National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Acknowledgements

- This presentation covers work accomplished by the Sounder PEATE staff:

- Virgil Adumitroaie
- Robert Ando
- John Burke
- Van Dang
- Evan Fishbein
- John Gieselman
- Brian Kahn
- Sung-Yung Lee
- Ruth Monarrez
- Vicky Myers
- Quyen Nguyen
- Mathias Schreier
- Michael Starch
- Andres Tamayo
- Irina Tkatcheva

… and the Sounder Science Team

- William Blackwell
- Bjorn Lambrigtsen
- Evan Fishbein
- Henry Revercomb
- Larrabee Strow

National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Primary Objectives of Sounder PEATE

- **Primary Objective of the Sounder PEATE:**

  Support the NPP Sounder Science Team evaluating NPP sounder products:

  - Determine whether these products are climate quality
  - Can these products support ongoing and new climate studies?

- **Provide feedback to NASA and NOAA on observations**
- **Primary products to be evaluated are:**

* CrIMSS = Cross Track Infrared Microwave Sounding Suite: CrIS + ATMS

Sensor Data Records (SDRs)	Environmental Data Records (EDRs)
CrIS SDR ATMS SDR ATMS TDR	CrIMSS* Vertical Temperature Profile CrIMSS Vertical Moisture Profile CrIMSS Vertical Pressure Profile – (including surface) CrIMSS Intermediate Products

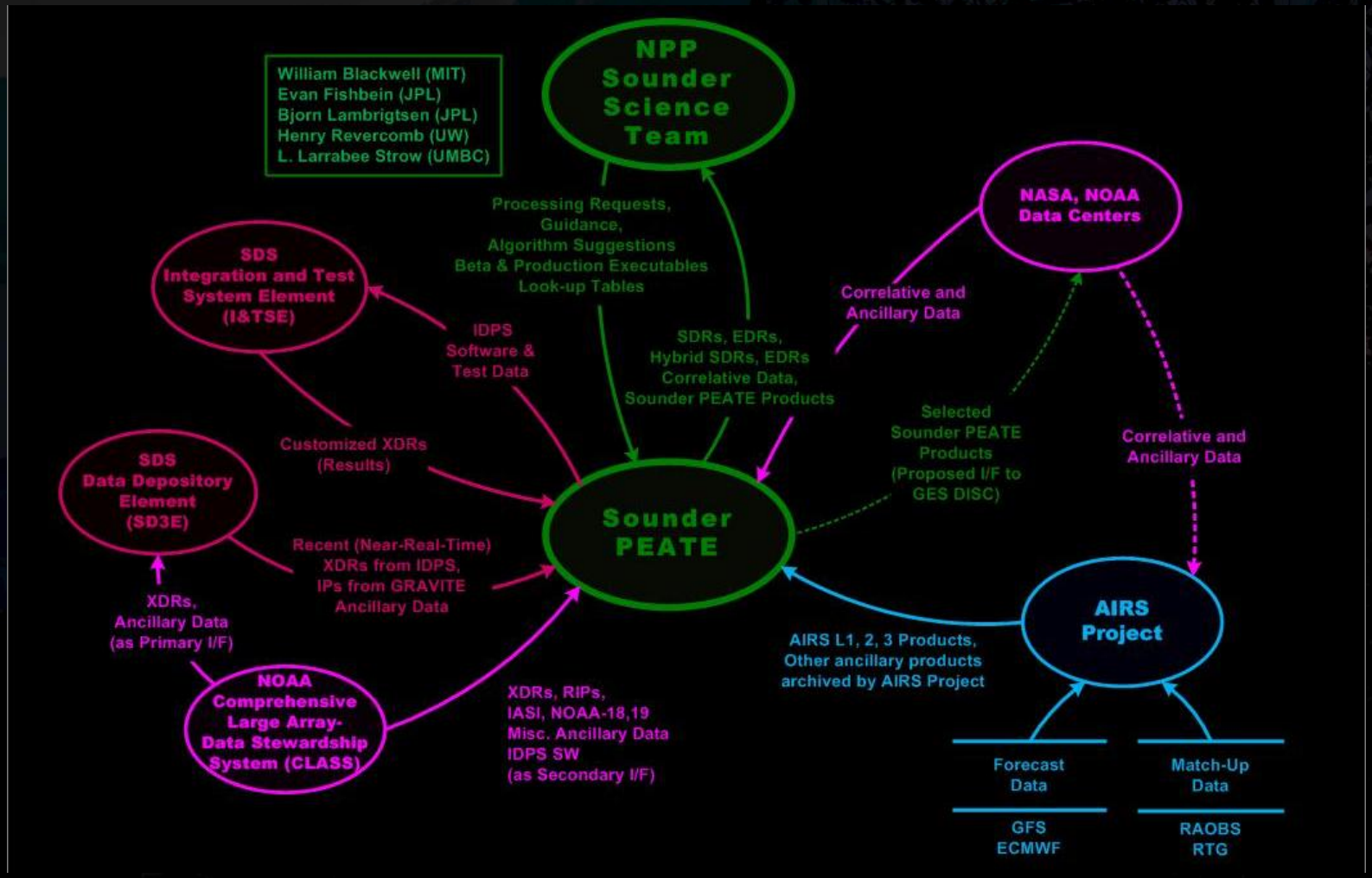
Supporting the Science Team

- **Supportive Activities include:**
  - Providing data for Cal/Val
  - Assessing and validating Calibration xDRs
  - Assessing and validating climate quality of SDRs and EDRs
  - Evaluating the NPP Retrieval Code
    - Evaluate IDPS production and science code
      - develop, demonstrate, test and verify algorithm enhancements
- **Develop inter-instrument data comparison tools:**
    - CrIMSS data compared to other instruments and correlative data
- **Provide data and analysis products to the Science Team**
- **Provide compute resources and analysis tools for Science Team use**

National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Sounder PEATE Functional Interfaces



National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Sounder PEATE Products (1 of 2)

- **Calibration Subsets (CrIS and IASI)** in four categories:
  Clear, Random, Deep-convective Cloud FOVs, Fixed-site
  - Also have access to AIRS Calibration Subsets

- **Simultaneous Nadir Observations (SNO), NPP-CrIS/ATMS with:**
  - **Aqua**-AIRS/AMSU
  - **MetOp A/B**-IASI/AMSU/MHS
  - **NOAA-18**, **NOAA-19** AMSU

- **Match-up Products**
  - Analysis Matchup (Calculated radiances from forecast models)
  - Radiosonde Matchup
  - GPS-RO Matchup – *planned for this year*

Sounder PEATE Products (2 of 2)

- Calculated Radiances (SARTA, OSS)
- Level 3 Products – for all EDR and IPs
  - Daily
  - Multi-day
  - Monthly
- Rain Rate (ATMS) – (beta version – Blackwell)
- GPolygon Maps (granule coverage maps)

Data Access for the Masses

- **Sounder Science Team has access to all Sounder PEATE products, NPP products and ancillary products archived at Sounder PEATE**
- **Currently, no public data access is available**
- **Archive and data ordering capability for selected Sounder PEATE Products may be available at GES DISC soon**
  - Agreement established
  - Developing interface specification and support documentation
  - Product List:
    - *SNO*
    - *Calibration Subset*
    - *Level 3*
    - *Other TBD PEATE products (depending on future requests)*
  - **Data archived at GES DISC will be publically available**

National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

IDPS Data Product Evaluation

- **We routinely evaluate products from each IDPS build**
- **Our analyses are shared with:**
  - Sounder Science Team
  - Suomi NPP SDS and Suomi NPP Change Control Board
  - NOAA's Cal/Val and EDR teams
- **In addition to utilizing code developed at the Sounder PEATE, other resources are utilized as well to further evaluate data products**
  - The "mini-IDPS"
  - ADL

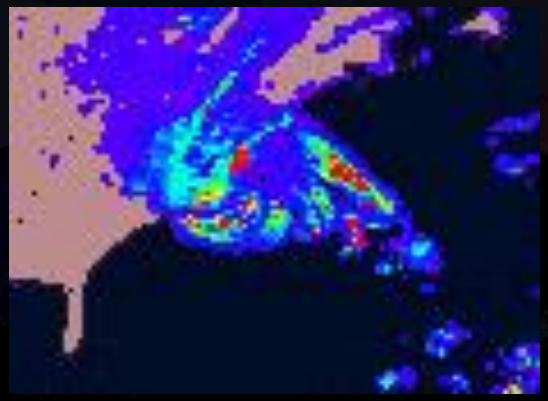
Both tools provide additional capabilities

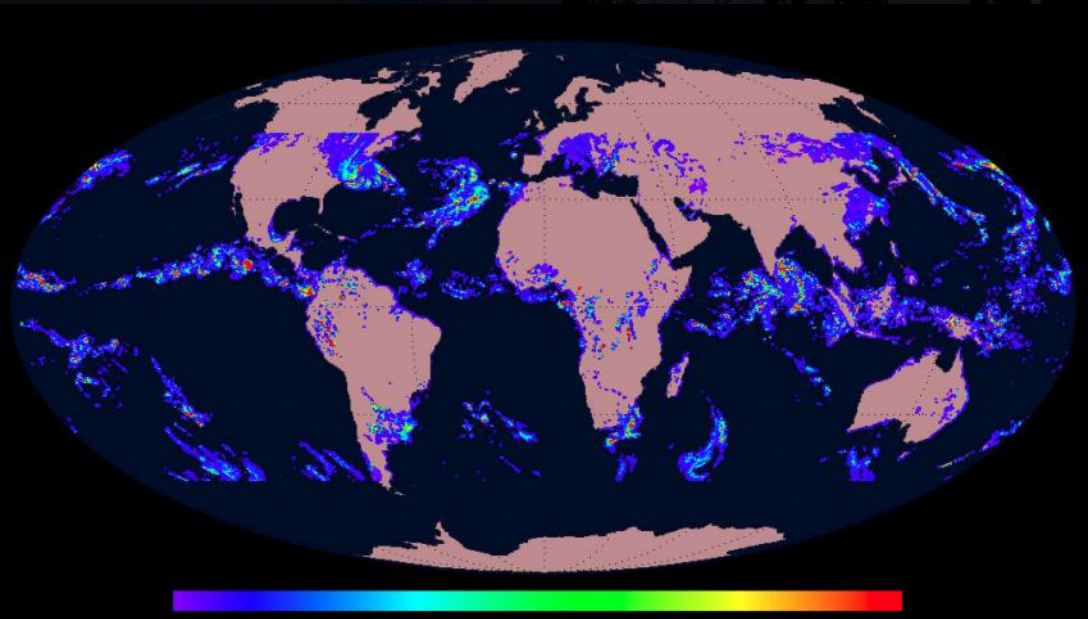
National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Data Product Evaluation: Supporting the Sounder Science Team

- **Microwave Rain Rate (NPP ATMS)**
  - Daily product
  - Currently pre-beta version (early development)
  - Supporting research by William Blackwell





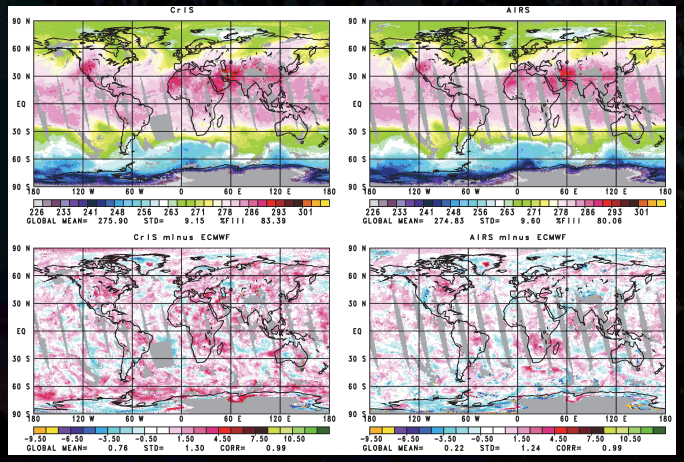
Rain Rate (mm/hr)
October 29, 2012
(Super-storm Sandy)

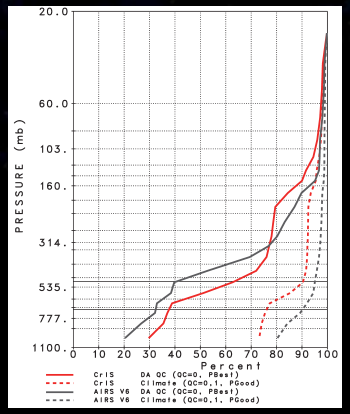
National Aeronautics and Space Administration

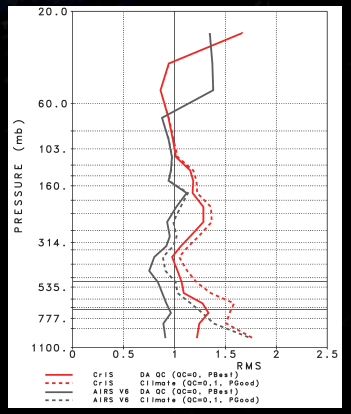
Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Data Product Evaluation: Supporting the Sounder Science Team

- **Supporting Alternative Retrieval Algorithms (example)**
  - Developing NPP retrievals based on AIRS Version 6 algorithm
  - Evaluating hybrid-CrIMSS retrievals in comparison to AIRS standard Level 2 standard products and ECMWF forecasts.
  - Comparing retrieval yields and RMS differences with respect to ECMWF forecast



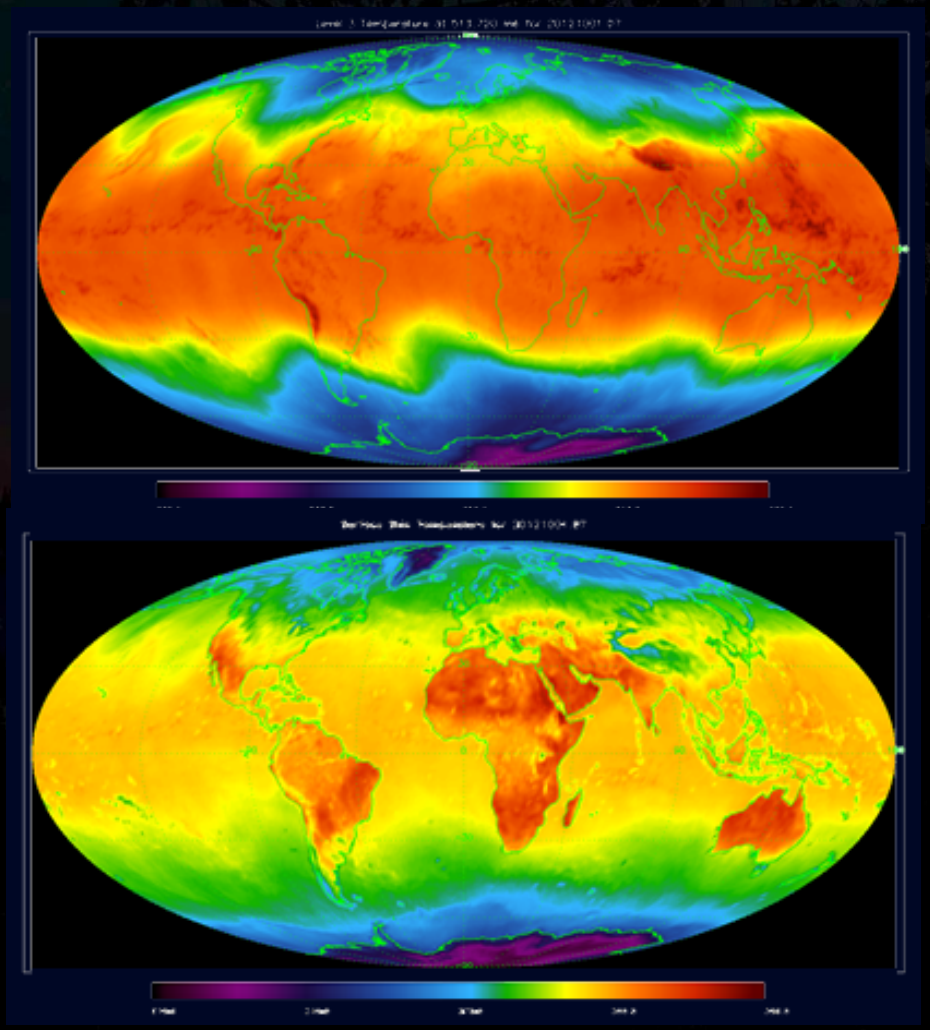




National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Level 3 Products

- **Level 3 Products (NPP, MetOP, AIRS*)**
  - Daily, Multi-day, Monthly
  - Currently beta version
  - Will be useful for characterization global patterns of temperature, water vapor and key atmospheric constituents.
  - Will support cross-comparisons between NPP, MetOP and AQUA sounder products

*AIRS data from AIRS Project