LAI, FPAR, MOD15 STATUS

R.B.Myneni, Y.Knyazikhin, Y. Tian, S. Hoffman, Y.Wang, N.Shabanov, X.Song, G.J.Smith, M.Weiss

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Missoula, MT 59812

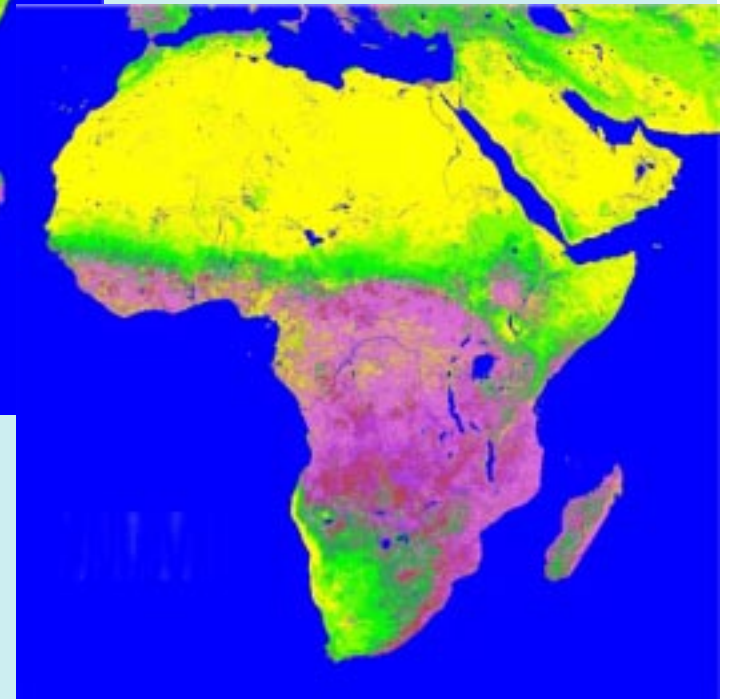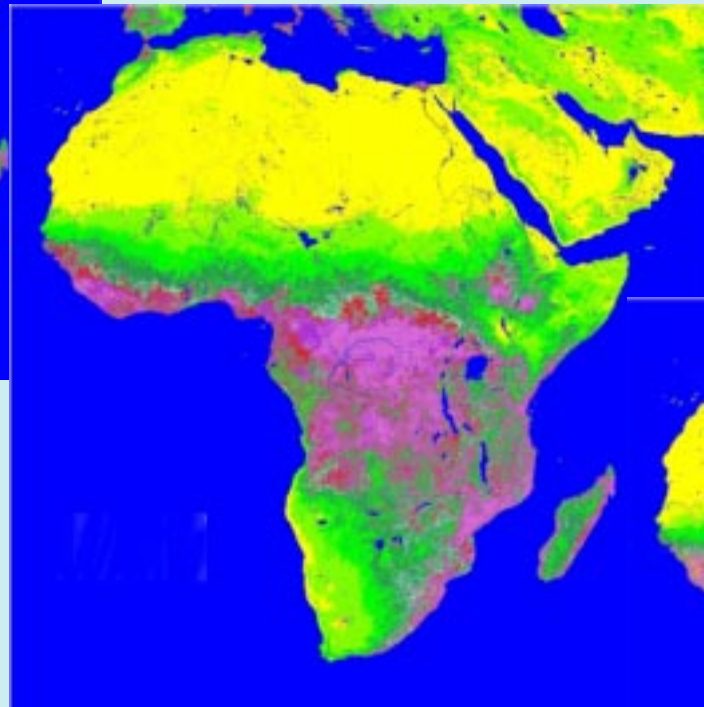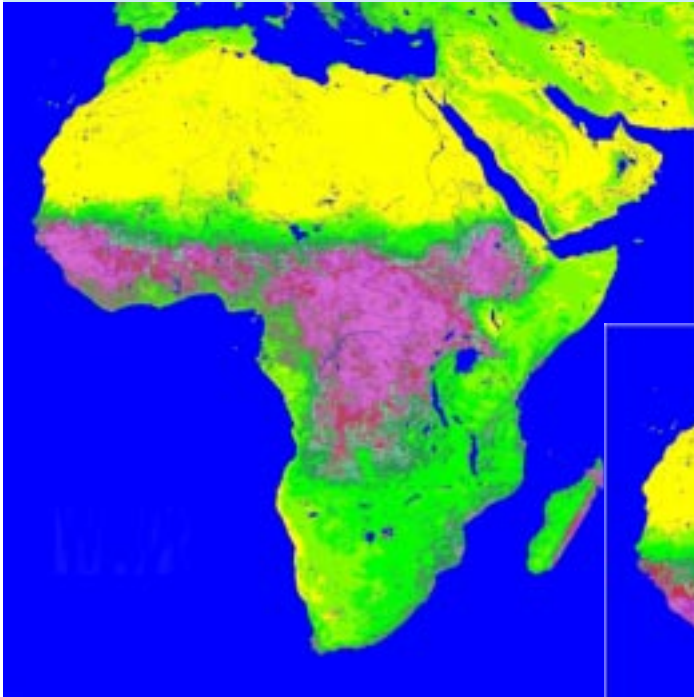MODIS Science Team Meeting

December 17-19, 2001

September 2000

MODIS Leaf Area Index
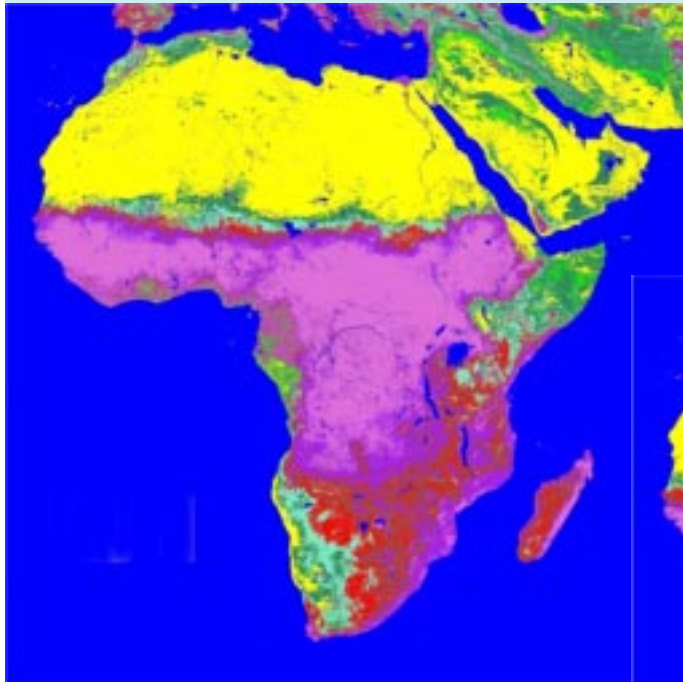
December 2000
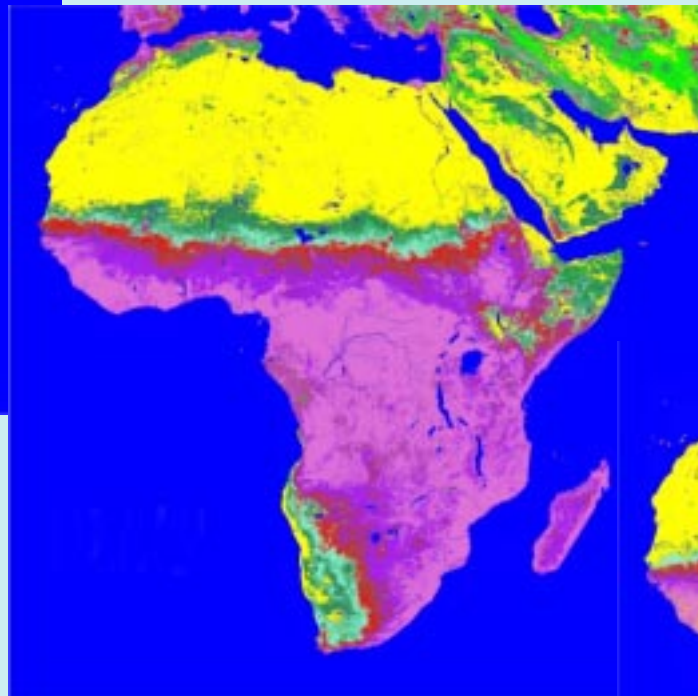
April 2001

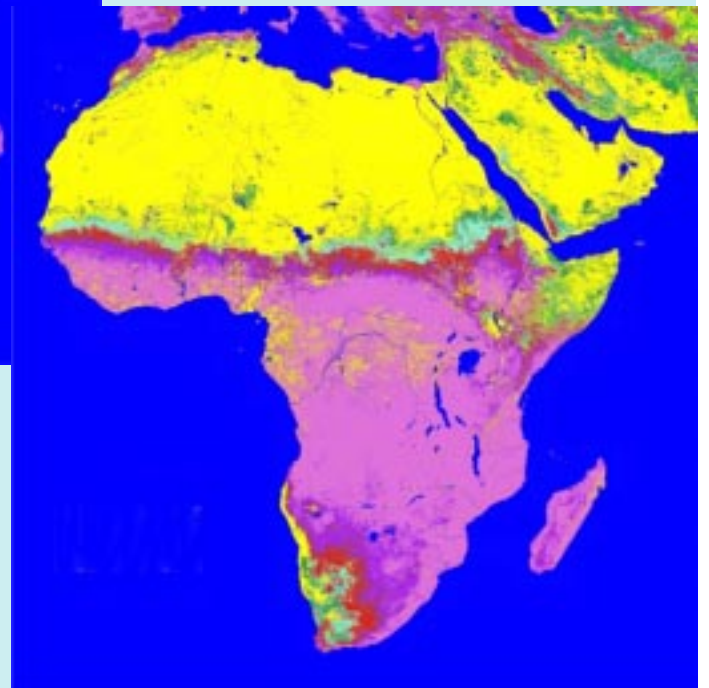0   3   6

September 2000

MODIS FPAR

(Fraction of absorbed Photosynthetically Active Radiation)
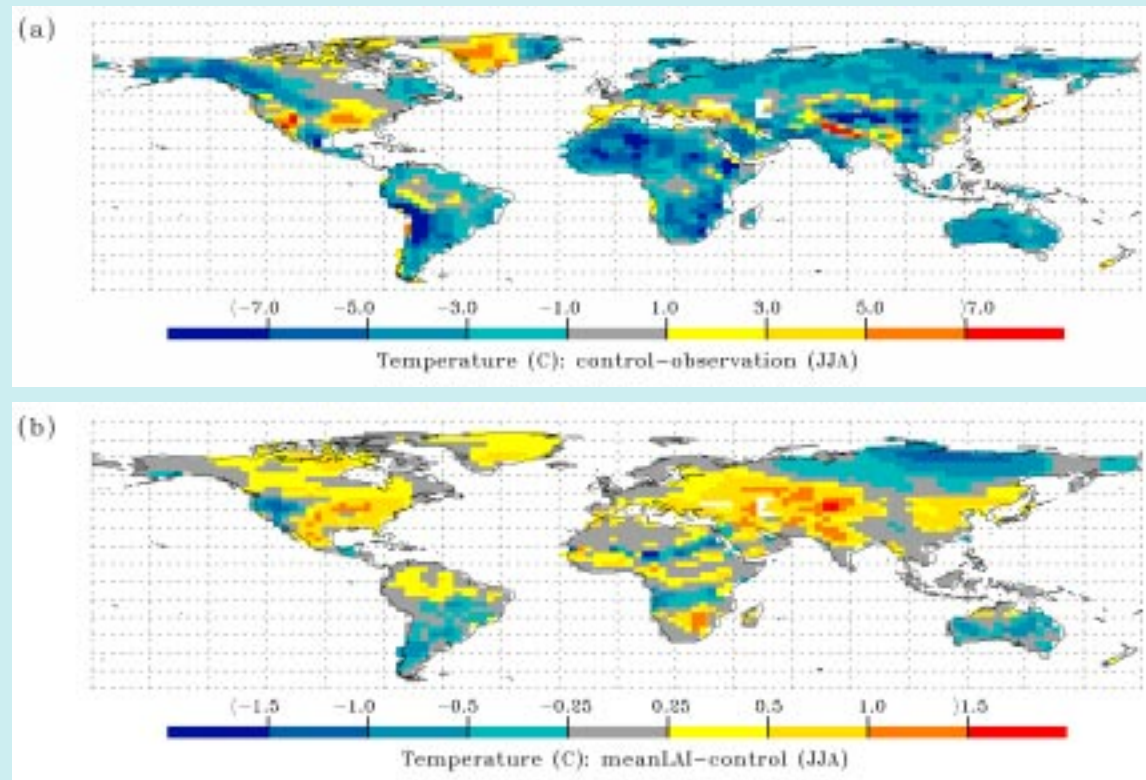
December 2000

April 2001

0   0.5   0.9

Utility of Satellite Based Vegetation LAI Data For Climate Simulations

Buermann, W., J. Dong, X. Zeng, R. B. Myneni, and R. E. Dickinson, 2001: Evaluation of the utility of satellite based vegetation leaf area index data for climate simulations, *J. Climate,* 14(17), 3536-3550.

The use of satellite LAI reduced the model biases in near-surface temperature in comparison to observations

MODIS LAI/FPAR ALGORITHM

INPUT: **surface reflectances, land cover, cloud state**

OUTPUT: **LAI, FPAR, quality indicator of the algorithm**

*Provisional status:* (a) Does not output LAI and FPAR if input is incorrect

(b) Identifies saturation correctly

(c) Follows regularities expected by laws of physics

(d) Agrees with LAI/FPAR field derived from other sensors

MODIS LAI/FPAR ALGORITHM

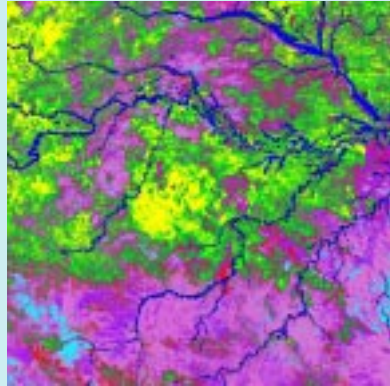**INPUT:** surface reflectances, land cover, cloud state

OUTPUT: LAI, FPAR, quality indicator of the algorithm

Provisional status: (a) Does not output LAI and FPAR if input is incorrect
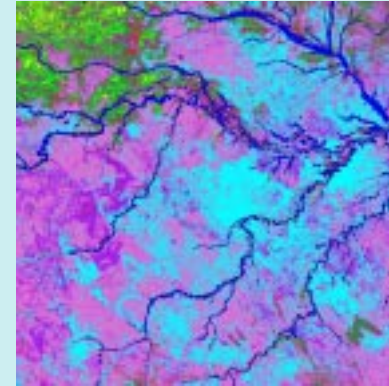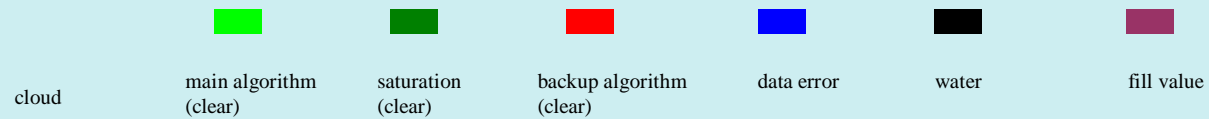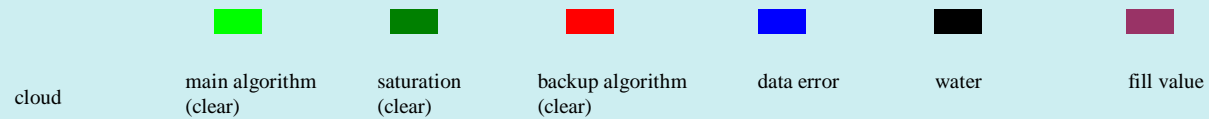

Mean Algorithm Differences
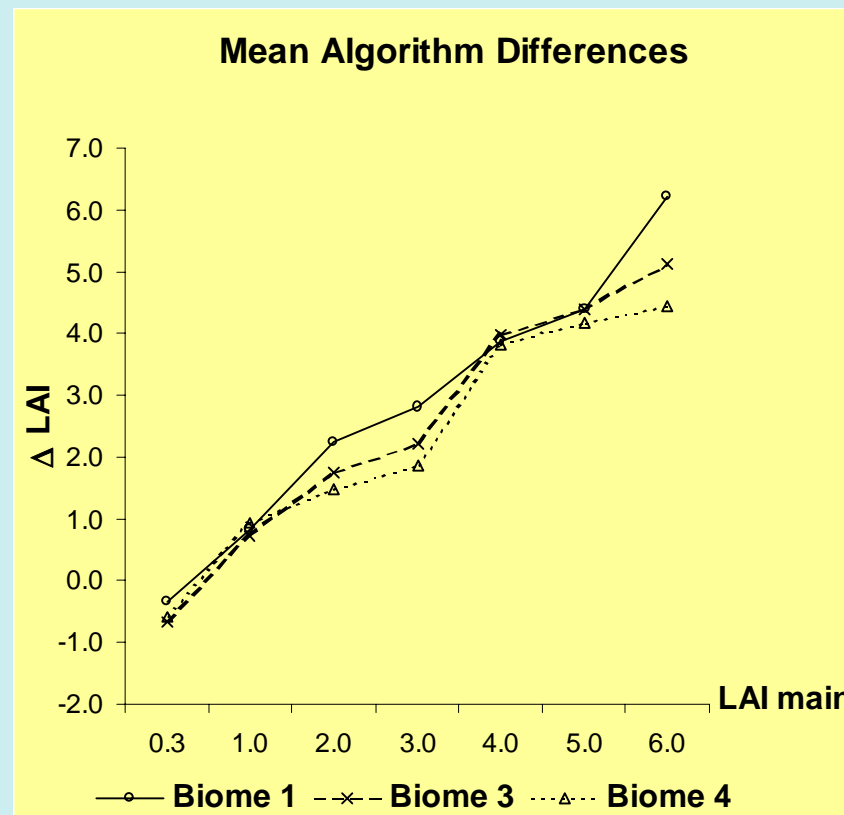
LAI, TILE:H11V09
DATE: July 3, 2000 – July 10, 2000
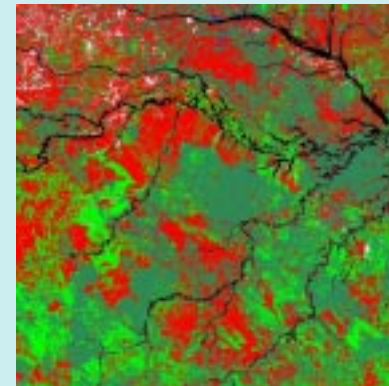
LAI, TILE:H11V09
DATE: July 19, 2000 – July 26, 2000
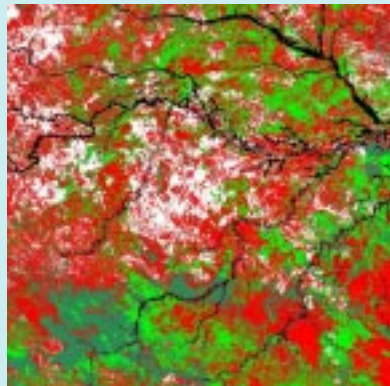
0-0.5	0.5-1.0	1.0-2.5	2.5-4.0	4.0-5.0	5.0-6.0	6.0-7.0	non-vegetated	water	fill value

QA, TILE:H11V09
DATE: July 3, 2000 – July 10, 2000

QA, TILE:H11V09
DATE: July 19, 2000 – July 26, 2000

cloud	main algorithm (clear)	saturation (clear)	backup algorithm (clear)	data error	water	fill value

MODIS LAI/FPAR ALGORITHM

INPUT: surface reflectances, land cover, cloud state

OUTPUT: LAI, FPAR, quality indicator of the algorithm

Provisional status: (b) Identifies saturation correctly

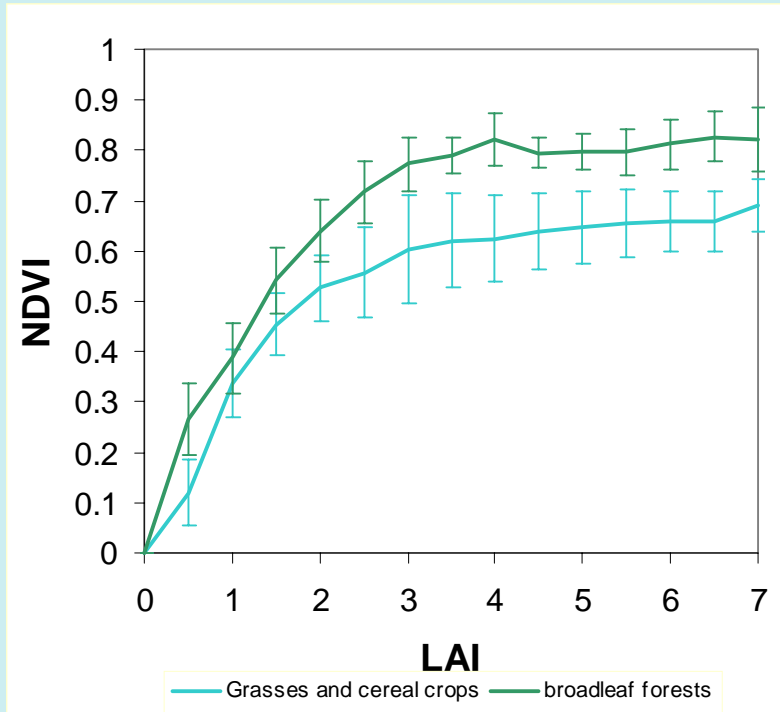KONZA field campaign, July-1999 (saturation test)
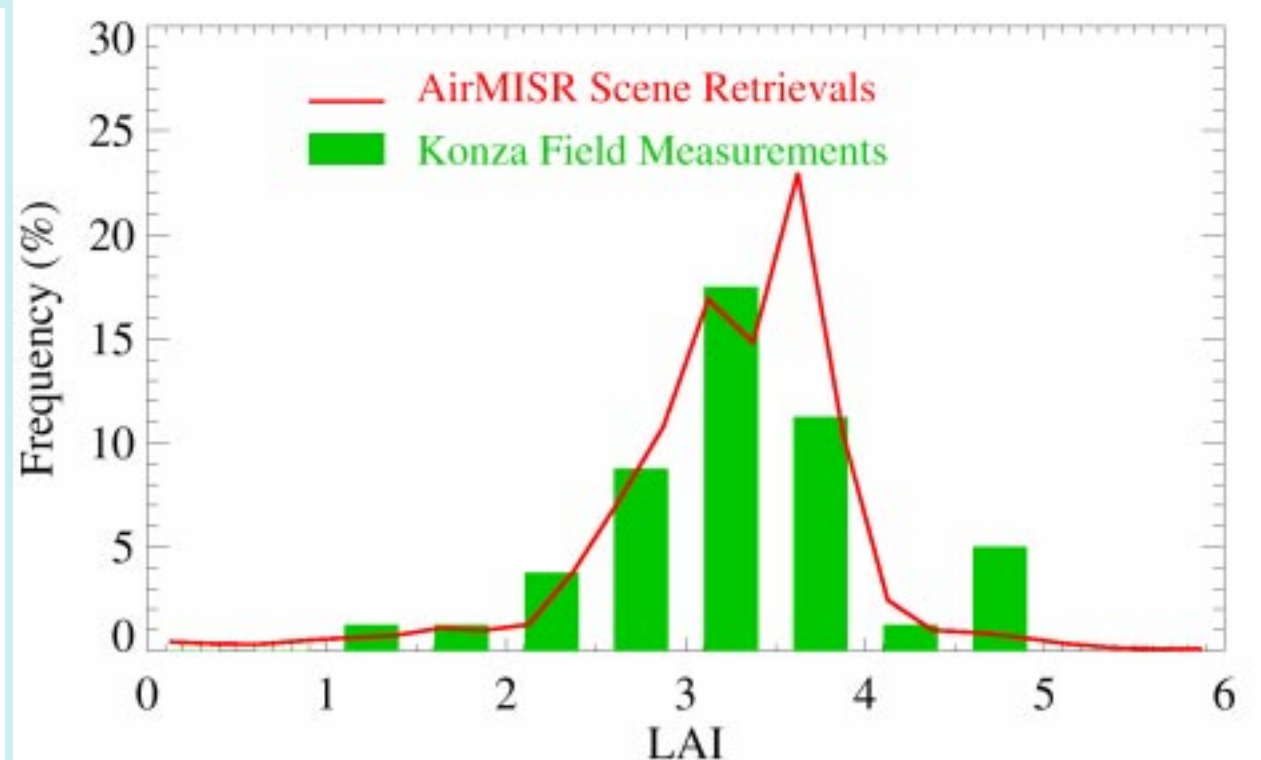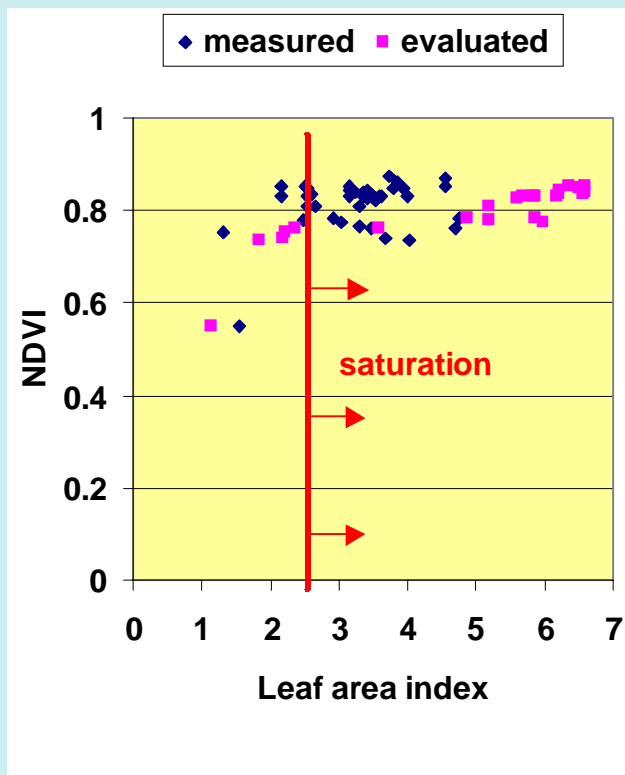
MODIS LAI/FPAR ALGORITHM

INPUT: surface reflectances, land cover, cloud state

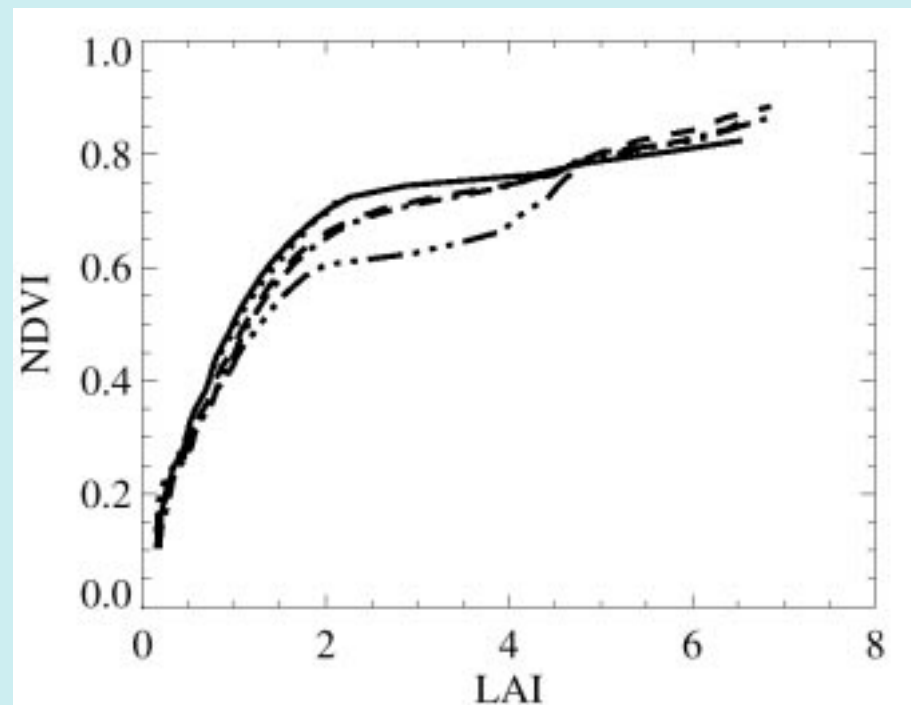**OUTPUT:**   LAI, FPAR, quality indicator of the algorithm

Provisional status: (c) Follows regularities expected by laws of physics

(d) Agrees with LAI/FPAR field derived from other sensors

MISR LAI-NDVI relation

MODIS LAI-NDVI relation

MODIS LAI/FPAR ALGORITHM

INPUT: surface reflectances, land cover, cloud state

OUTPUT: LAI, FPAR, quality indicator of the algorithm

Provisional status: (a) Does not output LAI and FPAR if input is incorrect

(b) Identifies saturation correctly

(c) Passes test of physics

(d) Agrees with LAI/FPAR field derived from other sensors

Partially validated, improvements are continuing.
Useful for exploratory and process studies

THE USERS ARE STRONGLY ADVISED TO PAY ATTENTION TO THE QA FILES ACCOMPANYING THE PRODUCTS

LAI and FPAR Validation Sites
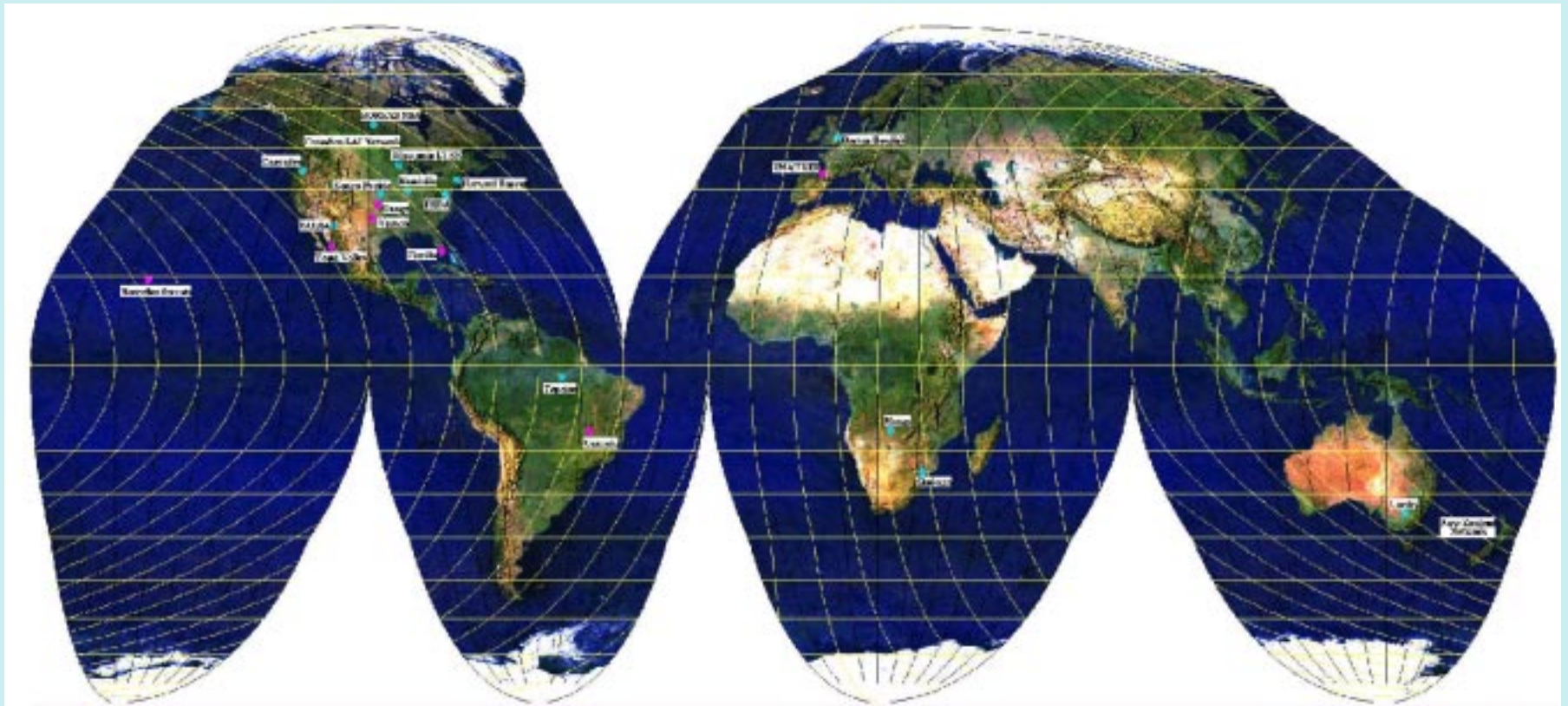
Assessing the uncertainties of satellite derived LAI and FPAR

Assessing the uncertainties of satellite derived LAI and FPAR

BU FIELD CAMPAIGNS:

- SAFARI 2000 WET SEASON CAMPAIGN IN BOTSWANA: MARCH 2000

- FINLAND, RUOKOLAHTI CONIFEROUS FOREST:JUNE 2000

- HARVARD FOREST: JULY 2000 AND 2001

- VALERI VALIDATION SITES: PUECHABON, FRANCE:JUNE 2001

Ruokolahti Field Campaign 2000
Jun. 14—Jun. 21, 2000
Yujie Wang, Wolfgang Buermann, Pauline Stenberg, Pekka Voipio, Heikki Smolander, Tuomas Hame
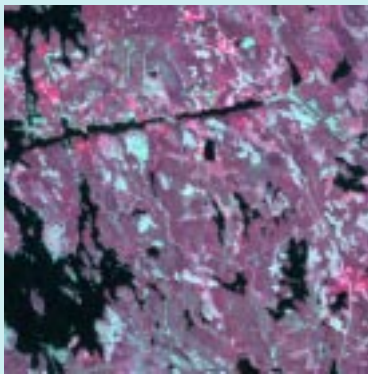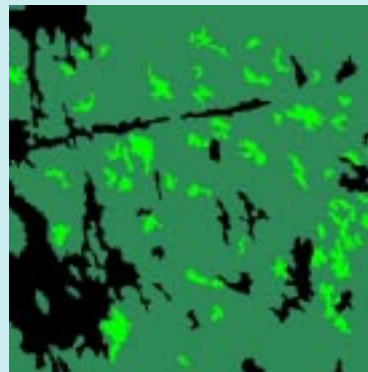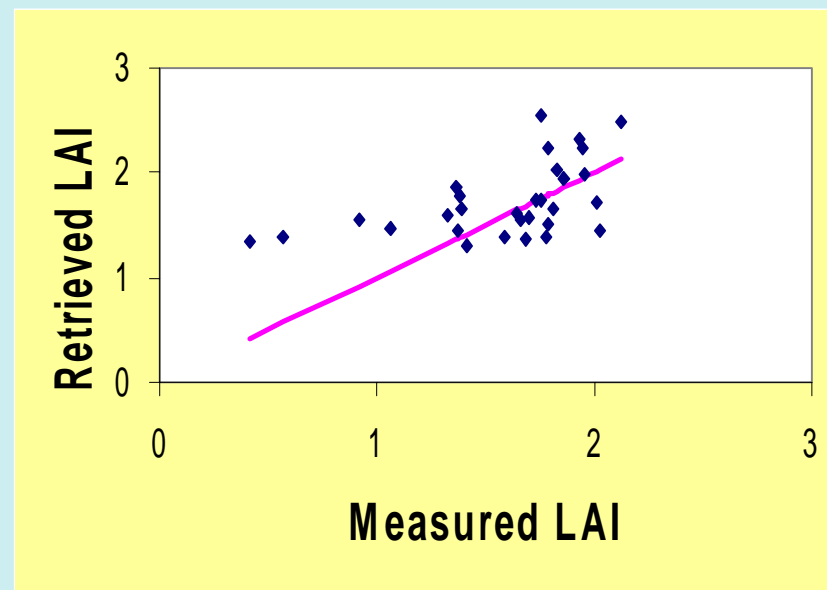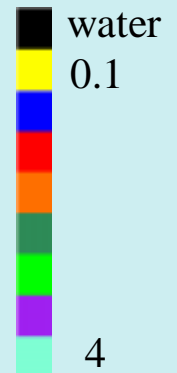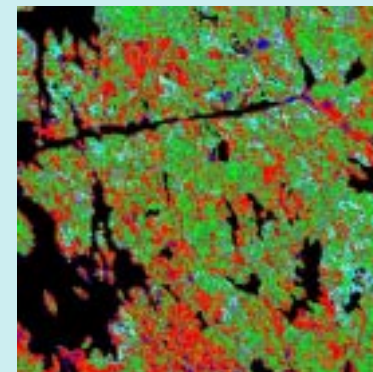
MODIS LAI

10 km Area

MODIS QA

water
0.1

4

Good   Fail   Cloudy   Other
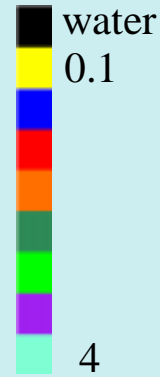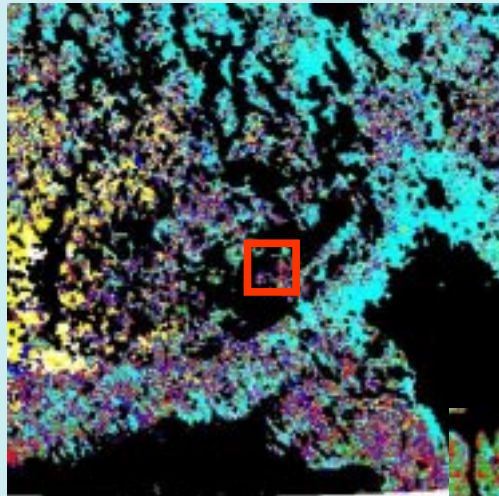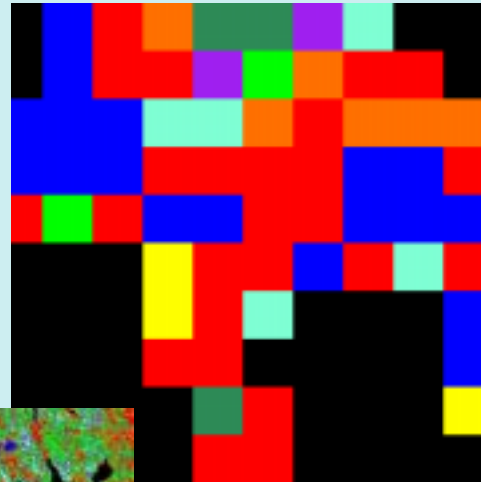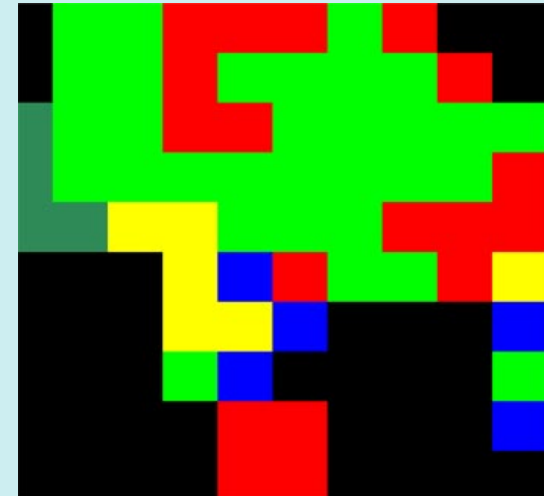
ETM LAI of 10 km Area
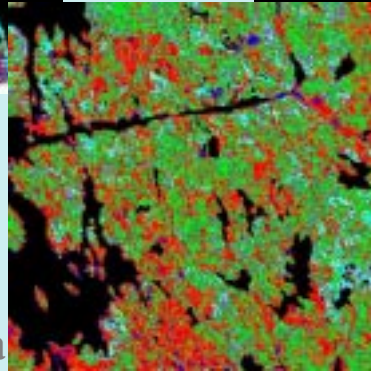
Ruokolahti Field Campaign
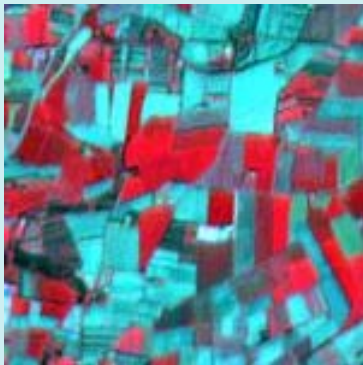# Jun. 14—Jun. 21, 2000

Best   Best & water   Other
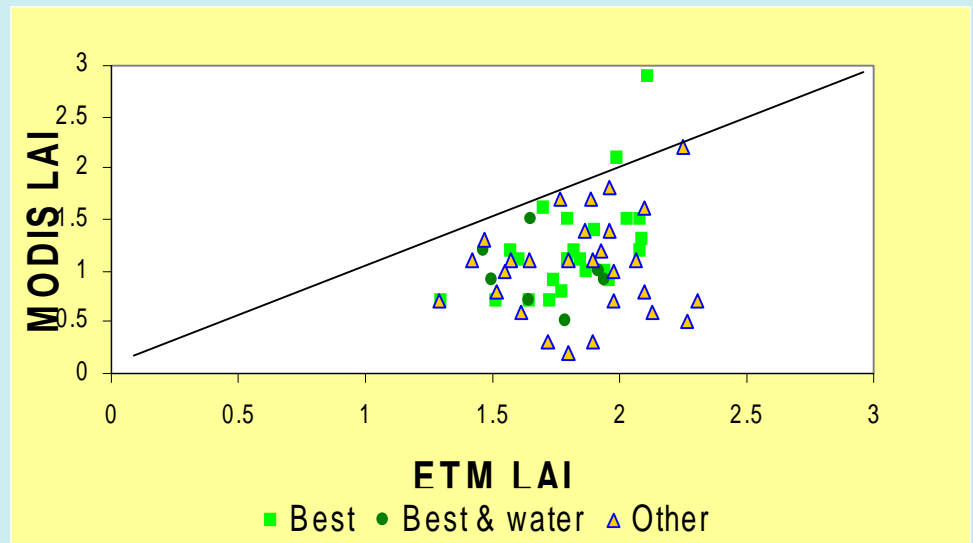
VALERI 2001 Field Campaign: **Alpilles, France**

February 26—March 15, 2001
Marie Weiss (INTA, France), Grace R. Smith (Boston)
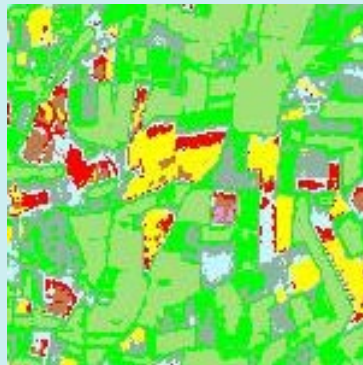
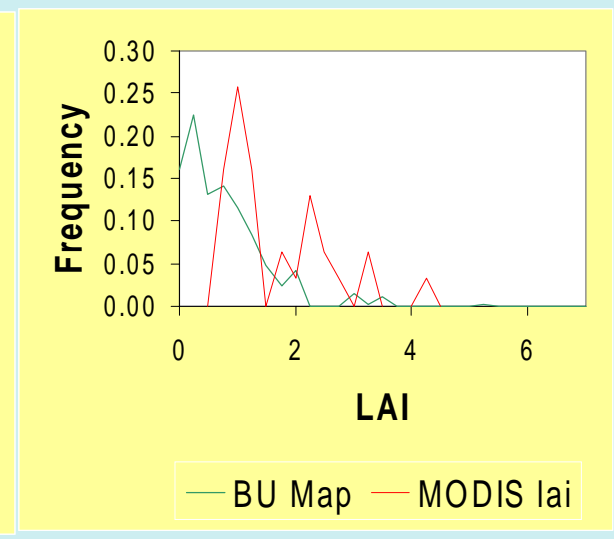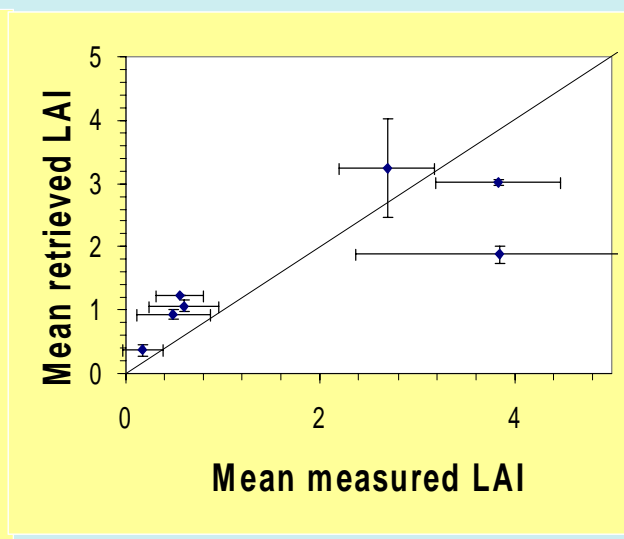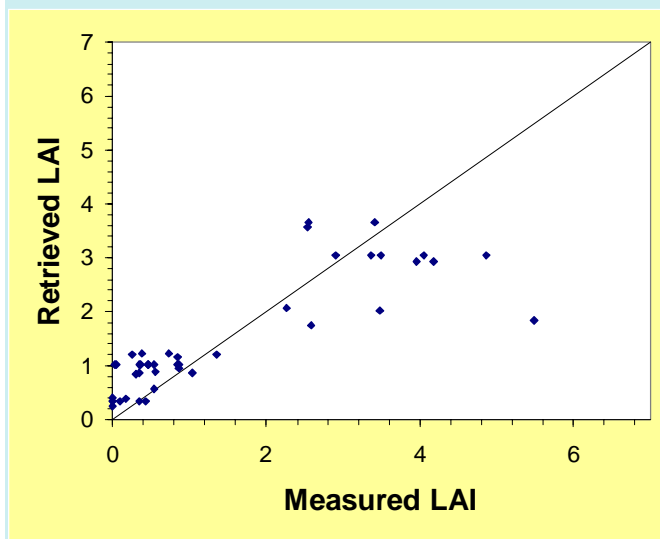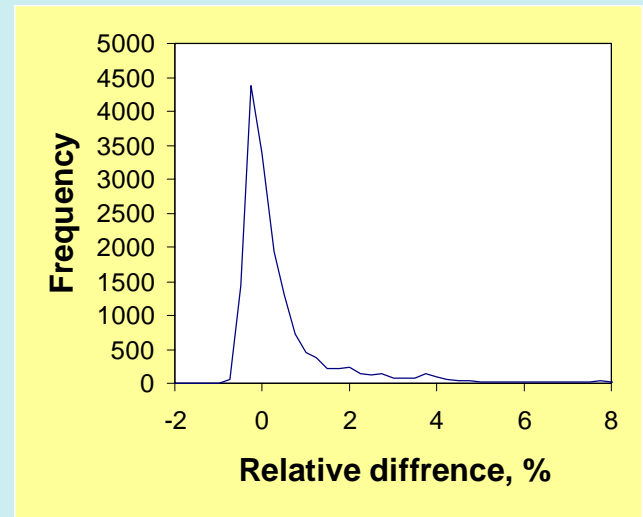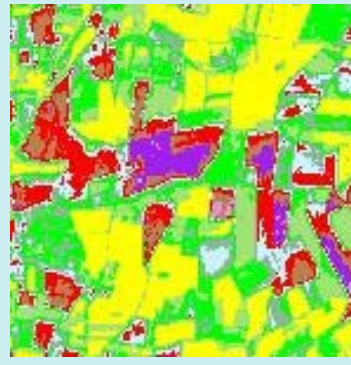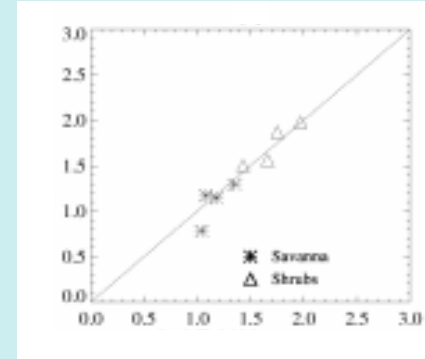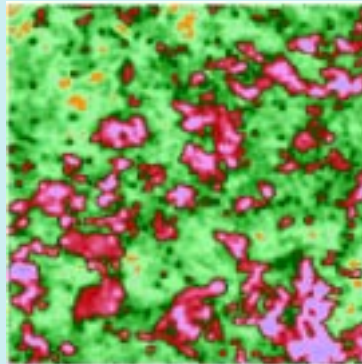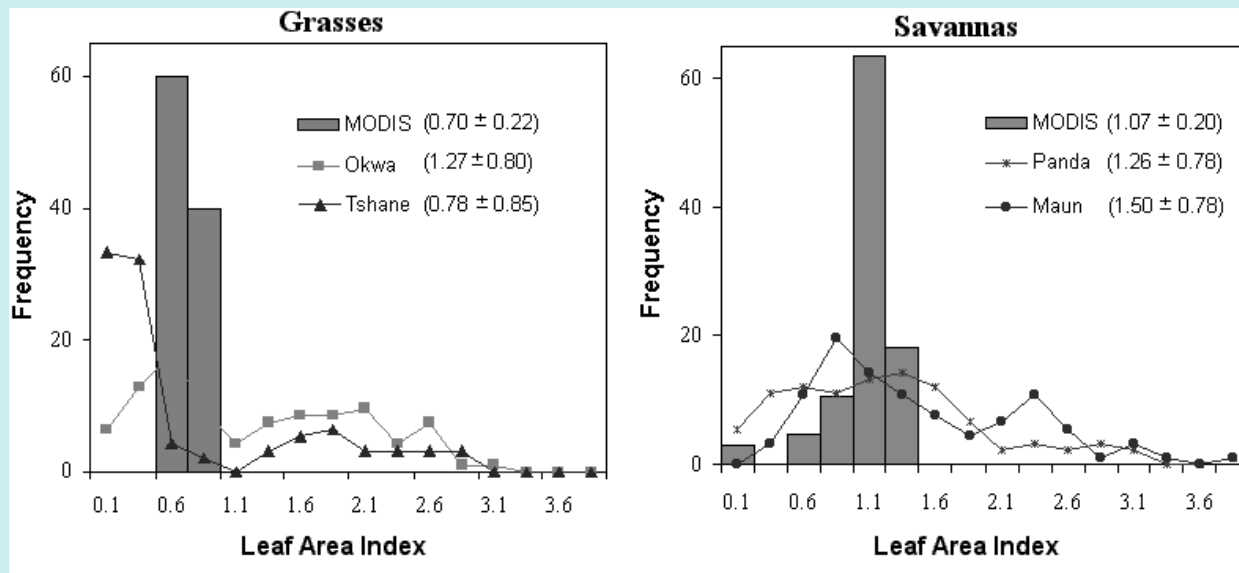# SAFARI 2000 WET SEASON FIELD CAMPAIGN, MARCH 3-18, 2000

ETM+ Image
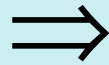
A fine resolution LAI map and its uncertainty

MODIS LAI product is numerically accurate to within the field measurements uncertainty

IMPROVEMENT OF THE LAI/FPAR PRODUCT

- Uncertainty Information in the Surface Reflectance

- Accounting for within pixel heterogeneity