

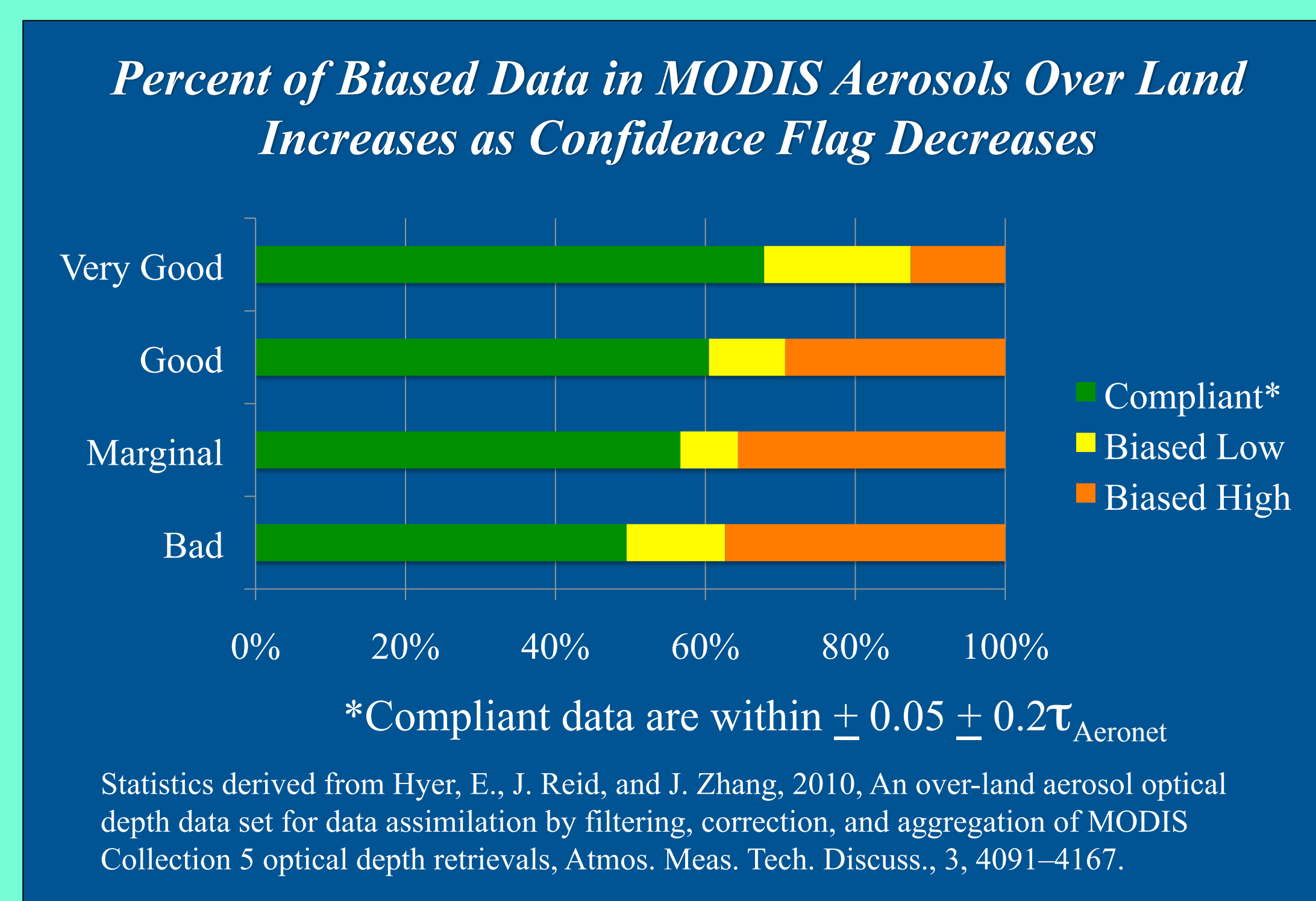


Data Quality Screening Service

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(1) Why Screen Data Based on Quality Flags?

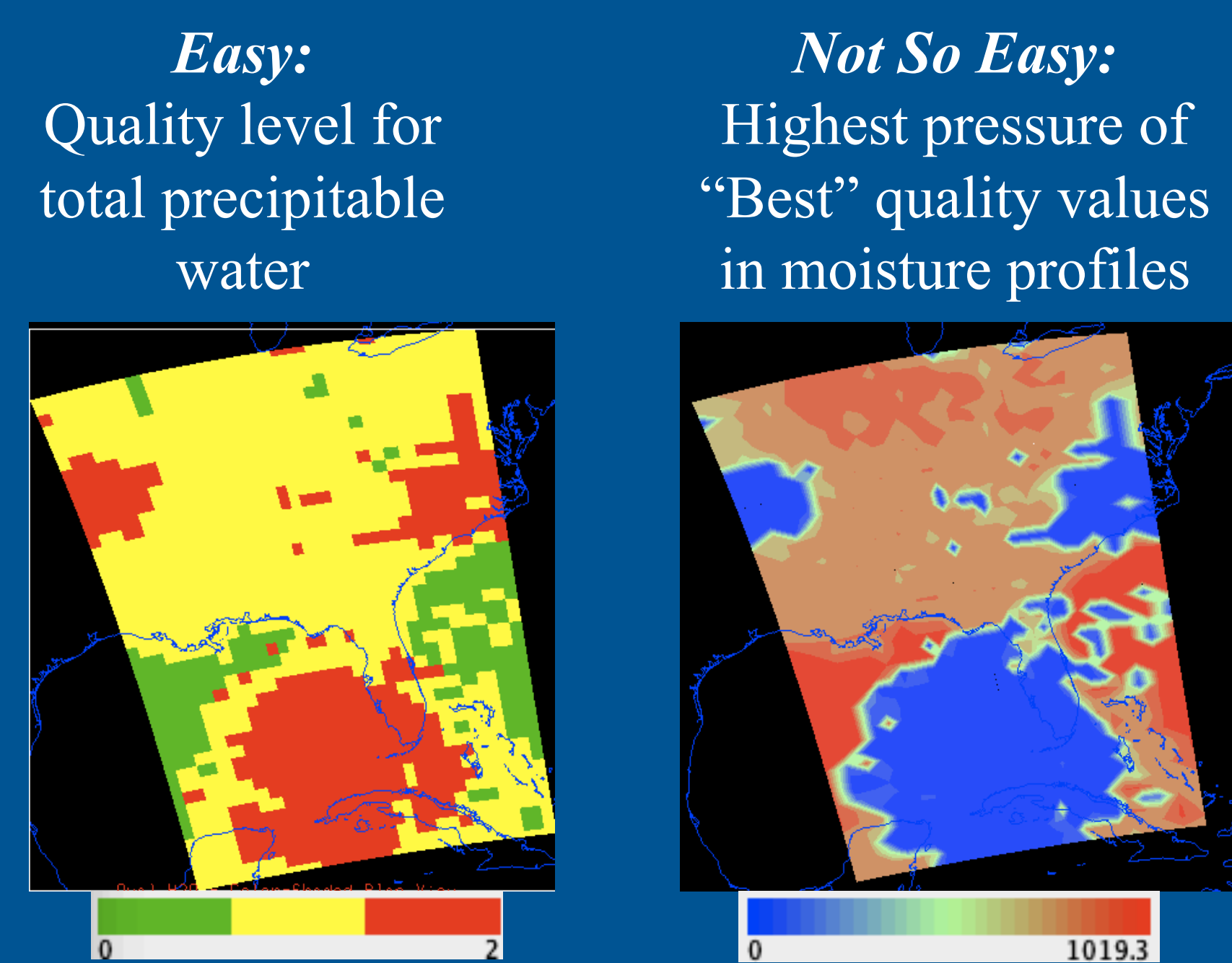
- Level 1 and 2 satellite data products typically keep all retrieved values.
- Quality Control “flags” are often available for these data
 - Describe instrument performance and calibration
 - Reflect observing conditions (e.g., cloud fraction)
 - Are based on algorithm “happiness”
- *Statistically*, the better the quality flag, the less likely it contains systematic biases.



(2) Why Use a Service for Quality Screening?

(a) Quality Control flags can be complicated to handle

Two Different AIRS Quality Schemes



MODIS Quality Bitfields in Cloud_Mask_SDS

Cloud Mask Status Flag	0
0=Undetermined	
1=Determined	
Cloud Mask Cloudiness Flag	1
0=Confident cloudy	
1=Probably cloudy	
2=Probably clear	
3=Confident clear	
Day/Night Flag	3
0=Night	
1=Day	
Sun/Int Flag	4
0=Yes	
1=No	
Snow/Ice Flag	5
0=Yes	
1=No	
Surface Type Flag	6
0=Ocean, deep lake/river	
1=Coast, shallow lake or river	
2=Desert	
3=Land	7

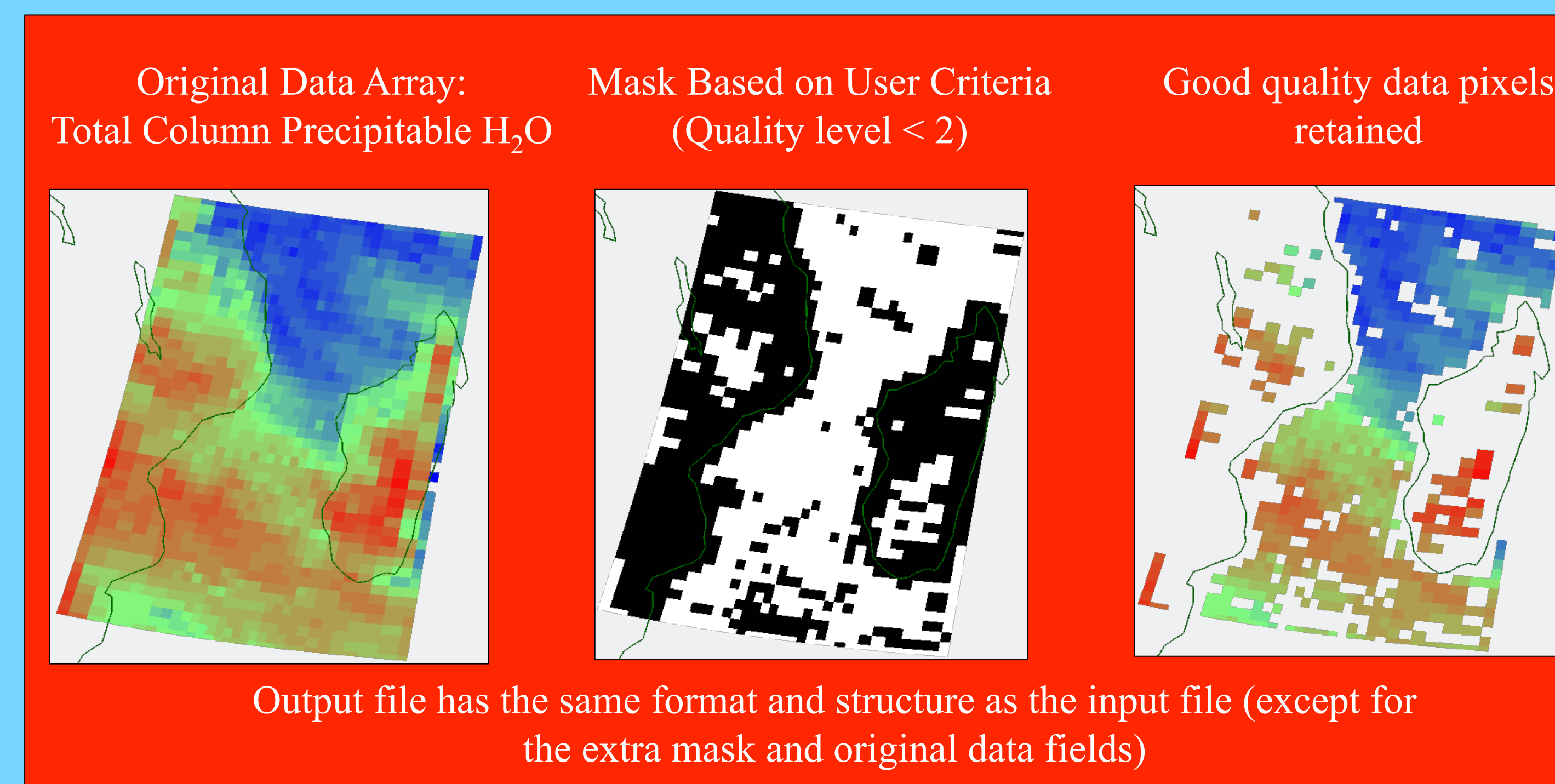
(b) Interpretations and recommendations vary across and within instruments

AIRS Quality Levels		MODIS Aerosols Confidence Flags	
		Ocean	Land
0 Best	Data Assimilation	3 Very Good	3 Very Good
1 Good	Climatic Studies	2 Good	2 Good
2 Do Not Use		1 Marginal	1 Marginal
		0 Bad	0 Bad

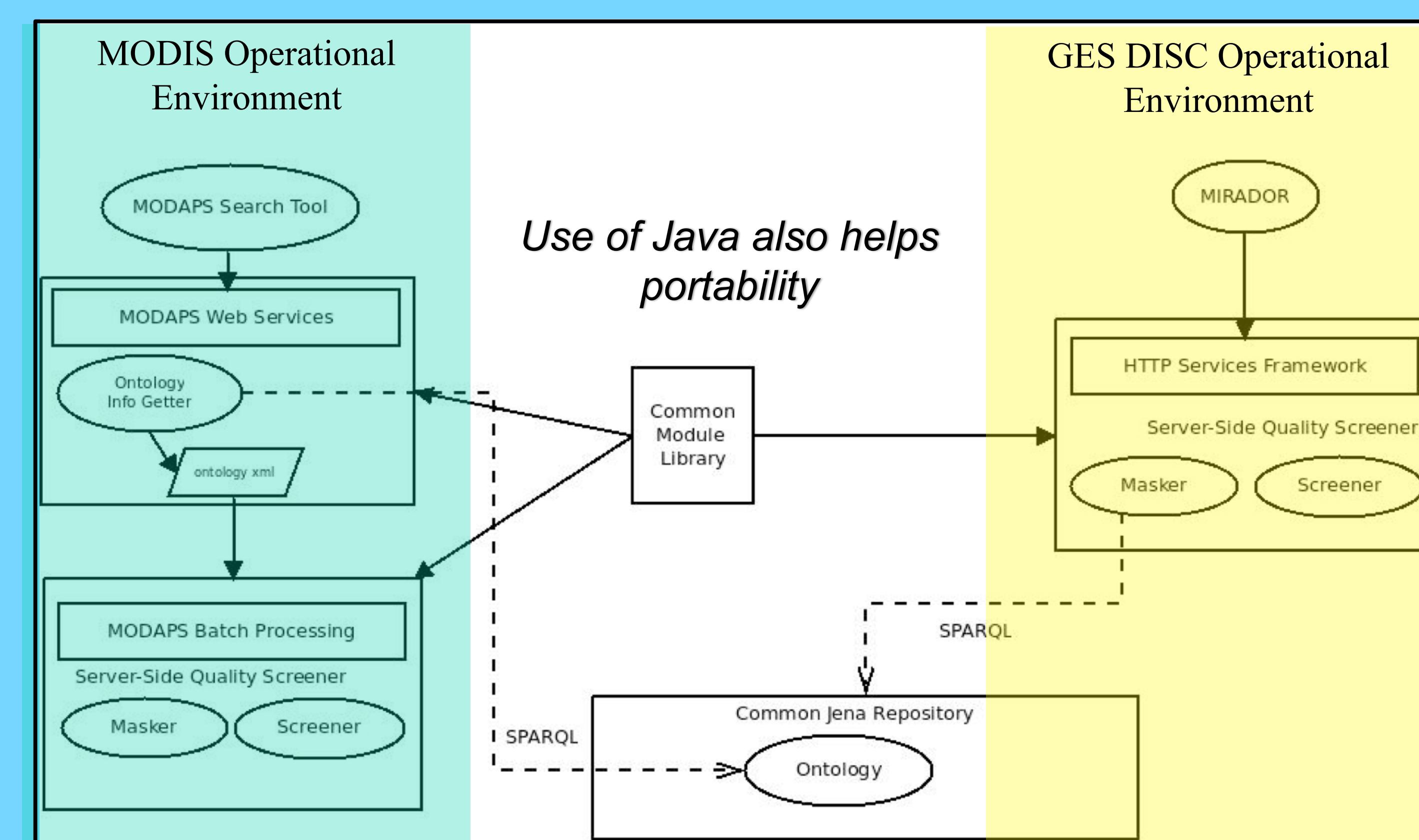
Use these flags to have 2/3 of values within expected error bounds

Ocean	Land
$\pm 0.03 \pm 0.10 \tau$	$\pm 0.05 \pm 0.15 \tau$

(3) The Data Quality Screening Service (DQSS) filters out bad pixels for the user

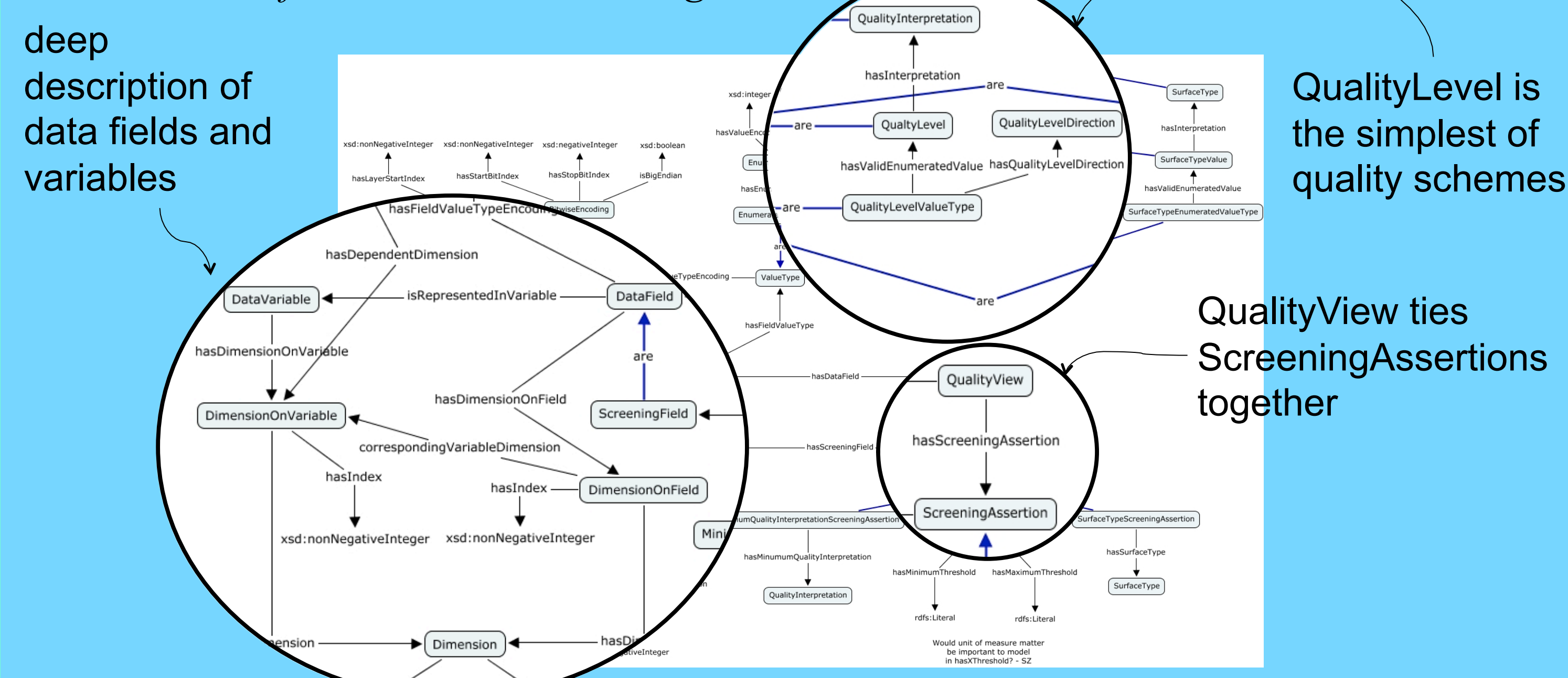


(4) Distributed architecture can support DQSS at a diverse set of data providers



(5) Ontology-driven software reduces the cost of applying DQSS to additional data products

An ontology organizes the variations in quality schemes and drives both the selection interface and the Masker algorithm.



(6) DQSS is available for AIRS Level 2 data at GES DISC and MODIS Level 2 Water Vapor at MODAPS

AIRS Level 2 Quality Control Selection Interface in GES DISC's Mirador search tool

MODAPS Post-Processing Selection Interface

LAADS Web

Level 1 and Atmosphere Archive and Distribution System

Set Post Process Criteria

You have selected a total of 2 files to post-process. Each product file will be processed using the stages listed below.

Data Quality Screening Service (DQSS)

Please select from the following criteria to include data with the selected quality value and better in the order:

Product: MYD05_L2

Quality_Assurance_Near_Infrared: ☐ NoScreening for Determined Values ☐ Marginal ☒ Good ☐ VeryGood

Cloud_Mask_QA: ☐ NoScreening for Determined Values ☒ > 66% Confidence ☐ > 95% Confidence ☐ > 99% Confidence

Order

(7) What's Next?

- More Datasets
 - Microwave Limb Sounder (relatively easy)
 - MODIS Level 2 Aerosols (not easy)
 - Ozone Monitoring Instrument (account for row anomalies?)
- Link Quality Control ontology with other ontologies?
 - Quality Assessment Ontology?
 - Data and Services Ontology (deep description of data fields?)
- Collaborative Screening?
 - Dr. Alice shares screening criteria with Dr. Bob

(8) Acknowledgments

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