

# **Land breakout session report**

# Issues discussed (2/1)

- Product / algorithm “classification”
- Remaining work with SNPP
  - Most products are on track to complete S-NPP cal/val and algorithm development, with well defined expected outcome
  - Major issues remain
    - Dark Pixel Surface Albedo, Gridding / granulation
      - Related to DPSA and VCM
- J1 readiness
  - Algorithm upgrades (per L1) – Vegetation Index and Active Fires
  - Any other critical upgrades – LST (emissivity implicit)
  - J1 test data: S-NPP as proxy, but critical J1 features need to be captured

# Issues discussed (2/2)

- Common algorithms
  - Science readiness and feasibility
    - LST is a good candidate
  - Merged / fused products
    - Albedo is a good candidate, but possibly outside of NOAA JPSS cal/val program
- Ground implementation options
  - IDPS, NDE, NASA
    - Need for implementation –agnostic product and algorithm development
    - Need for single thread or pre-processing for within the same product family (i.e. VI, GVF, VH etc.)
- Quality flags
  - Need for thorough assessment of input as well as output
- Product validation
  - Product intercomparison vs. independent validation
  - Common validation protocols (CEOS WGCV LPV)

# Product / algorithm “classification”

*NPOESS algorithm has evolved into the NOAA-endorsed JPSS algorithm and any needed improvements should continue*

Surface Reflectance, Surface Type (IP offline, potentially new algorithm), BPSA

*NPOESS (or evolved) algorithm will not meet requirements or effort is too large, replace with NOAA-endorsed JPSS algorithm*

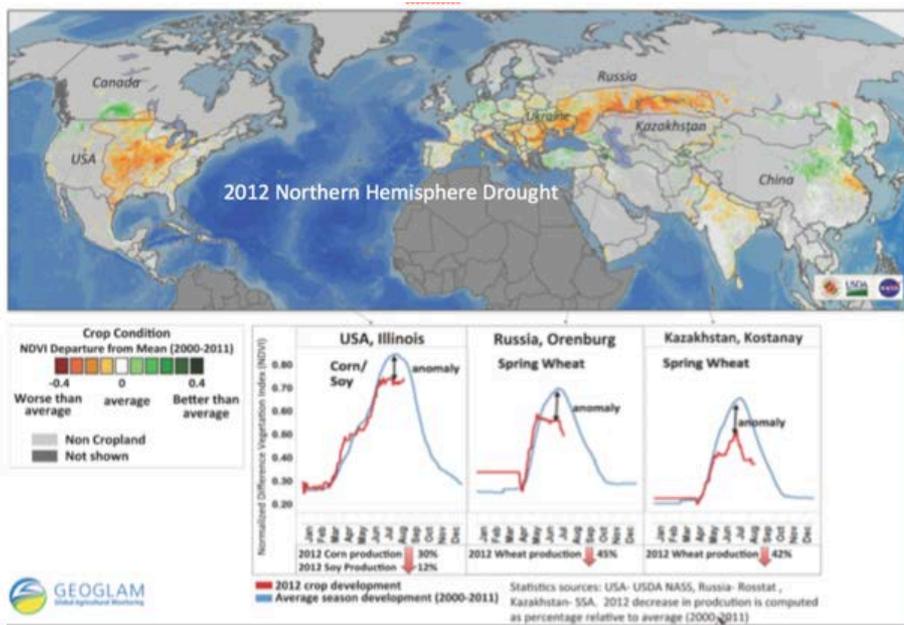
VI – J1 in process

AF (J1 in process)

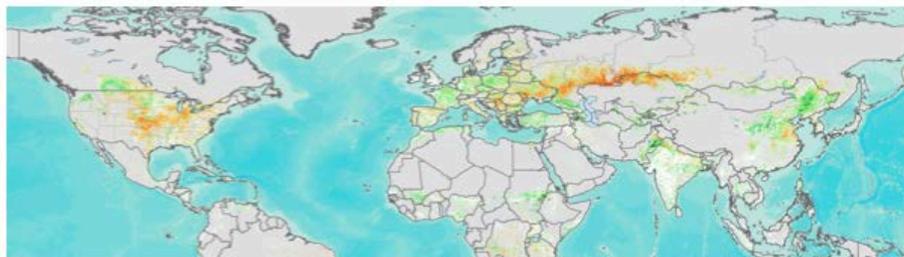
DPSA (key decisions to be made – in conjunction with gridding and VCM)

*NOAA-endorsed algorithm should be used even if NPOESS (or evolved) algorithm meets performance because of legacy, enterprise, blended products, and other considerations*

# VIIRS SR potential to replace MODIS in agriculture applications (GEOGLAM drought monitoring) has been explored



Assessment of the impact of the 2012 Northern Hemisphere Drought from the MODIS Climate Modeling Grid daily NDVI data



A VIIRS NDVI anomaly (prototype) computed for the same date (July, 30<sup>th</sup> 2012) as the MODIS NDVI anomaly shown above, generated from data produced at the Land PEATE

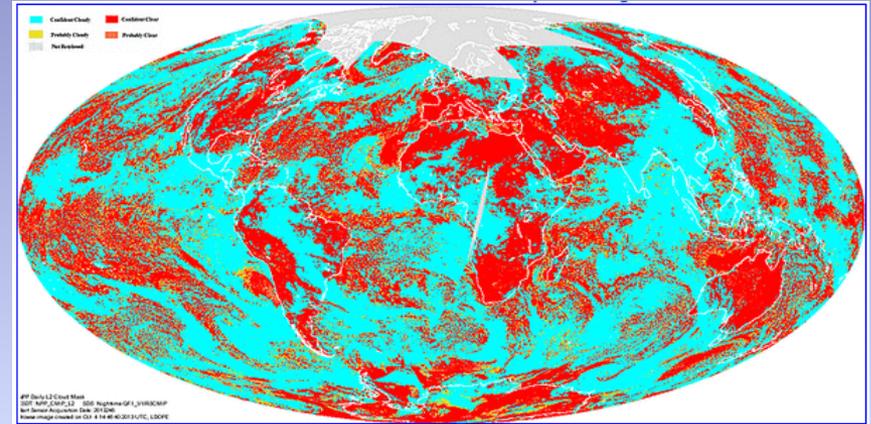
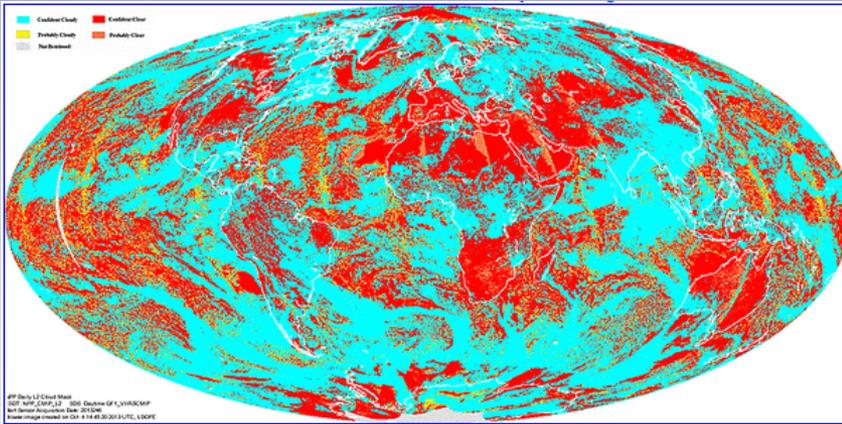
# VCM: simplified NDVI input in C1 reprocessed dataset

- Day Time Cloud Confidence from NPP\_VCM\_IP: Day 2013246

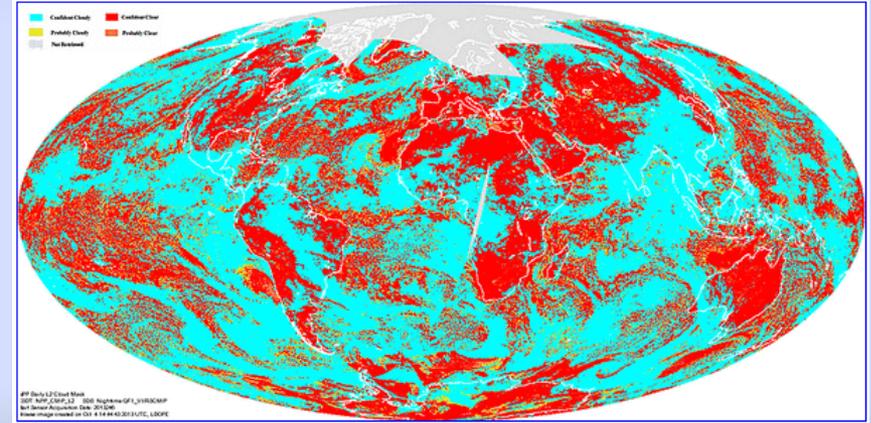
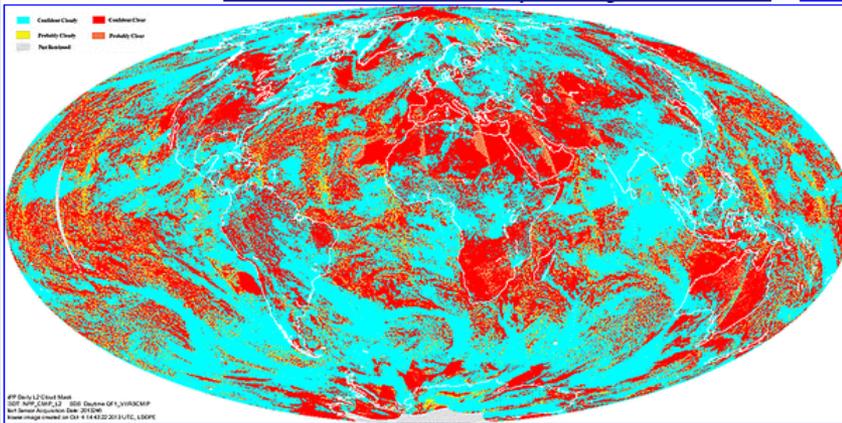
Day time

Night time

IDPS



LPEATE-C1



# VIIRS DPSA offline vs MODIS Daily V006



*Suomi NPP VIIRS*

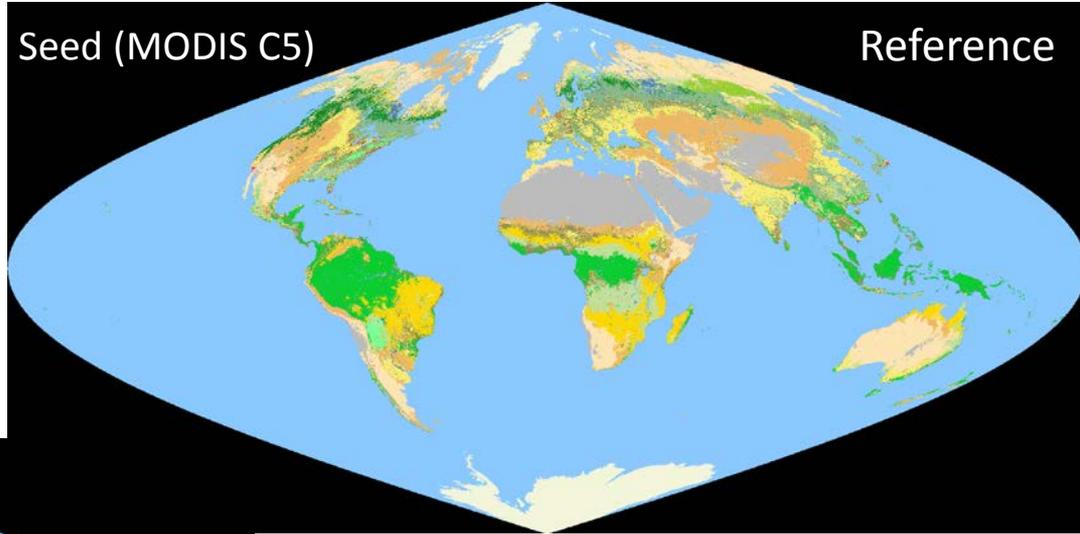


*MODIS V006*

*True color BSA of tile H12V04 of New England and southeastern Canada, Sept 2013*

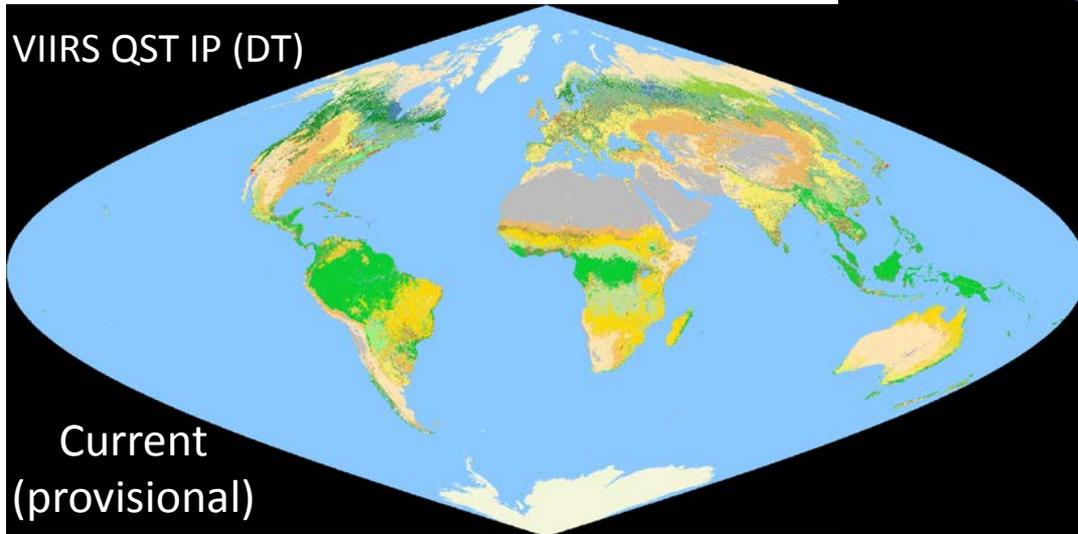
# Surface Type

Seed (MODIS C5)



Reference

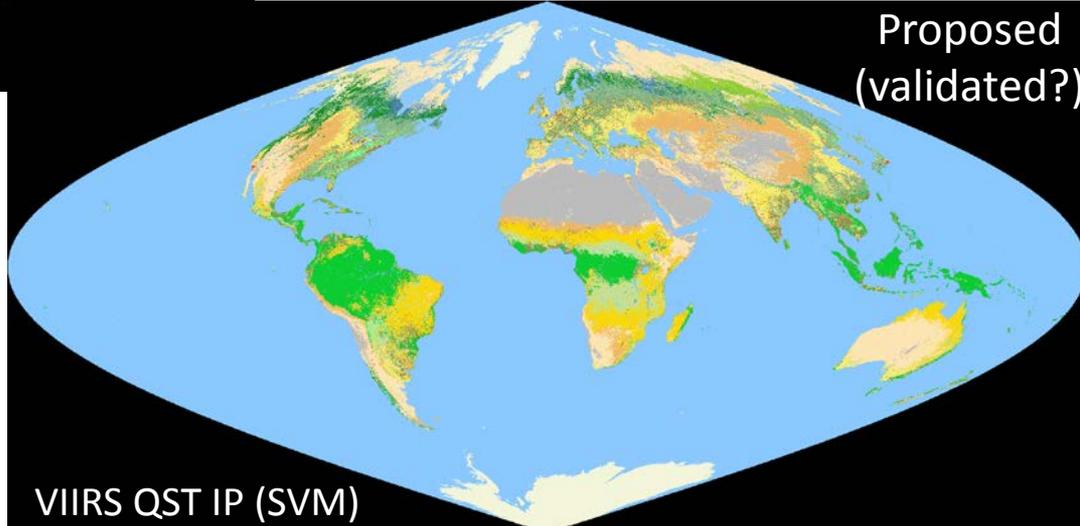
VIIRS QST IP (DT)



Current  
(provisional)



Proposed  
(validated?)

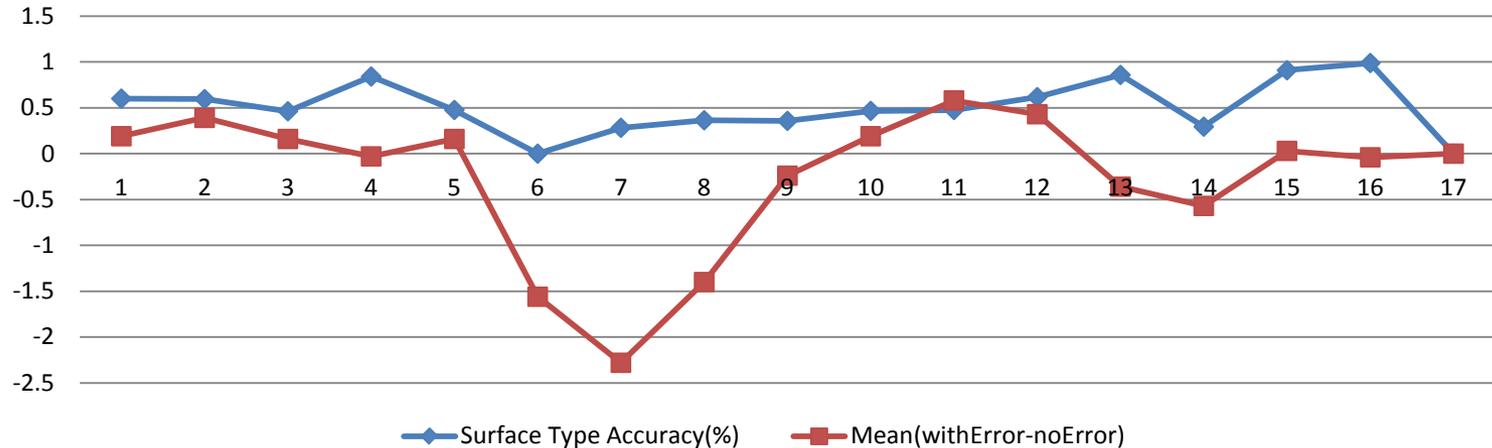


VIIRS QST IP (SVM)

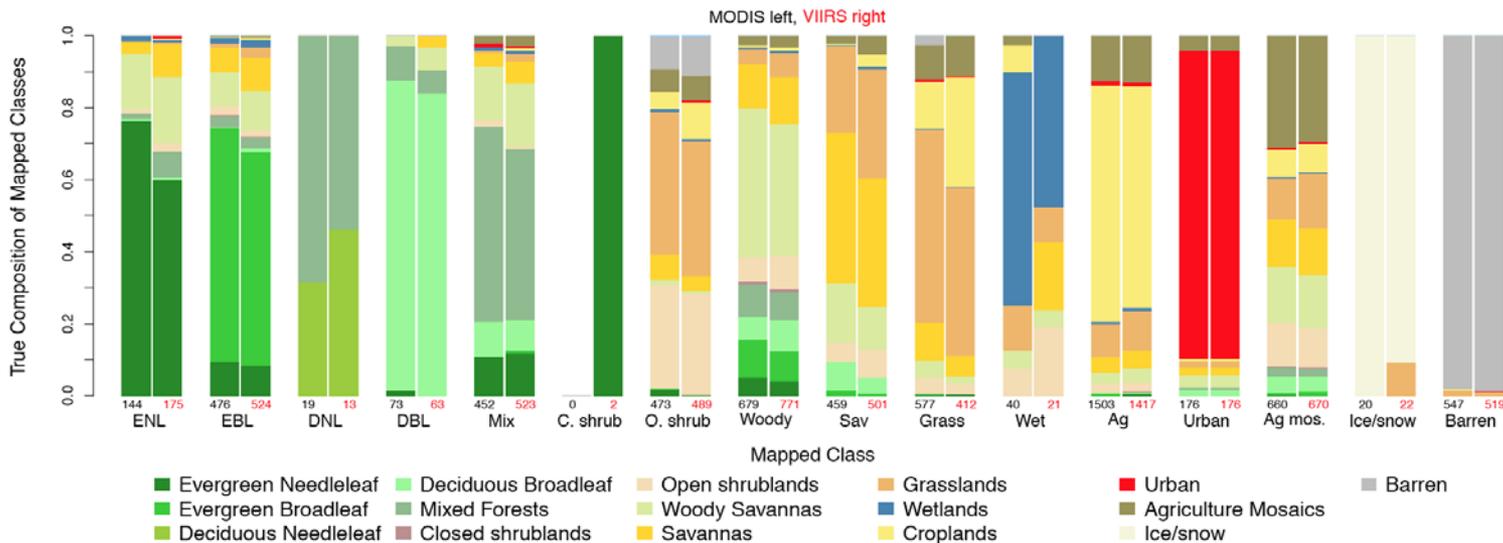
*evaluation of SVM is ongoing  
towards meeting  
requirements*

# Surface type accuracy on LST(Day)

## Surface Type Accuracy on LST(Day)

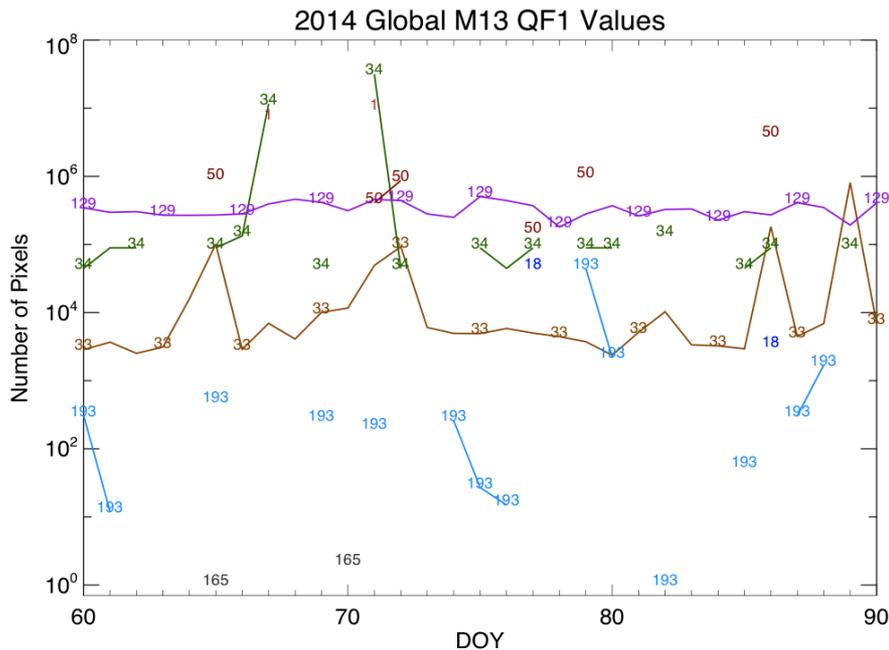
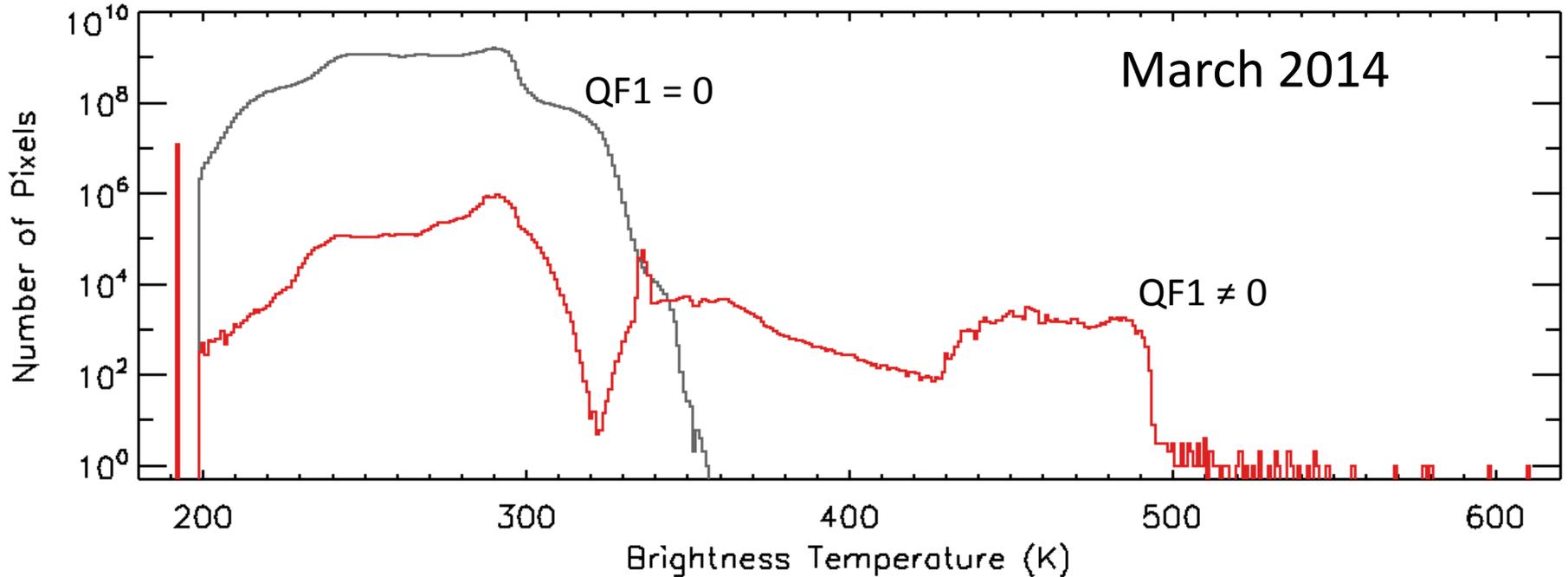


## Class Composition of Commission Errors



***dependence of LST quality on surface type misclassification***

M13



NB. QF1  $\neq$  0 curve does not include trim (QF1 = 2) or fill (QF1 > 247).

***“Garbage in, garbage out”***  
***Fixes expected to go into Mx8.5 (early August)***  
***Active fire – valid observations are “anomalies” compared to typical conditions***

# Quality flag general issues

- Quality flags in input data
  - Ensure that the definition of conditions defined to set quality flags provides useful information for
    - Tracking the quality of the given input product
    - Characterizing input data for downstream algorithms
    - Characterizing the quality of the data for end users
  - Work with upstream product teams and thorough understanding of the definition and performance of the quality flags is critical
    - QF-based data filtering and/or additional internal tests
- Quality flags in output data
  - Same as above!
- Another strong argument for reprocessing

# Validation

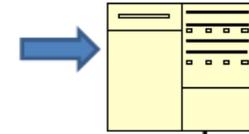
- Multi-satellite intercomparison including Landsat
- Linkage to CEOS, GCOS ECVs and other coordination efforts



NPP & JPSS VIIRS  
GOES-R ABI  
Landsat-7 & -8  
MODIS  
Sentinel-2  
others..  
& In Situ

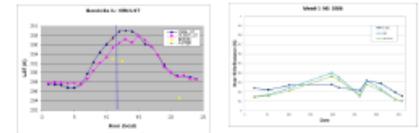
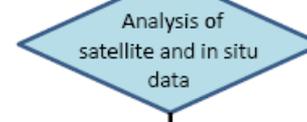
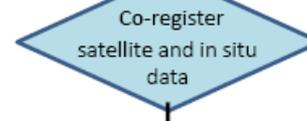
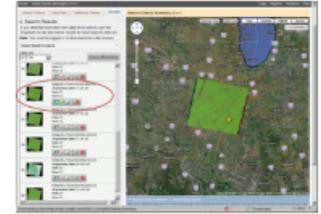
## GOES-R ABI and VIIRS Land Product Validation System

On demand data acquisition  
Automated data acquisitions

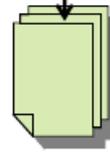
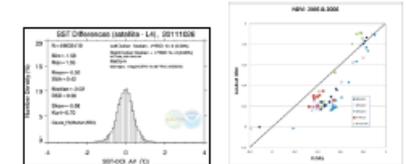


Data and Inventory information stored at EROS.

Feedback / Additional Analysis



Generate statistics, charts and reports



Review by cal/val teams.  
Product algorithm updates.