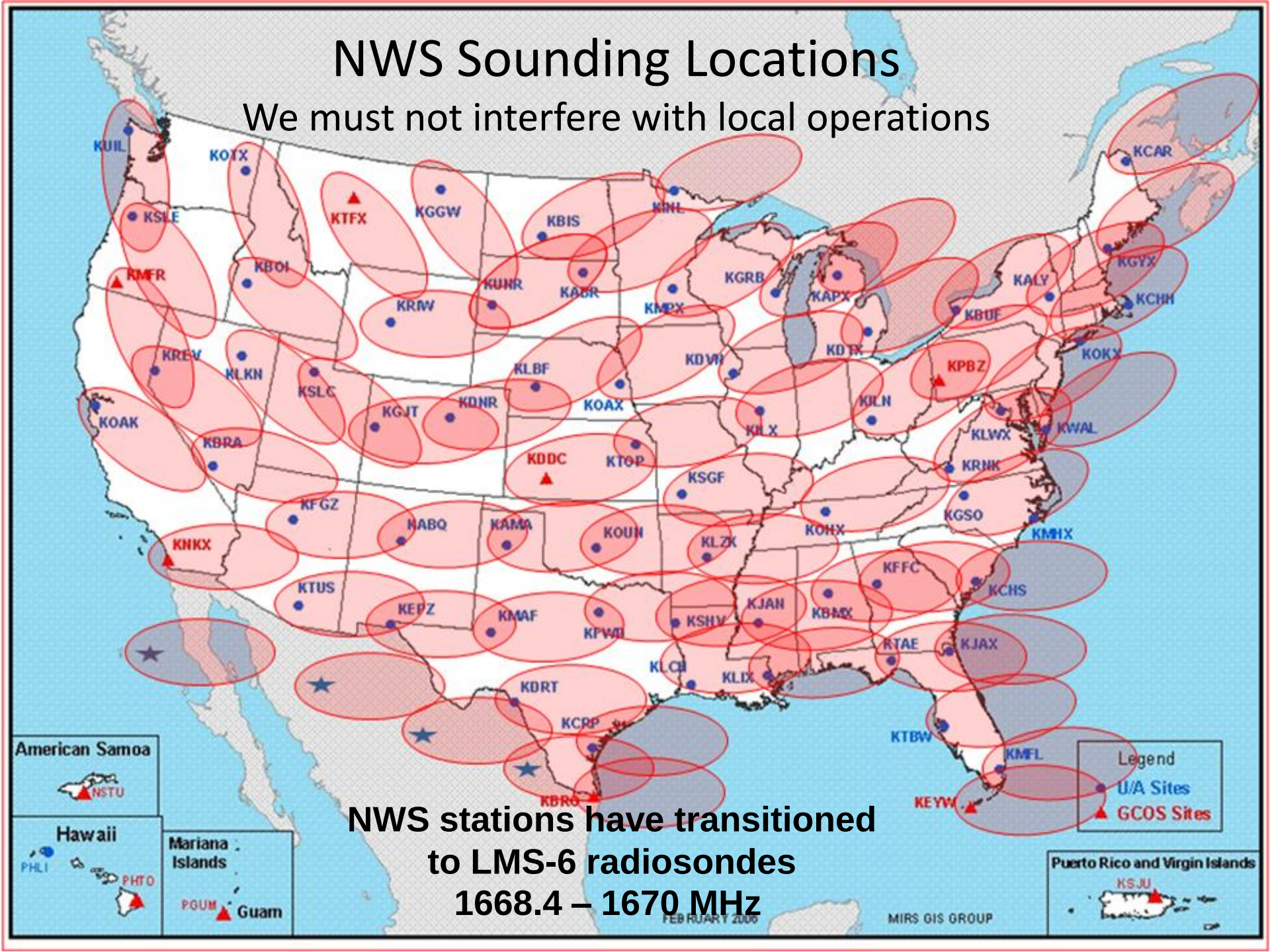
Radiosonde Frequency management

- 13 Sounding systems
- 6 at fixed locations
- 7 in mobile locations
- 1,440 radiosondes (not including DOE/ARM Central Facility)

ALL TRANSMITTING between 400-405Mhz

NWS Sounding Locations

We must not interfere with local operations



NWS stations have transitioned to LMS-6 radiosondes 1668.4 – 1670 MHz

DOE/ARM/SGP

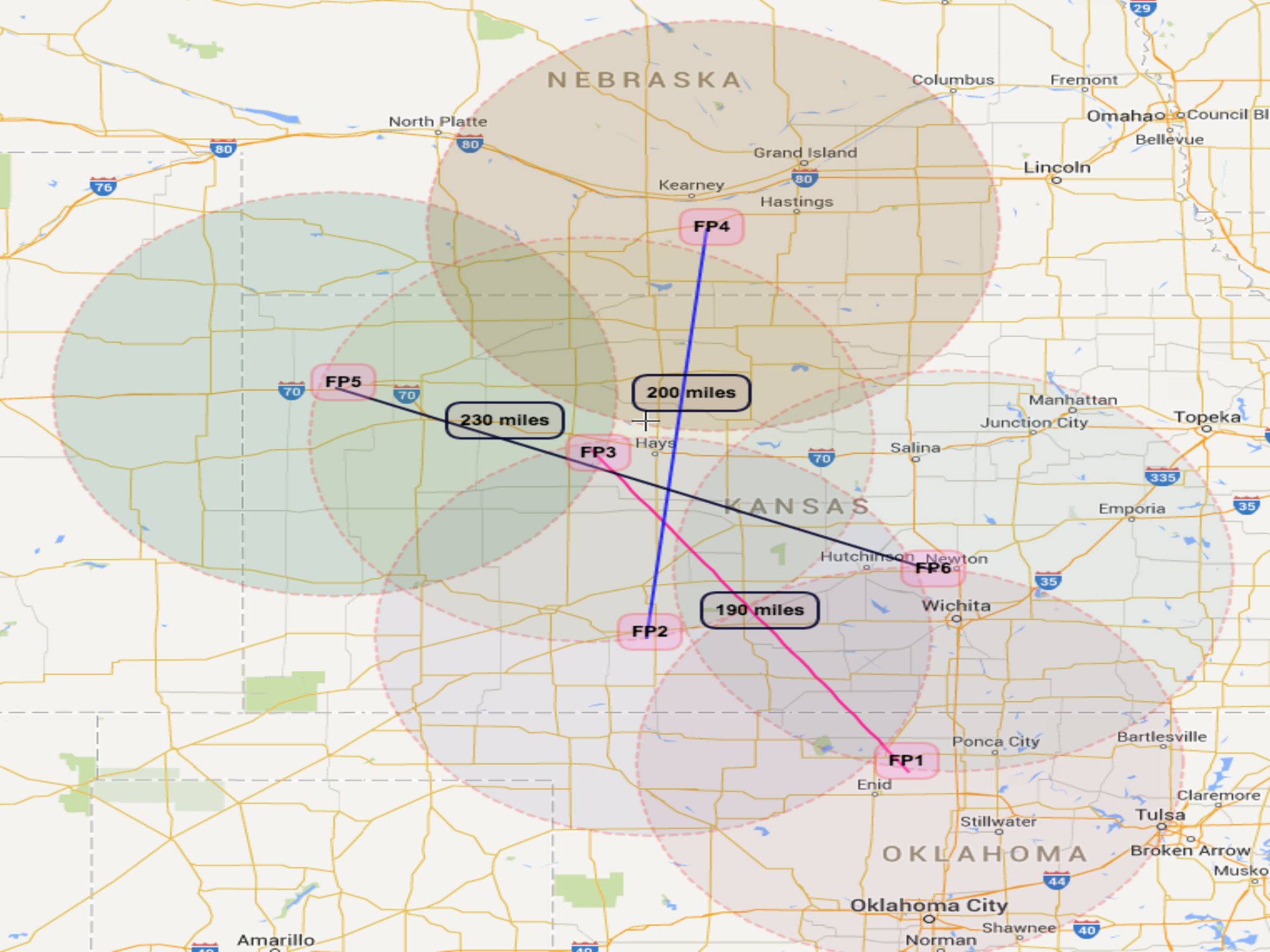
John Schatz, SGP site manager

SGP has four Vaisala RS-92 radiosonde systems

05:30/11:30/17:30/23:30 (L) daily@403.10Mhz*

- Many additional radiosondes launched at 402.56 & 403.56
- NPOES/NASA Aqua sat. validation, launches coincide with satellite overpass

*John has agreed to alter their usual launch frequencies to accommodate PECAN. Normal frequencies are 403.00, 403.50, 402.50


NEBRASKA
KANSAS
OKLAHOMA
North Platte
Grand Island
Kearney
Hastings
Columbus
Fremont
Omaha
Council Bl
Bellevue
Lincoln
Hays
Salina
Manhattan
Junction City
Topeka
Emporia
Hutchinson
Newton
Wichita
Ponca City
Bartlesville
Enid
Stillwater
Tulsa
Broken Arrow
Claremore
Oklahoma City
Shawnee
Norman
Amarillo
FP1
FP2
FP3
FP4
FP5
FP6
200 miles
230 miles
190 miles

Frequency allocations 400-406Mhz

Vaisala RS-92 radiosonde = 11 systems
Intermet imet radiosondes = 2 systems

Vaisala RS-92 radiosondes have good frequency discrimination- 20Khz
Frequency plan offers 40 - 60Khz separation
Minimum of 6 frequencies for each system (18 for FP1)

Intermet sondes have minimal frequency options, discrimination ~40Khz
MP1 (CLAMPS) – sondes ordered with 402.50, 403.50, 404.50, 405.50
MP2 (MIPS) – sondes are standard- 402.00, 403.00, 404.00, 405.00

	400.xx	401.xx	402.xx	403.xx	404.xx	405.xx
40x.00			MP2	MP2	MP2	MP2
40x.02						
40x.04	FP3	FP3	FP3	FP3	FP3	FP3
40x.06						
40x.08						
40x.10	FP1	FP1	FP1	FP1	FP1	FP1
40x.12						
40x.14						
40x.16	FP5	FP5	FP5	FP5	FP5	FP5
40x.18						
40x.20						
40x.22	FP1	FP1	FP1	FP1	FP1	FP1
40x.24						
40x.26						
40x.28	MP3	MP3	MP3	MP3	MP3	MP3
40x.30						
40x.32						
40x.34						
40x.36	NSSL3	NSSL3	NSSL3	NSSL3	NSSL3	NSSL3
40x.38						
40x.40						
40x.42	FP4	FP4	FP4	FP4	FP4	FP4
40x.44						
40x.46						
40x.48						
40x.50			MP1	MP1	MP1	MP1
40x.52						
40x.54						
40x.56	FP1	FP1	FP1	FP1	FP1	FP1
40x.58						
40x.60						
40x.62	NSSL2	NSSL2	NSSL2	NSSL2	NSSL2	NSSL2
40x.64						
40x.66						
40x.68						
40x.70	NSSL1	NSSL1	NSSL1	NSSL1	NSSL1	NSSL1
40x.72						
40x.74						
40x.76						
40x.78	FP6	FP6	FP6	FP6	FP6	FP6
40x.80						
40x.82						
40x.84						
40x.86	FP2	FP2	FP2	FP2	FP2	FP2
40x.88						
40x.90						
40x.92						
40x.94	MP4/MGAUS1	MP4/MGAUS1	MP4/MGAUS1	MP4/MGAUS1	MP4/MGAUS1	MP4/MGAUS1
40x.96						
40x.98						

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HELIUM Logistics

Quotes from 3 major vendors for 220 cylinders

- USWelding =$149/cyl + 1K shipping + rent (~33.5K)
- AIRGAS = $95/cyl + 5K shipping (~28.2K)
- Matheson Tri-Gas =$115/cyl +rent (~27.4K)

Matheson has a facility in Hays, Ks., but delivery is to our garage*

What garage, you say?

Mobile PISA Garage and parking

- Secure area required for storage
- Workspace for equipment repair
- Parking for oversized equipment


RAG MOTORS
USED CARS & TRUCKS
BUY
SELL
TRADE
Roger A Gray


Storage
Systems


SERVICE ENTRANCE


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RADIOSONDE DATA QUALITY CONTROL

Kate Young

Quality Control of Radiosonde Data

In field data inspection by operator → **Entries in an electronic log**

Individual examination T/RH and Wind profiles → **Can detect:**
Sounding system lockup
Errors with the automatic launch detect
RH sensor offsets
Slow ascent rates
Descending data

Ground Check Pressure Correction

Apply radiation correction → **Takes into account solar angle at time of launch**
And removes solar heating that could skew T

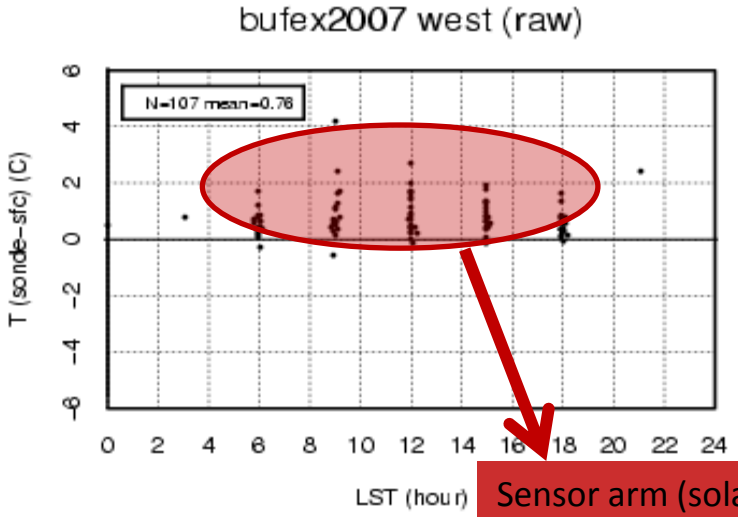
Surface Altitude correction

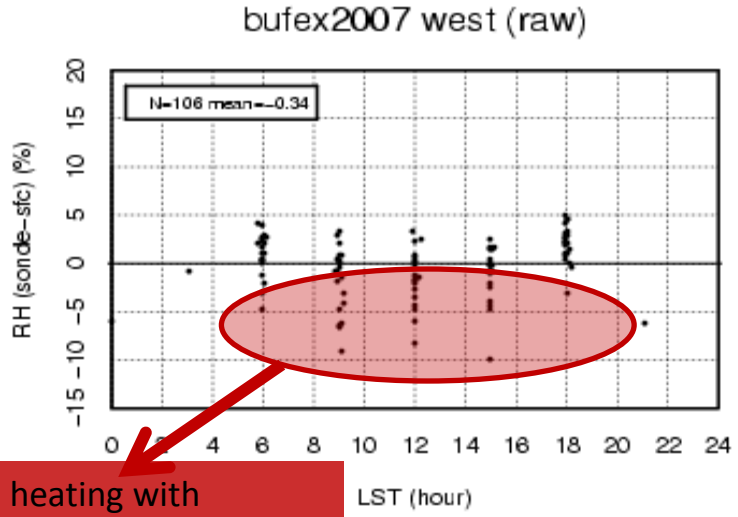
Comparisons of prelaunch and surface data

ASPEN

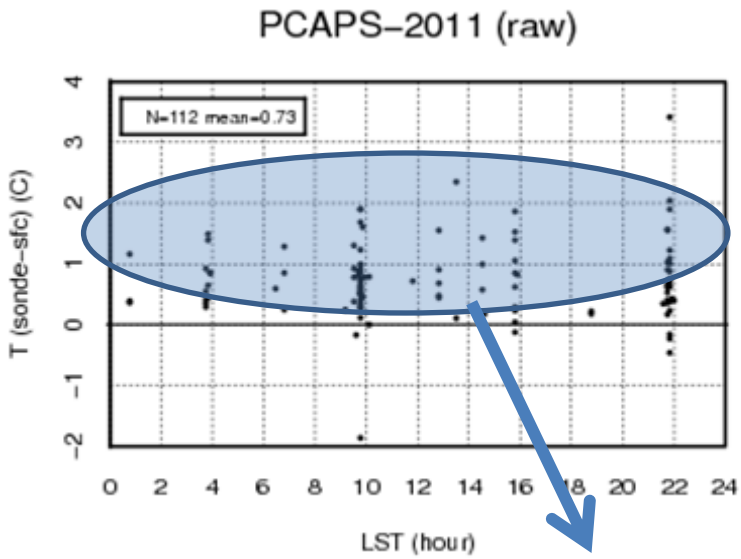
Visually examine QC sounding profiles

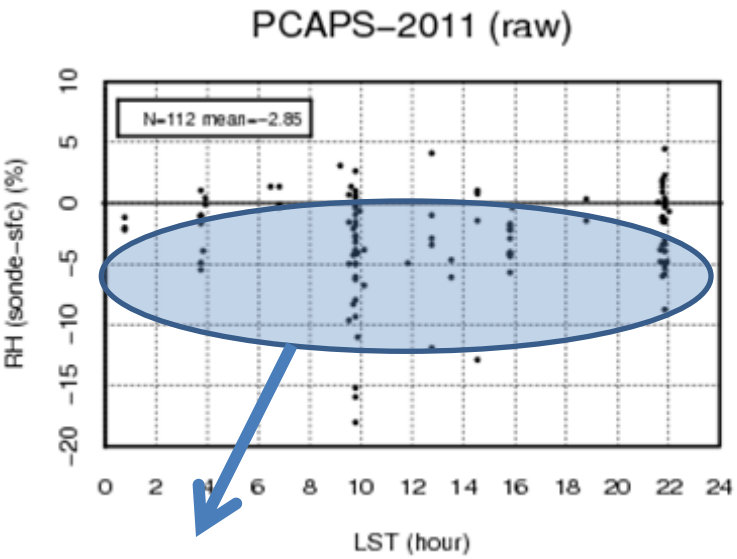
Surface Met vs. Pre-launch Radiosonde Comparisons





Sensor arm (solar) heating with radiosondes measuring warmer and drier





Systematic offset of sfcmet sensor with T/RH measuring colder and wetter

Common Radiosonde Data Problems

- Sensor arm heating (surface & aloft)
- Surface met sensor errors
- RH sensor offsets
- Artificial dry spikes caused by slow ascent/inadequate ventilation
- Balloon descent (icing or vertical downdrafts)
- Sounding system “lock-up” caused by weakening of the radiosonde signal

Thank You For Your Attention.

Questions?