



# A View from NOAA Center for Satellite Applications and Research (STAR)

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**Director**  
**STAR**



# OUTLINE

- **About STAR**
- **Priority for Sounding**
- **Importance of Validation**
- **GRUAN Reference as Validation Benchmark**
- **NOAA Products Validation System (NPROVS+)**
- **Sharing Expertise (MOU with EU)**

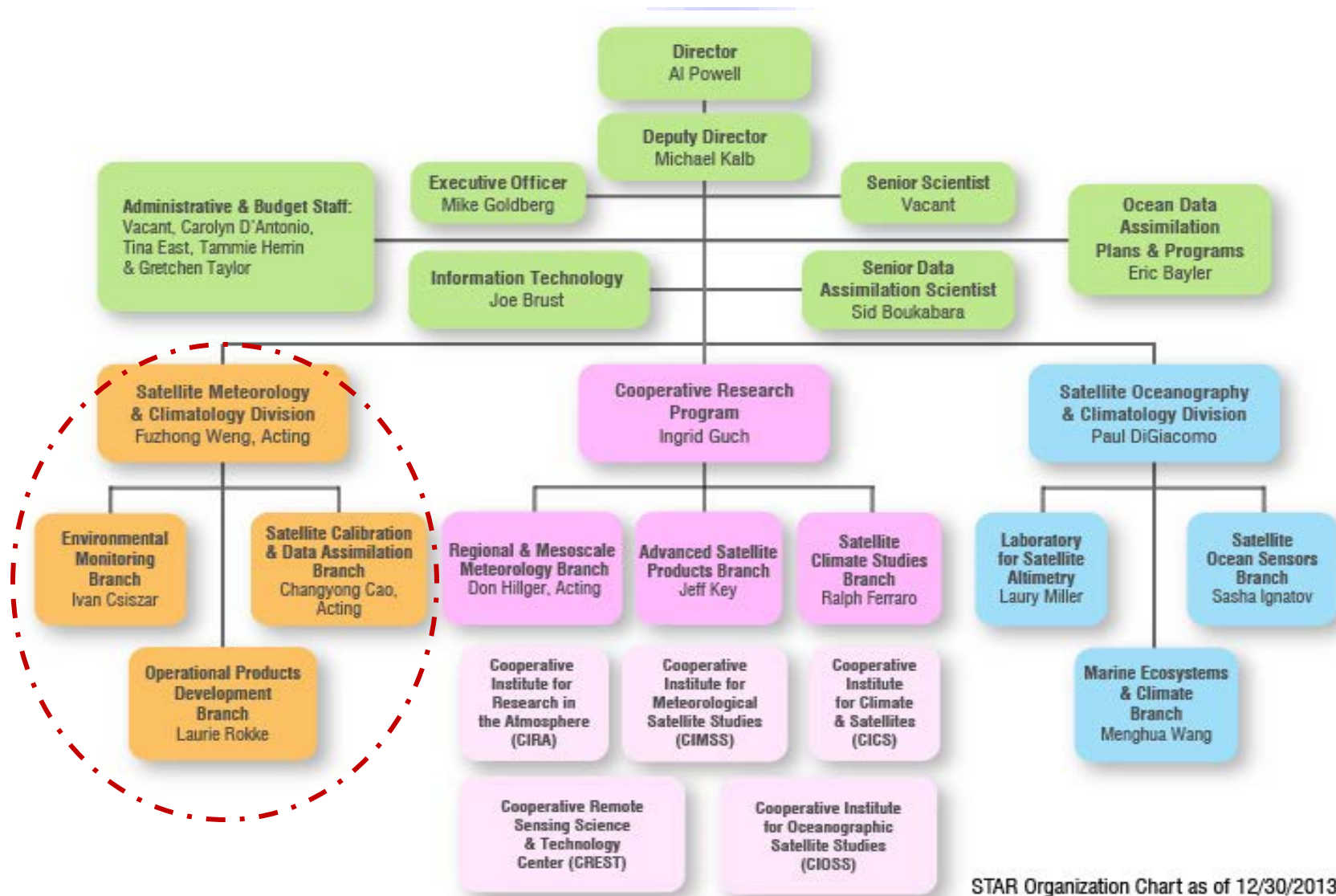


*“... to accelerate the transfer of satellite observations of the land, atmosphere, ocean, and climate from scientific research and development into routine operations, and offer state-of-the-art data, products, and services to decision-makers”*

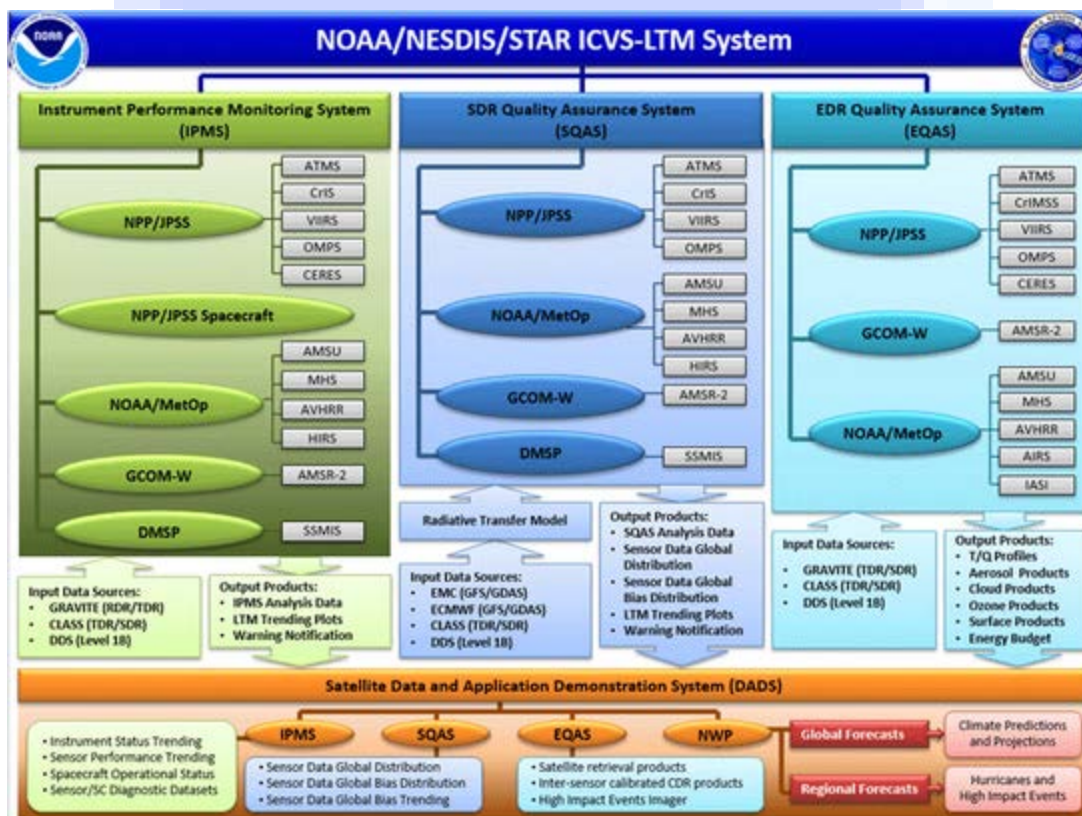


# STAR Center for Satellite Applications and Research

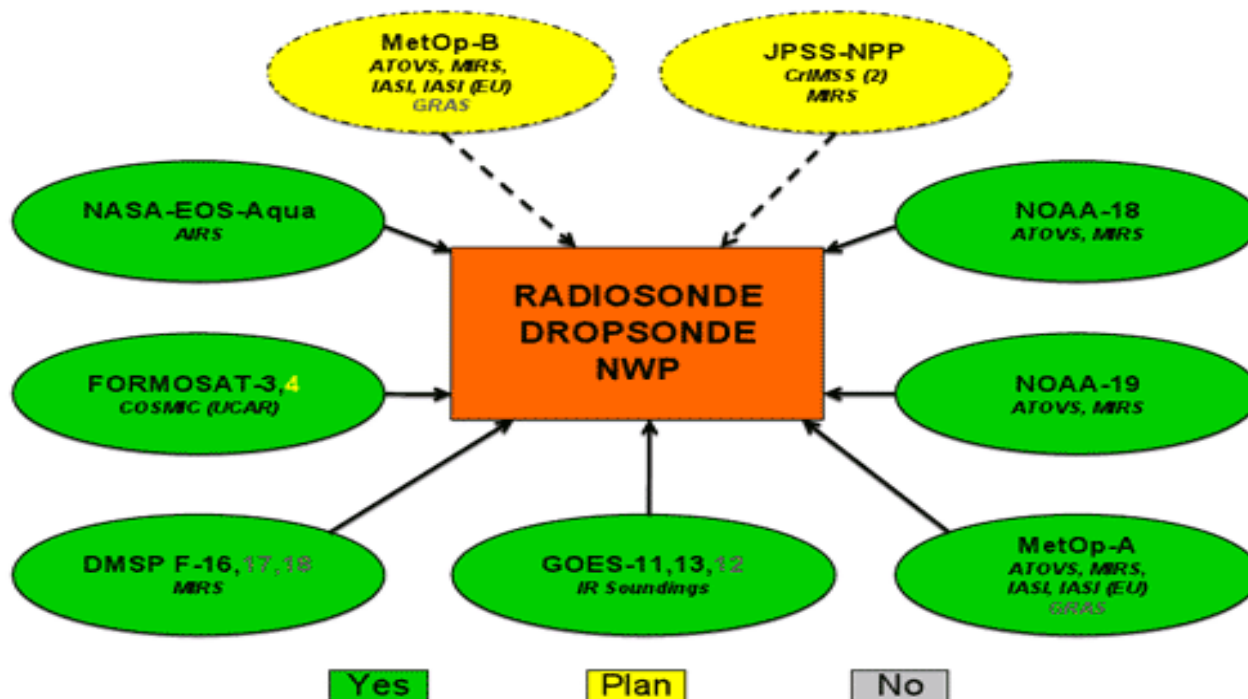
formerly ORA — Office of Research and Applications



STAR Organization Chart as of 12/30/2013



**ICVS: Long-Term Sensor Calibration/Validation Monitoring (SDR) from Space**  
(<http://www.star.nesdis.noaa.gov/icvs/index.php>)



NOAA Products Validation System (NPROVS)

**NPROVS: Product (EDR) validation / monitoring from the ground** 6  
 (<http://www.star.nesdis.noaa.gov/smcd/opdb/nprovs/index.php>)



# Why Soundings

- **Atmospheric vertical temperature and moisture profiles are critical environmental data records (EDR) for weather and climate**
- **Validated sounder EDRs constitute a complete demonstration of sounder/sensor system capability**
- **Operational and Research priority at NOAA STAR**
- **Validation is critical: Supports science development, RT Model**



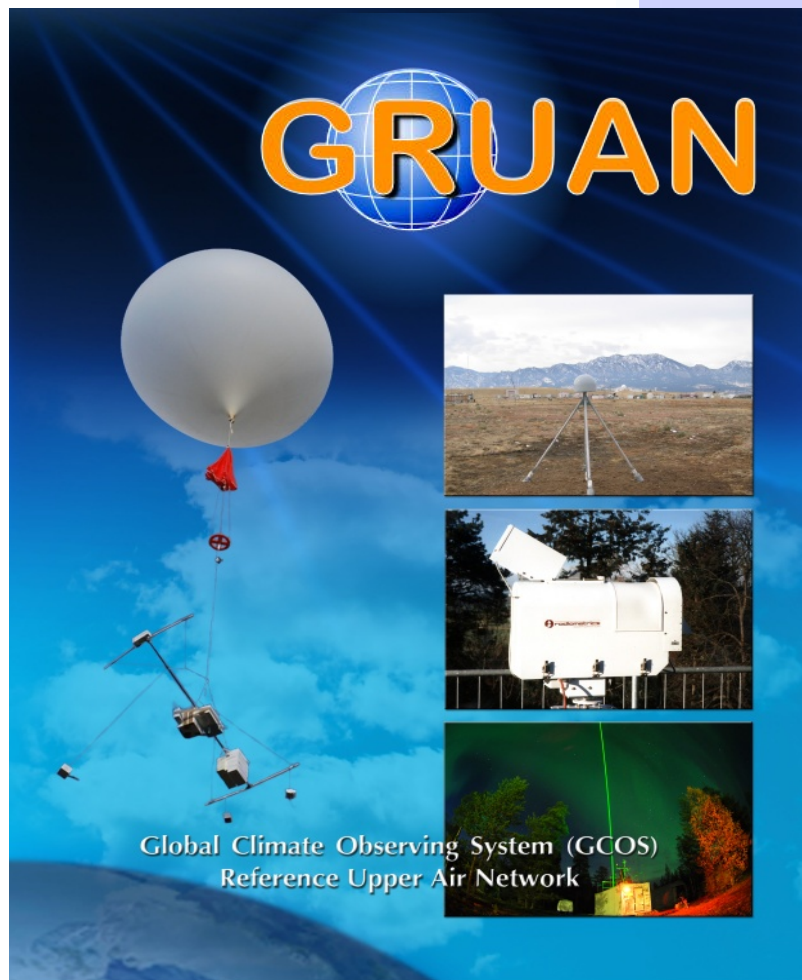
# Validation is Key

- **Validation is forever (sustained)**
- **Improvement cost/benefit curve a challenge**
- **Global product validation very difficult**
  - **Conv Obs OK but not good enough (NPROVS)**
  - **NOAA/NASA JPSS funded dedicated RAOBs**
  - **Intensive field campaigns few and far between; not sustained, costly!**

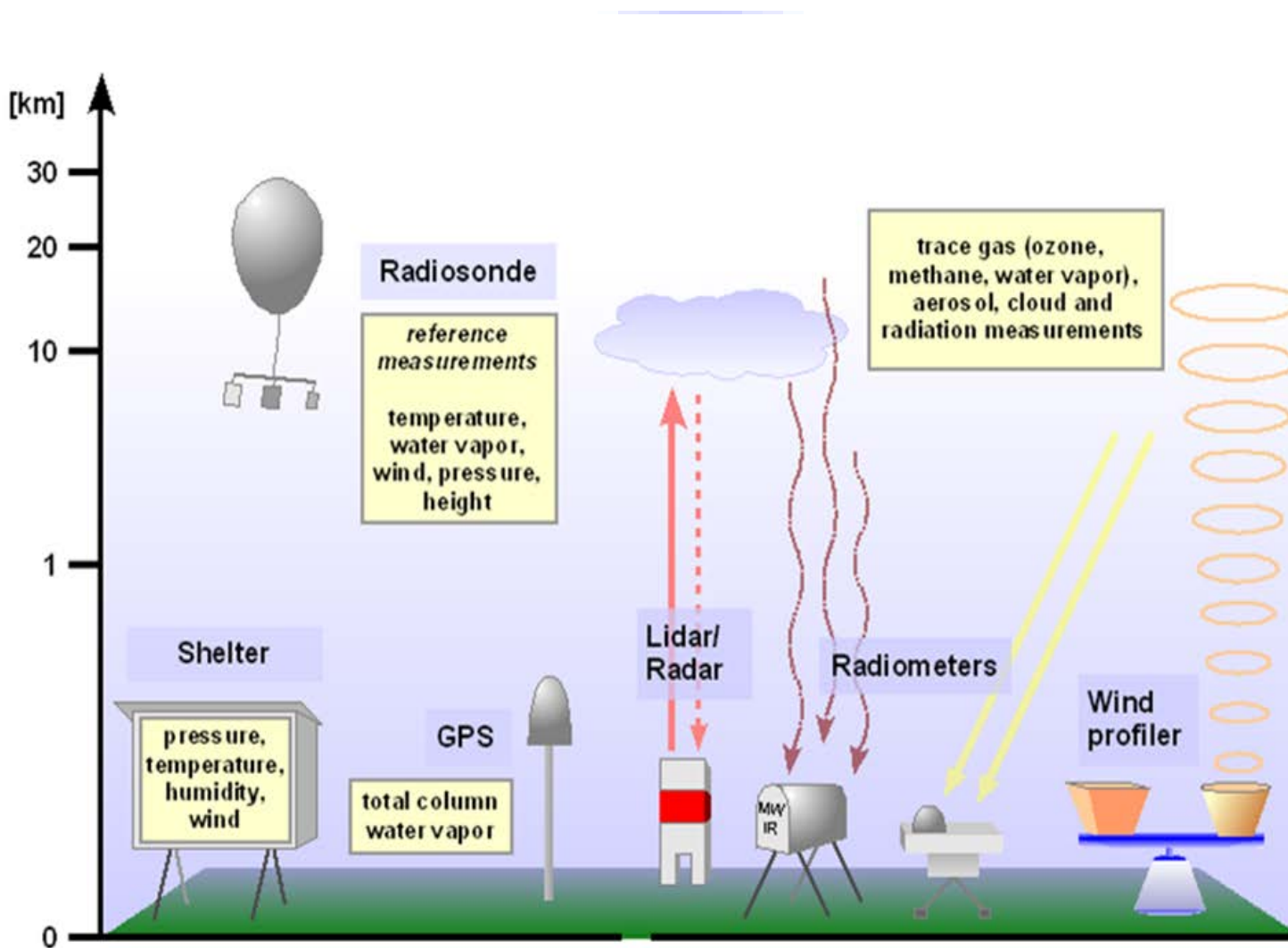




# GCOS Reference Upper Air Network (GRUAN)



... reference provide evolving cornerstone for validation since 2010...



Characterization of atmospheric column well suited to assess satellite product



# GRUAN Reference

- Provide traceability for EDR and RT validation
- ***“Uncertainty” reshapes how validation is done***
- Dedicated / Reference RAOBs most desirable
- GRUAN processing of NOAA/JPSS Dedicated RAOB (ARM) adds value ...



# NPROVS +

- **Focus on collocating Reference / Dedicated RAOB and Satellite (SDR and EDR)**
- **Unifies product monitoring and scientific algorithm development (RT model)**
- **Feedback to GRUAN**



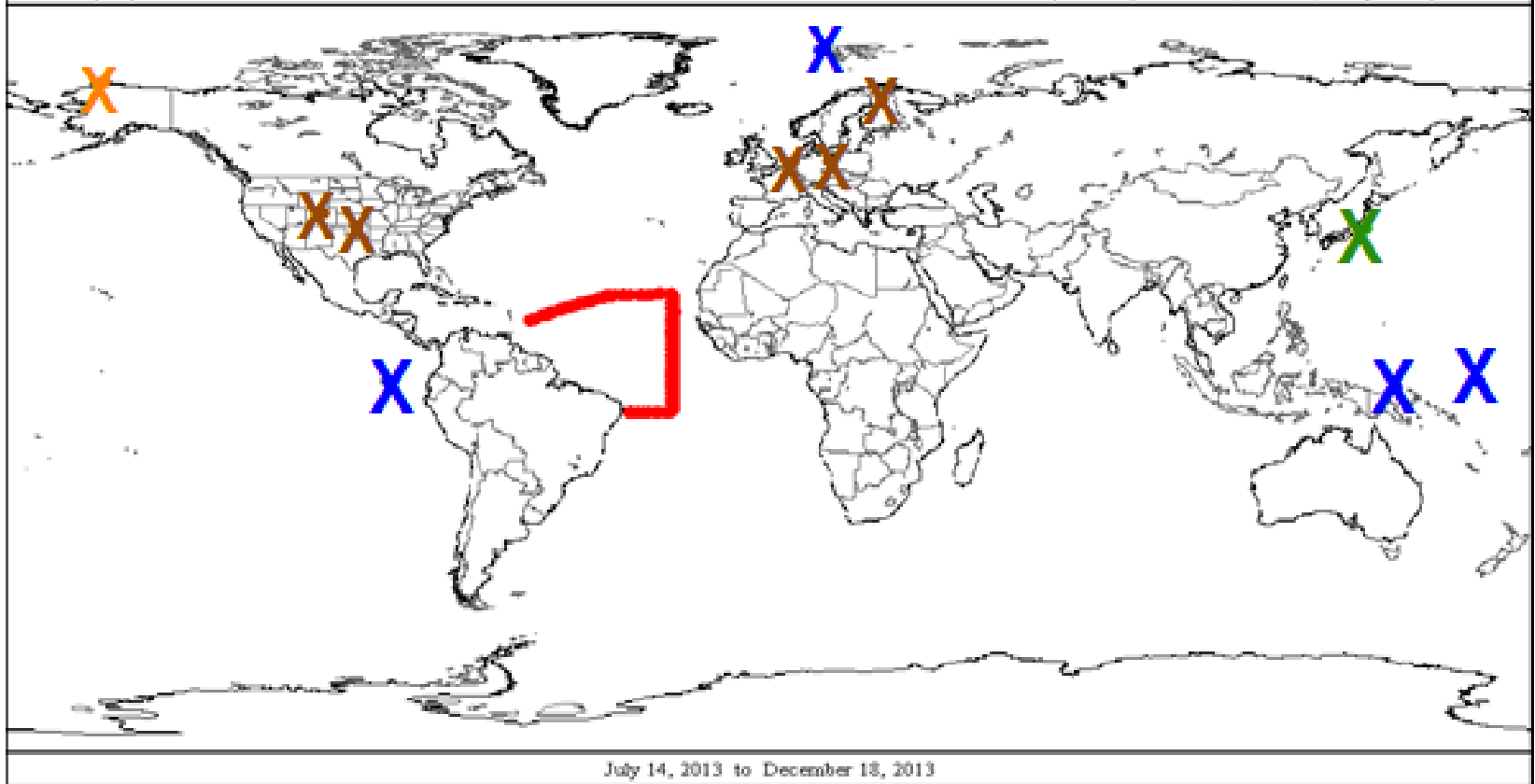
# NPROVS+



## NOAA Products Validation System (NPROVS)

2141 (12) available out of 2141

CoastLandIsland (Coast)Island (Inland)ShipDropsonde



2050 collocations (350 Dedicated, 1700 GRUAN) ... 5mos



# Sharing Expertise

- NOAA promotes opportunities to share with international community ...
- *Leverage / baseline using NPROVS+*
- MOU
- Mutual benefit to NOAA and Partners



# Summary

- In addition to SDR, STAR places high priority on EDR product validation
- *Integration of GRUAN with JPSS funded “dedicated” RAOB Validation program ... NPROVS+*
- **GRUAN and NOAA Synergy / Feedback**
- **Open to sharing expertise**



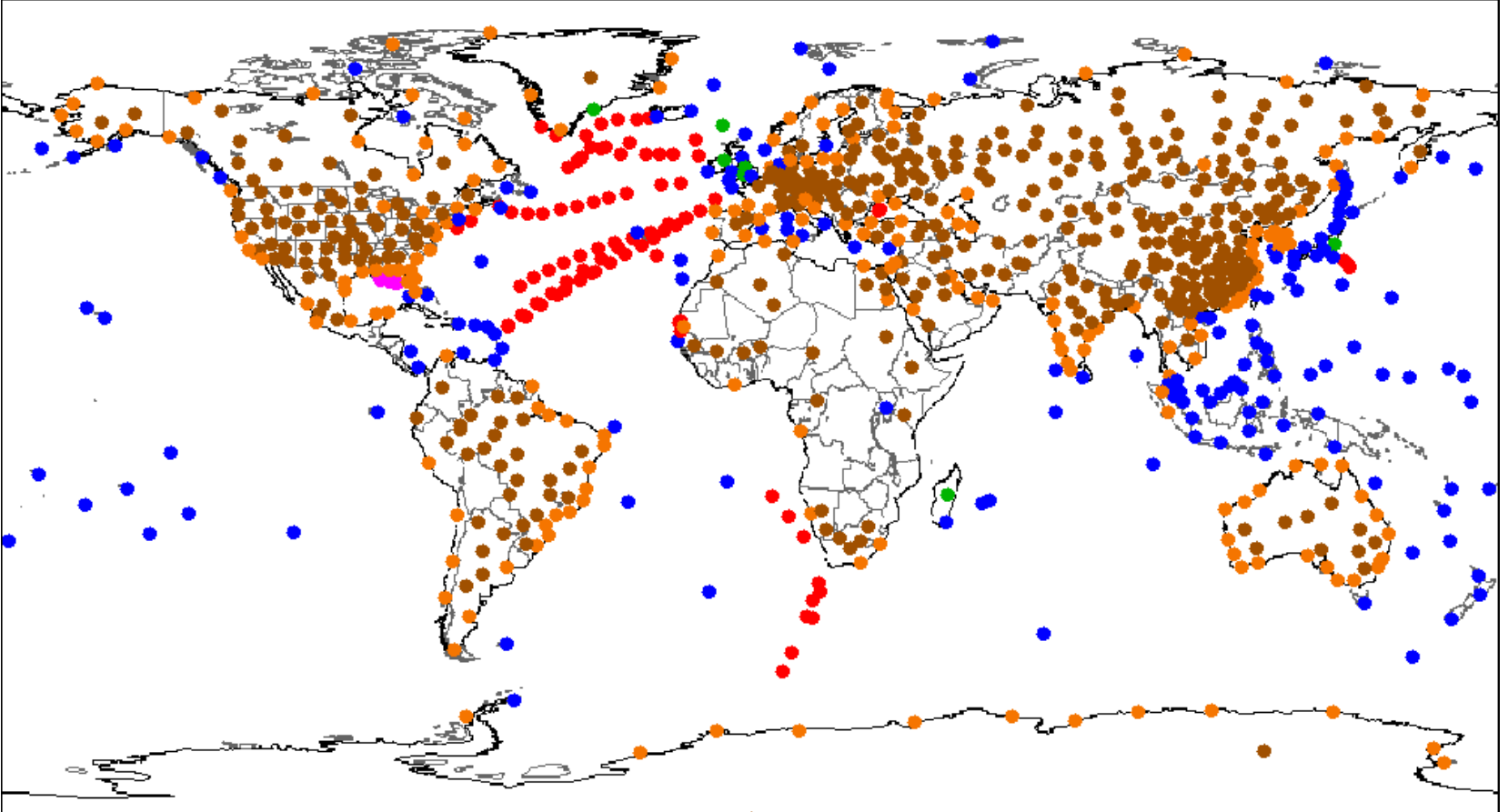




## NOAA Products Validation System (NPROVS)

12335 (781) available out of 12335

CoastLandIsland (Coast)Island (Inland)ShipDropsonde



December 16, 2013 (14z) to December 26, 2013 (13z)

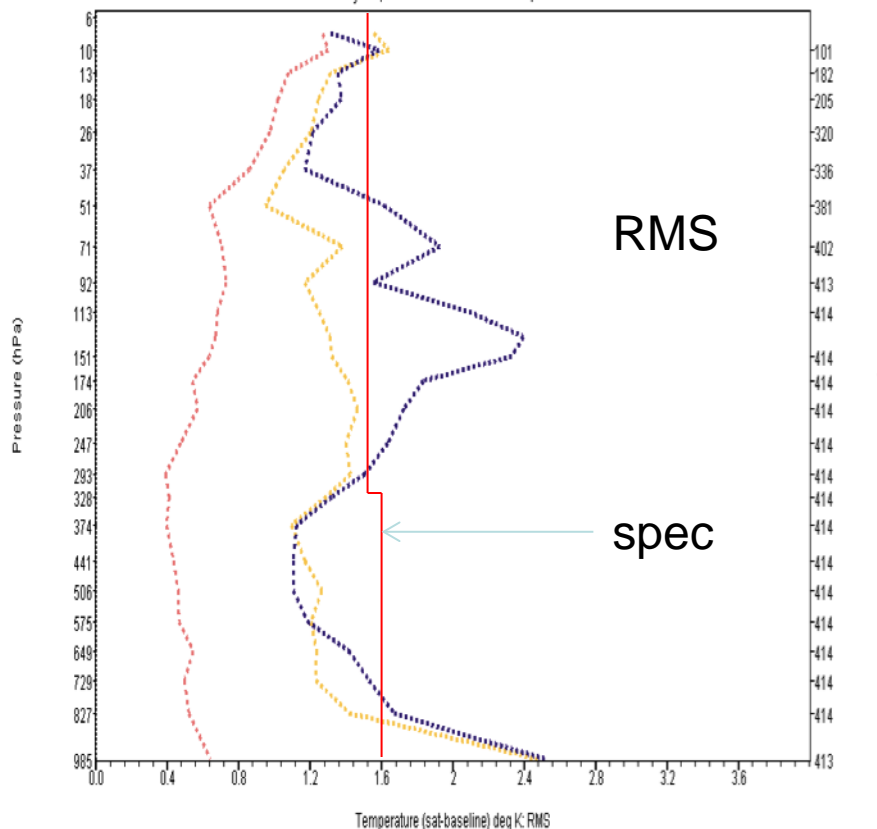
**NPROVS Collocations 12/16 to 12/26 2013 ... 12,335**



# EDR Validation Results

NOAA Products Validation System (NPROVS)

July 14, 2013 to December 18, 2013



Baseline: REFERENCE SONDE GRUAN RAOB

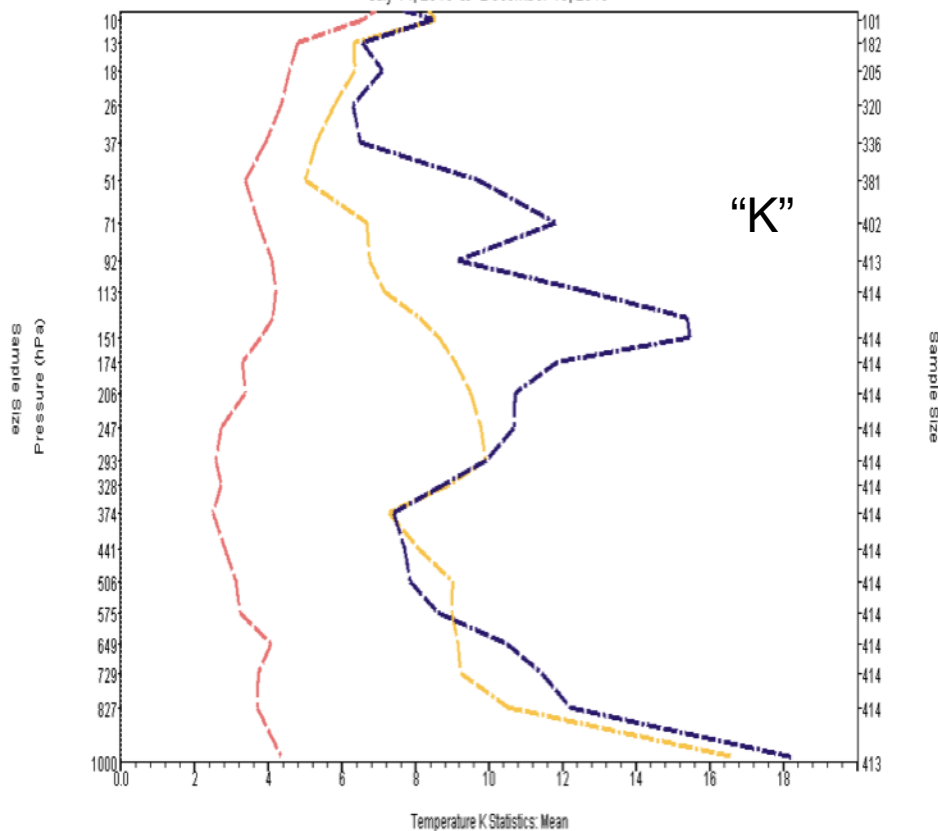
CRIMSS NPP Infrared (IP)

ECMWF ANALYSIS

NUCAPS NPP TEST

NOAA Products Validation System (NPROVS)

July 14, 2013 to December 18, 2013



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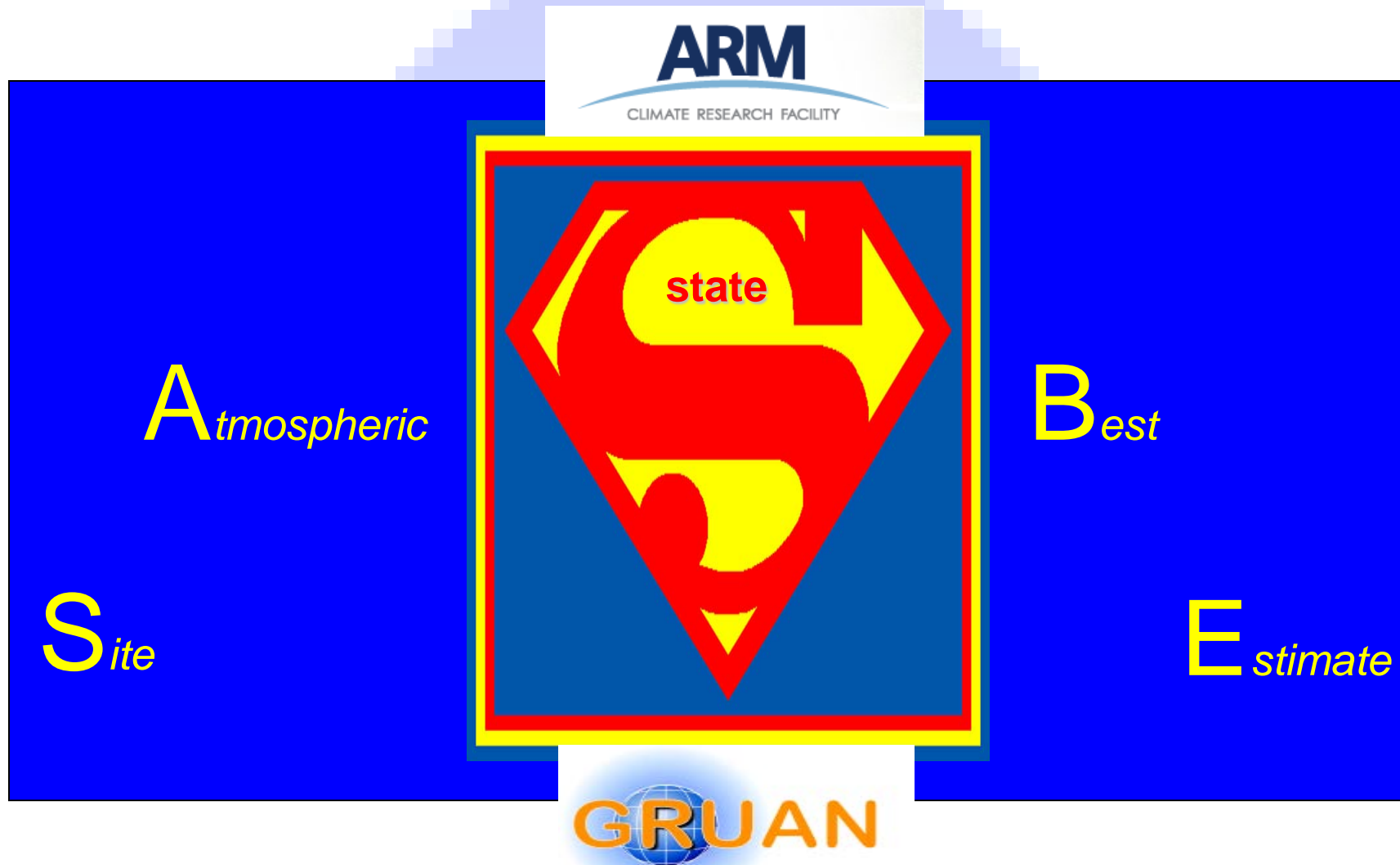
ECMWF ANALYSIS

NUCAPS NPP TEST

GRUAN Include Uncertainty Estimates facilitating "K" Profile analysis ...



# Site Atmospheric State Best Estimate (SASBE)





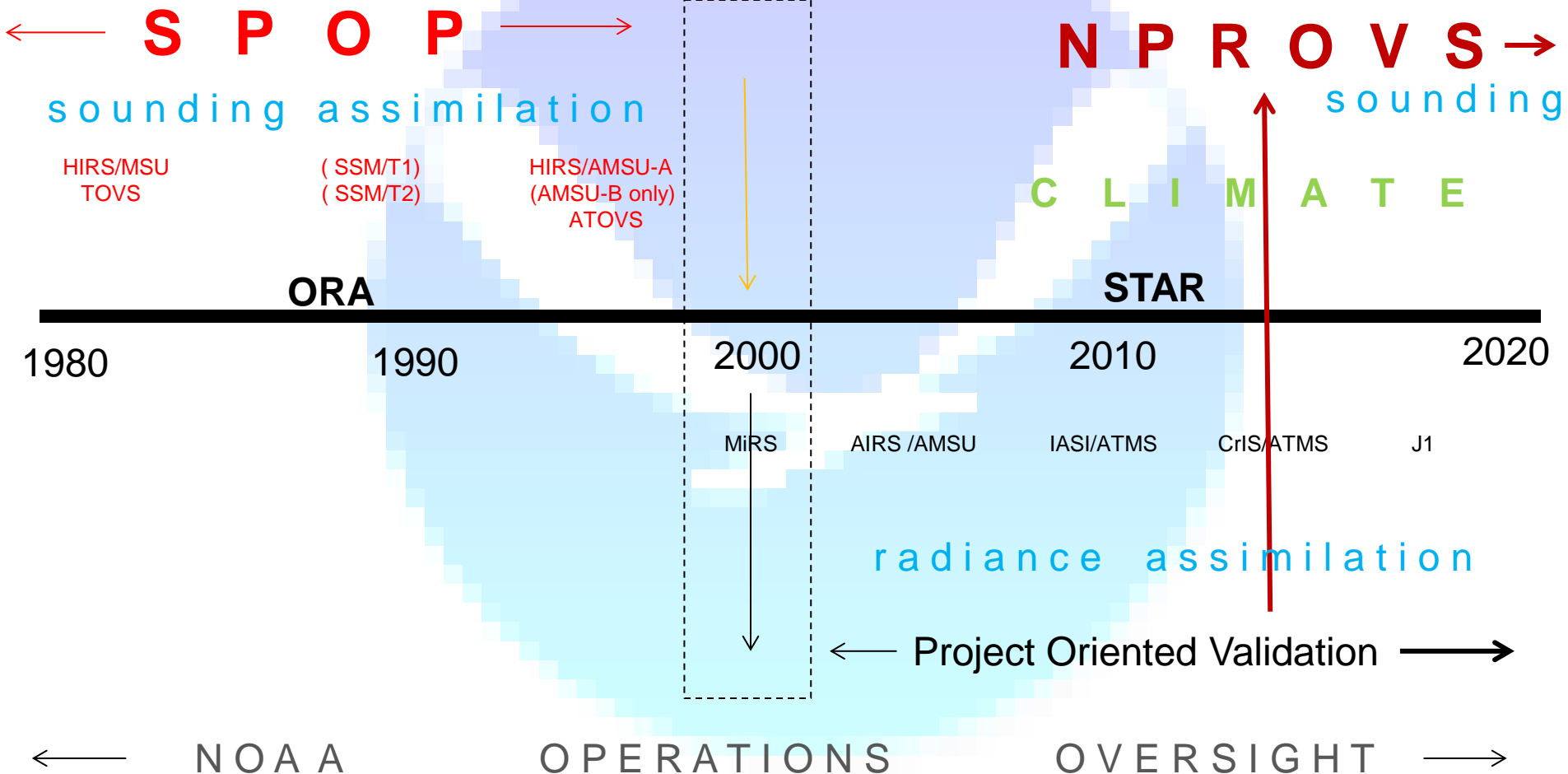
# STAR

## Center for Satellite Applications and Research

formerly ORA — Office of Research and Applications



# Brief History NOAA Program for Soundings



Restore Project Independent **NOAA PROduct OVERSight**<sup>20</sup>