

BRDF/Albedo/NBAR: Extending MODIS to VIIRS

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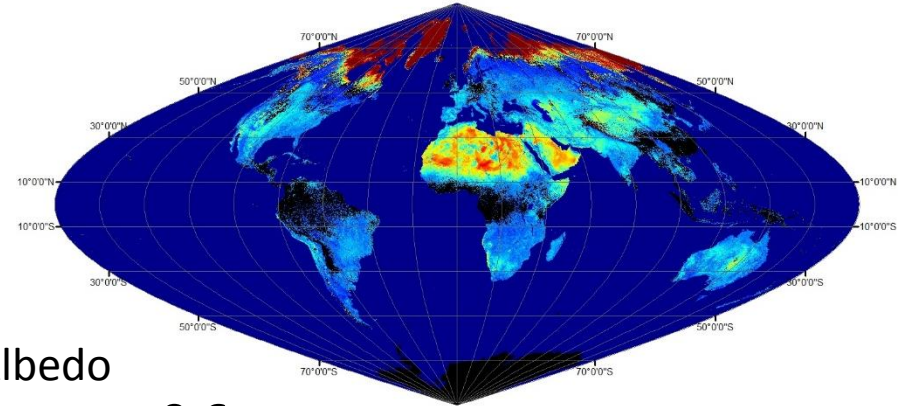
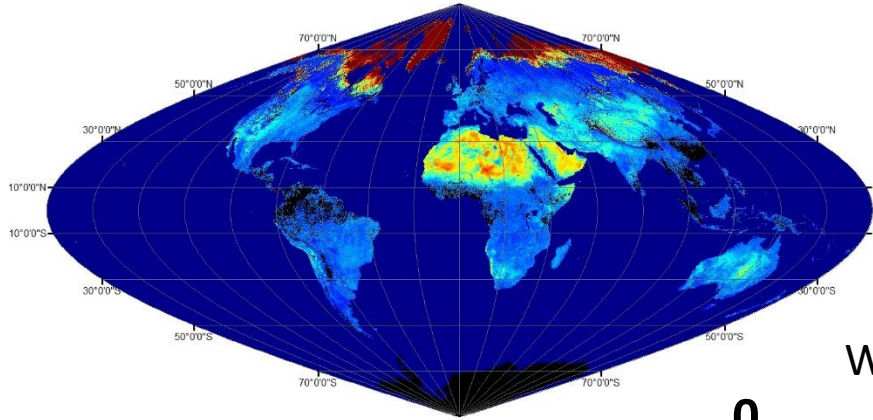
MODIS and VIIRS Products

- MODIS V006
 - Terra AND Aqua (morning and afternoon)
 - DAILY BRDF, Albedo, NBAR (Nadir BRDF Adjusted Reflectance)
 - NBAR frequently used for phenological research
 - 500m Tiles, 30arc-second CMG
 - 7 bands, 3 Broadbands
 - QA, uncertainty measures
- VIIRS
 - Suomi NPP only (afternoon)
 - DAILY BRDF, Albedo, NBAR
 - 500m Tiles (3 I-Bands), 1km (9 M-Bands, 3 Broadbands)
 - QA, uncertainty measures

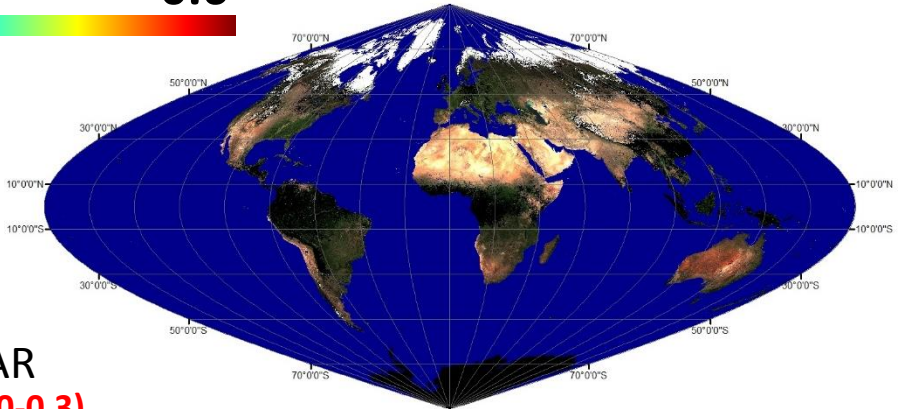
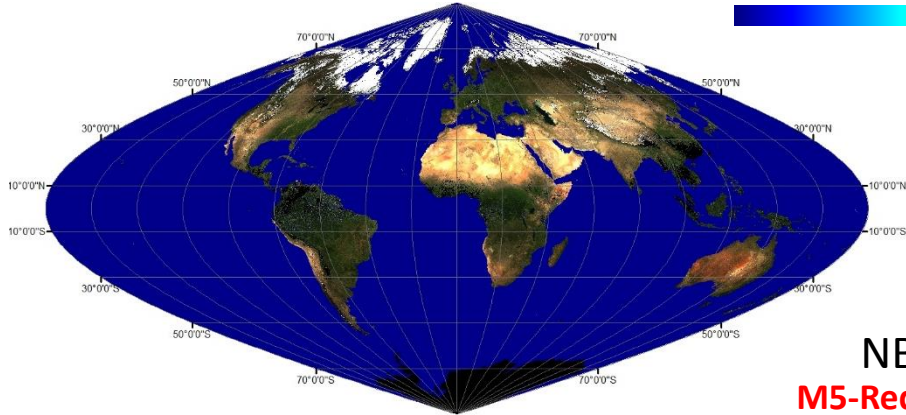
12 May 2014 (DOY 132)

MODIS

VIIRS



WSAIbedo

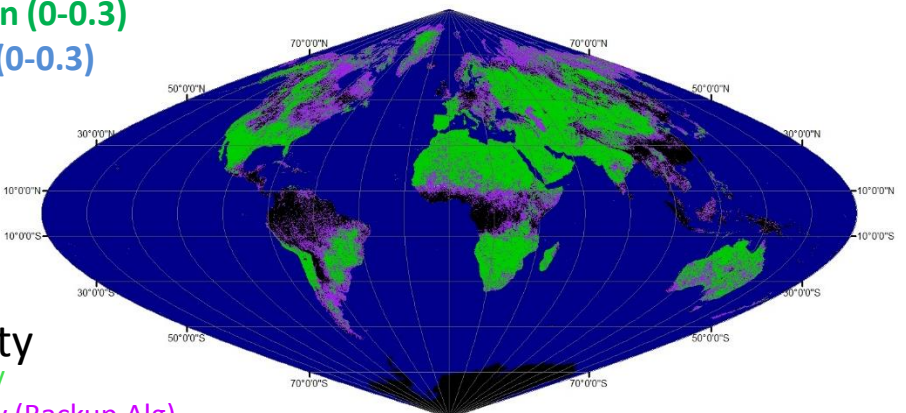
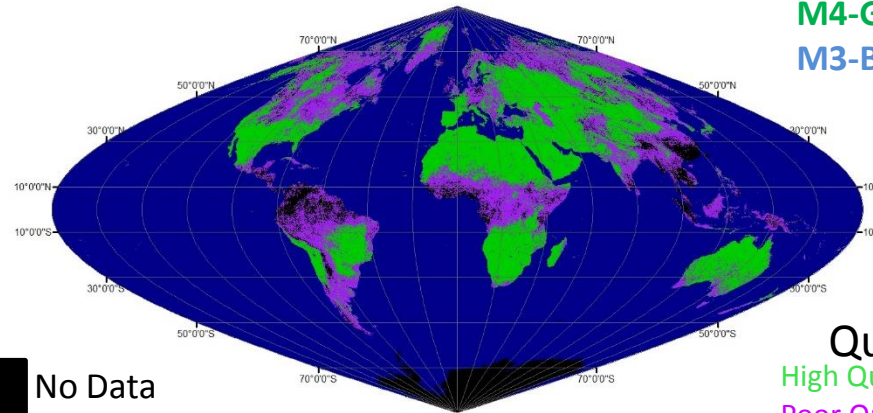


NBAR

M5-Red(0-0.3)

M4-Green(0-0.3)

M3-Blue(0-0.3)



Quality

High Quality

Poor Quality (Backup Alg)

No Data

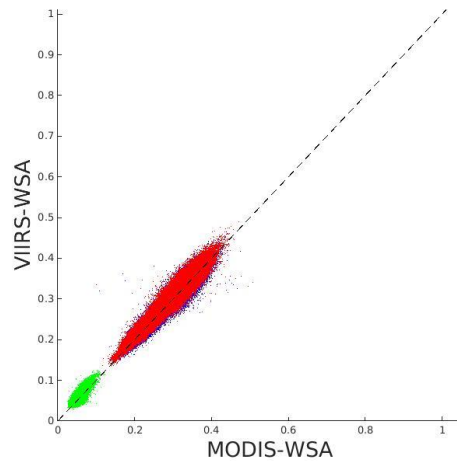
H12V04 New England

2013 DOY 270

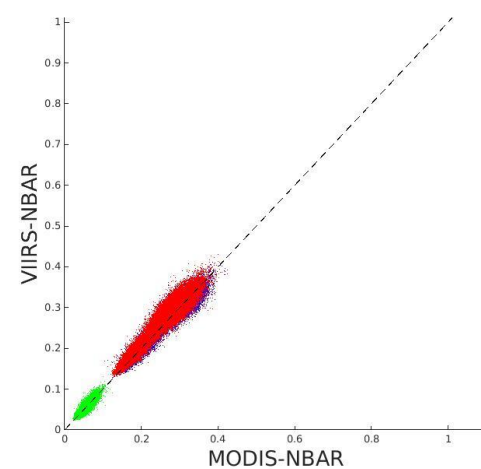
Red, Green, Blue: (0-0.1)



WSA



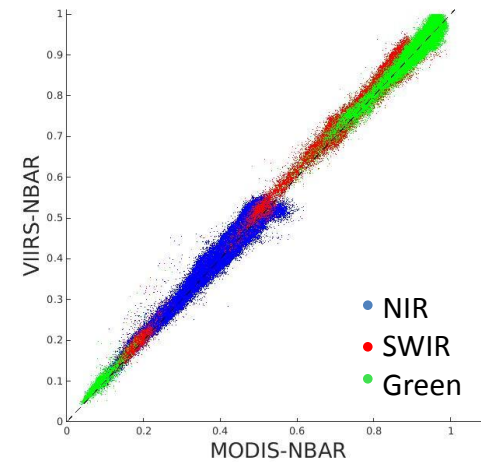
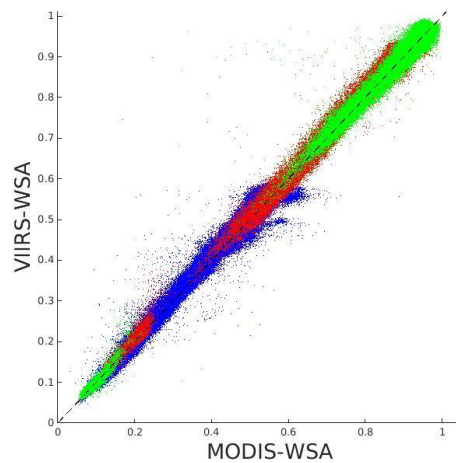
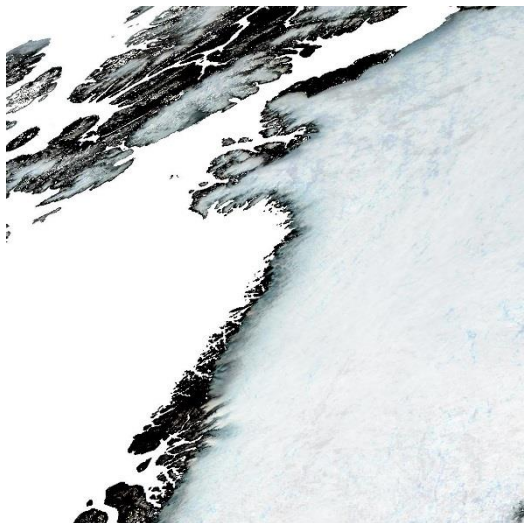
NBAR



H16V01 Greenland

2013 DOY 193

Red, Green, Blue: (0.4-1.0)

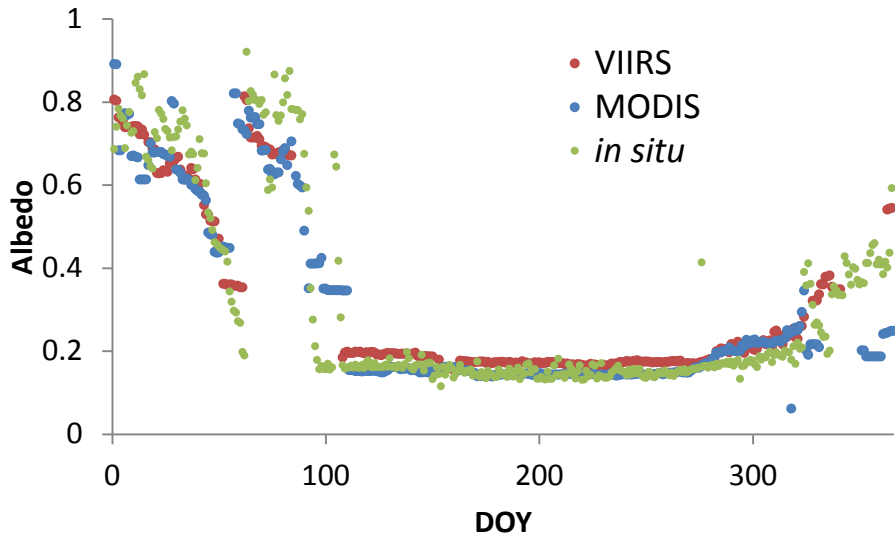


Land Product Validation

- CEOS/WGCV/Land Product Validation (LPV)
 - Albedo
 - Baseline Surface Radiation Network (BSRN)
 - Gold Standard of Albedo Measures
 - Surfrad (NOAA)
 - Ameriflux (DOE)
 - NEON (NSF)
 - Fluxnet, TERN, ICOS, etc.
 - BRDF
 - Cloud Airborne Radiometer (CAR)
 - (multiangle aircraft acquisitions of opportunity)

Fort Peck--Grassland 2013

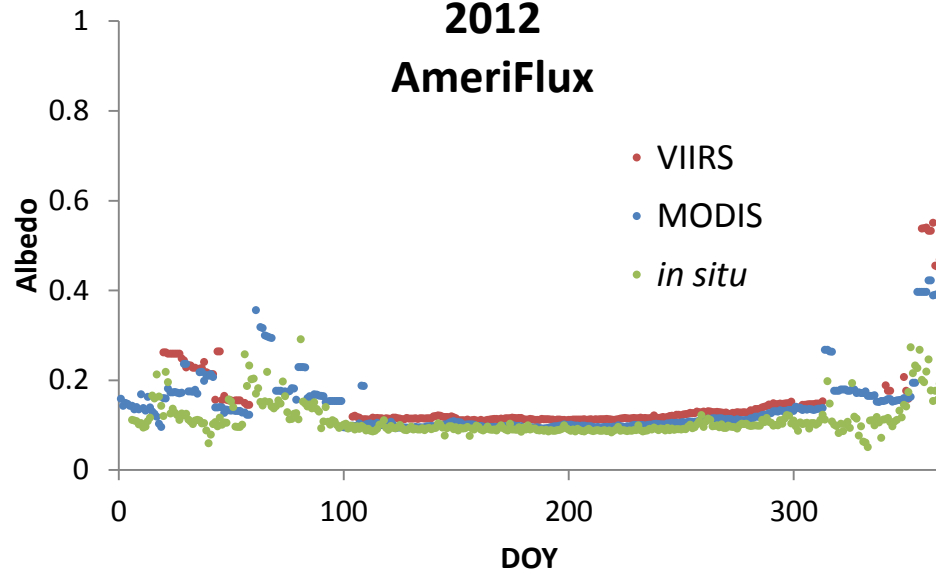
SURFRAD



Metolius Intermediate Pine --Forest

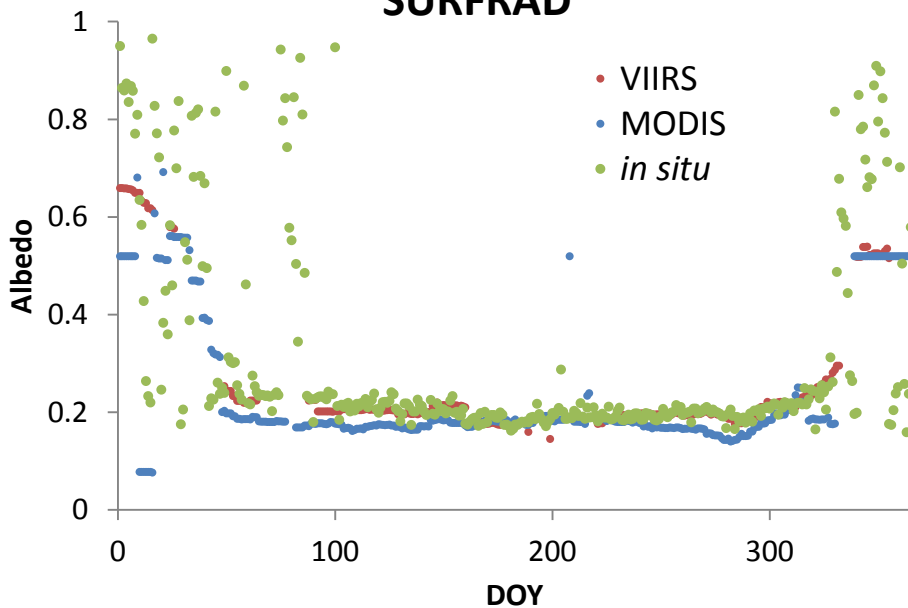
2012

AmeriFlux



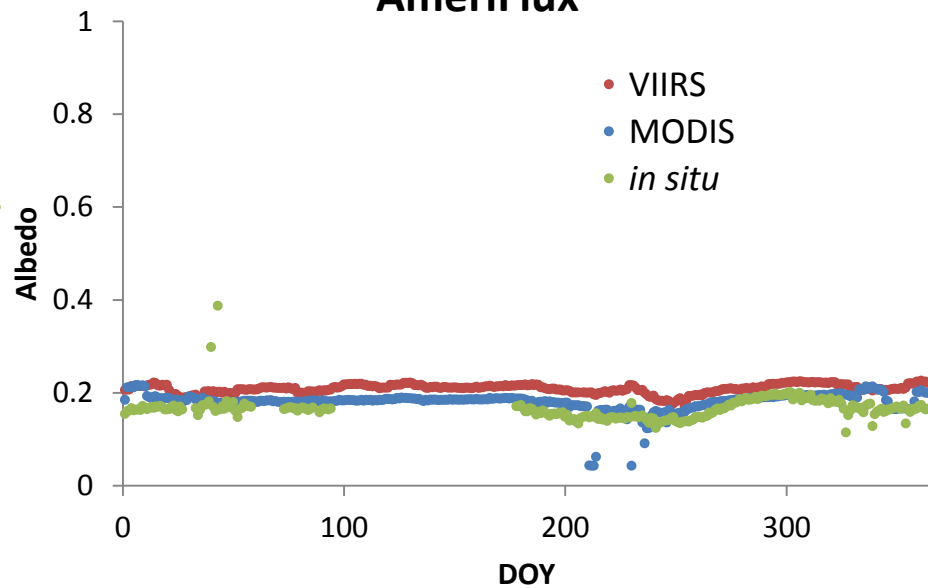
Penn State--Cropland 2013

SURFRAD



Santa Rita Mesquite Savanna 2013

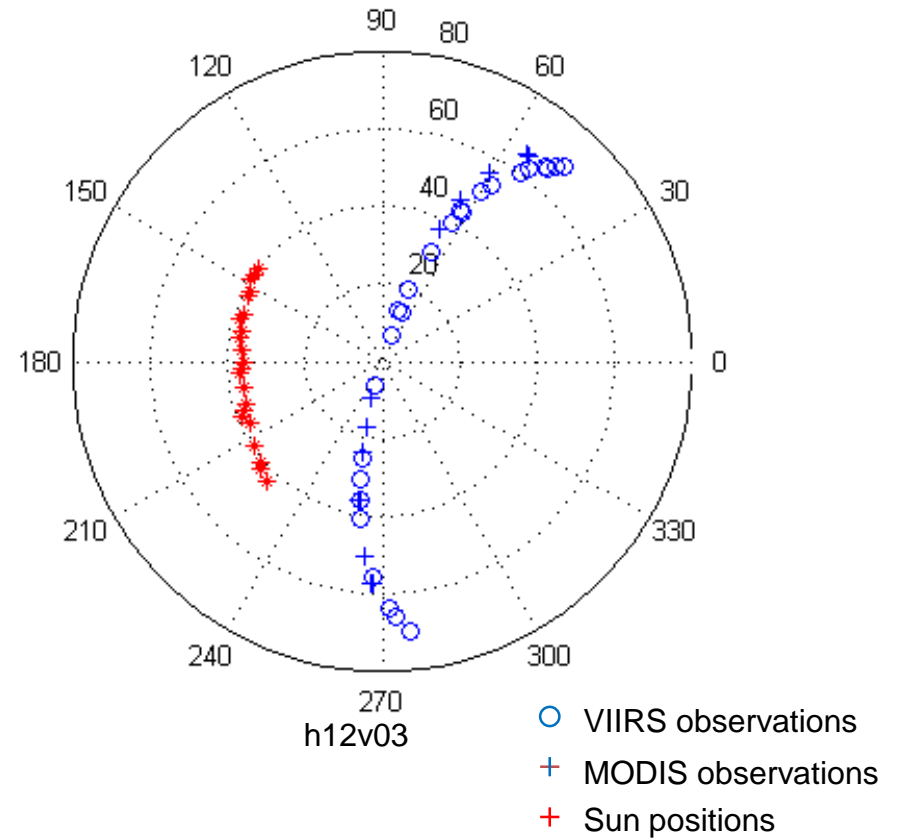
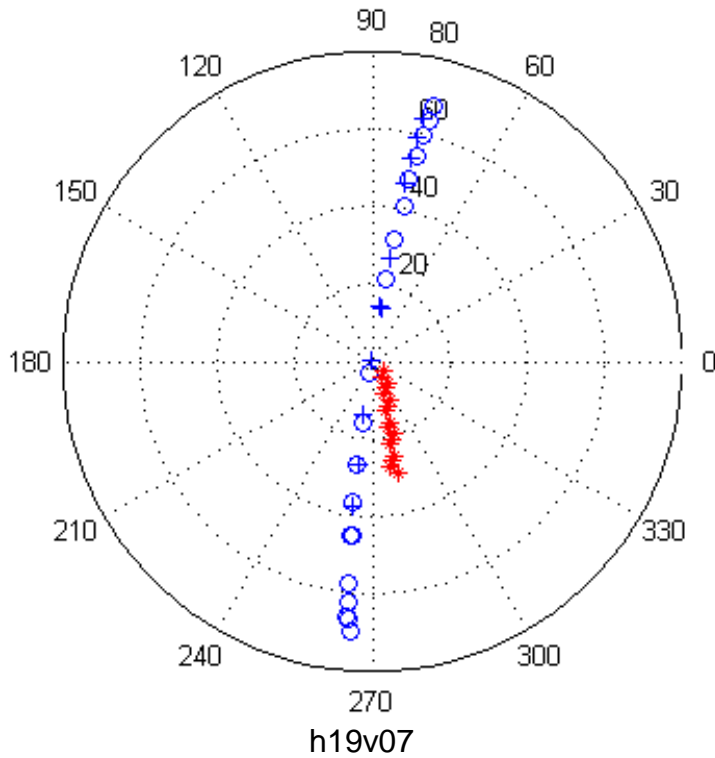
AmeriFlux



Efforts Underway

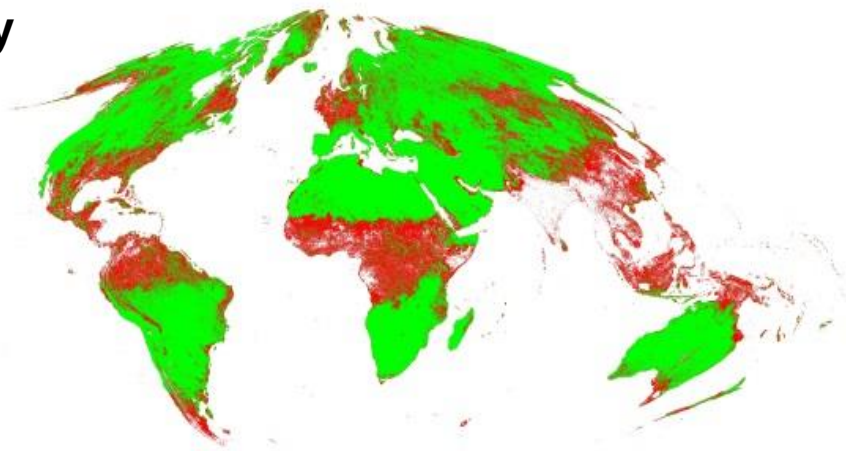
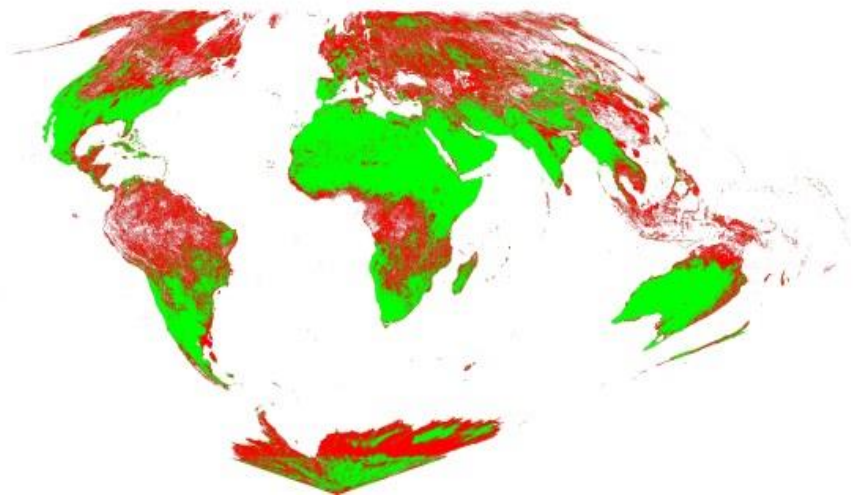
- Impact of Upstream Enhancements
- VIIRS N2B (Hyperion based)
- VIIRS and MODIS spatial resolutions
 - 500m products, 1km and/or 30arc-second
- VIIRS and MODIS combined
 - What happens when Terra finally ends....

MODIS and VIIRS Combined

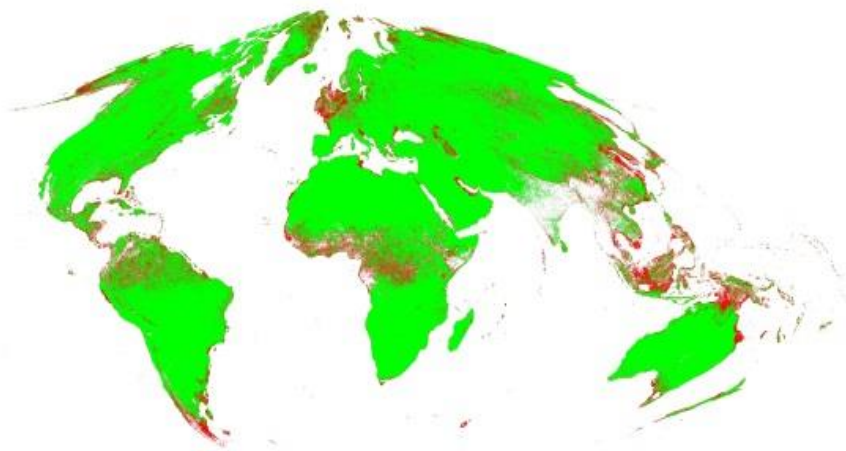
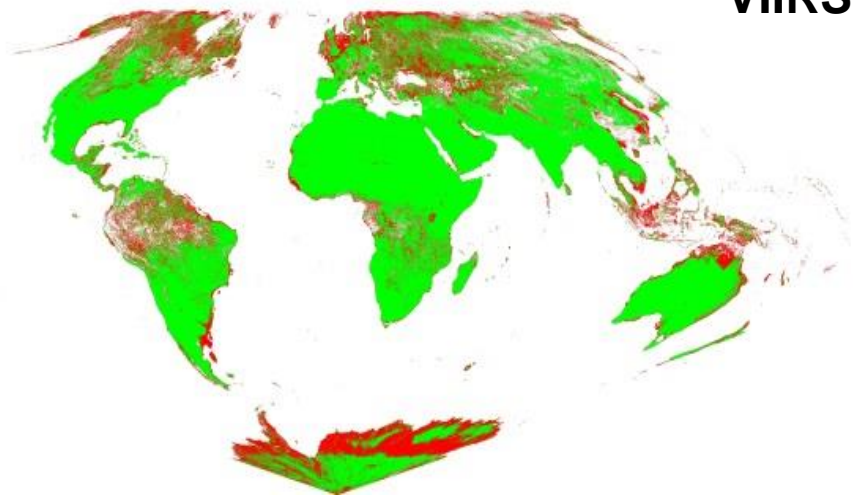


Observations DOY
185-200, 2012

Aqua only



**Aqua
+
VIIRS**



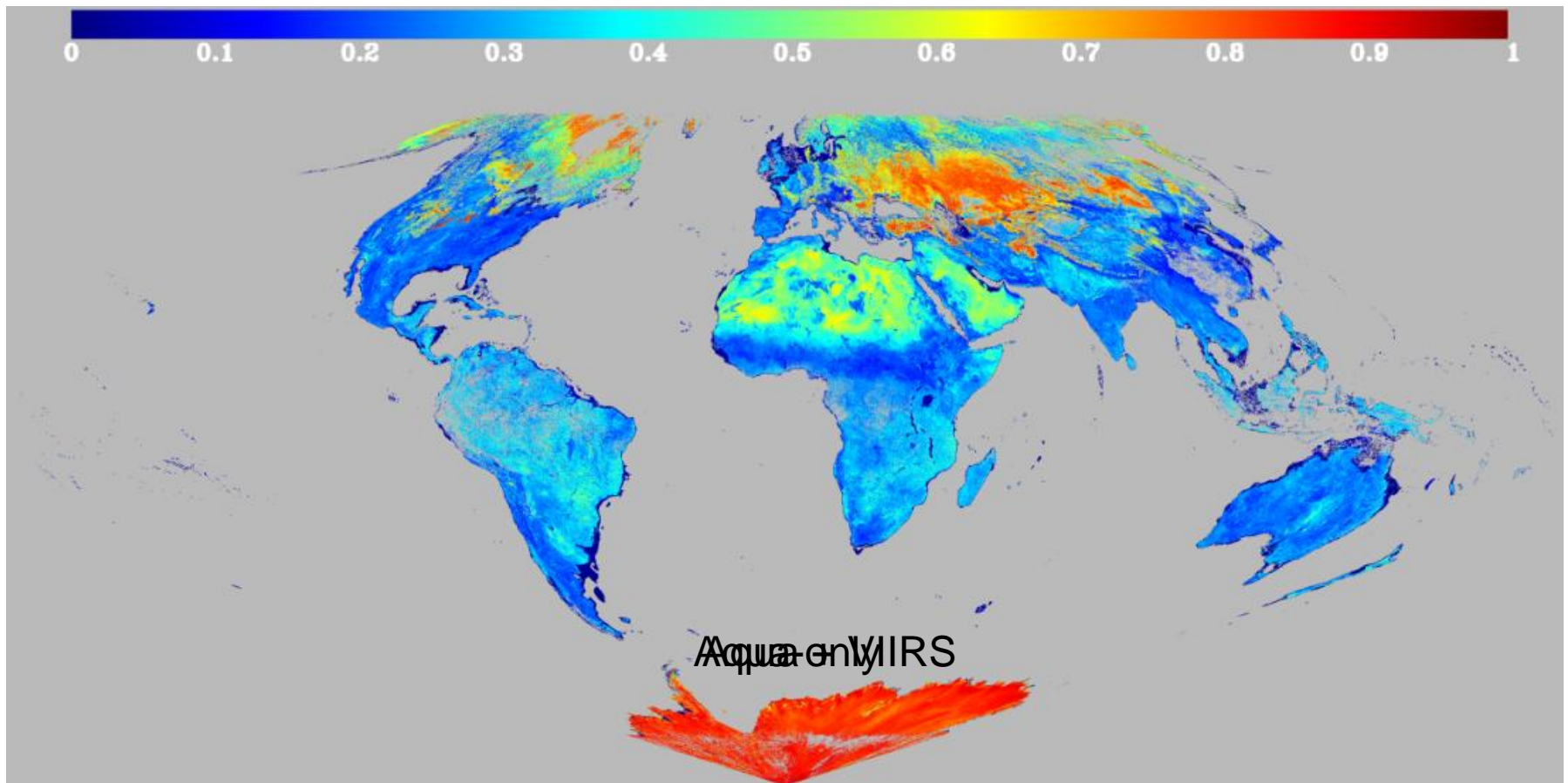
DOY 025

DOY 185

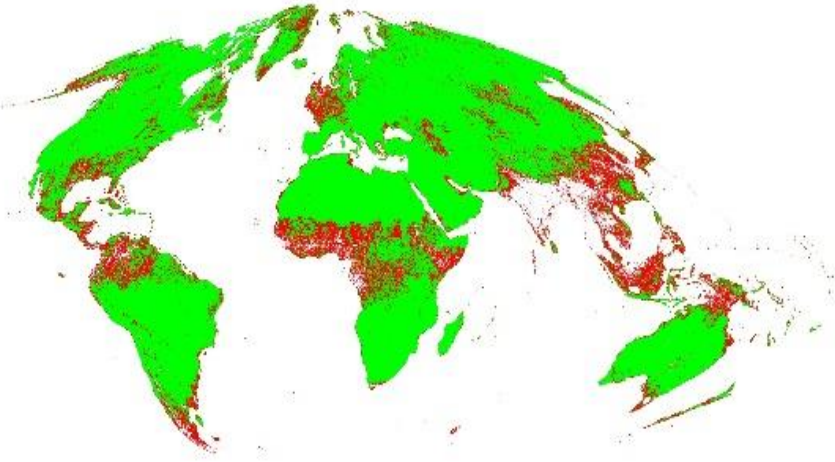
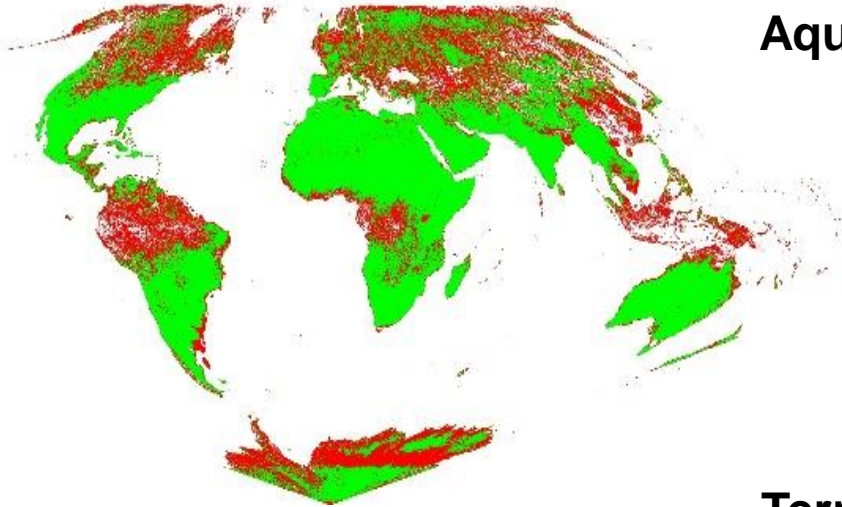
Red band

MODIS and VIIRS

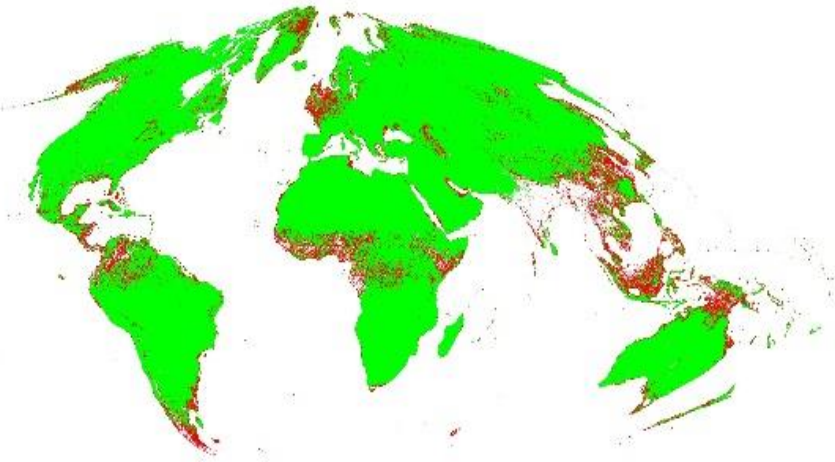
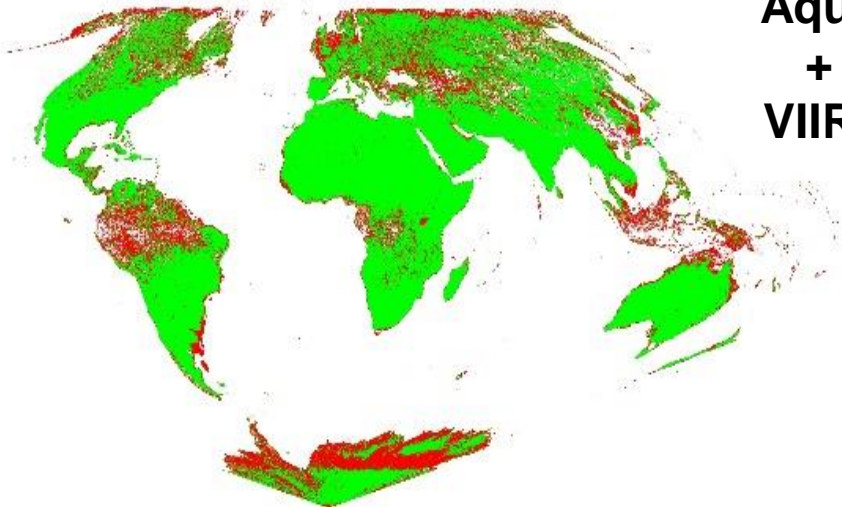
WSA NIR 025, 2012



Terra
+
Aqua



Terra
+
Aqua
+
VIIRS



NIR band

DOY 025

DOY 185

MODIS and VIIRS Continuity

- VIIRS continuity products are currently being implemented and evaluated.
- Eventual loss of Terra will reduce number of high quality retrievals possible per attempt.
- However, high quality VIIRS products will provide long term continuity for BRDF, Albedo, NBAR data.