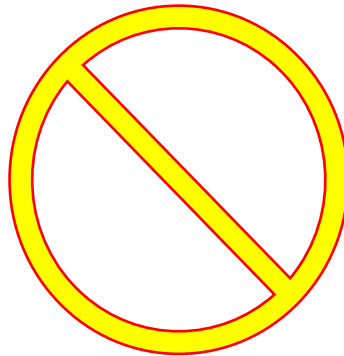




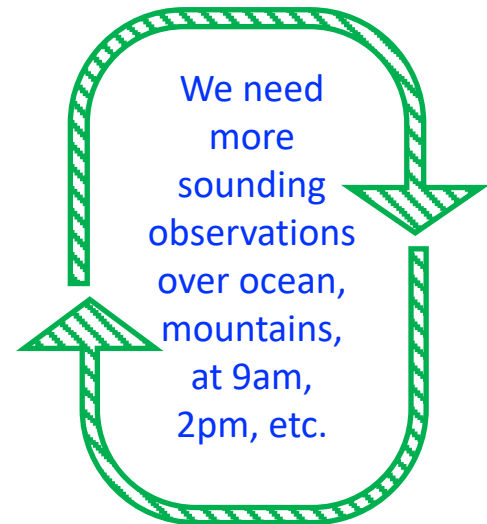
## JPSS Subject Matter Experts

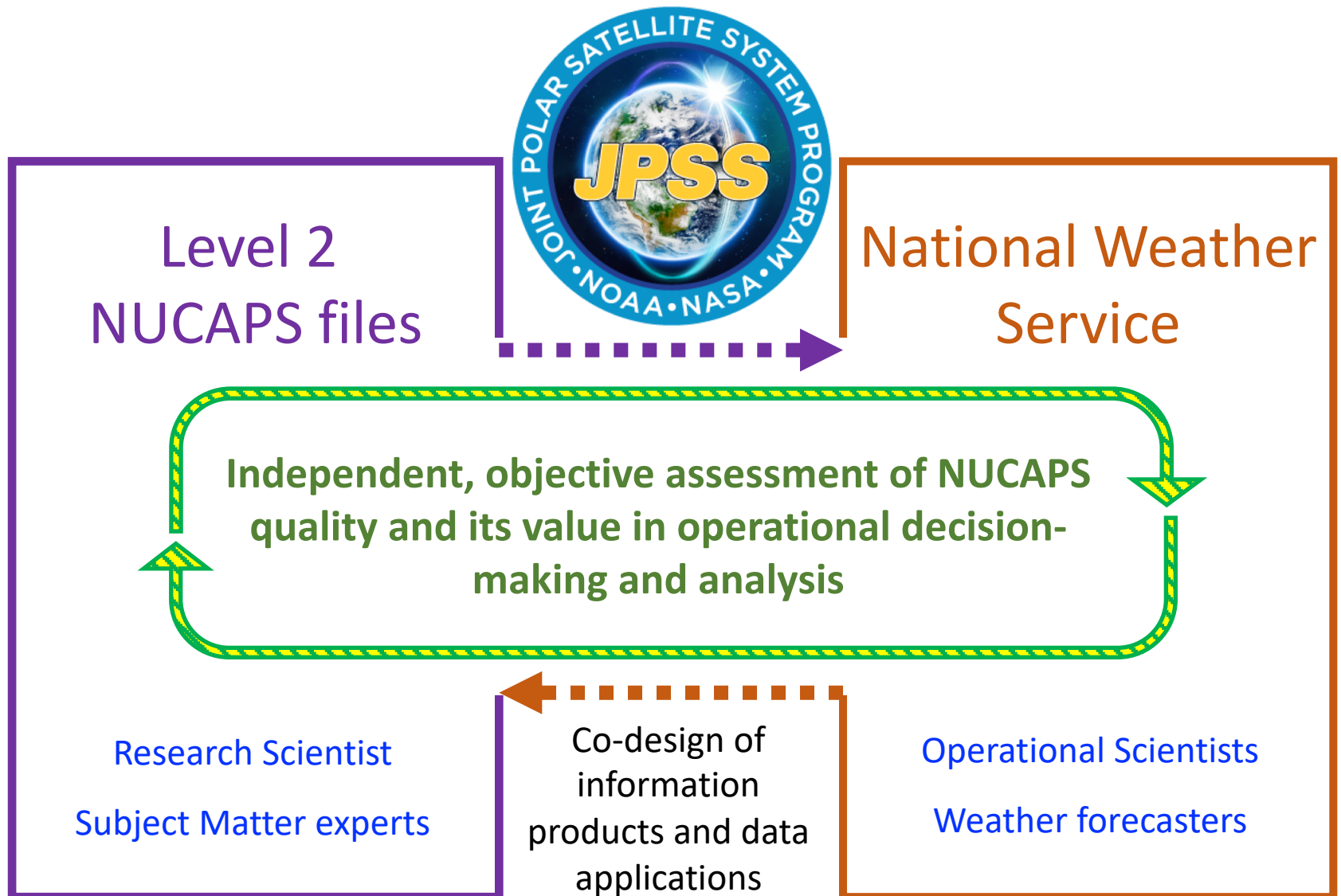
\* NUCAPS Improved Latency • Data Availability • 1400+ SBU • 100% Edge Thu 18:  
NUCAPS-CONUS 400MB-200MB-Wea. Humidity-100% W-18 QHR Thu 18:  
• NUCAPS-16 CH-3A-6.19um Thu 18:  
• NUCAPS-16 CH-02-0.64um Thu 18:

## Level 2 NUCAPS files



## National Weather Service





## Proving Ground and Risk Reduction: Sounding Initiative

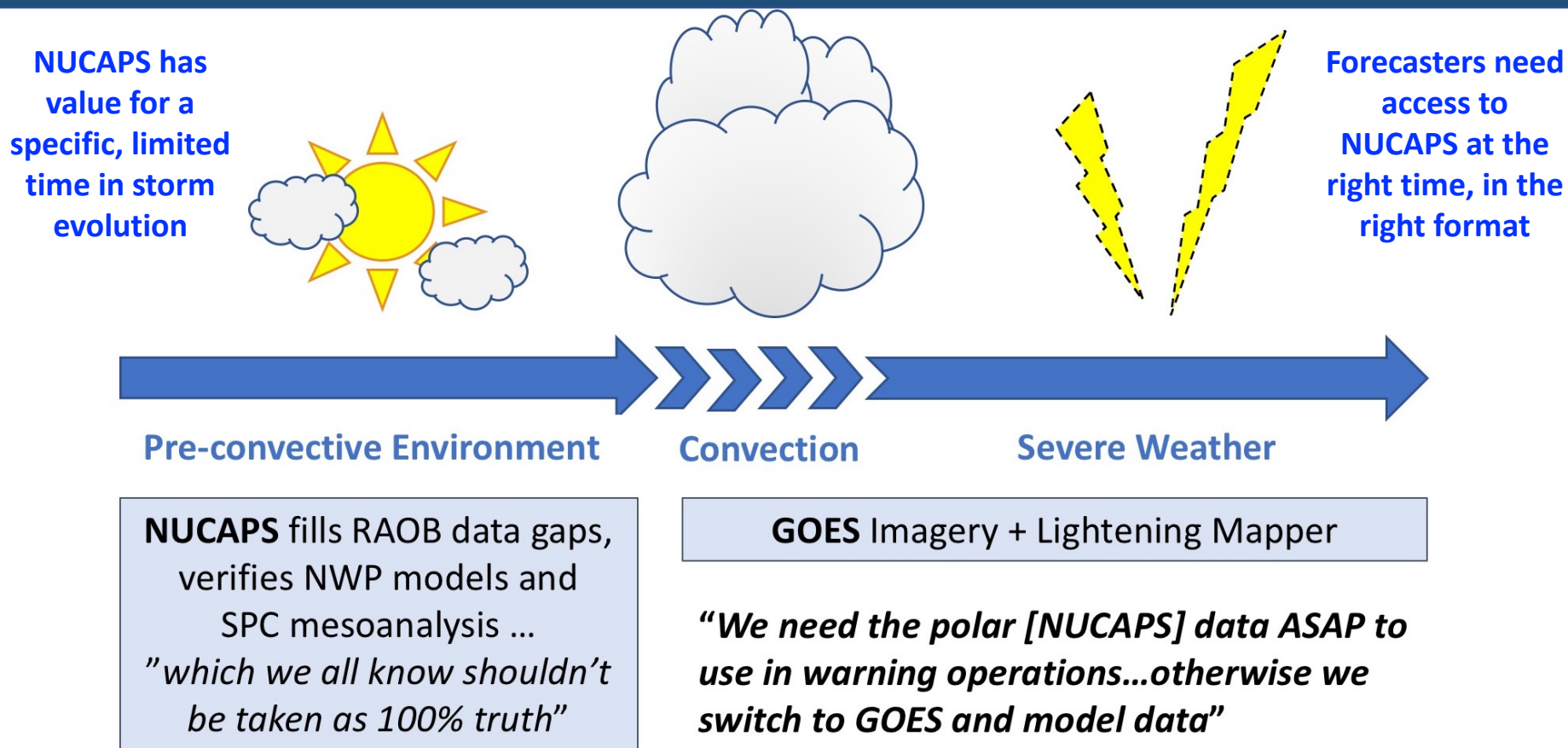
# How do weather forecasters interpret NUCAPS?

NUCAPS is a swath of sounding observations that:

- are **independent of the latest NWP forecast**
- have **skill in the mid-troposphere**
- have **uncertainty in the boundary layer**
- characterize the atmosphere before, during and after storms
- are **spatially uncorrelated**
- have predictable, widespread coverage – spatially and temporally
- are **unavailable where it is overcast/raining** but available everywhere else

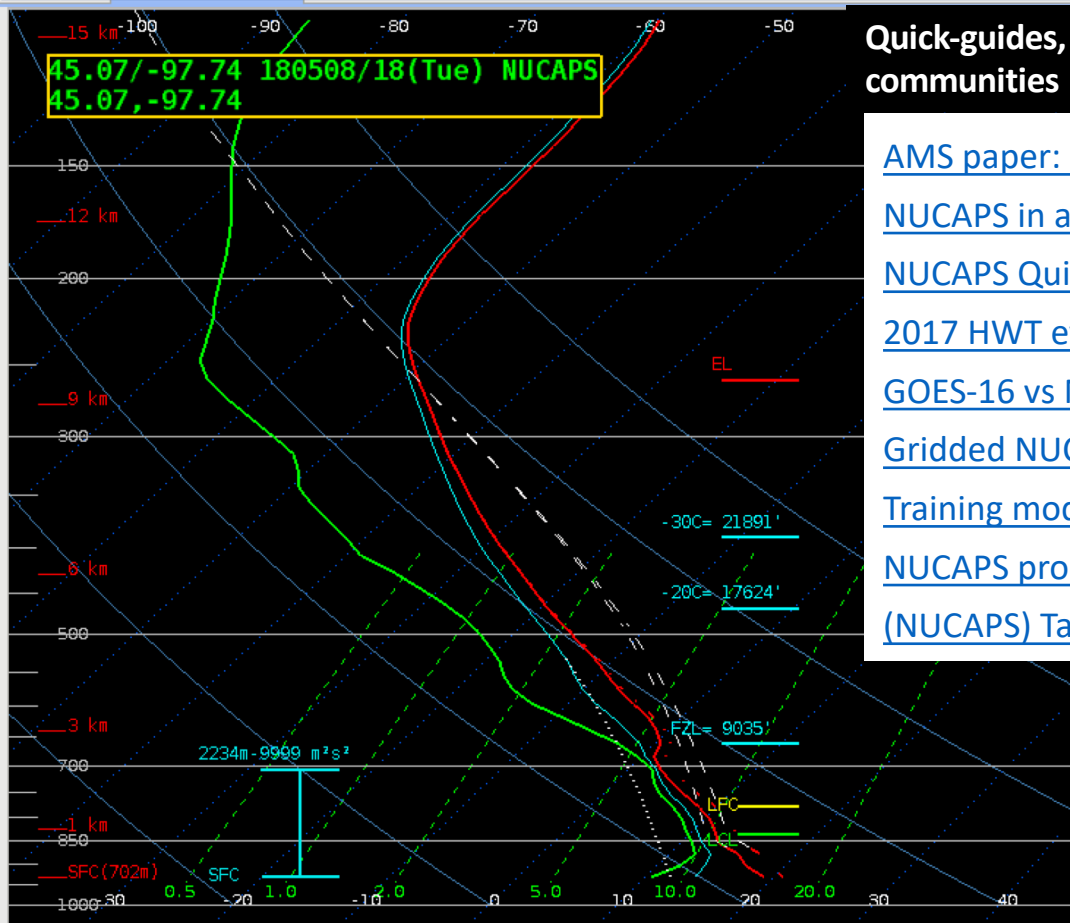
In a forecast office, NUCAPS evaluation is event-driven

# Forecasters determined that NUCAPS has value in Weather Forecasting



Operational meteorologists need NUCAPS as mesoscale observations of real-time atmospheric state ahead of storm development – compare NUCAPS to NWP models and SPC mesoanalysis for **situational awareness** and **confidence in their conceptual models** of storm potential.

# Forecasters determined that NUCAPS has value in Weather Forecasting



Quick-guides, evaluations, blog posts by the research and weather communities

[AMS paper: NUCAPS product design](#)

[NUCAPS in a Tropical Storm](#)

[NUCAPS Quick guide](#)

[2017 HWT evaluation](#)

[GOES-16 vs NUCAPS](#)

[Gridded NUCAPS product: responding to forecast challenges](#)

[Training modules](#)

[NUCAPS procedures for AWIPS](#)

[\(NUCAPS\) Tales from the Testbed](#)

MidRH= 77%	DownT= 53F	ConvT= 72F	HMP= 0.00
LowRH= 80%	MeanW= 9.4g/kg	MaxT= 74F	NCAP= 0.13
sfc-3km Agl LapseRate= 20C/7.1C/km	Supercell= 0		
3-6km Agl LapseRate= 23C/8.0C/km	STP(CIN)= 0		
850-500mb LapseRate= 28C/7.3C/km	STP(fixed)= 0		
700-500mb LapseRate= 18C/7.2C/km	SHIP= 0		

"...looked at mid-level lapse rates. They matched up well with mesoanalysis..."

"NUCAPS was helpful to see how the atmosphere was working up to a severe storm today"

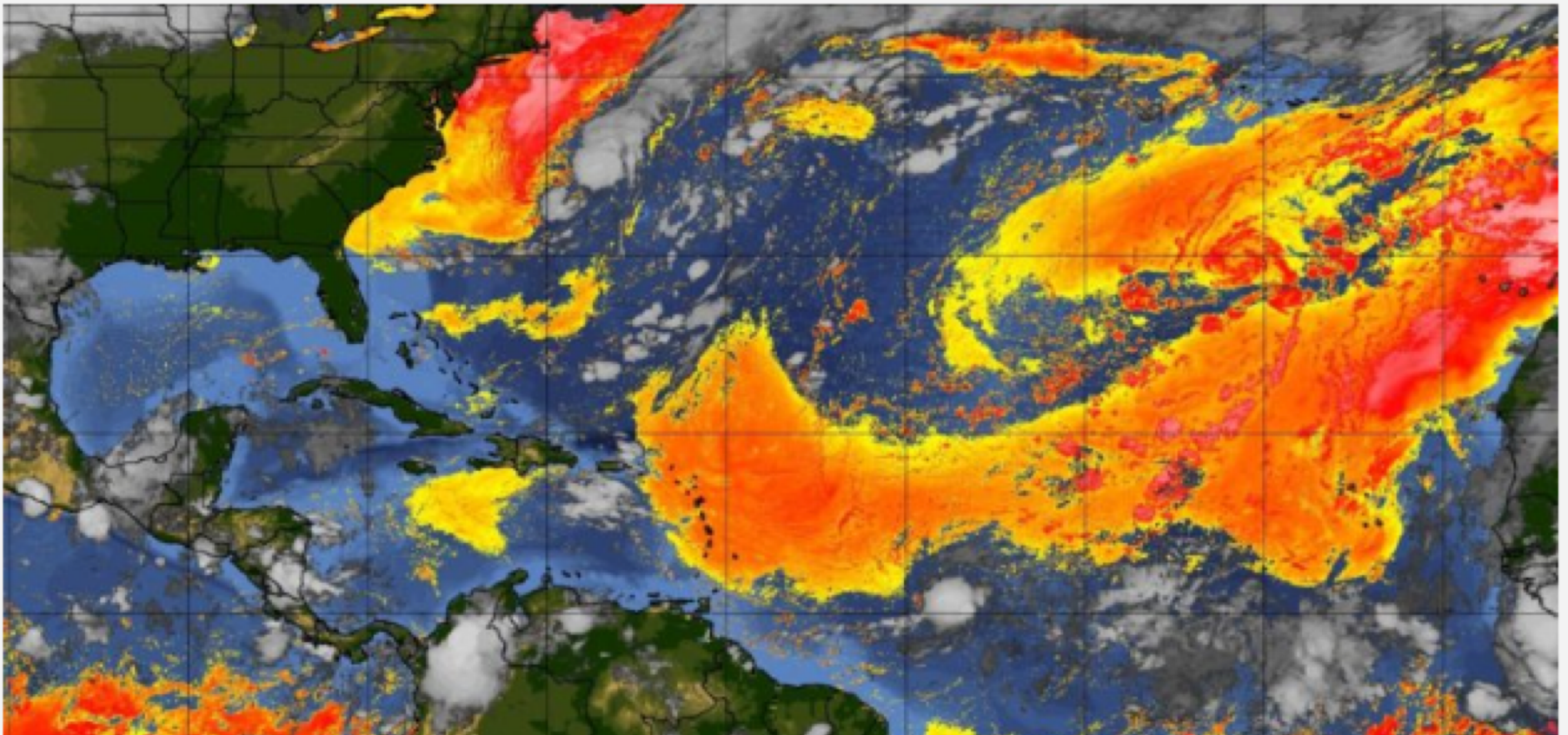
"NUCAPS was not used as much today because convection was already underway"

"Utilized NUCAPS to assess atmospheric changes since the morning radiosonde release"

"NUCAPS was useful in assessing the performance of various models"

# NUCAPS views Saharan Air over the Atlantic

September 20th, 2018 | [Scott Lindstrom](#) <http://cimss.ssec.wisc.edu/goes/blog/archives/29877>



The JPSS PGRR program funds **independent researchers** to:

- Evaluate NUCAPS in real-world scenarios and real-time weather
- Develop quick-guides and training modules
- Identify caveats and strengths

# How to use NUCAPS in AWIPS-II (Advanced Weather Interactive Processing System)

## The Satellite Proving Ground Hazardous Weather Testbed



Thursday, May 10, 2018

### **New NUCAPS procedures for HWT...**

So, after a few days of discussion and observation, we've revised the NUCAPS sounding Procedure set for HWT. Here is a short description of the procedures and the reasoning behind each one. Whenever we refer to NUCAPS soundings, we're referring to the NUCAPS Improved Latency Soundings, with the exception of one procedure that contains the modified soundings. Example pics of each are included at the bottom.

**Kris White: NWS forecaster / NASA SPoRT**

**Nadia Smith: STC / JPSS subject matter expert**

<https://goesrhwt.blogspot.com/2018/05/new-nucaps-procedures-for-hwt.html>

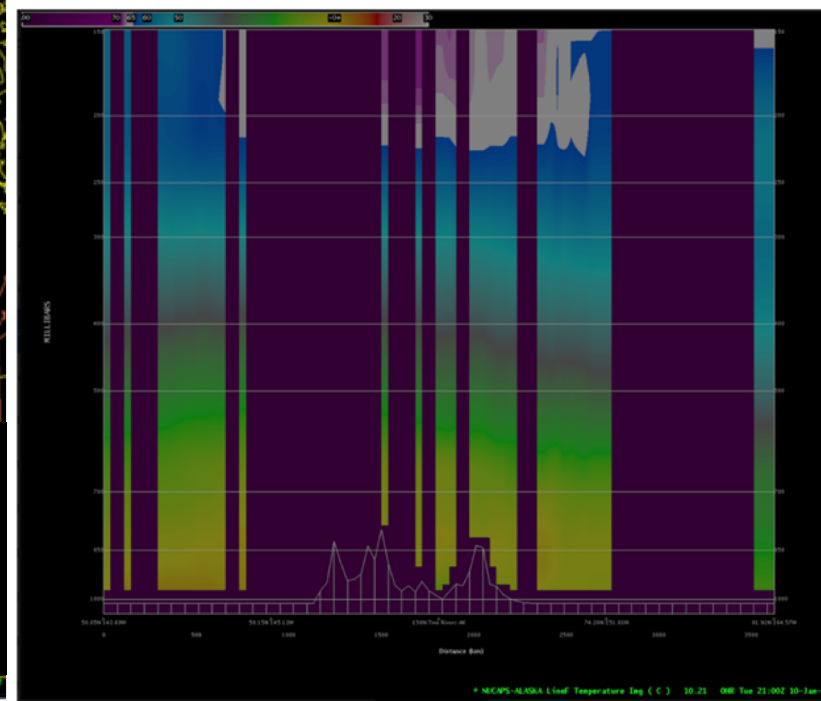
# Forecasters determined that NUCAPS have value in Weather Forecasting

Gail Weaver, NWS, Anchorage, AK  
<https://ams.confex.com/ams/98Annual/webprogram/Paper323132.html>

Cold Air Aloft



“After two winters of CAA assessments, **we are ready to go 100% operational with NUCAPS** this winter (2018/2019) to produce our Meteorological Impact Statements (MIS)” Gail Weaver

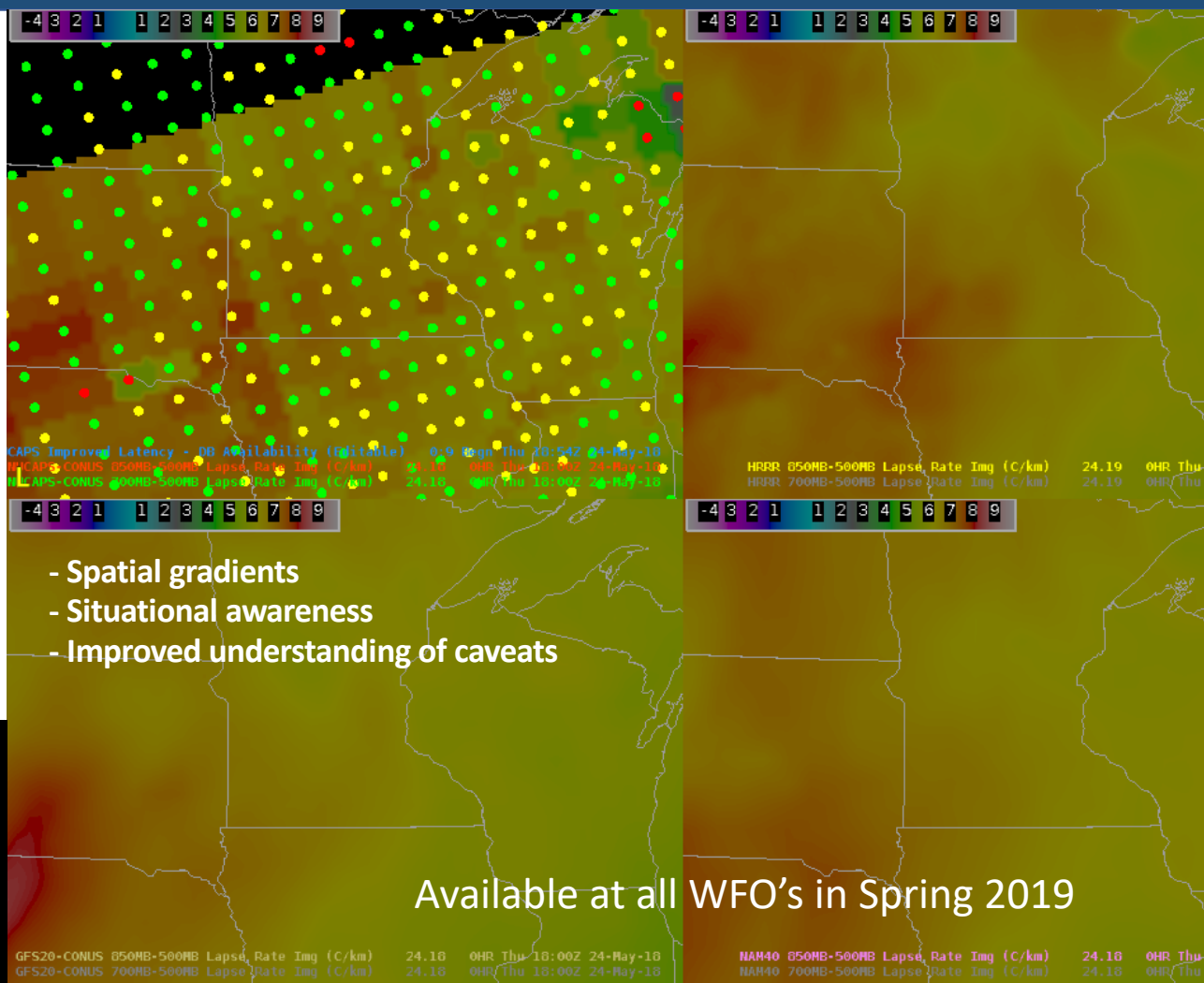


# We continue to tailor NUCAPS product to Forecaster needs

## Gridded NUCAPS

NASA/SPoRT + STC + NWS +  
CIRA + AWIPS

NUCAPS soundings on  
standard NWP pressure  
levels and regular spatial grid  
= **Data Cube** or “level 3”  
weather product



## Boundary layer

- (1) Forecast-independent
- (2) Spatially uncorrelated
- (3) Dominates in the boundary layer

- [illegible]

# We continue to tailor NUCAPS product to Forecaster needs

**NUCAPS Time-series: MetOP + SNPP + NOAA20\***

**At least 8 x soundings per day per area**

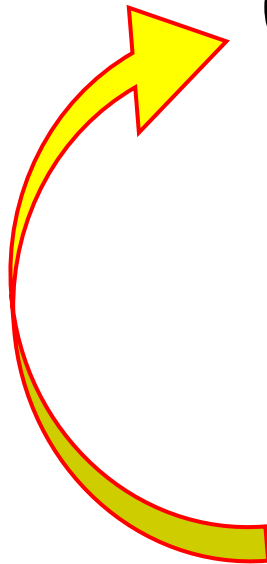
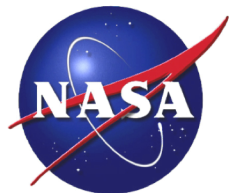
- NUCAPS is a NOAA-enterprise system = sensor agnostic
- **But the NUCAPS Regression first guess is instrument- and training-dependent**

Research question: how much of the observed change is due to weather and how much is due to noise in the first guess?

\*Soulliard, “Hyper-spectral Enterprise Algorithm Package”, Oct, 4 @ 10:10am



Forecasters (and society) benefit from research that make it into operations. The PGRR Sounding Initiative promotes and maintains an active R2O pathway



# Operations

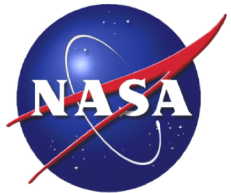
## R2O

# Research





CLIMCAPS algorithm and product design  
will benefit from lessons learned in NOAA  
Sounding Initiative and Operations



Our CLIMCAPS research is driven by and  
responsive to society



*"I like being able to see the environment from the top down...A whole different perspective"*

Questions?

\* NUCAPS Improved Latency • Data Availability: 400MB 200MB 100MB 50MB 25MB 12.5MB 6.25MB 3.125MB 1.5625MB 0.78125MB 0.390625MB 0.1953125MB 0.09765625MB 0.048828125MB 0.0244140625MB 0.01220703125MB 0.006103515625MB 0.0030517578125MB 0.00152587890625MB 0.000762939453125MB 0.0003814697265625MB 0.00019073486328125MB 0.000095367431640625MB 0.0000476837158203125MB 0.00002384185791015625MB 0.000011920928955078125MB 0.0000059604644775390625MB 0.00000298023223876953125MB 0.000001490116119384765625MB 0.0000007450580596923828125MB 0.00000037252902984619140625MB 0.000000186264514923095703125MB 0.0000000931322574615478515625MB 0.00000004656612873077392578125MB 0.000000023283064365386962890625MB 0.0000000116415321826934814453125MB 0.00000000582076609134674072265625MB 0.000000002910383045673370361328125MB 0.0000000014551915228366851806640625MB 0.00000000072759576141834259033203125MB 0.000000000363797880709171295166015625MB 0.0000000001818989403545856475830078125MB 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