

*Southern Africa Fire Network
(SAFNet)
of the Global Observation of Forest Cover
(GOFCC)*

Developing Capacity for Operational Fire Monitoring
and Management Systems in Southern Africa

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SAFNet – Currently coordinated at the University of Botswana under the Botswana Global Change Committee in the Dept of Environ. Sc.

- **A regional network formed 3 years ago - Global Observation of Forest Cover Network (GOFC).**
- **SAFNet aims to foster collaborative efforts in fire monitoring & management in Southern Africa**
 - **SAFNet goal: achieve effective fire management policies & practices through the use of spatial information technologies such as remote sensing, GIS etc.**
 - **Current membership: represents Meteorological Departments, National Parks, Range/Forest fire sectors, NGOs, Community Based Organizations, University and Research bodies.**
 - **Last SAFNet meeting: July 2002 at the University of Botswana.**
 - **Next Meeting: August 2003 at Kruger National Park – South Africa.**

SAFNet)



Why SAFNet?

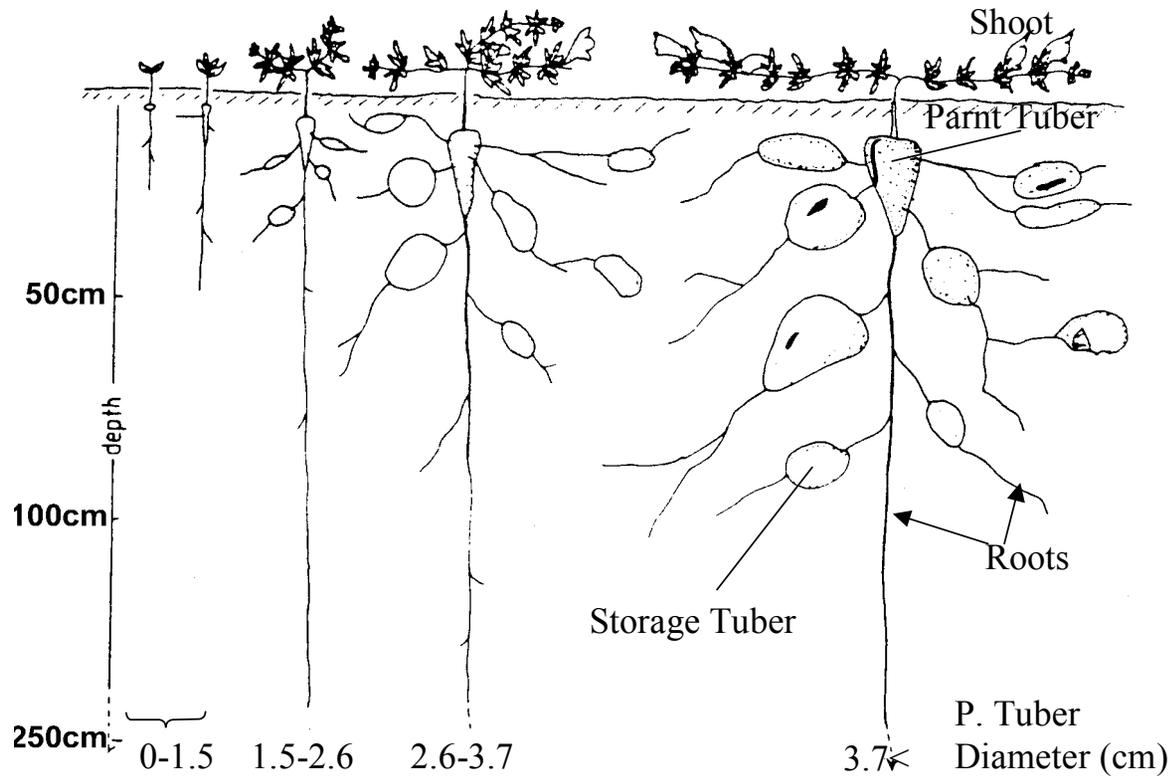
- *Large parts of Southern Africa burn nearly every year*
 - We do not know how much burns where & how frequent
 - But this has short & long term implications on
 - availability of key resources
 - Climate processes
- **Currently preparing to conduct a questionnaire on “What is going on with fire in Southern Africa”



DEVIL'S CLAW, Kalahari Resource

Grapple Plant (*Harpagophytum procumbens* (Burch.) DC
and *H. zeyheri* Decne : Pedaliaceae)

* Plant morphology



(Slide: Sekhwela, 2000)

*Fire is an important tool resource
management in rural areas of Africa*

Most outbreaks of wildfires result from these land use activities.

Fire also contributes to the functioning of the savanna rangelands

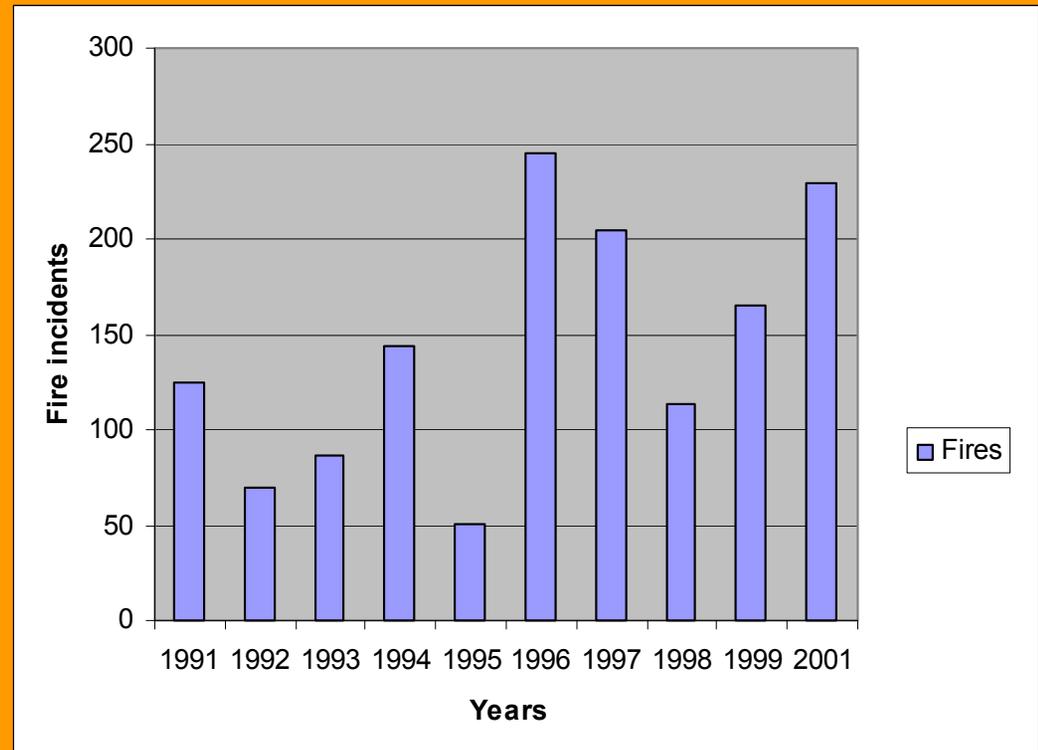
We do not only need to develop effective fire monitoring & management schemes
but

Involve communities directly affected by fires

Questions:

- Is a fire suppression policy the most appropriate approach?
- How far have fire suppression policies involve communities?
- Have they been successful in controlling fires?

- *In this country ARB reports that :*
- Outbreaks of fire are common
- Most fires are human induced
- People are reluctant to provide names of those who caused a fire
- Nearly all fire outbreaks are reported by communities *i.e* *There is no monitoring system*



Fire management needs to be a community issue

As it is now there is no NGO whose primary focus is fire

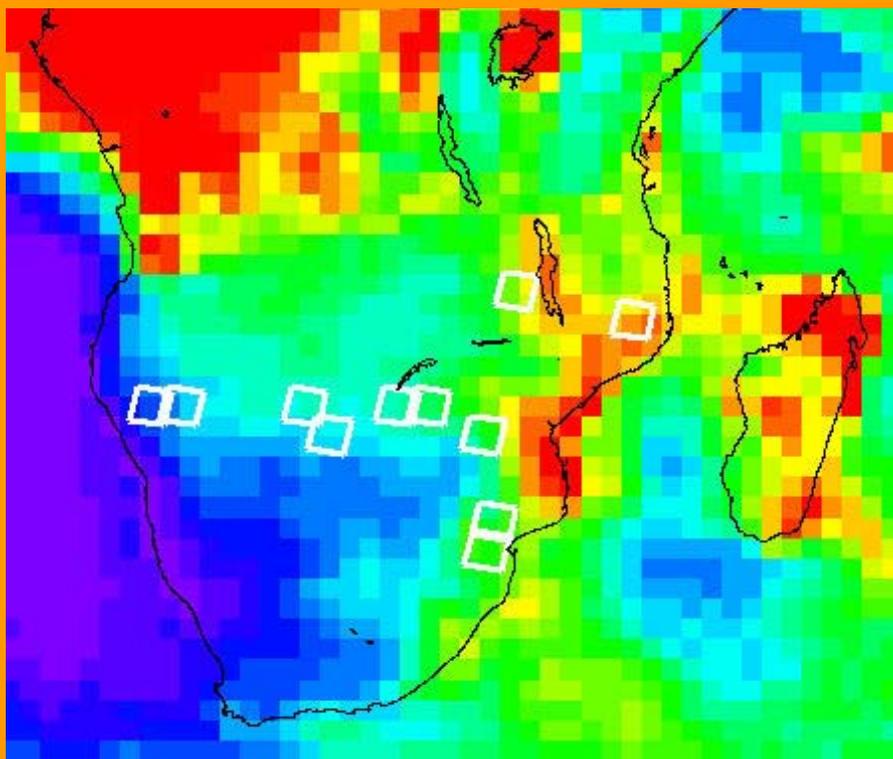
SAFNet burned area validation protocol

developed during a SAFNet field trip held to develop the protocol and to discuss southern African fire information needs and how these could be met through the use of satellite products, Zimbabwe-Zambia, 11-19th July 2000

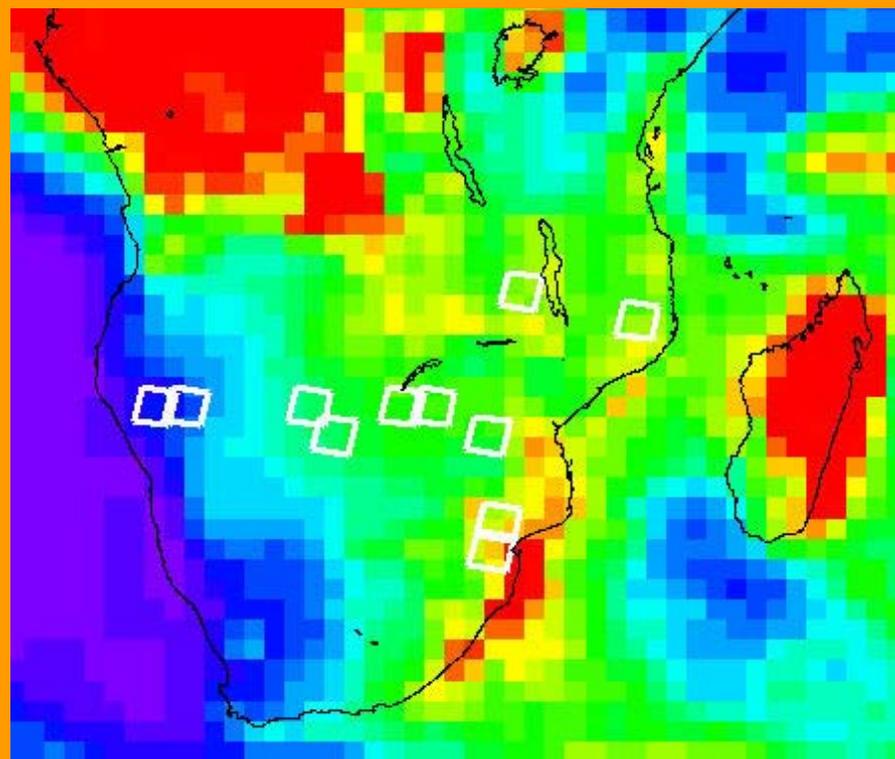


The Southern Africa Fire Network (SAFNet) regional burned area product validation protocol, Roy, D., Frost, P., Justice, C., Landmann, T., Le Roux, J., Gumbo, K., Makungwa, S., Dunham, K., Du Toit, R., Mhwandagara, K., Zacarias, A., Tacheba, B., Dube, O.P., Pereira, J., Mushove, P., Morisette, J., Santhana Vannan, S., Davies, D., Submitted to SAFARI 2000 *International Journal of Remote Sensing*

SAFNet Burned Area validation sites,
defined by Landsat ETM+ path/rows
distributed from dry savanna to wet miombo woodland
(quantify product accuracy over range of representative biomass burning conditions)



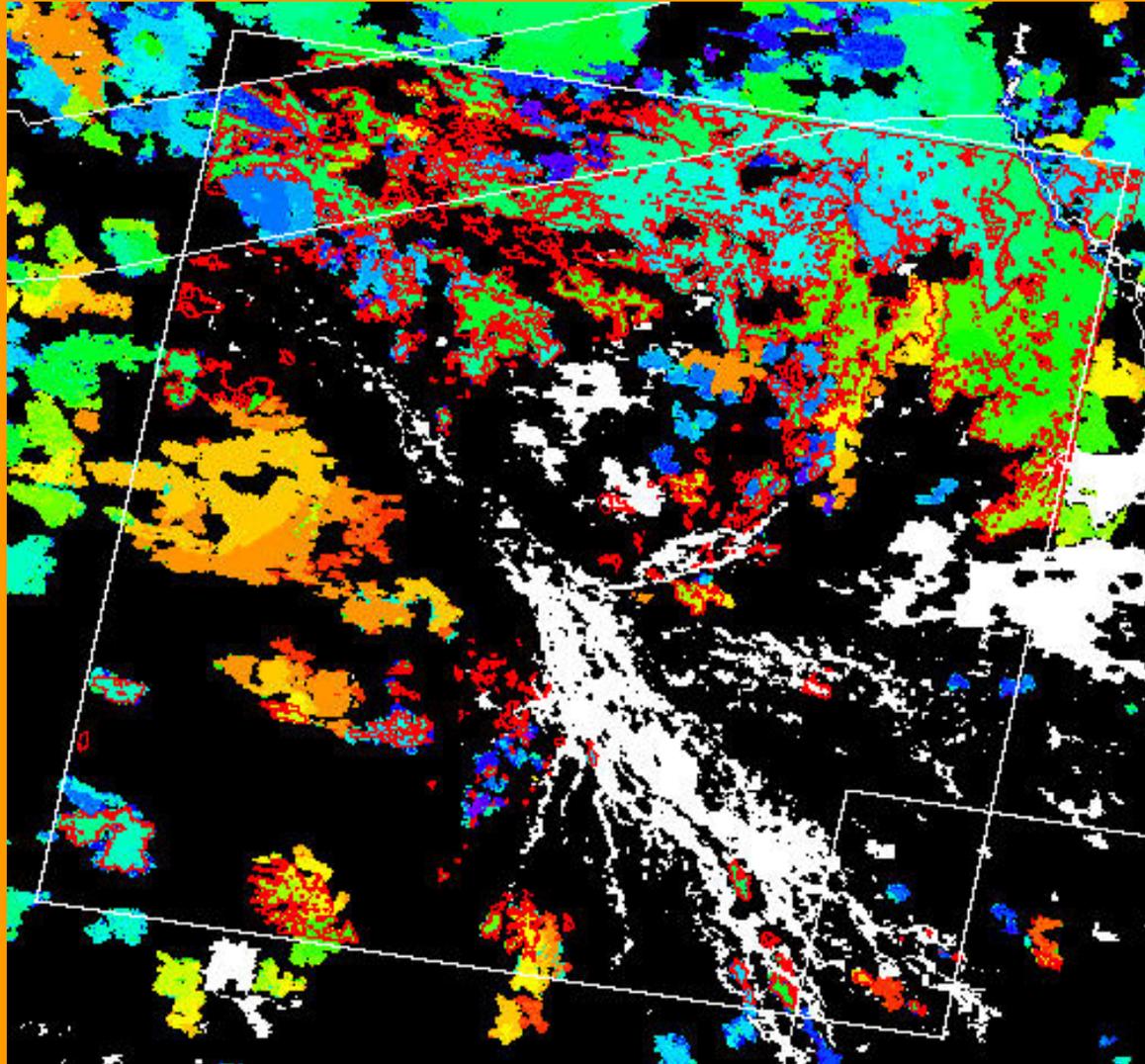
1999



2000

sites superimposed on annual precipitation derived from TRMM 1° data
(blue < 300mm, red > 1500mm)

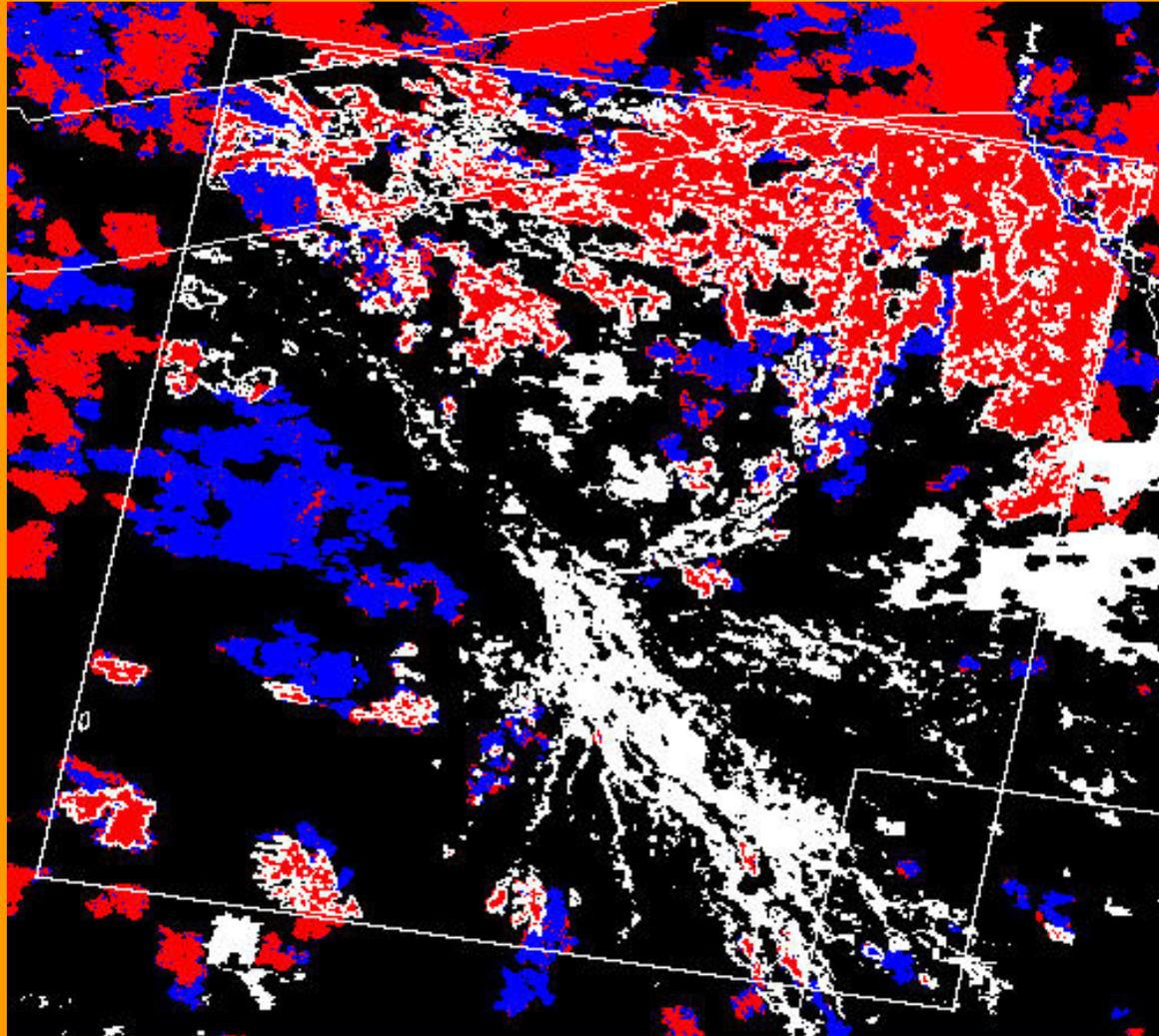
Example: MODIS 500m burned area product & Landsat ETM+ independent burned area validation results, Okavango delta, Botswana, 2001



Colored pixels = burned areas detected by MODIS in 105 day period 20 July to 1 Nov. (rainbow color scale to indicate the approximate day of burning, black no burning, white not be mapped due to missing MODIS data or persistent cloud).

Red vectors = burned areas mapped following SAFNet validation protocol between two ETM+ acquisitions sensed 6 August and 23 September.

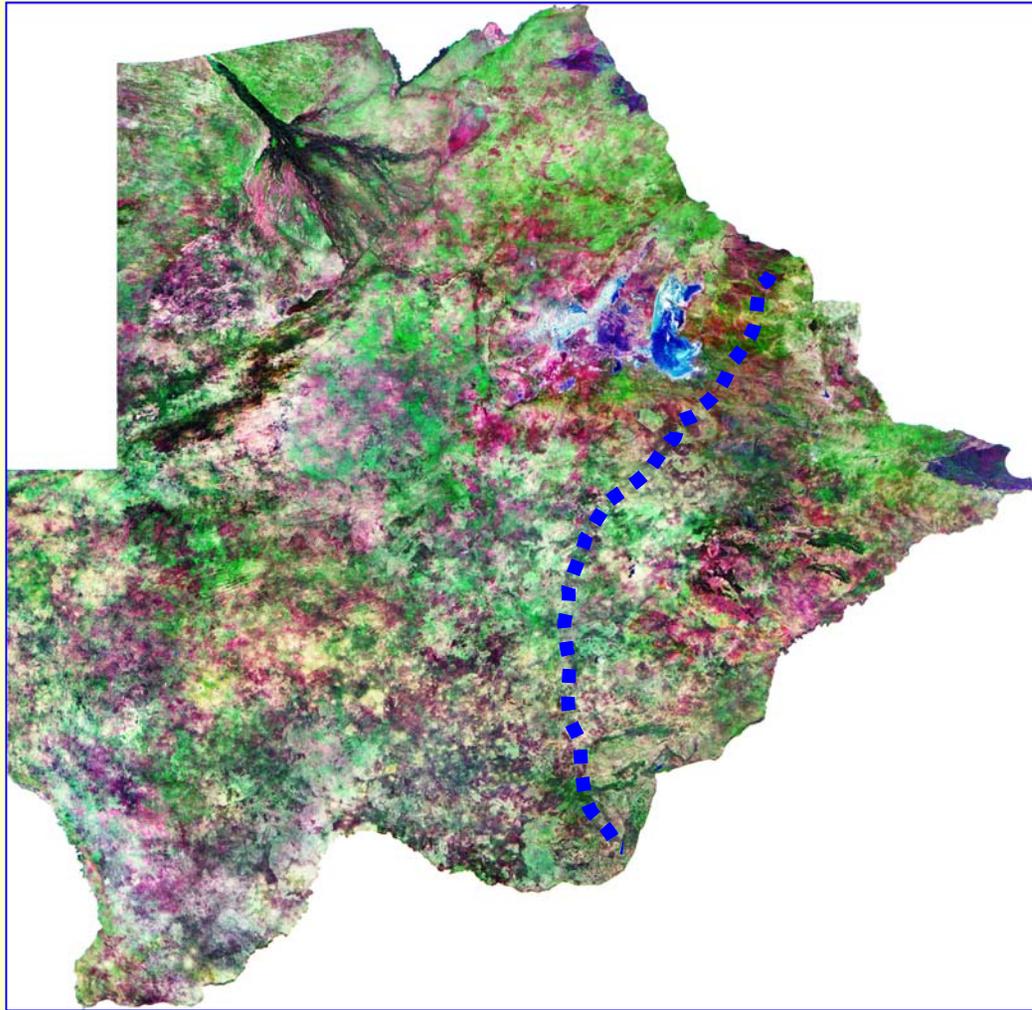
Example: MODIS 500m burned area product & Landsat ETM+ independent burned area validation results, Okavango delta, Botswana, 2001



Colored pixels = burned areas detected by MODIS in 105 day period 20 July to 1 Nov. (red= burned area detected within the ETM+ acquisition period, blue = burned areas detected before or after the ETM+ acquisition period).

White vectors = burned areas mapped following SAFNet validation protocol between two ETM+ acquisitions sensed 6 August and 23 September.

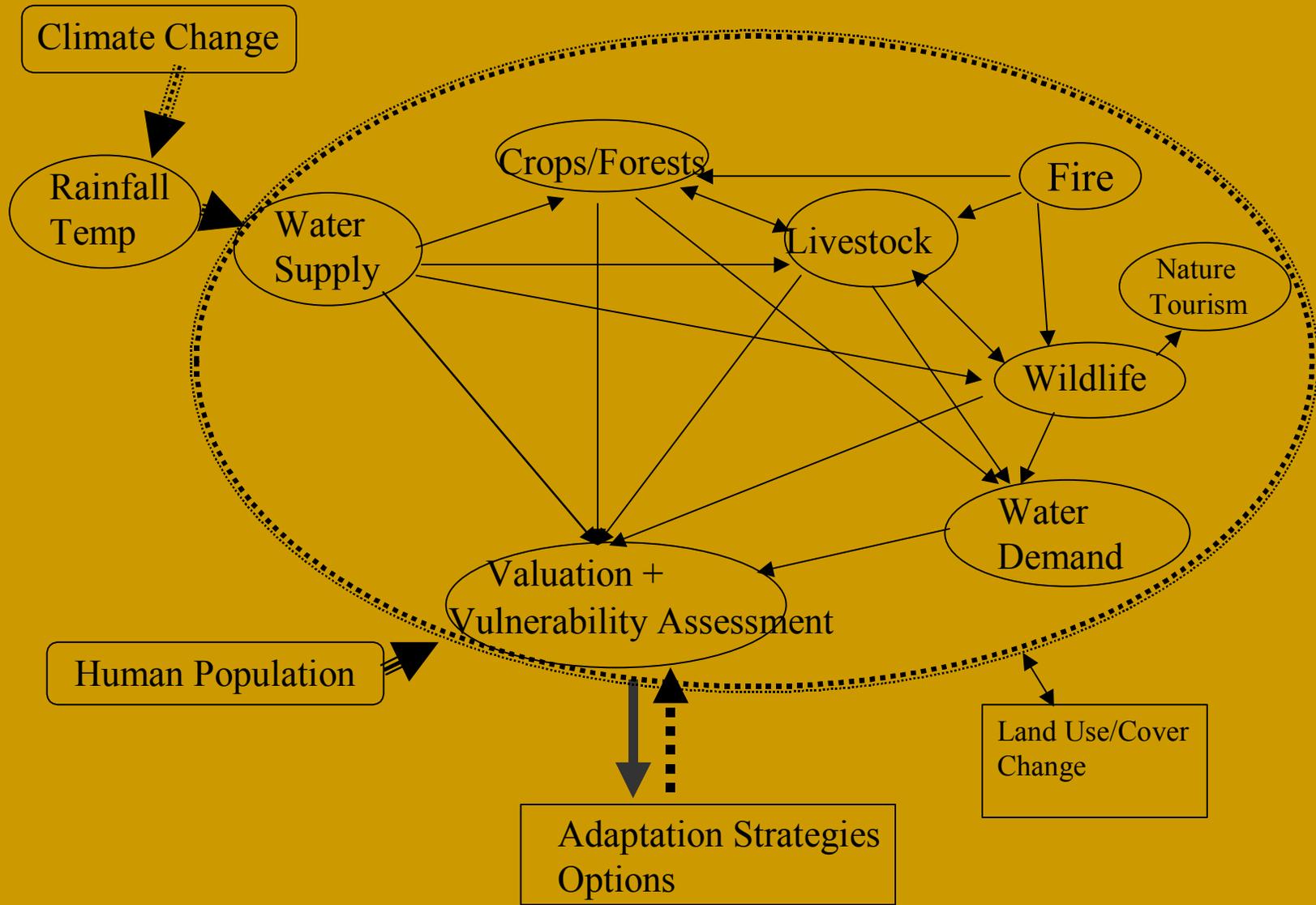
Botswana



UNEP/GEF/START/TWAS:
Assessment of Impacts of and
Adaptations to Climate
Change in Multiple
Regions and Sectors
(AIACC)

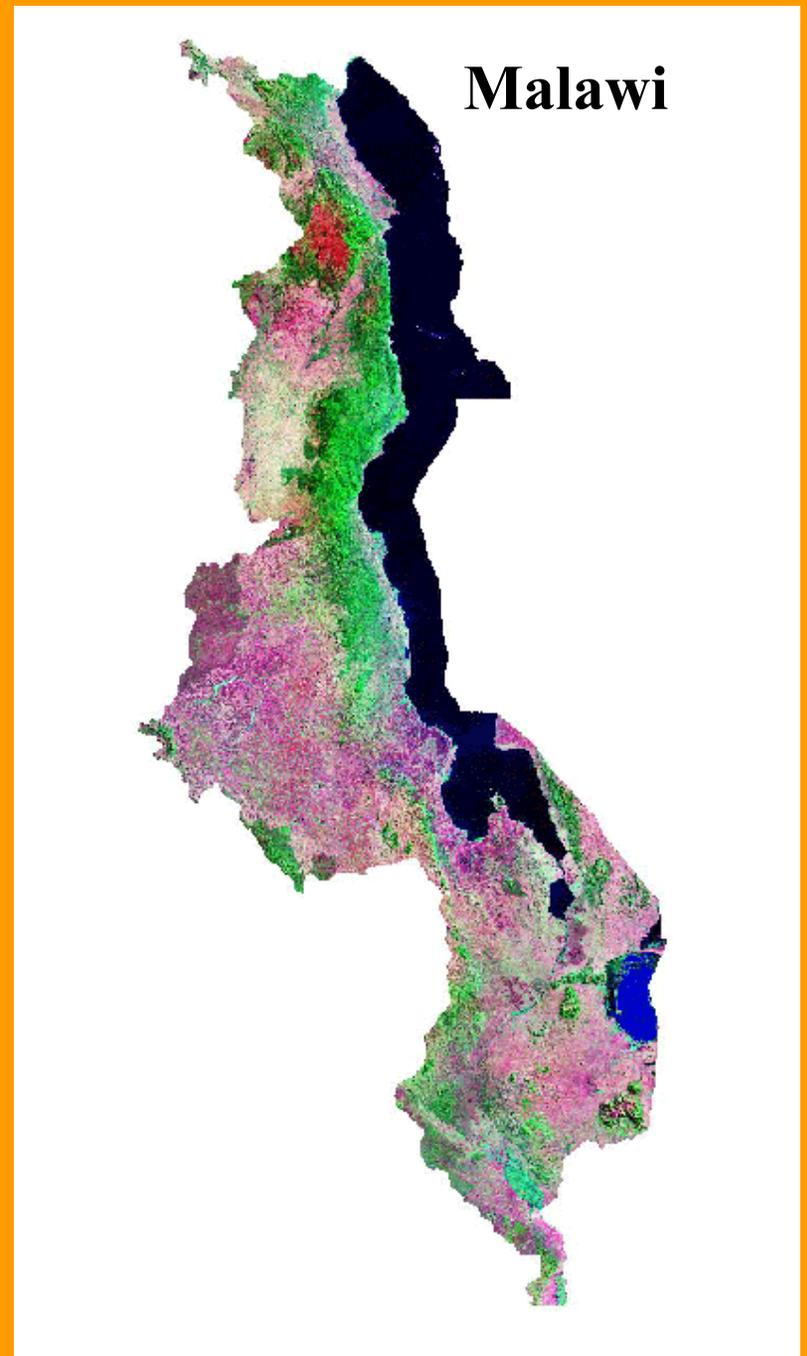
**IMPACTS OF CLIMATE CHANGE, VULNERABILITY AND
ADAPTATION CAPACITY IN THE LIMPOPO BASIN**

Focus: Food & Water

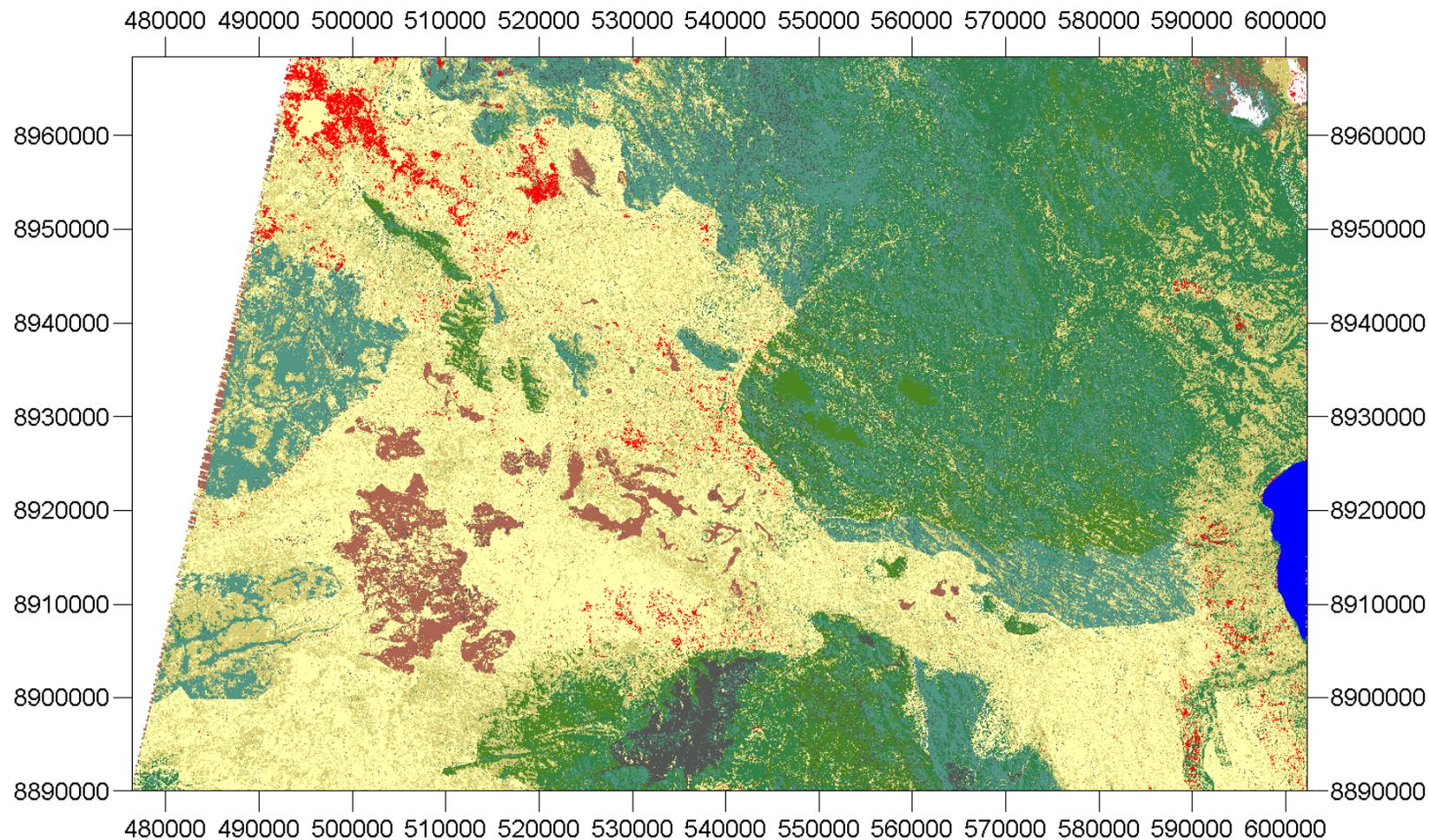


Environmental Information
Systems Education and Training
Sub-Program (SETES)

Lake Malawi Catchment Project



Lake Malawi Catchment - Initial land cover classification



■ Bare rock /Burnt area, ?
■ Built up areas
■ Deciduous forest
■ Evergreen forest

■ Miombo woodland
■ Water
■ Wet soil / Bare soil / burnt area, ?
■ Vegetation and sand benches

0 25000



MODIS Rapid Response System – Great interest generated e.g. from the WSSD demonstration.

MODIS fire maps for individual countries – e.g Zimbabwe, Namibia

Limited resources to move to operational stage

Also limitations with Internet Services

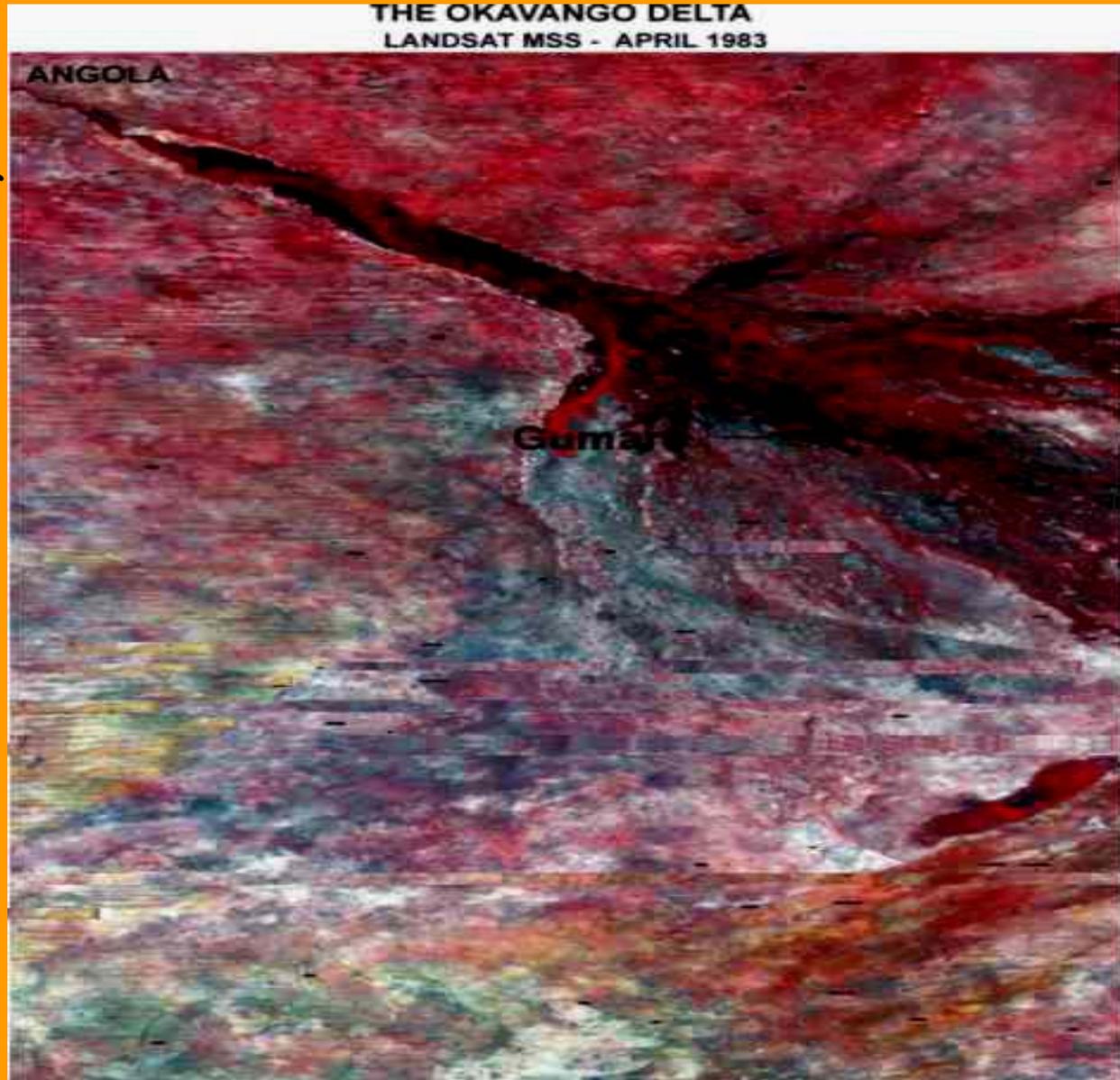
MODIS Fires across the Sahel



Pilot attempt to directly link with local communities on use of Satellite products for fire management -

Community Based Organisations (CBOs)

To be supported by UNDP/GEF/ Small Grant Program



Message from communities:

Spatial Information tools can *only contribute* towards an effective fire management system

- Fire control requires collective efforts

e.g. There will always be a need for resources to put out ongoing fires

Links with UN OOSA

- Potential to link with various Africa disaster Networks and satellite providers

SAFNet - to coordinate fire related disaster management activities linked to application of satellite data

Nighttime lights from the Defense Meteorological Satellite Program (DMSP)





Chobe National Park

Work by Wooster, Smith
& Drake (2001) – Uni. Of
London

Chobe National Park

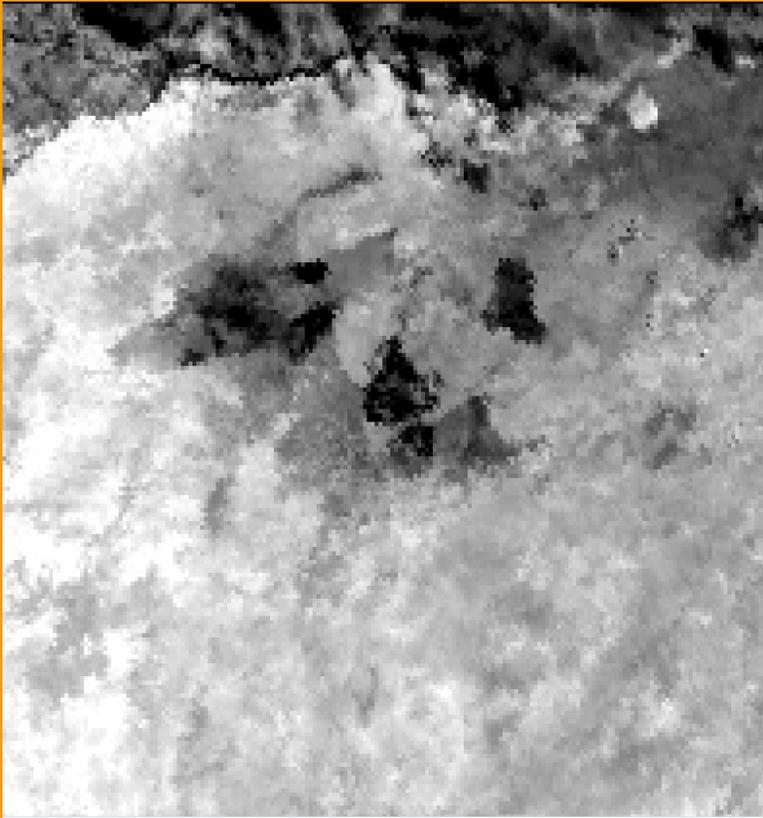


Figure 4. Chobe National Park - September 2001. On the left is the 1000 m spatial resolution ATSR image covering Chobe National Park, of approximate size 200 x 200 km. A large fire scar is seen as a dark area at upper middle. The right hand image shows the result of a basic burned area mapping technique applied to these data, which has highlighted the burned area in white, though there is also other areas highlighted that are not burned area but some other landcover type. Data from the field campaign will be used to improve these burned area mapping algorithms. A photo of a typical fire scar on the ground is shown in Figure5, indicating why such areas appear dark on the remote sensed images.

Wooster, Smith & Drake (2001)

SAFNet has no funding:

- So far University of Botswana (UB) provides limited infrastructure resources to keep the network running
- Through GOFC & the University of Maryland (UMD) limited funding from NASA supports the ongoing MODIS validation work
- For past meetings support from:
 - System for Analysis Research & Training (START):
UMD: UB: & UNDP/GEF Small Grant program
- Provision of satellite data through GOFC helps keep the networking functioning
- ***Great effort put on finding funding***

At National level: UNDP/GEF/SMG is a potential source

- Regionally – UN OOSA potential link to funding
- No Success from WSSD/GISD
- USAID through WWF
- UNESCO/SIMDAS – Sustainable Integrated Management and Development of Semi-Arid Lands of Southern Africa