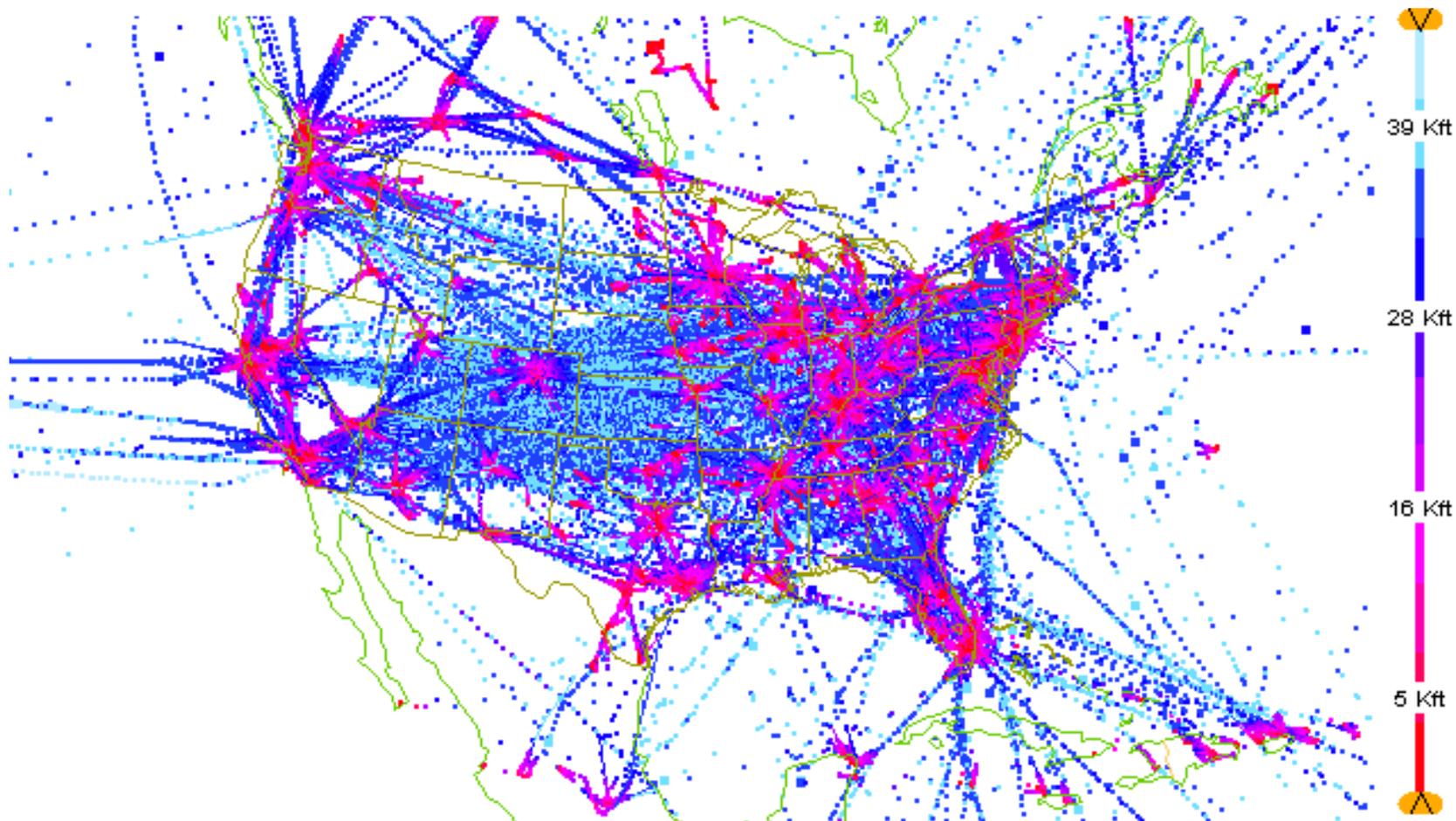


TAMDAR contributions to boundary-layer observations

- TAMDAR: a sensor installed on **regional airlines**
 - Owned *and operated* by AirDat, LLC.
- What it measures
 - T, W, RH, icing, turbulence (iffy)
- Resolution in the PBL
 - Pressure-based, **currently -- every 10 mb** in first 100 mb on ascent, and in lowest 200 mb on descent (adjustable)
- Shown to improve NWP forecasts

All AMDAR (MDCRS + TAMDAR) data, Wed 10 March 2010

Coverage looks dense, but...

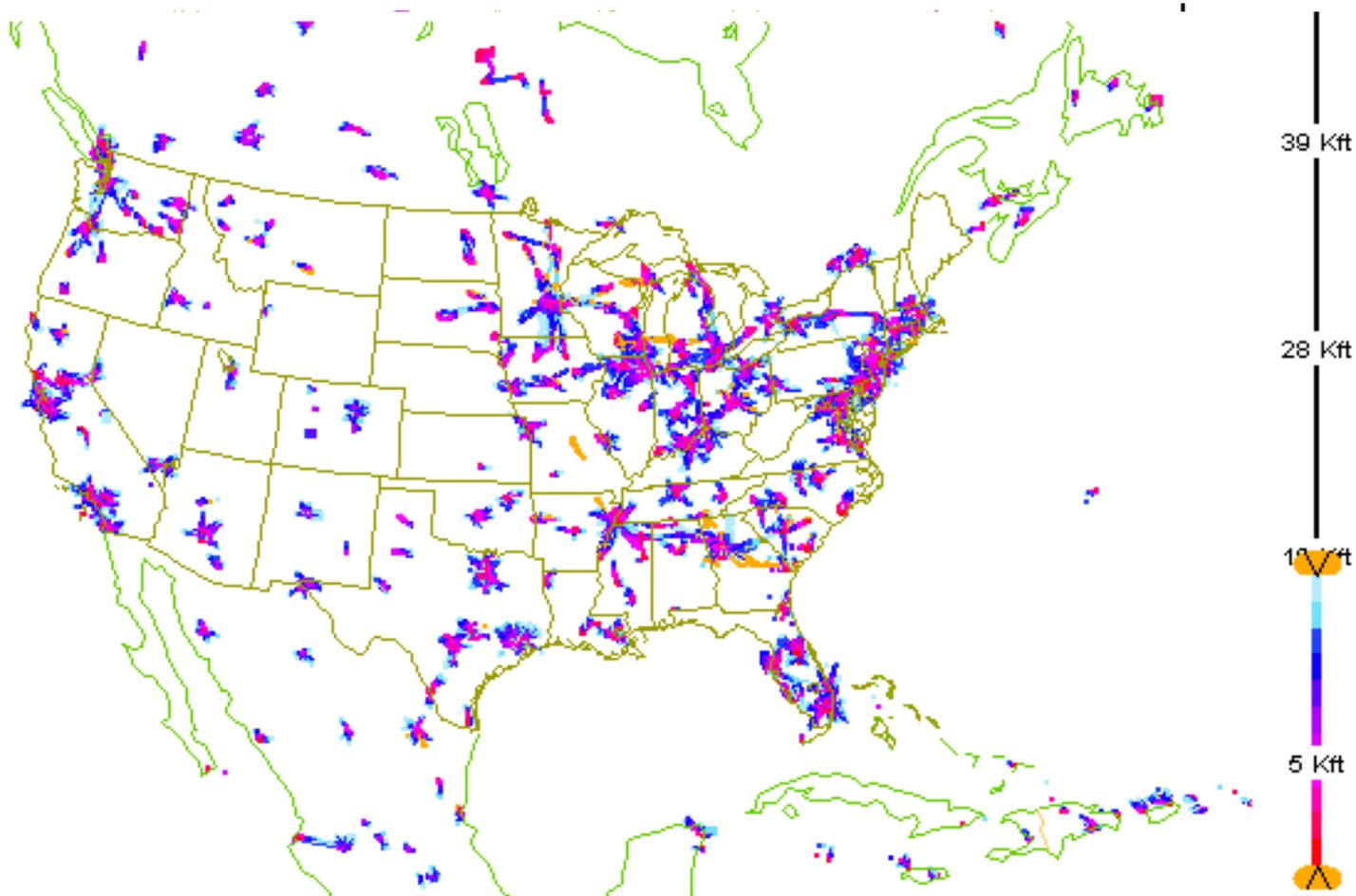


10-Mar-2010 00:00:00 -- 10-Mar-2010 23:59:58 (289260 obs loaded, 143268 in range, 32302 shown)

NOAA / ESRL / GSD Altitude: -1000 ft. to 45000 ft.

Good w and T

...data gaps exist in the lower atmosphere



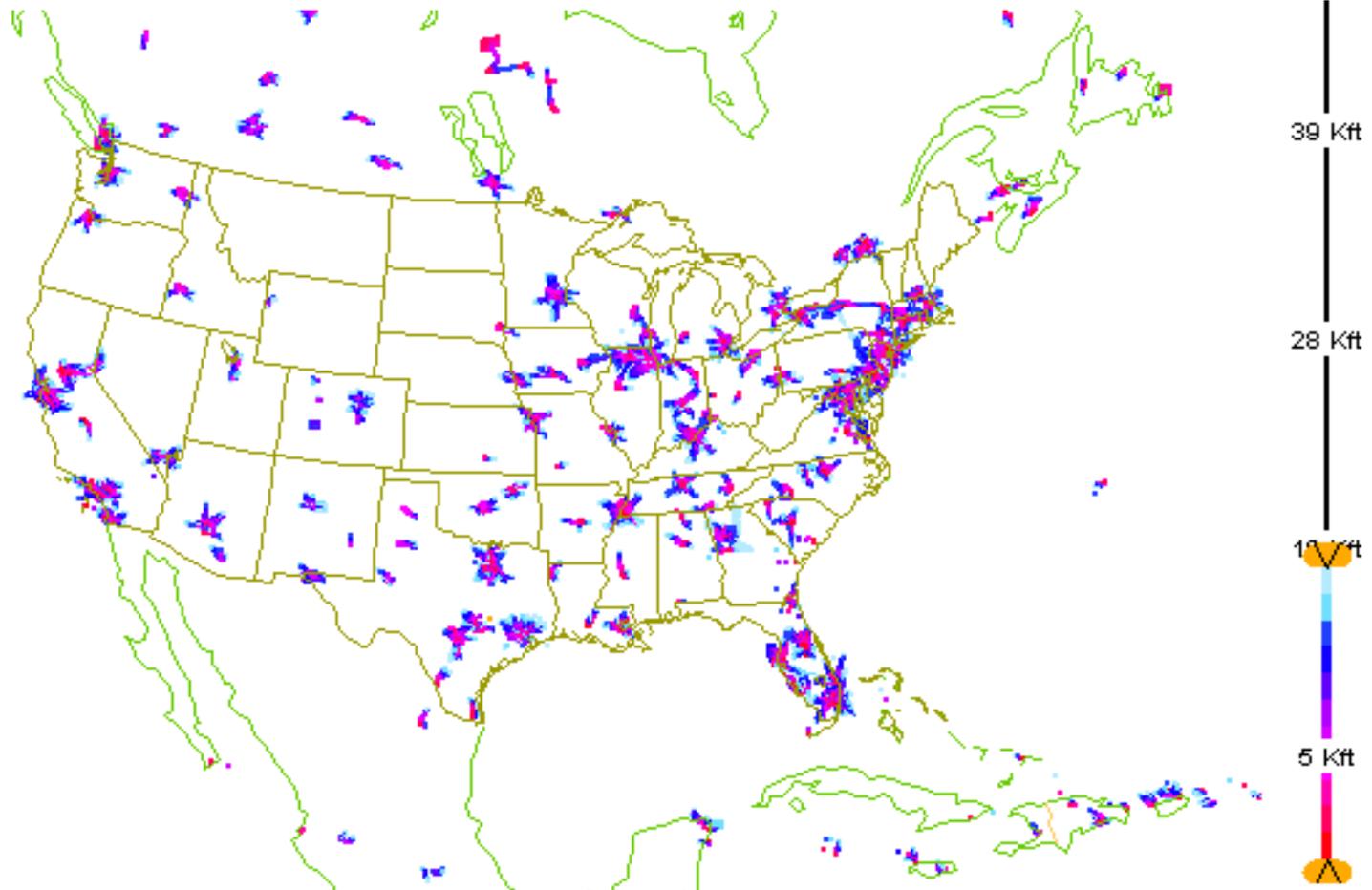
10-Mar-2010 00:00:00 -- 10-Mar-2010 23:59:58 (289260 obs loaded, 88251 in range, 7253 shown)

NOAA / ESRL / GSD Altitude: -1000 ft. to 15000 ft.

All data

MDCRS data below 15 Kft

MDCRS data flies into major hubs



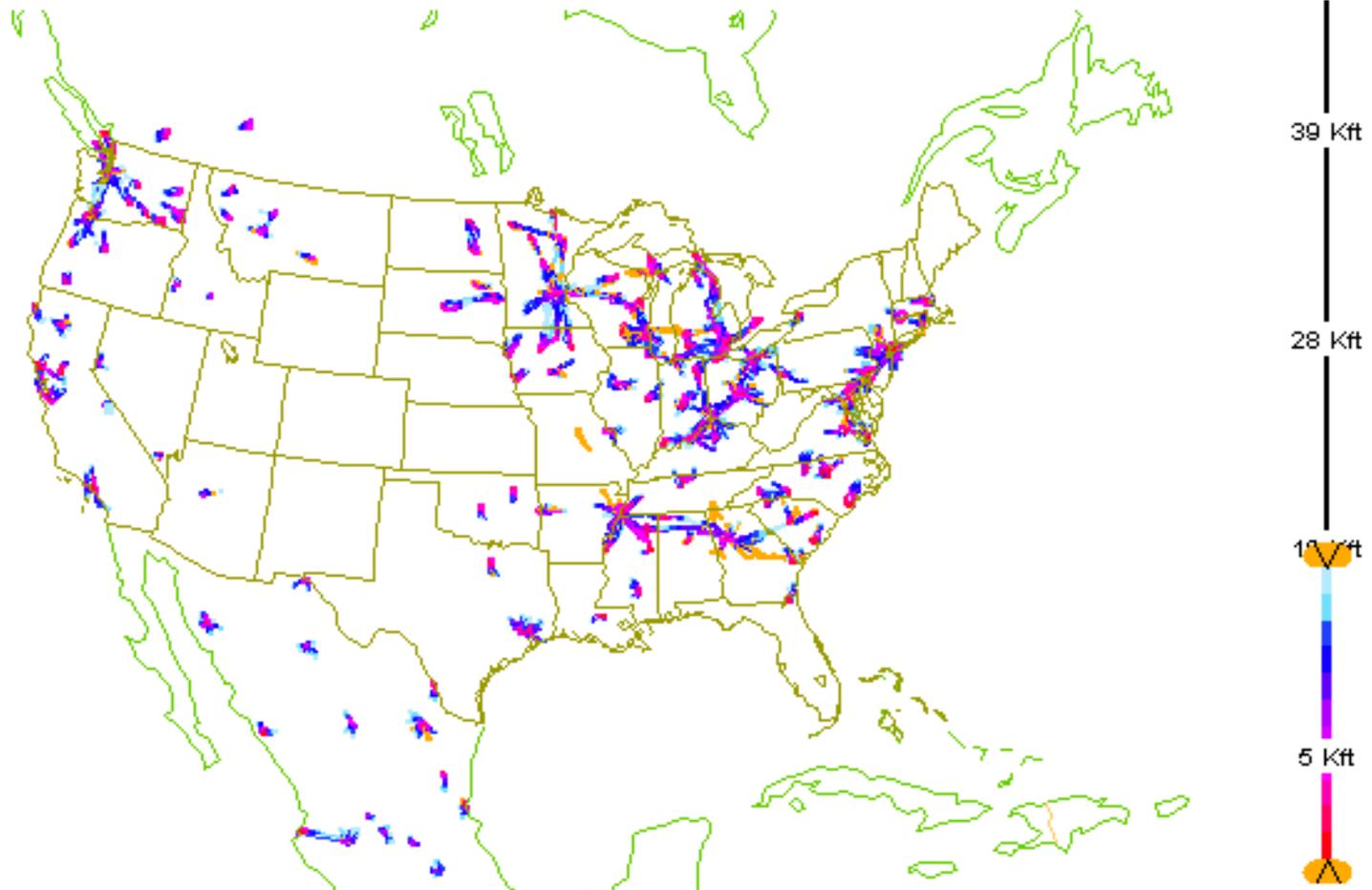
10-Mar-2010 00:00:00 -- 10-Mar-2010 23:59:58 (289260 obs loaded, 63706 in range, 5033 shown)

NOAA / ESRL / GSD Altitude: -1000 ft. to 15000 ft.

not-TAMDAR

TAMDAR data below 15 Kft

TAMDAR flies into regional airports (and hubs)



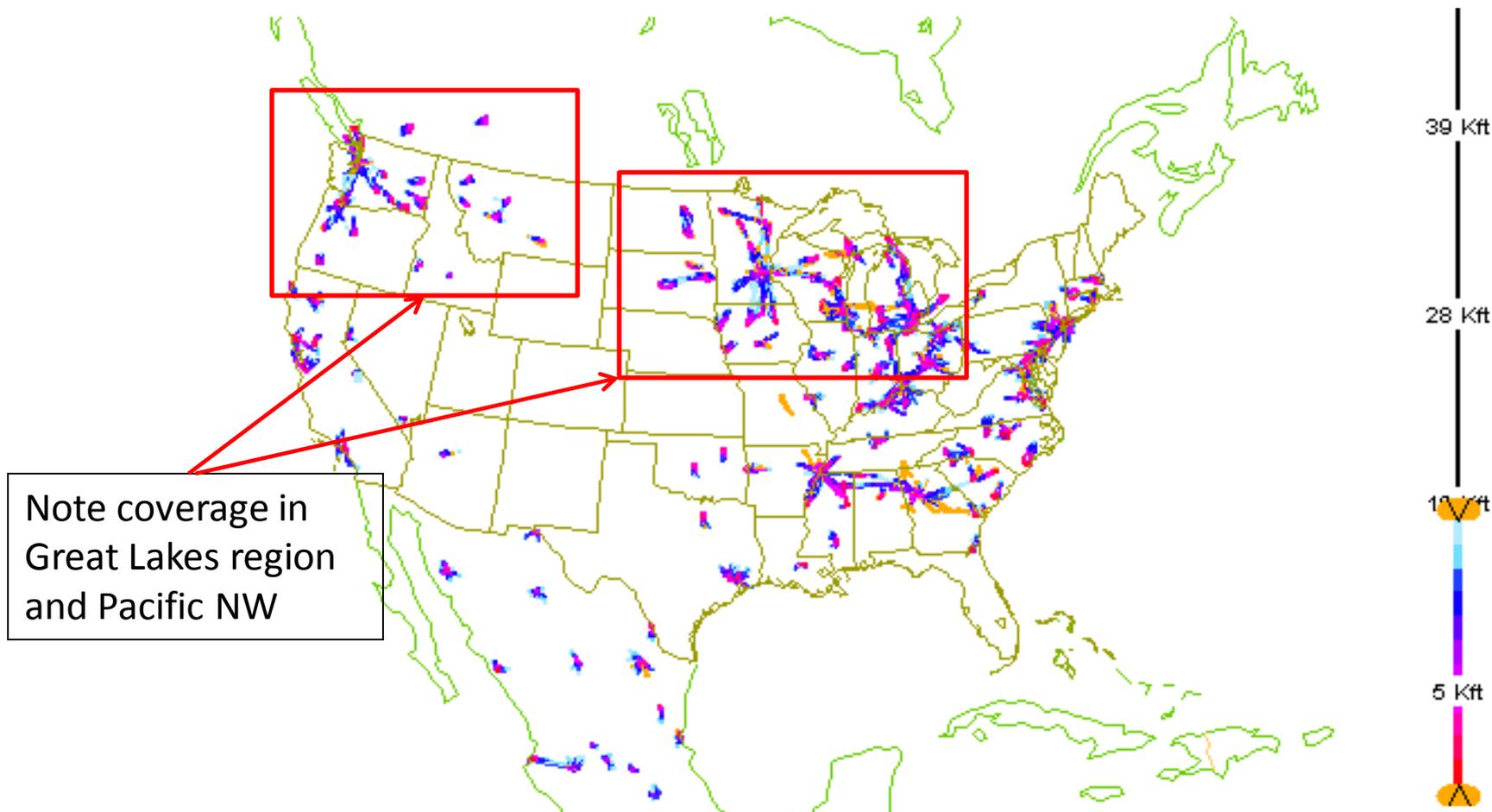
10-Mar-2010 00:00:00 -- 10-Mar-2010 23:59:58 (289260 obs loaded, 24545 in range, 3372 shown)

NOAA / ESRL / GSD Altitude: -1000 ft. to 15000 ft.

all TAMDAR

TAMDAR data below 15 Kft

TAMDAR flies into regional airports (and hubs)



Note coverage in Great Lakes region and Pacific NW

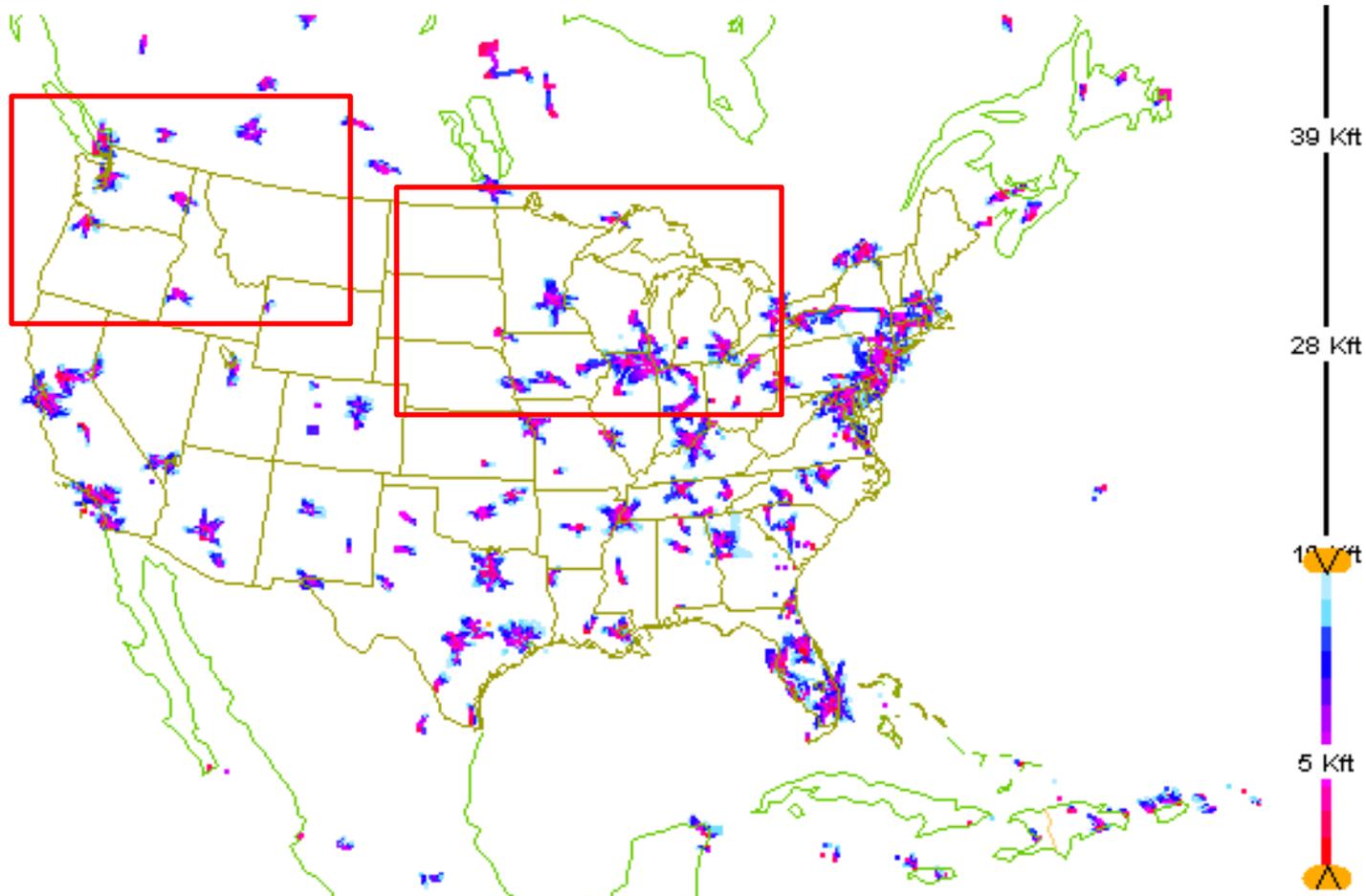
10-Mar-2010 00:00:00 -- 10-Mar-2010 23:59:58 (289260 obs loaded, 24545 in range, 3372 shown)

NOAA / ESRL / GSD Altitude: -1000 ft. to 15000 ft.

all TAMDAR

MDCRS data below 15 Kft

MDCRS data flies into major hubs



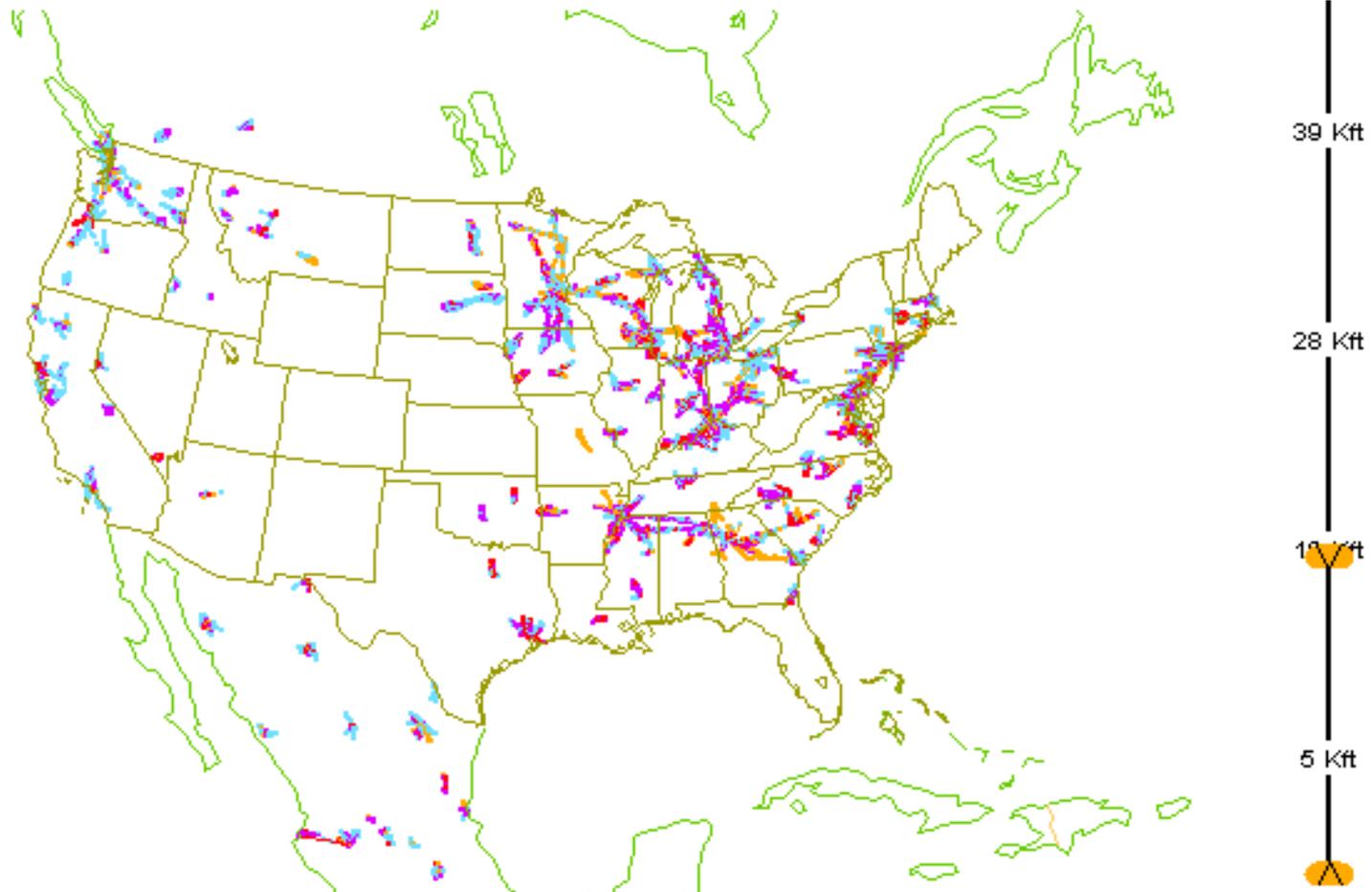
10-Mar-2010 00:00:00 -- 10-Mar-2010 23:59:58 (289260 obs loaded, 63706 in range, 5033 shown)

NOAA / ESRL / GSD Altitude: -1000 ft. to 15000 ft.

not-TAMDAR

TAMDAR turbulence data below 15 Kft

Quality is not good yet; AirDat is working to improve it.



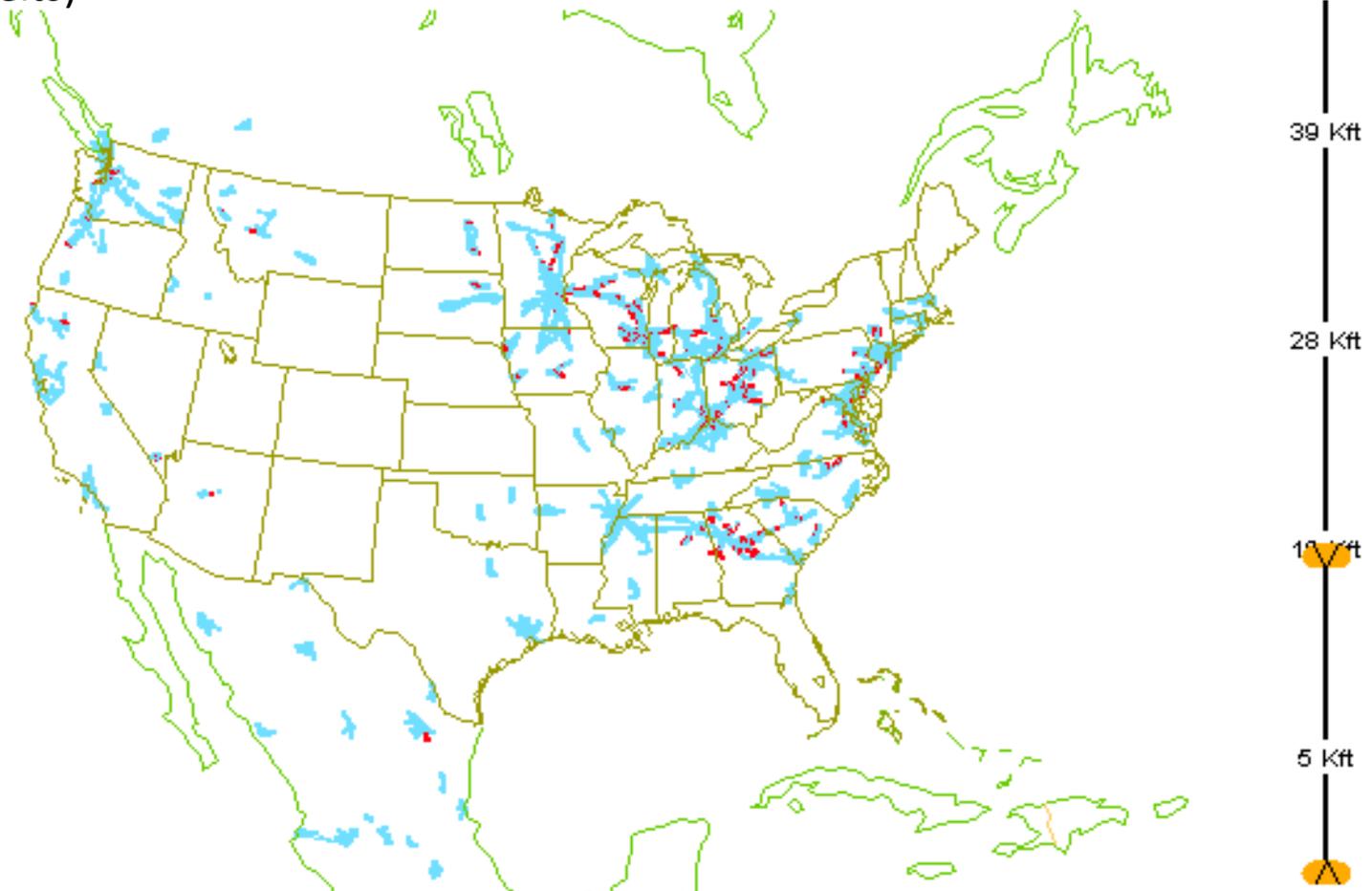
10-Mar-2010 00:00:00 -- 10-Mar-2010 23:59:58 (289260 obs loaded, 24545 in range, 3372 shown)

NOAA / ESRL / GSD Altitude: -1000 ft. to 15000 ft.

edr all TAMDAR

TAMDAR icing data below 15 Kft

Gives *approximate* vertical location of icing (some hysteresis because deicer stays on while ice melts)



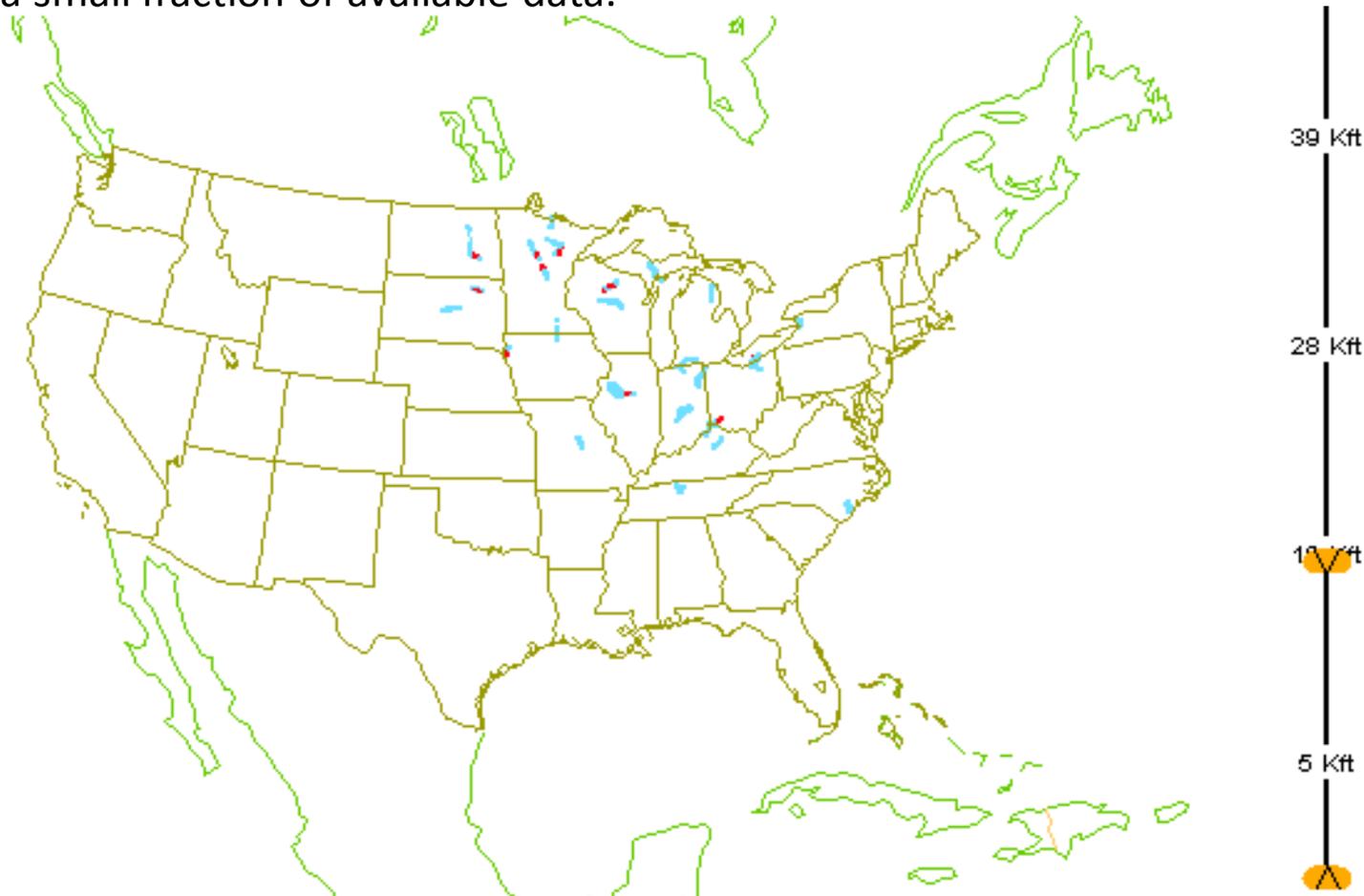
10-Mar-2010 00:00:00 -- 10-Mar-2010 23:59:58 (289260 obs loaded, 24545 in range, 3372 shown)

NOAA / ESRL / GSD Altitude: -1000 ft. to 15000 ft.

icing all TAMDAR

Operational TAMDAR icing data below 15 Kft

AirDat business model gives the government little control over prices. NWS is now purchasing a small fraction of available data.



10-Mar-2010 00:00:00 -- 10-Mar-2010 23:59:58 (289260 obs loaded, 1110 in range, 239 shown)

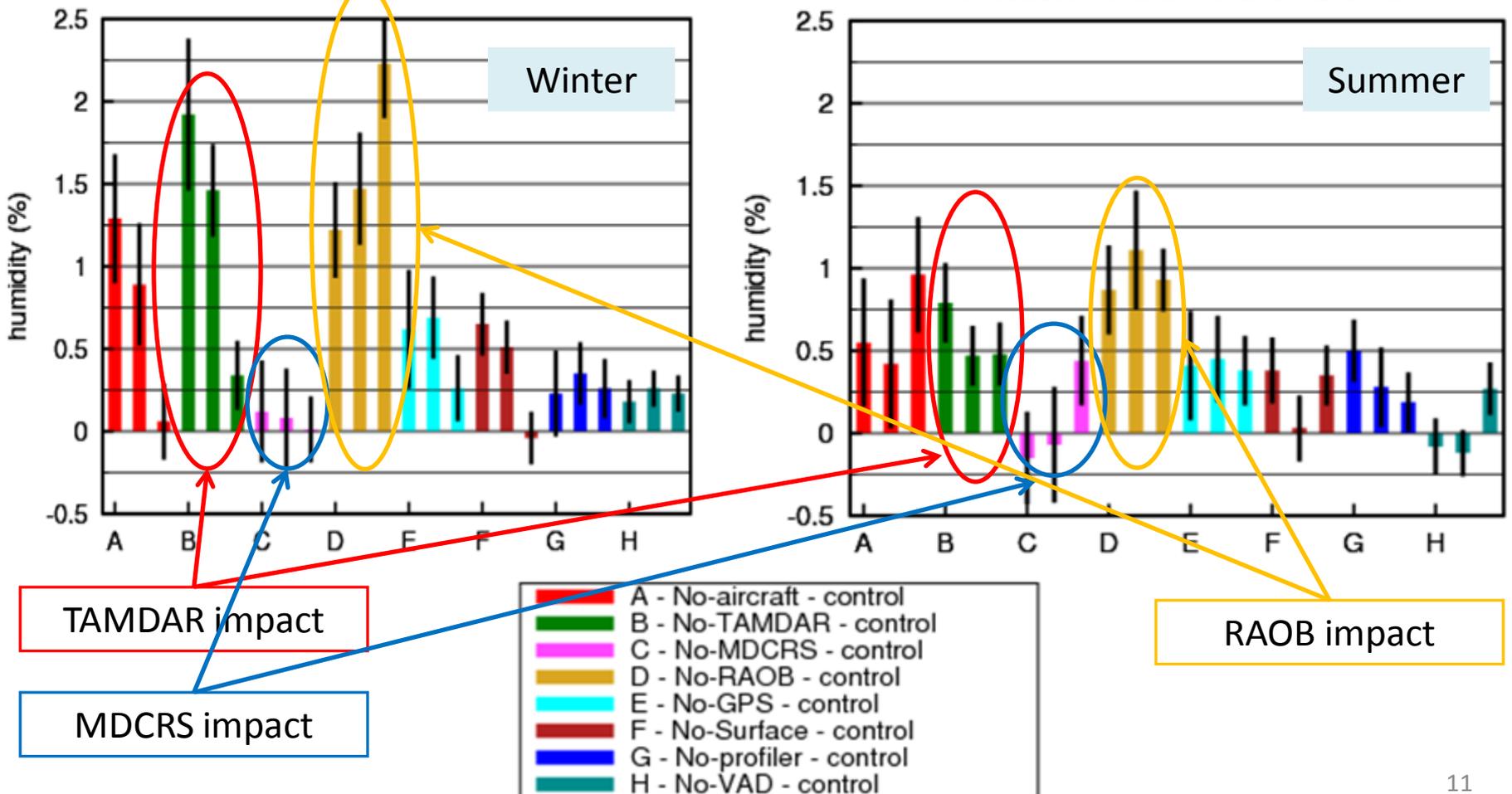
NOAA / ESRL / GSD Altitude: -1000 ft. to 15000 ft.

icing TAM & OPS

TAMDAR/MDCRS impact on RH forecasts, compared with other data impacts, for 3, 6, 12h forecasts in the Great Lakes Region 1000 – 400 hPa (*TAMDAR Great Lakes fleet only*)

GtLk region, humidity averaged rms - matched
2006-11-26 thru 2006-12-05 (1000-400 mb)
Forecasts valid at 00 and 12 UTC

GtLk region, humidity averaged rms - matched
2007-08-15 thru 2007-08-25 (1000-400 mb)
Forecasts valid at 00 and 12 UTC



Points to remember (1)

- Sensors on regional airlines have great potential to improve forecasts, *and are doing so*
- *Regional coverage*: means **TAMDAR complements MDCRS and WVSSII**
- Data are needed *at* airports, and *upstream of* airports to support forecasts

Points to remember (2)

- **Vapor data are critical**; TAMDAR has provided high-quality data for several years
- TAMDAR wind data—initially lower quality than MDCRS—have improved
- Icing and turbulence data have untapped potential
- More detail at <http://amdar.noaa.gov/docs/>