

STAR's Contributions to the CDR Program

Mitch Goldberg
NOAA/NESDIS/STAR

NOAA Began Developing CDR Program Concept Several Years Ago

NOAA White Paper on CDRs (2003)

Began dialog with NRC as part of Committee Report
“*Climate Data Records from Environmental Satellites*”
(NRC, 2004)

NOAA should embrace its new mandate to understand climate variability and change by asserting national leadership for satellite-based Climate Data Record generation, applying new approaches to generate and manage satellite Climate Data Records, developing new community relationships, and ensuring long-term consistency and continuity for a satellite Climate Data Record generation program.

Thrusts Span Past, Present, Future Needs

1970

1980

1990

2000

2010

2020

2030

POES/GOES

NPP

JASON-3/JPSS/GOES-R

Uncover climate trend information
buried in four decades of heritage operational data

Provide operations and
products for
“Remanifested” climate
sensors”

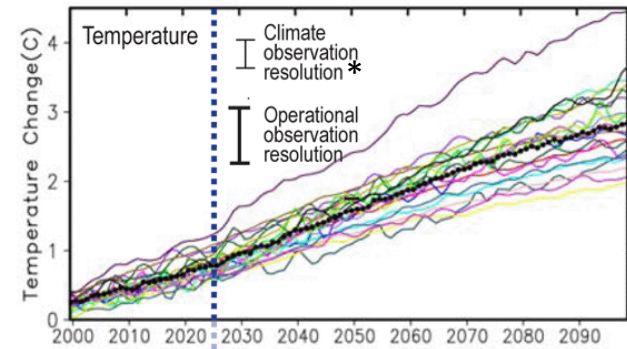
Ensure climate quality data from operational systems
and build efficiencies for future climate processing

Use Scenario: Climate Data Records (CDRs) Can Identify Most Accurate IPCC Model Projection

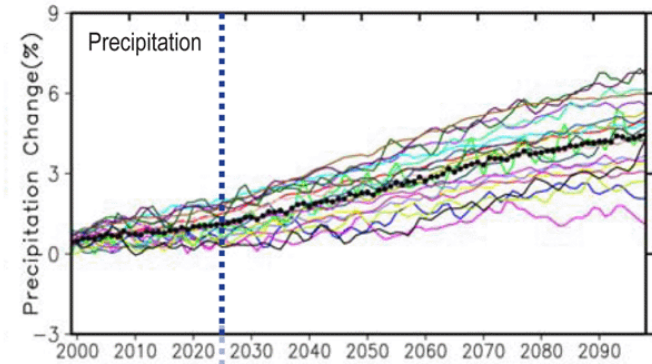
- IPCC model projections for most parameters vary greatly
- Mitigation and adaptation strategies depend on identifying which models are best
- Only high quality, sustained CDRs can validate climate model projections into the decades ahead

Other uses: Detecting, understanding, predicting, and projecting climate change also require long-term records

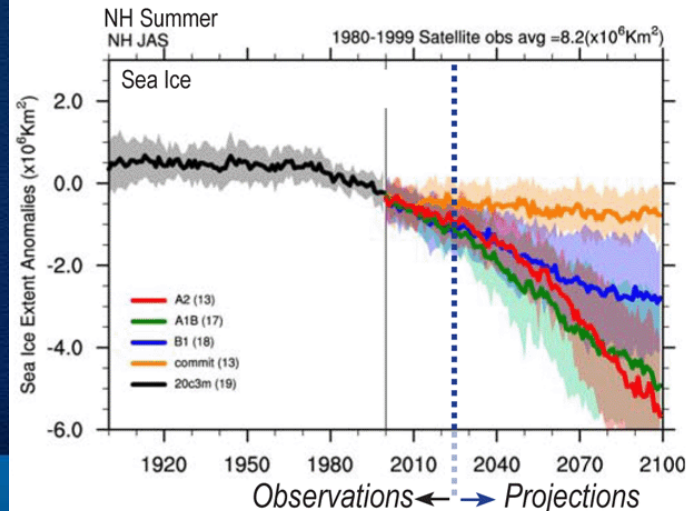
CDRs must distinguish which models are consistent with observations



Observations ← → Projections

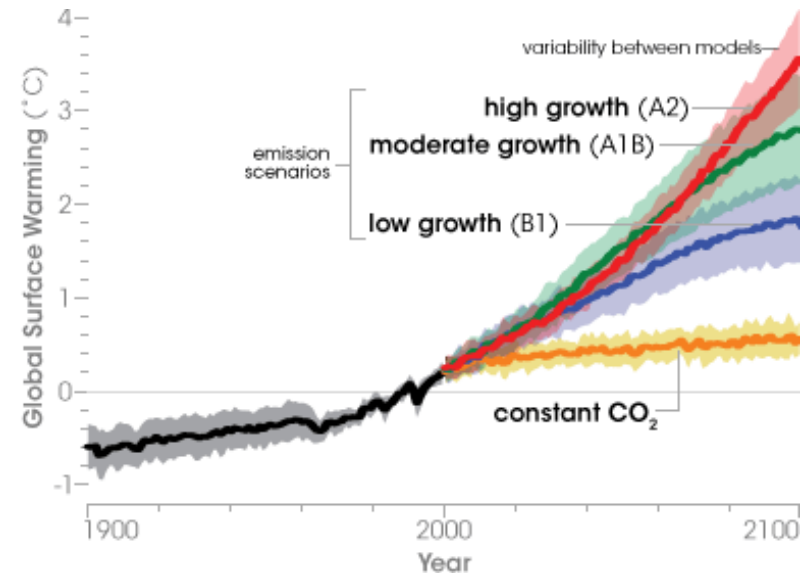
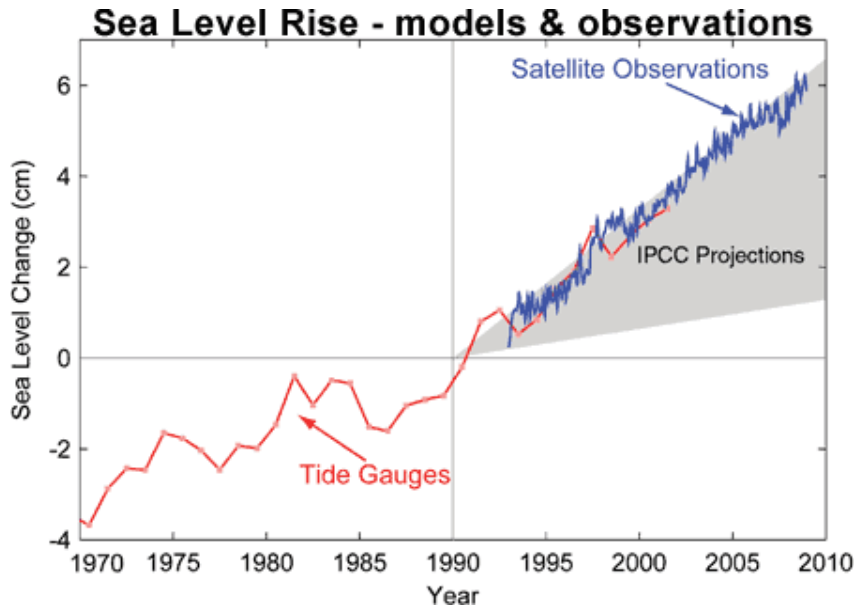


Observations ← → Projections



*Resolution scale in Panel 1 is notional only.

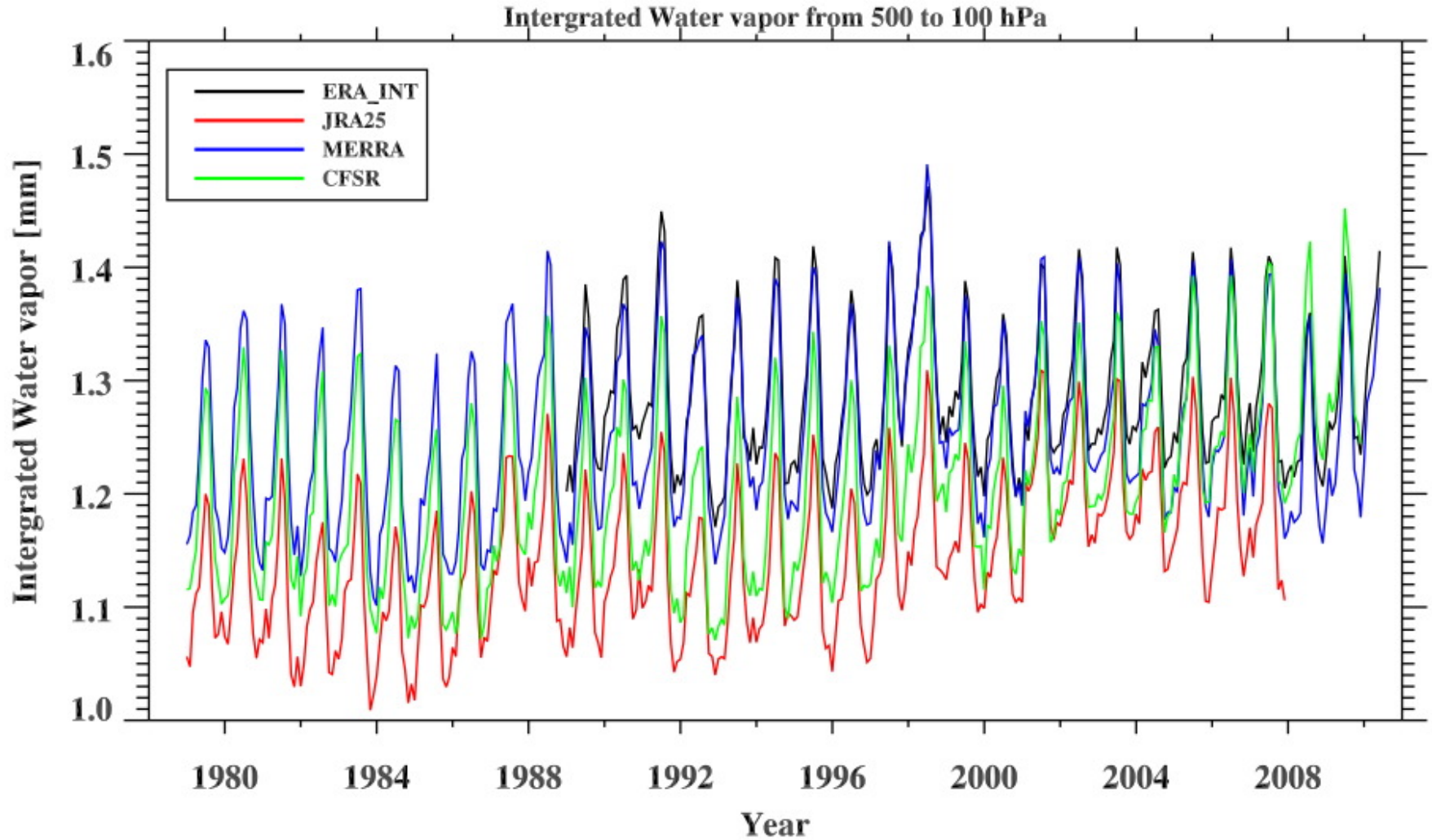
Challenge > Reduce wide spread in Projections



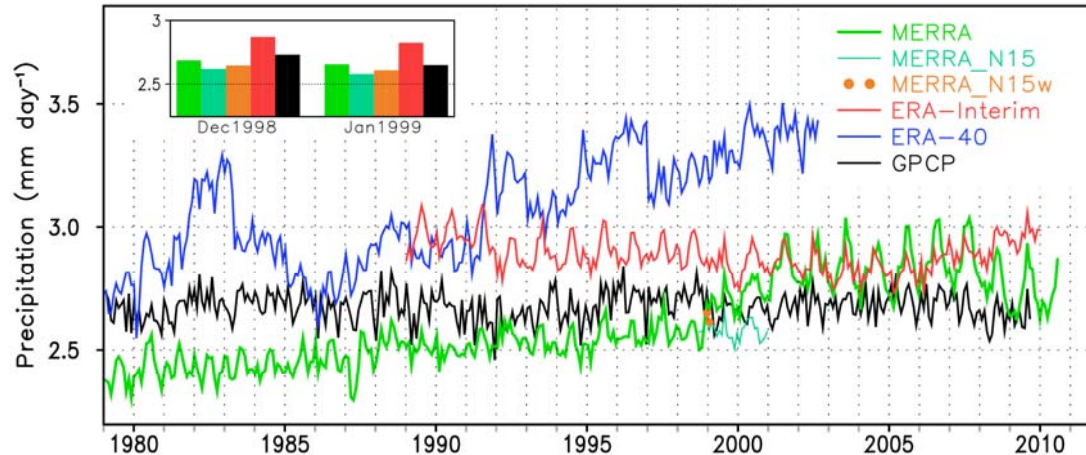
Need to improve model projections. With benchmark – reference satellite observations, we can insist that the models agree with the satellite observations.

CDRs can be used to validate reanalyses and projections

Challenge> Reconcile differences between the Reanalyses



Challenges for Reanalyses are captured in time series of global mean precipitation



- Significant improvement over earlier reanalyses (e.g., ERA-40)
- Both MERRA and ERA-Interim show sensitivity to changes in the observing system. MERRA is sensitive to AMSU-A; ERA-Interim is sensitive to SSM/I.
- Reanalyses are not yet providing new information on precipitation, beyond what is available in the CMAP and GPCP products

• From Michele Reinecker



STAR's contribution

- Participate in CDR program through competitive process
- Leverage our operational real-time responsibilities.
 - Product development and transition to operations
 - AMSU, SSMI, MHS products
 - Instrument calibration, validation and sustained monitoring
 - SNOs, real time instrument performance
- Lead the WMO GSICS Programme



Search

Enter search term(s)

» Integrated Cal/Val System

» Instrument Performance Monitoring

- NOAA-19 AMSU-A
- NOAA-19 MHS
- NOAA-19 AVHRR
- NOAA-19 HIRS

- MetOP-A AMSU-A
- MetOP-A MHS
- MetOP-A AVHRR
- MetOP-A HIRS

- NOAA-18 AMSU-A
- **NOAA-18 MHS >>**
- NOAA-18 HIRS

- DMSP F16 SSMIS
- DMSP F17 SSMIS
- DMSP F18 SSMIS

- GOES-11 Sounder
- GOES-12 Sounder
- GOES-13 Sounder
- GOES-14 Sounder
- GOES-15 Sounder

» Products Demonstration

» Meetings

» Publications

Data and images displayed on STAR sites are provided for experimental use only and are not official operational NOAA products. [More information>>](#)

Satellite Integrated Calibration / Validation System (ICVS)

NOAA-18 MHS Instrument Performance Monitoring

Please select the instrument performance index & press 'Display' Button

MHS NEAT

H-3

MHS Gain

10-Day Snapshot

MHS Space View Count

10-Day Snapshot

MHS PRT Temperature

OBCT PRT Temperature

MHS Local Oscillator Temperature

H-1

MHS Mixer/LNA Temperature

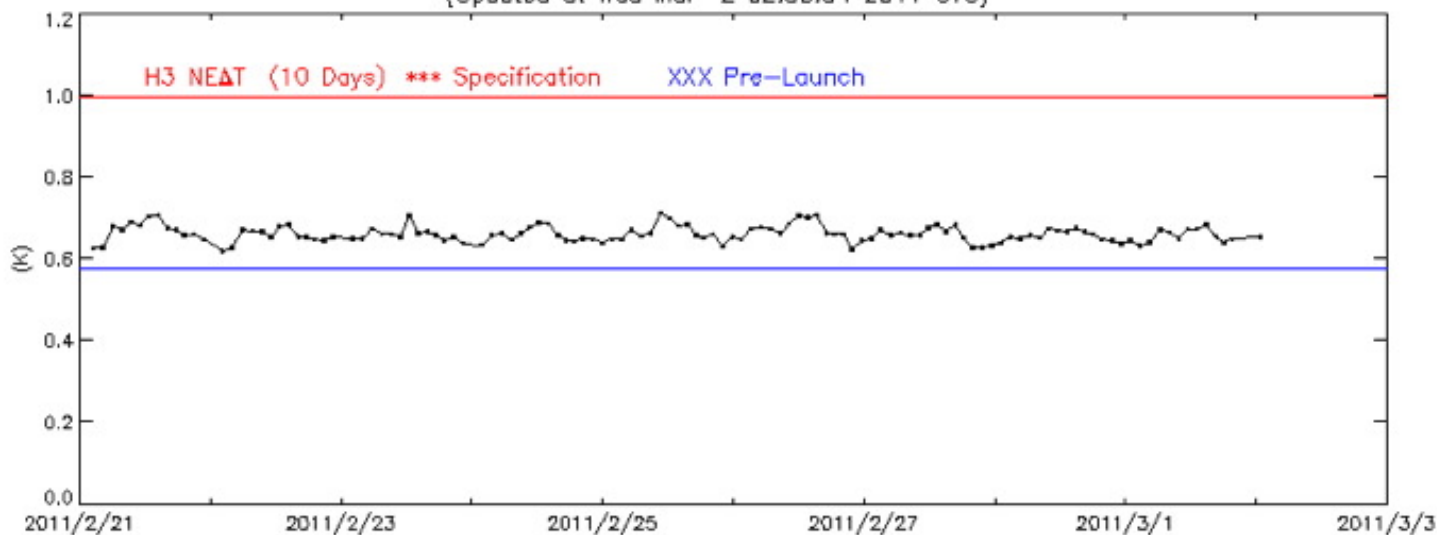
H-1

MHS Status

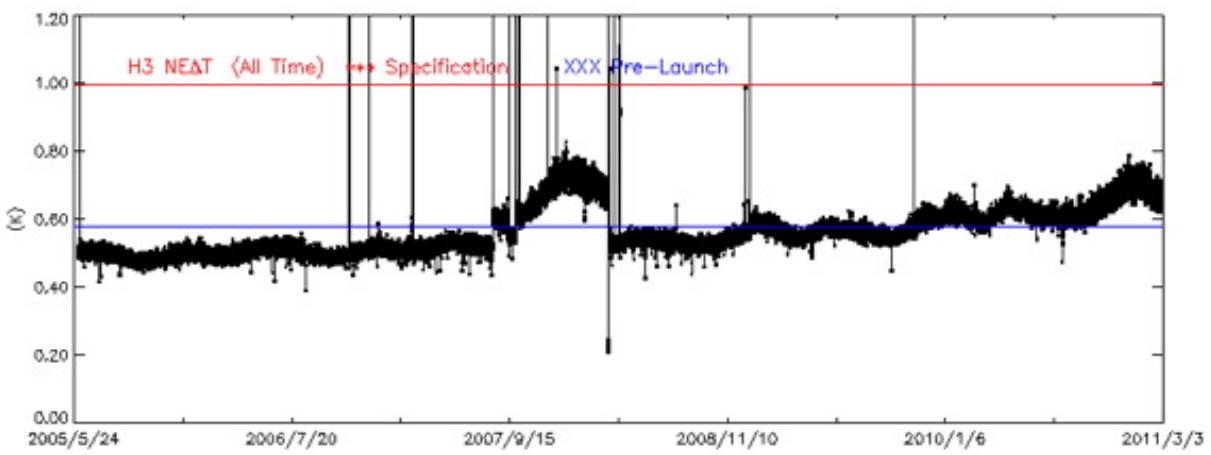
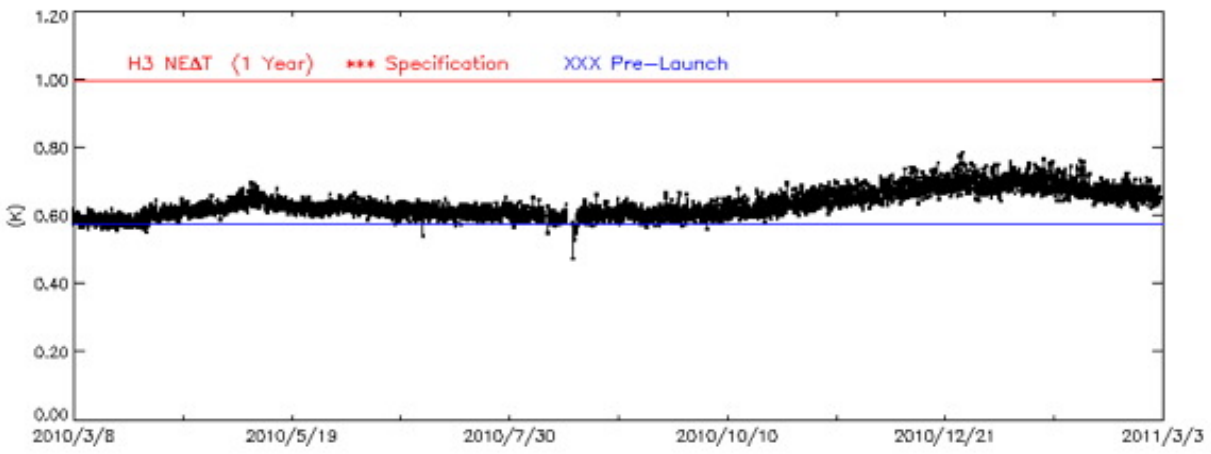
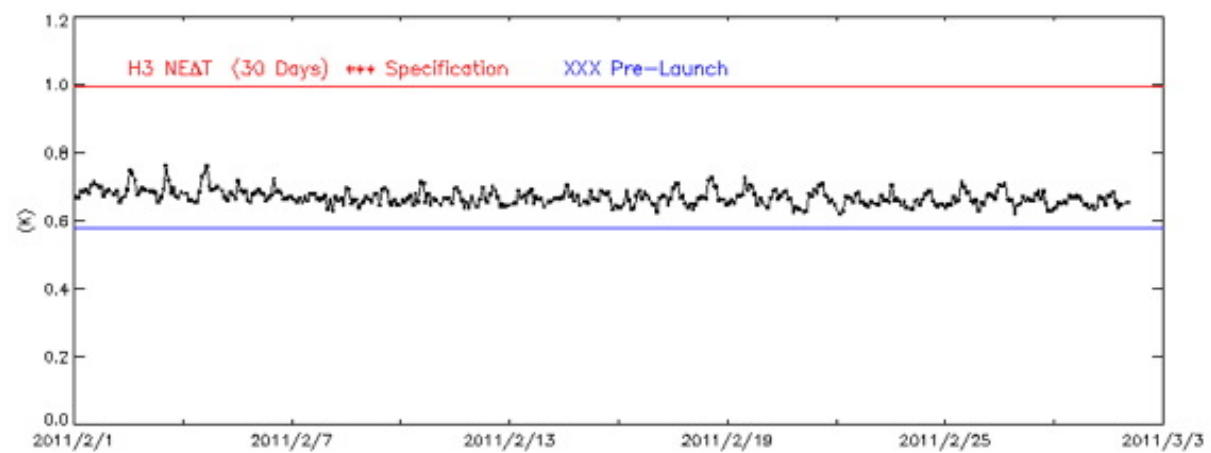
Weekly Orbit Status

NOAA-18 MHS NEAT

(Updated at Wed Mar 2 02:33:54 2011 UTC)



Data and images displayed on STAR sites are provided for experimental use only and are not official operational NOAA products. [More information>>](#)



Climate Data Records (CDR) Program, 2010 Selections

PI Name	Project Title and Abstract
Clayson	<u>The Development of a 20-year Database of Ocean Surface and Near-Surface Properties Suitable for Climate Analyses</u>
Ferraro	<u>The Development of AMSU FCDR's and TCDR's for Hydrological Applications</u>
Ho	<u>Construction of Consistent Microwave Sensor Temperature Records and Tropopause Height Climatology using MSU/AMSU Measurements, GPS RO Data and Radiosonde Observations</u>
Kato	<u>Development of a Radiation Climate Data Record Combining ERBE and AVHRR</u>
Luo	<u>Creating UTH-Related FCDRs from IR and Microwave Sensors Cross-Calibrated by In Situ Measurements from Commercial Aircraft</u>
Menzel	<u>Re-Calibrating HIRS and Evaluating Associated Impact on Cloud and Moisture Properties</u>
Minnis	<u>Calibration of Historical and Future AVHRR and GOES Visible and Near-Infrared Sensors and the Development of a Consistent Long-Term Cloud and Clear-Sky Radiation Property Dataset</u>



Climate Data Records (CDR) Program, 2009 Selections

PI Name	Project Title and Abstract
 Flynn	<u>Extending Ozone Climate Data Records (CDRs) into the Ozone Mapping and Profiler Suite (OMPS) Era</u>
 Key	<u>A Product Development Team for Snow and Ice Climate Data Records</u>
 Kummerow	<u>A Fundamental Climate Data Record of SSM/I, SSMIS and Future Microwave Imagers</u>
 Mittaz	<u>A Recalibration of the AVHRR data record to provide an accurate and well parameterized FCDR</u>
Pilewskie	<u>Developing a Climate Data Record for Total and Spectral Solar Irradiance</u>
 Vermote	<u>A Terrestrial Surface Climate Data Record for Global Change Studies</u>
 Zou	<u>Generating consistent radiance SDRs and deep-layer atmospheric temperature TCDRs from the MSU/AMSU/SSU temperature-sounding channels</u>

CDR Program Principles

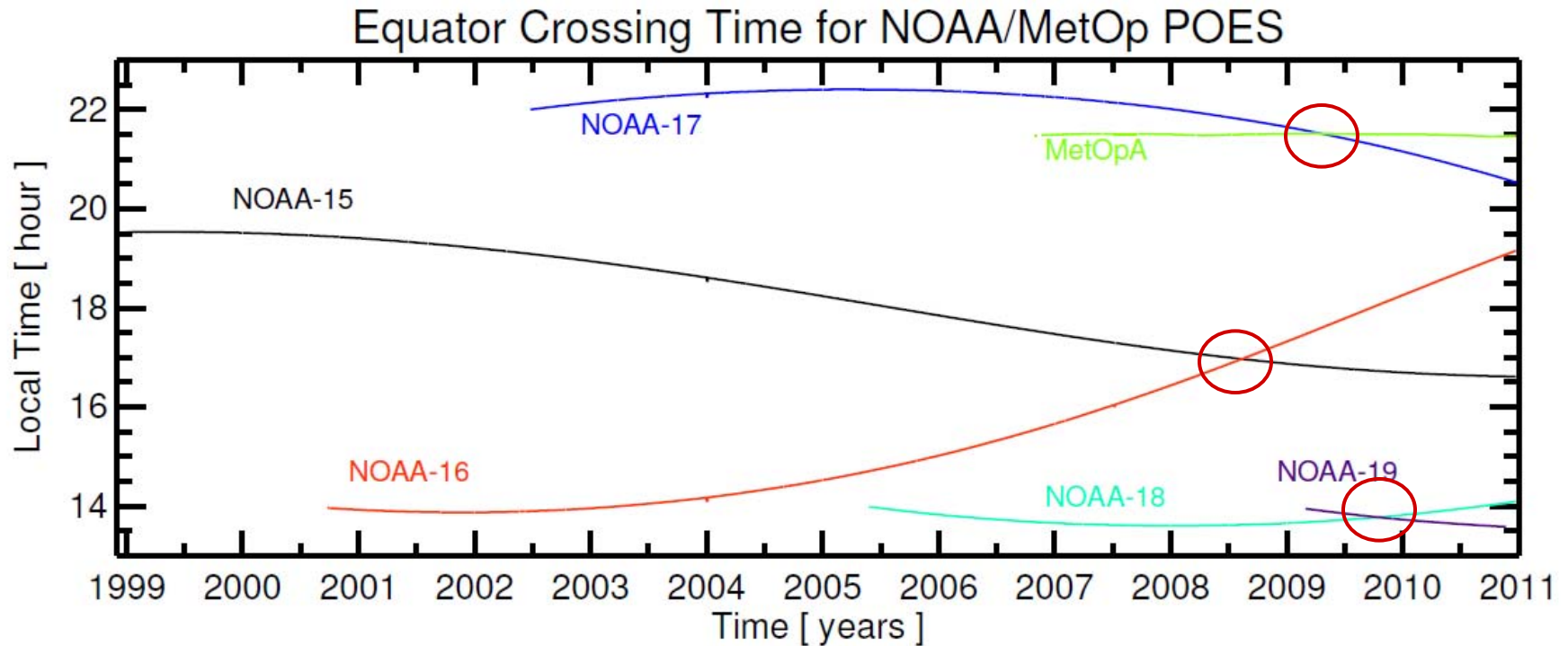
- Program seeks transparency, trust and responsiveness to CDR user needs
- Goals will be achieved by competing CDR development, public release of codes and documents, external oversight boards, and...
- FY09 AO requires winners to hold a community workshop to inform, solicit feedback and respond to community
- Last Year : Passive Microwave Workshop to assess and plan CDRs from MSU,AMSU, SSMI, SSMIS

Program's Goals for Workshops

- Seek and respond to input from the science and user communities on all concepts and concerns to ensure NOAA CDRs are both highly useful and appropriately up-to-date
- Describe technical approach to help ensure CDR is transparent and gains community acceptance and credibility
- Provide formal mechanism for input from external parties
- Define community consensus best practice approaches for NOAA CDRs

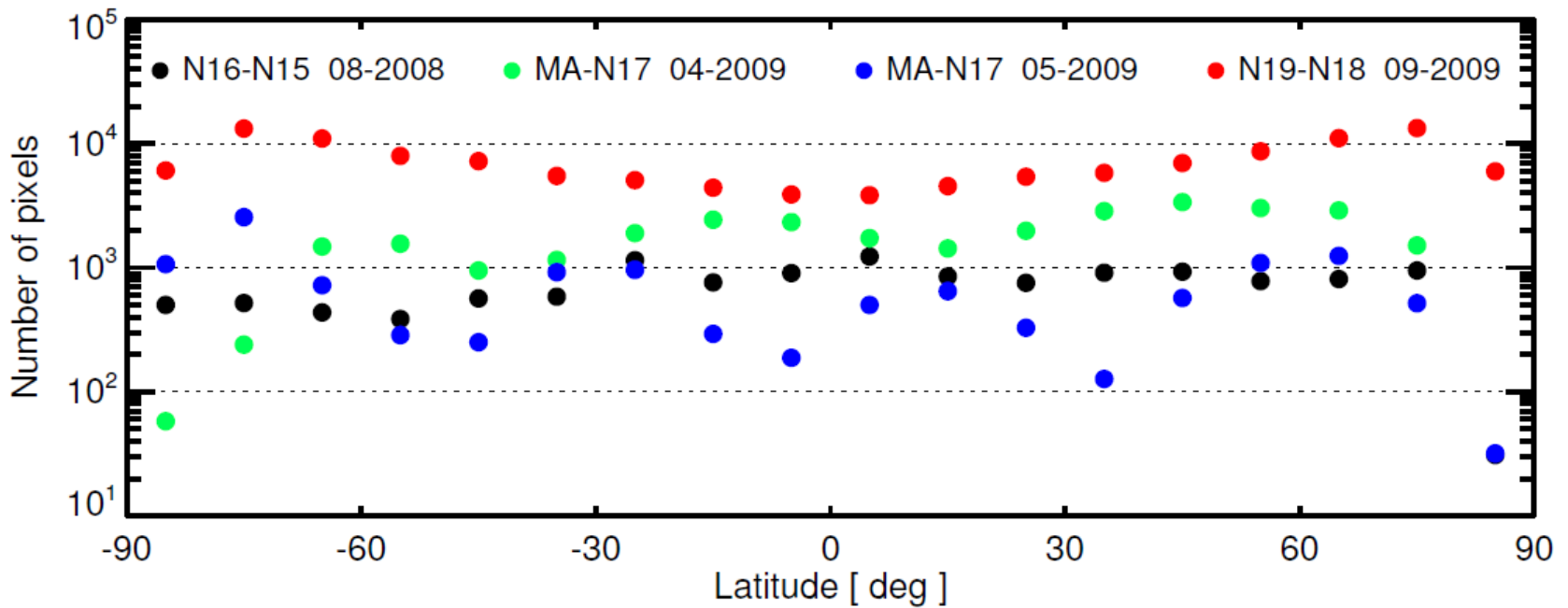
Relevant Research to Consider

Something good about orbit drift!



SNOs occur over all latitudes when Xing times are identical

Distribution of collocations

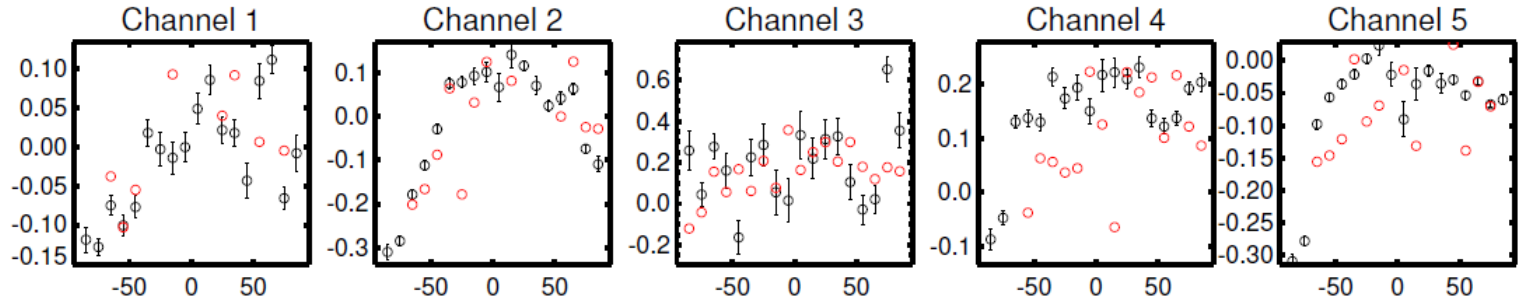




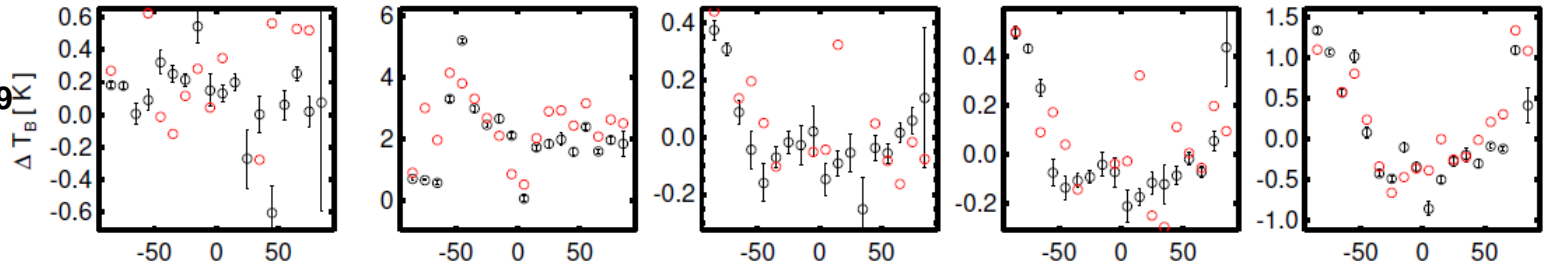
Distribution of bias for AMSU-B/MHS

Met Office
Hadley

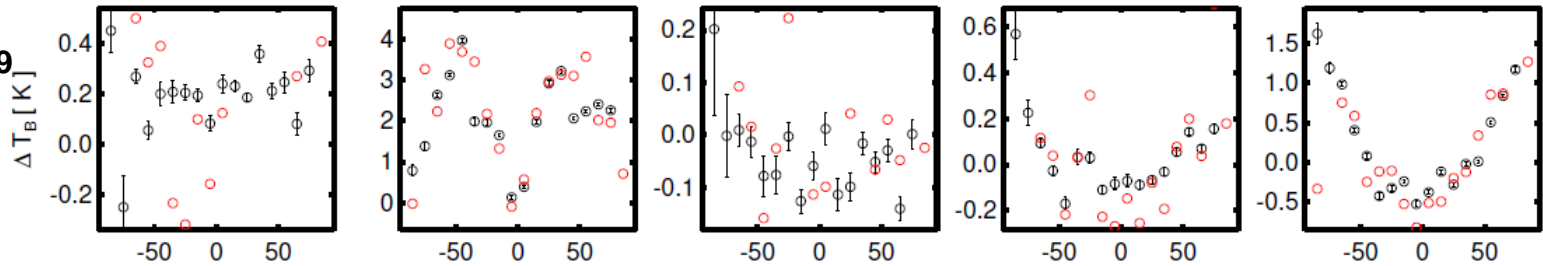
N19-N18 09/09



MA-N17 05/09



MA-N17 04/09



N16-N15 08/08

