

JRC K&C AFRICA PALSAR MOSAICS



Institute of Geography & Earth Sciences



K&C 14 Meeting – June 16, 2010
Tsukuba, Japan

STATUS of the K&C PALSAR AFRICA MOSAICS



David Kirk – Catching the bus

**2009 - We are always late...
Therefore we invented the saying:
The later, the better....**

**January 2010 - We are still late...
Therefore we invented the saying:
When the bus crashes, try to walk
to destination....**

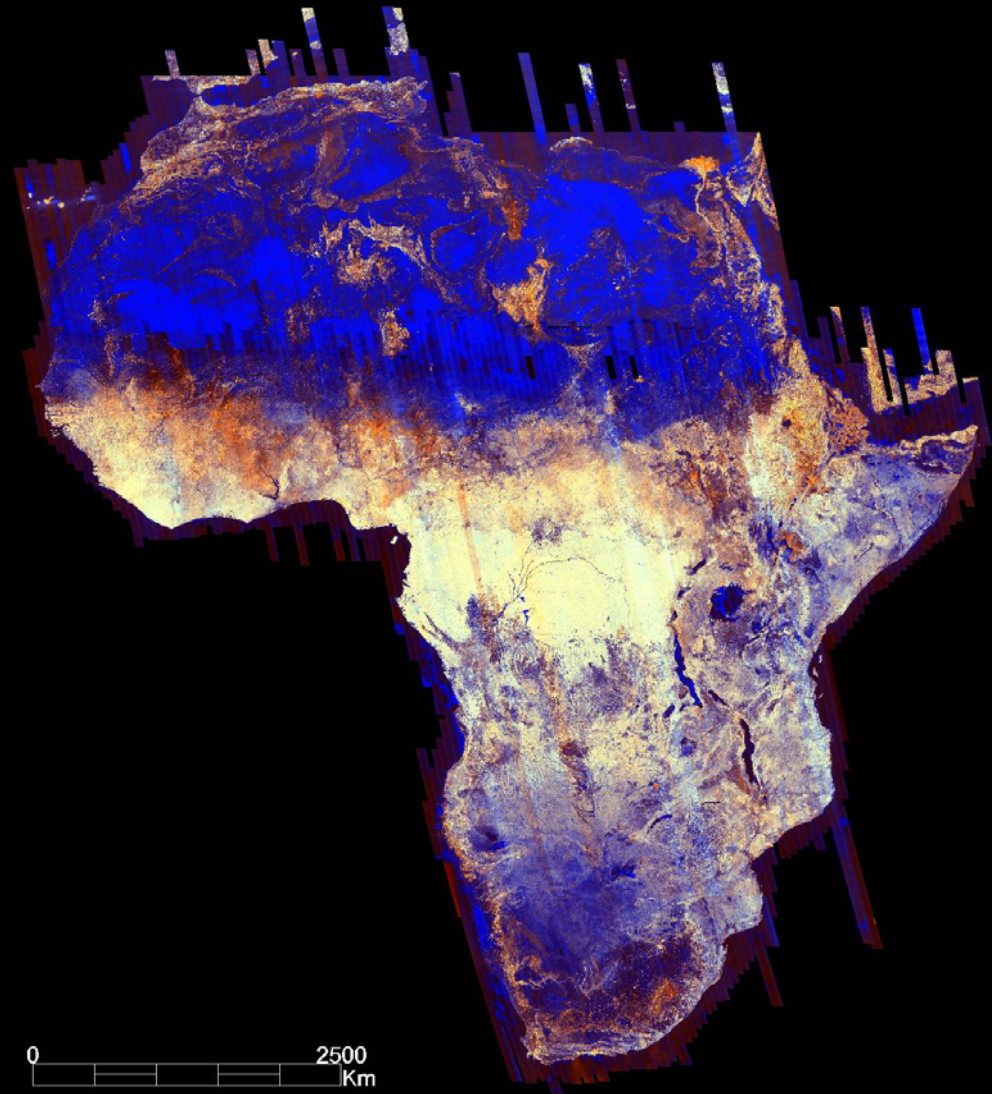
**June 2010 - We finally caught the
bus.....
However, we do not know now
where to stop....**

STATUS OF THE K&C PALSAR MOSAICS

They are there.....but need to grow up...



Prototype mosaics (HH + HV):
Central Africa
West Africa
Northern Africa
South Africa



THE K&C AFRICA PALSAR MOSAICS: FACTINOS

Compiled from 319 ALOS PALSAR dual-pol HH-HV slant range long strip images correlated by JAXA SigmaSAR processor, and acquired mainly between June and August 2007.

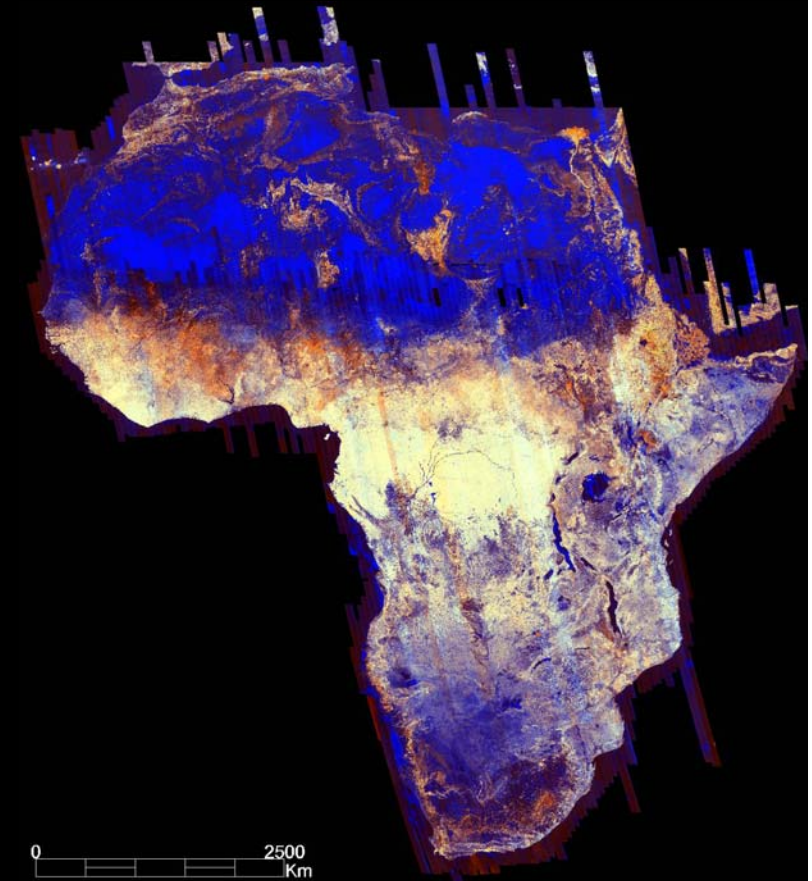
Strips geo-coded using SARscape software by SARMAP and a DEM derived from SRTM data.

Map coordinate system: geodetic (lat, lon) with 0.8333×10^{-3} Degree pixel size.

Radiometric correction for topography embedded into the classification step as a function of nominal incidence angle and terrain slope.

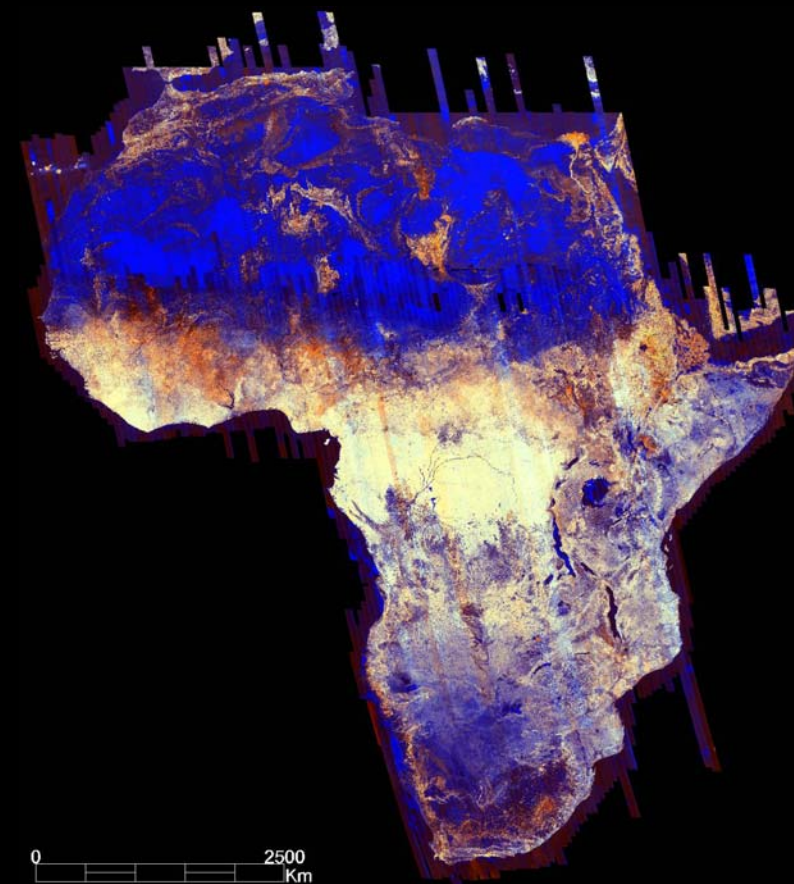
Data representation:
backscatter amplitude HH or HV, 16 bit unsigned integer. RGB composite HH-HV-HV/HH 8 bit BIP.

Radiometric cosmetics: strips boundaries blending at pasting stage, strip balancing to account for seasonality and incidence angle effects.



PROCESSING CHAIN SUMMARY

- 1) Slant range strips correction for anomalous range dependence.
- 2) HV strips calibration for thermal noise.
- 3) Extraction of a strip bounding DEM subset from a global SRTM derived Africa DEM.
- 4) Strips geo-coding using SARscape software by SARMAP.
- 5) Geocoded strips data compression.
- 6) First approximation mosaic compilation (with automatic strip layout, and strip margins blending).
- 7) Estimation and report of between-strips radiometric discrepancies.
- 8) Generation of overall gain functions to account for anomalous radiometry (seasonality, rain-fall).
- 9) Generation of left-right gain functions (along track) to minimize discrepancies.
- 10) Compilation of second approximation mosaic with masks to allow backtracking to original data.
- 11) Mosaics geometric and thematic validation (using TREES2 data).



Some 30 thousand lines of IDL code

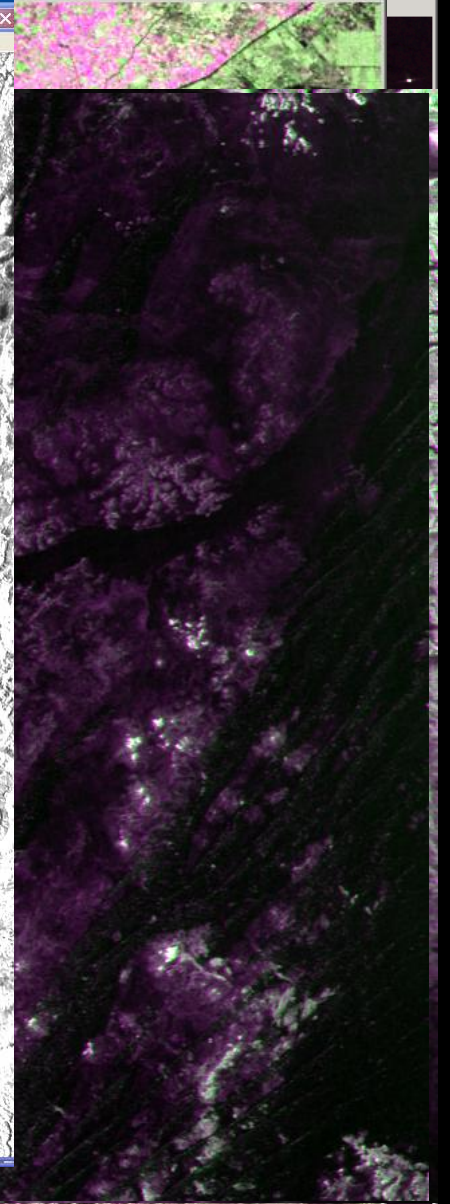
NORTHERN AFRICA TILE

#4 R:Band 1:NA_HH_Apr30_msc,G:Band 1:NA_HVrev_Apr12_msc,B:Band 1:NA_HH_Apr30_msc

File Overlay Enhance Tools Window

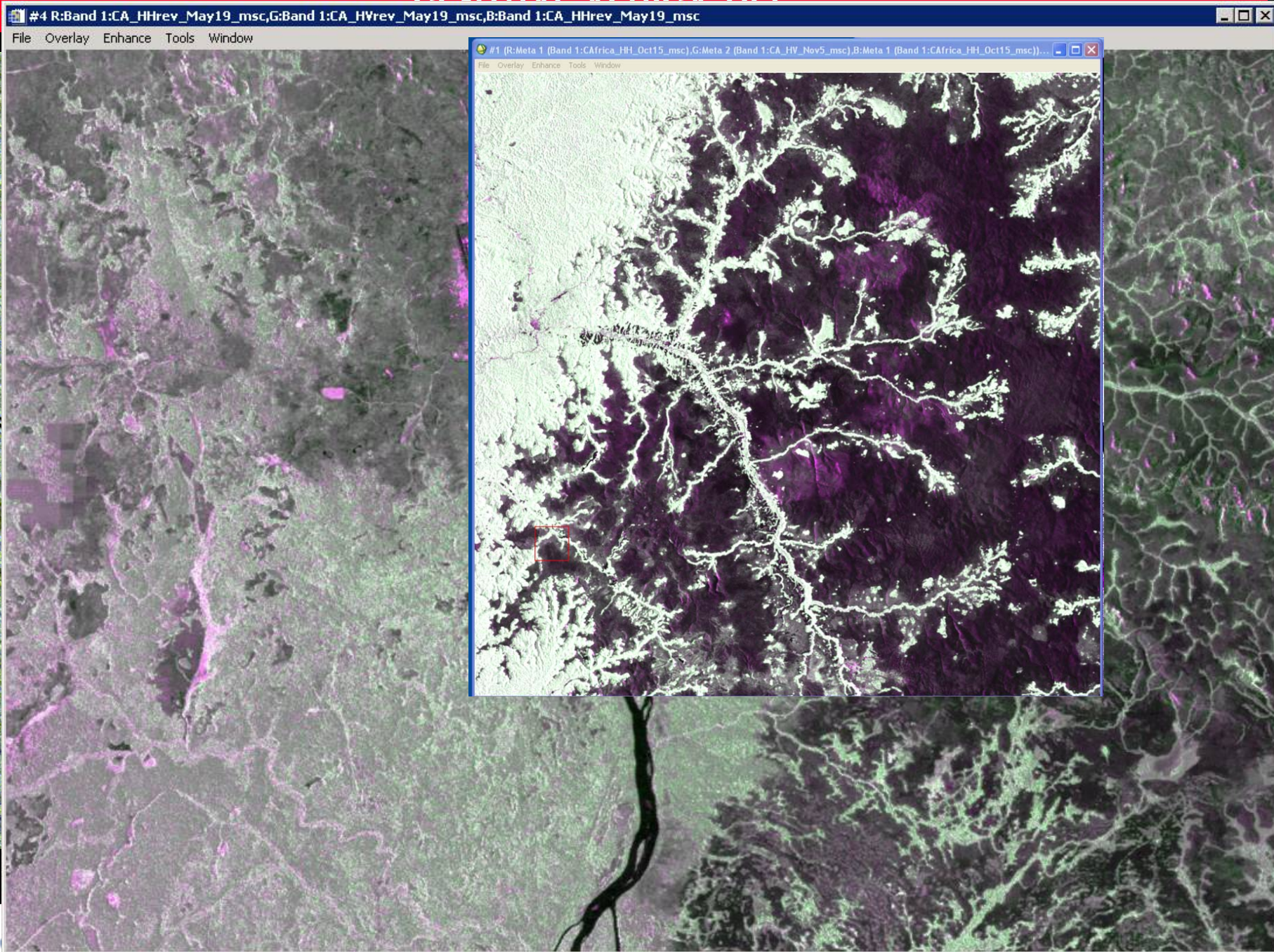
#5 Band 1:NA_HH_Dec4_msc

File Overlay Enhance Tools Window

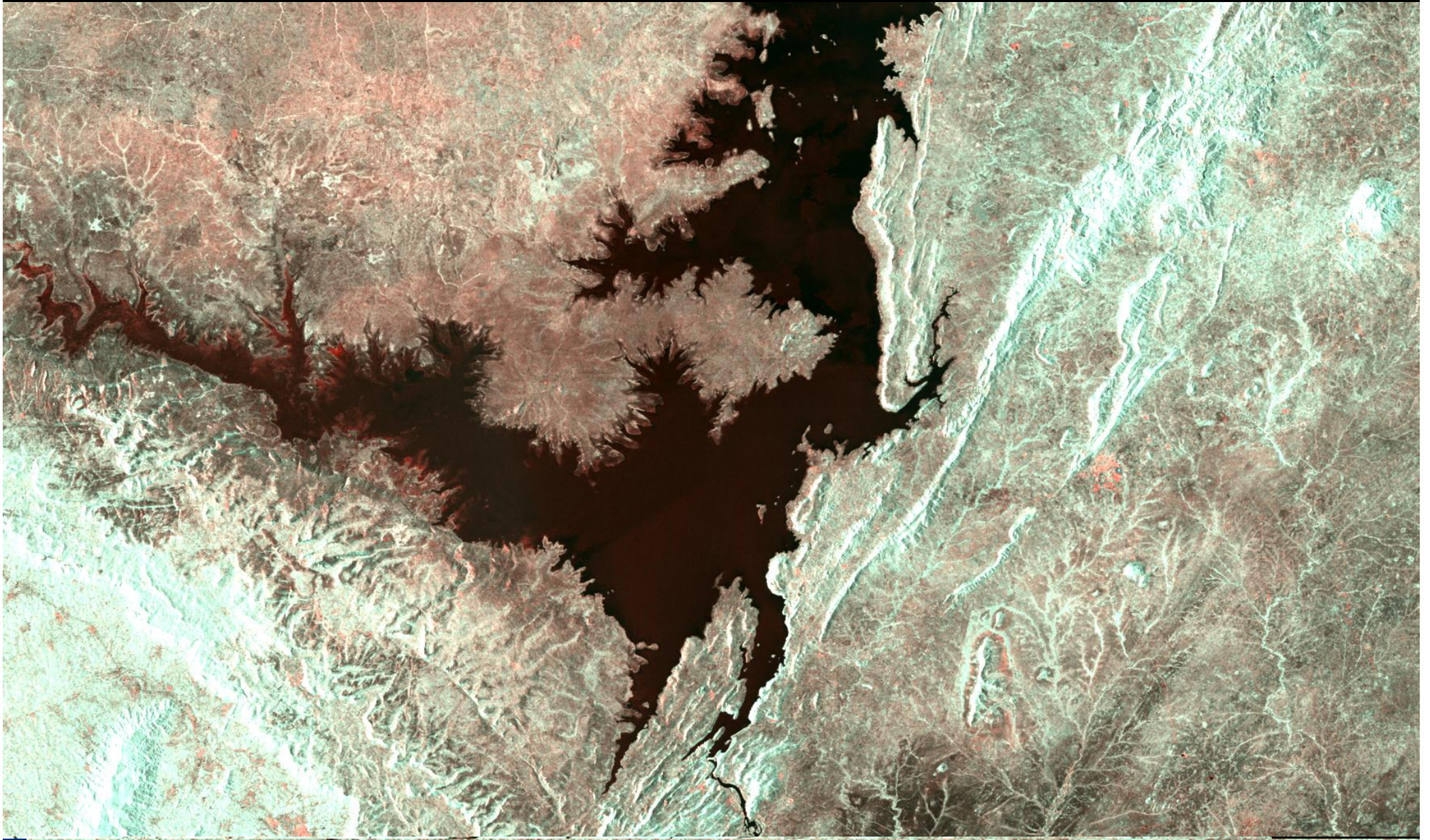


EUROPEAN COMMISSION

M



WEST AFRICA TILE

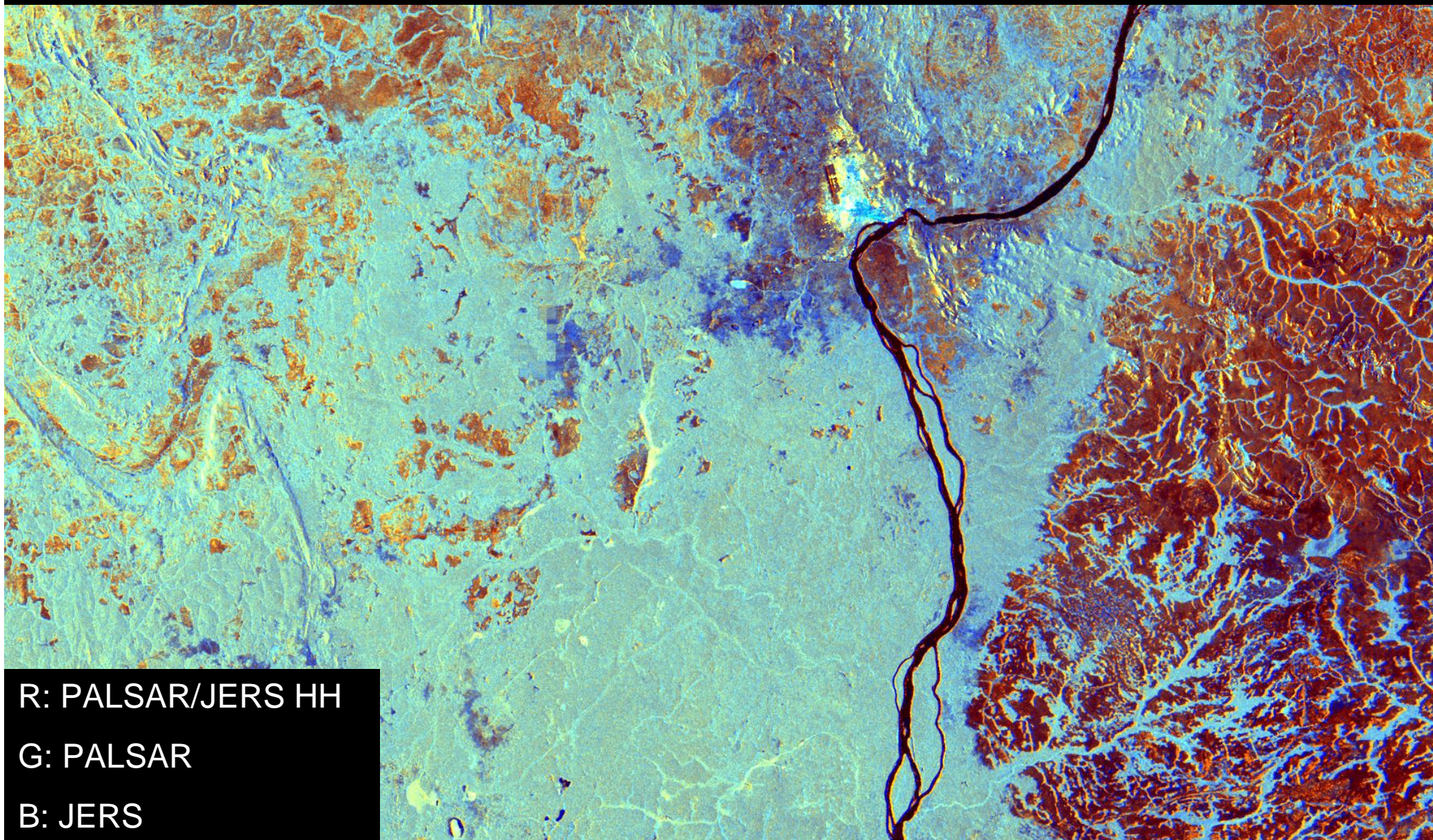


SOUTH AFRICA TILE

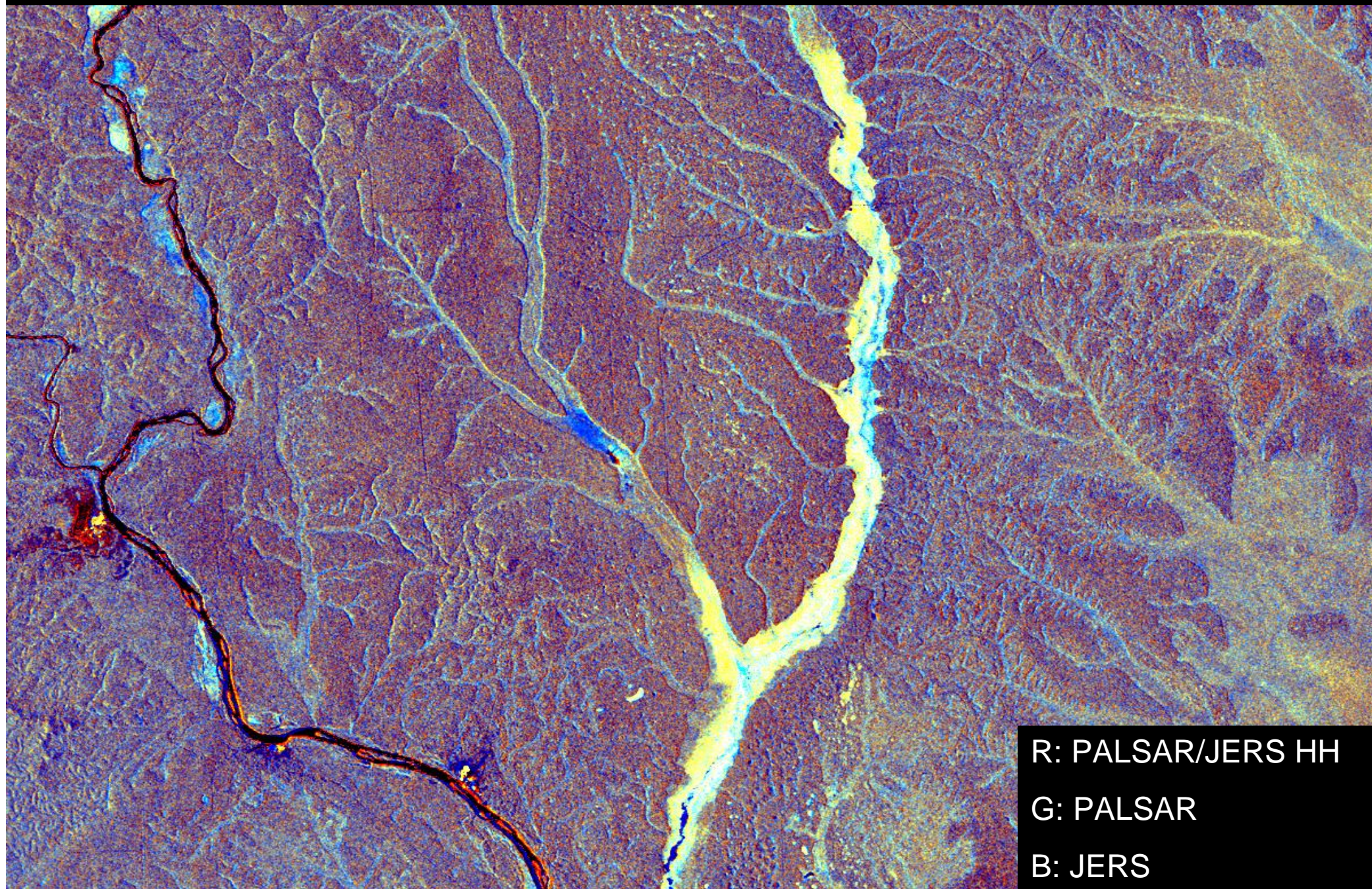


GRFM-KC 1997-2007 CHANGE DETECTION

Monitoring in time the interface between primary
rain forest and savanna



GRFM-KC 1997-2007 CHANGE DETECTION



where is the bus going....

GENERATION OF A PAN-AFRICAN SAVANNAS AND WOODLANDS BIOMASS MAP

Product based on functional dependence between PALSAR HH-HV radar backscatter and standing biomass estimated by correlation with ground-based plots and with constraining variables derived from the mosaic land-cover classification and TRMM rainfall data.

A joint effort involving
for the analysis:

University of Edinburgh UK

Aberystwyth University UK

Tropical Research Institute (IICT)

JRC – IES EC

NASA JPL US

Collaborators for field data:

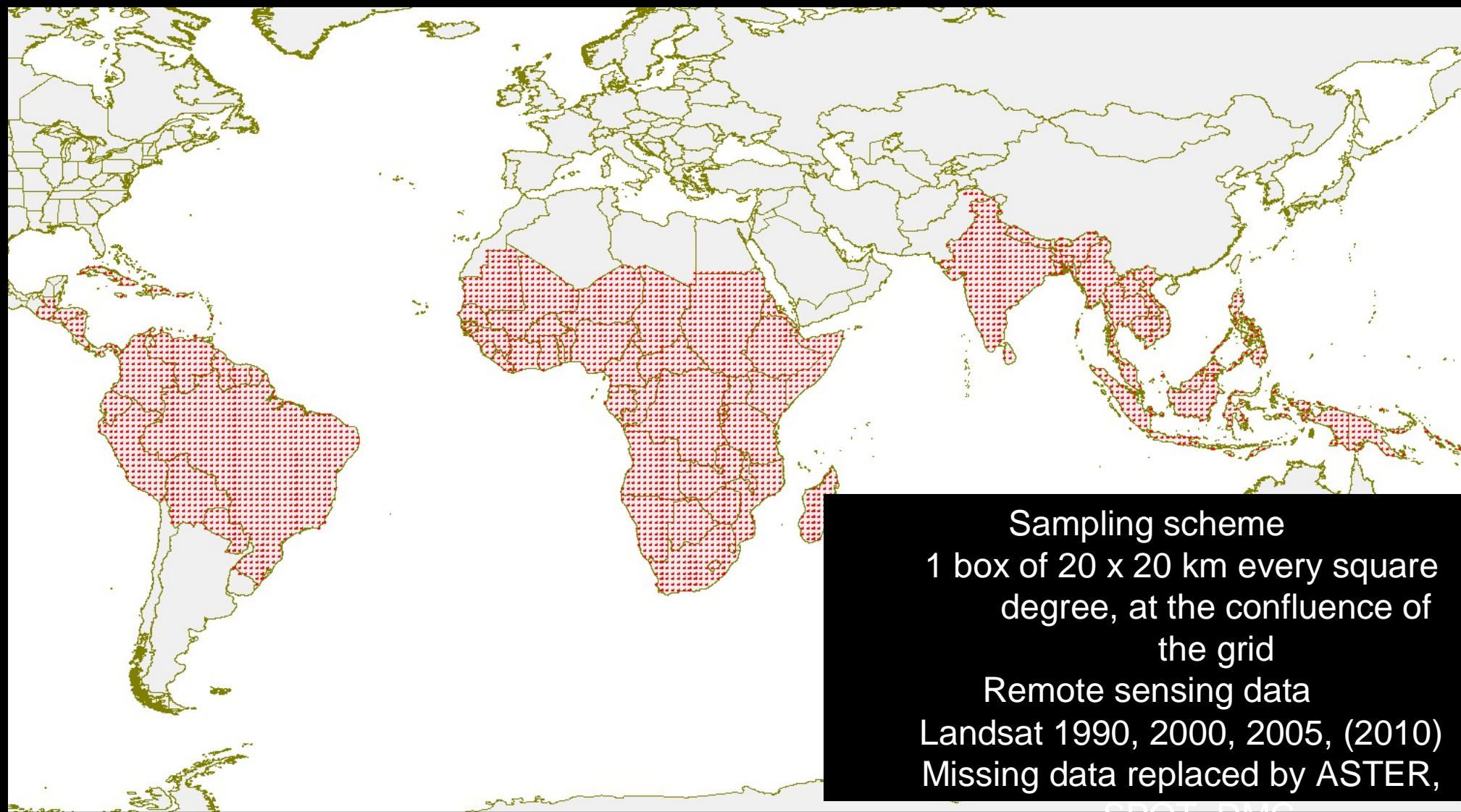
Gabonese Ministry of the Environment,
the University of Leeds, Rhodes
University (South Africa), the University
of Colorado, WCS Uganda, Peace
Parks Foundation (South Africa and
Zambia), and Envirotrade.



**In the framework of the JAXA-JRC 2010-2011 collaboration agreement
for the K&C Initiative**

where is the bus going....

K&C AFRICA MOSAICS GEOMETRIC AND THEMATIC VALIDATION WITH RESPECT TO TREES-3 PROJECT SAMPLES



Sampling scheme

1 box of 20 x 20 km every square
degree, at the confluence of
the grid

Remote sensing data

Landsat 1990, 2000, 2005, (2010)

Missing data replaced by ASTER,

SPOT, DMC...

ACKNOWLEDGMENTS



Many thanks to all the brave folks at JAXA and elsewhere who made it possible to climb the mountain...

² **CLIMB EV'RY MOUNTAIN**

Lyrics by OSCAR HAMMERSTEIN II
Music by RICHARD RODGERS

Moderately slow

mp

With pedal

mf

4

4

5

Copyright © 1989 by Richard Rodgers and Oscar Hammerstein II
Copyrights Renewed
This arrangement Copyright © 1989 by WGL JAMSON MUSIC
WILLIAMSON MUSIC: owner of publication and all other rights throughout the world
International Copyright Secured. All Rights Reserved