



History of the Miombo Network

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Manager, National Adaptation Plans and Policies

The beginning

- IGBP/DIS, LUC, PAGES, START ...
- Initial meeting in Zomba, Malawi Dec 1995, same time other regional networks e.g Kalahari Transect
- Motivated by north-south collaboration and science to policy/management needs
- Many projects and active groups/partners over the years
- START has consistently been the major supporter, in collaboration with many programmes, latest being GOFC-GOLD.



The Miombo Network is a regional alliance of researchers working on land use and land-use change and impacts, for the MIOMBO REGION in Southern Africa

Initiated under the auspices of the IGBP/IHDP Land Use and Cover Change (LUCC) Project and the IHDP/IGBP/WCRP Global Change System for Analysis, research and Training (START) in 1995

Members include government, university and research institutions in DRC, Malawi, Mozambique, Tanzania, Zambia and Zimbabwe. Elsewhere, members include Universities, research institutions and NGOs

GLOBAL
I G B P
CHANGE

IGBP REPORT 41

International Geosphere-Biosphere Programme (IGBP)



**The Miombo Network:
Framework for a Terrestrial Transect Study of
Land-Use and Land-Cover Change in the
Miombo Ecosystems of Central Africa**

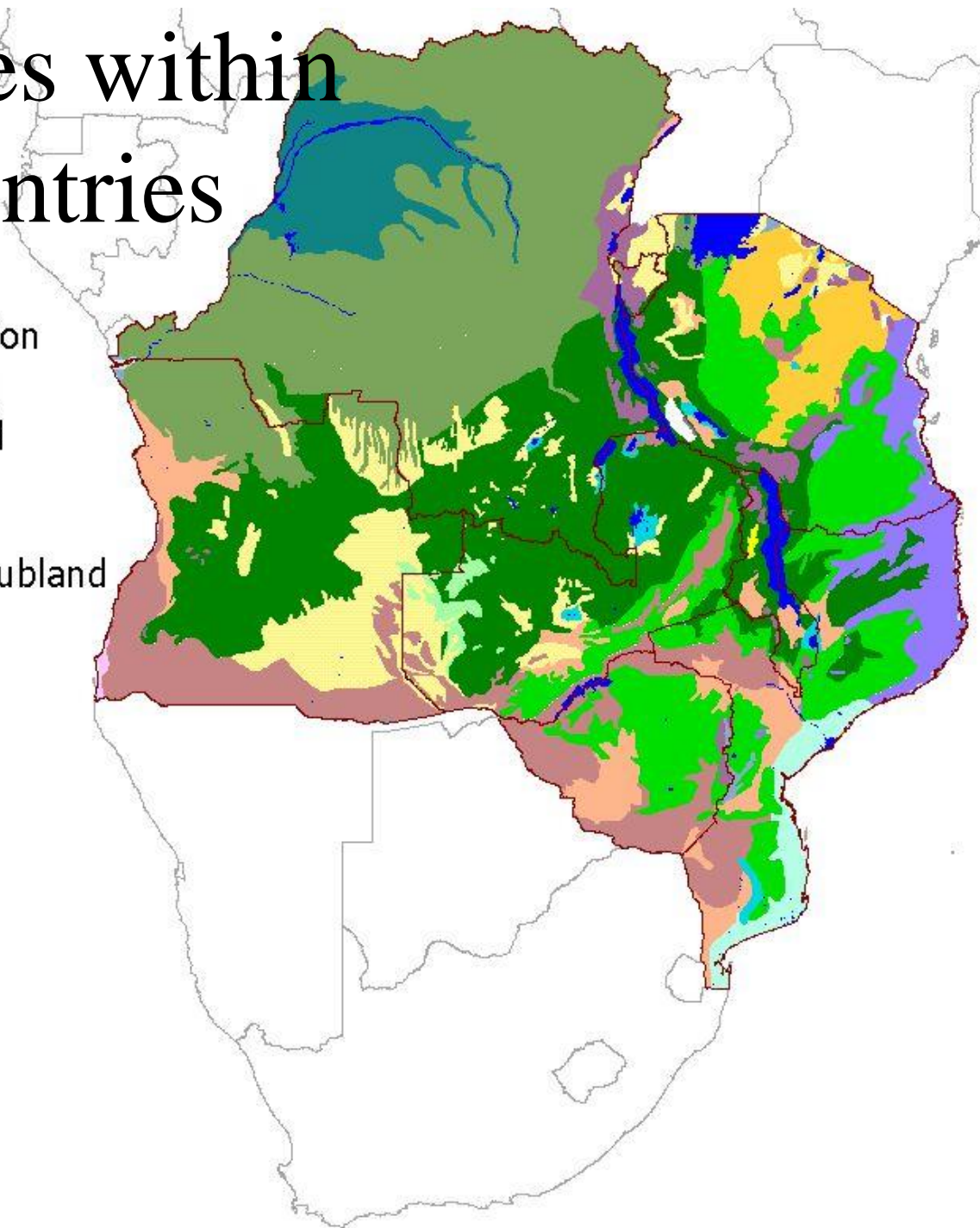
The International Geosphere-Biosphere Programme: A Study of Global Change (IGBP) of the
International Council of Scientific Unions (ICSU)
Stockholm, Sweden

edited by: Desanker, Frost, Scholes, Justice
(1997), *Available from IGBP in Stockholm,
START, or from the authors, can
request*

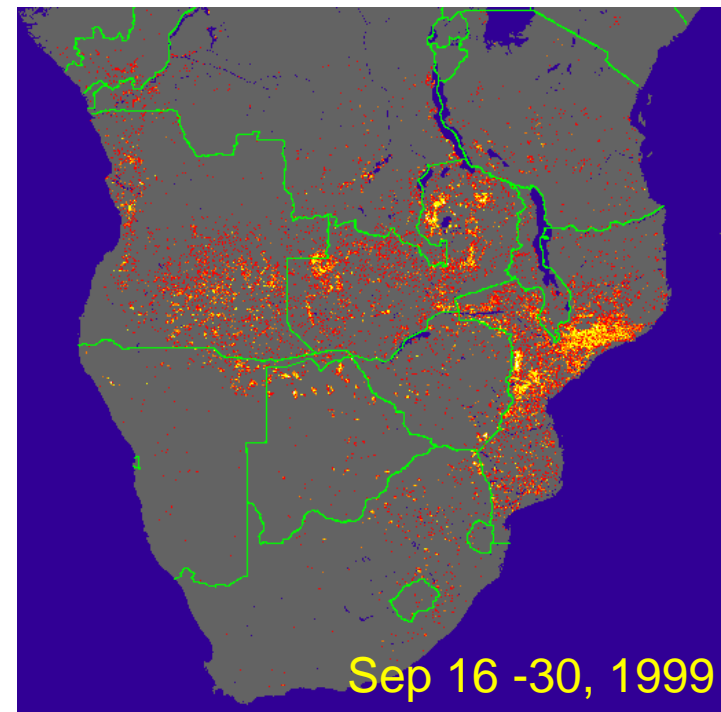
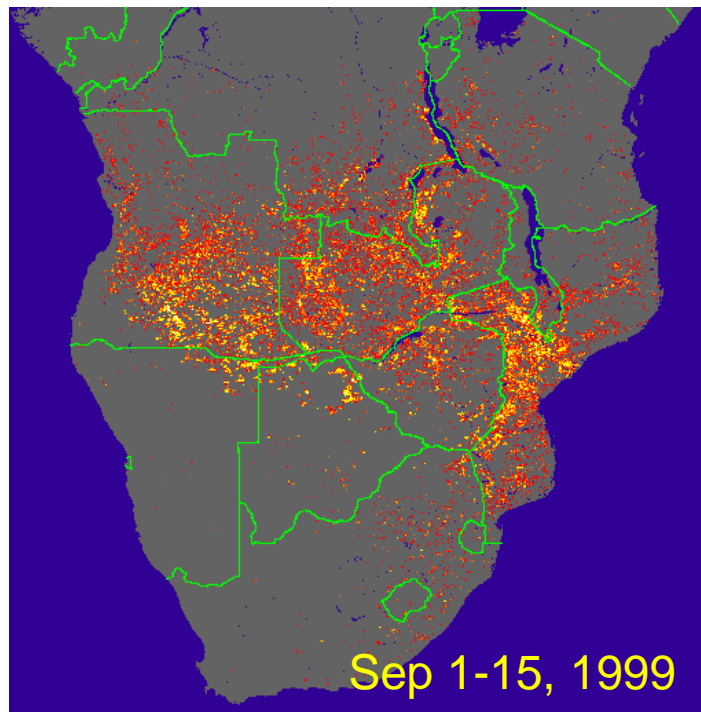
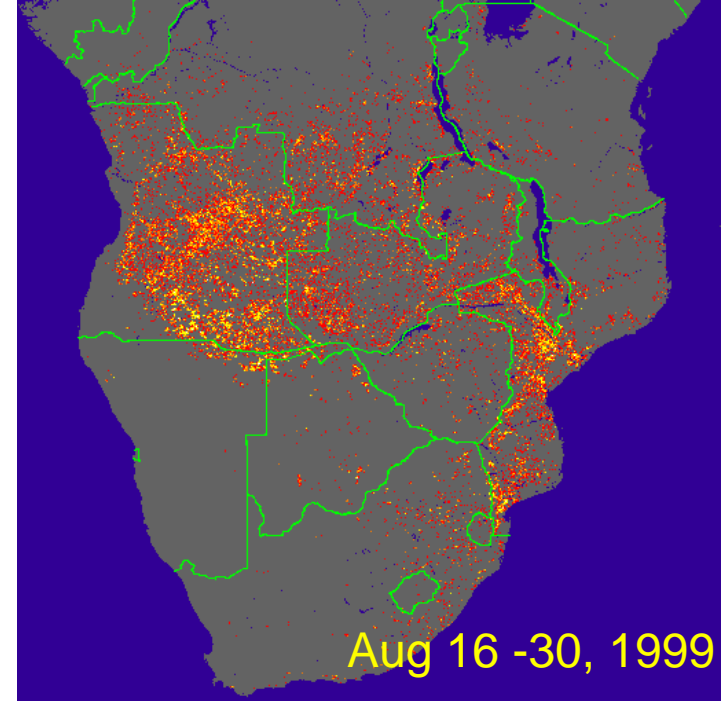
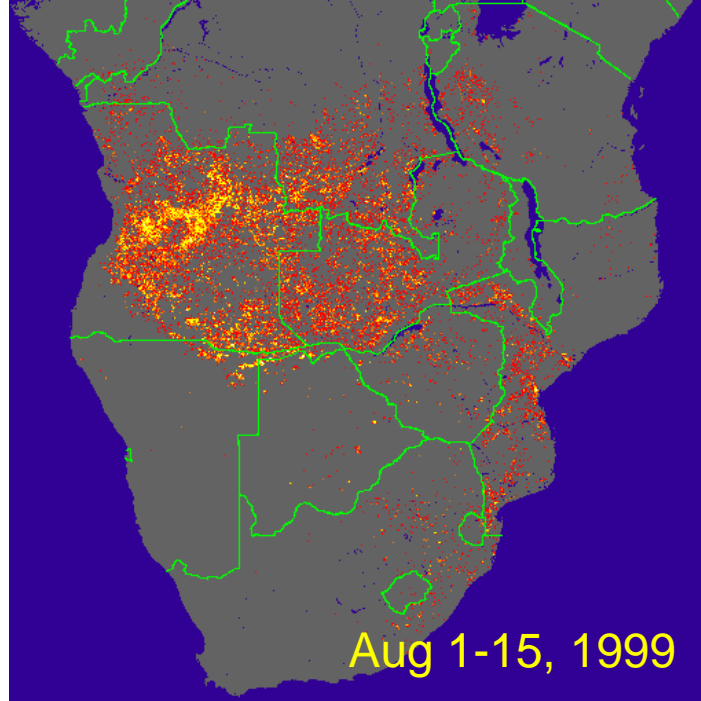
Vegetation Types within Miombo Countries

Basic Vegetation Types in Region

- Dry Miombo Woodland
- Wet Miombo Woodland
- Dry Forest
- Woodland
- Wooded Grassland/Scrubland
- Grassland
- Bushland/Shrubland
- Rainforest
- Swamp Forest
- Wetland
- Afromontane
- Zanzibar Mosaic
- Tongaland-Pondoland
- Mangrove
- Coastal
- Desert
- Lakes and Rivers
- Miombo Countries



Examples of
15 day fire
counts for
Africa
determined
from AVHRR



Ecological Transitions in Miombo



fire



More fire



degradation



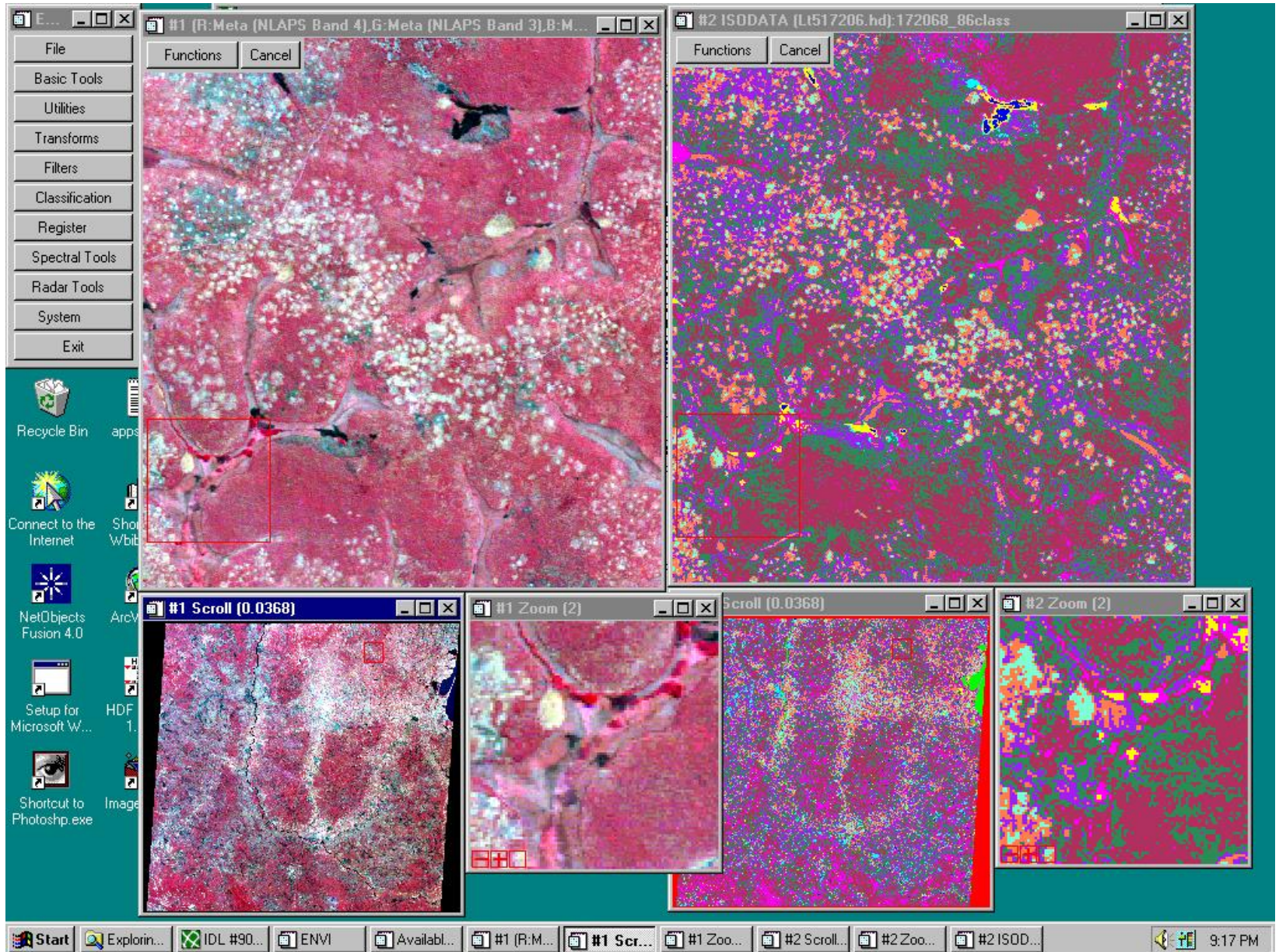
abandon

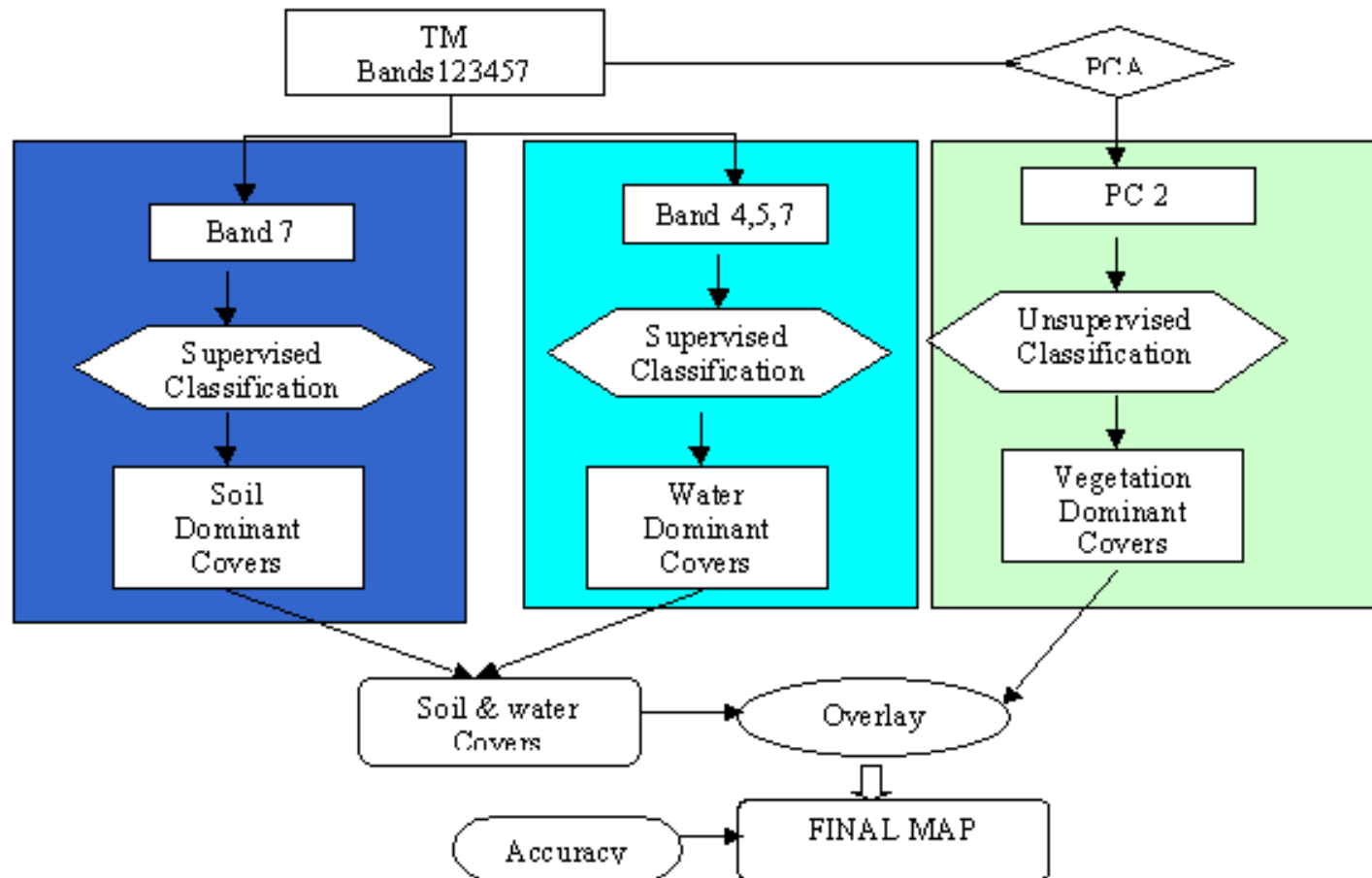


Slash & burn



Shifting cultivation and slash & burn on Landsat TM





Processing steps for Landsat in Miombo Woodlands using a hybrid of supervised and unsupervised steps (Jaiteh, 2000).

Data Access

The Miombo CD Project

The first Miombo Network meeting in Zomba, Malawi December 1995 identified data availability as a major constraint for development of a strong scientific agenda, and in general, for global environmental change research in Central and Southern Africa.

The Miombo CD project was then designed to make data widely available to Miombo Network Projects and more generally, to regional scientists.

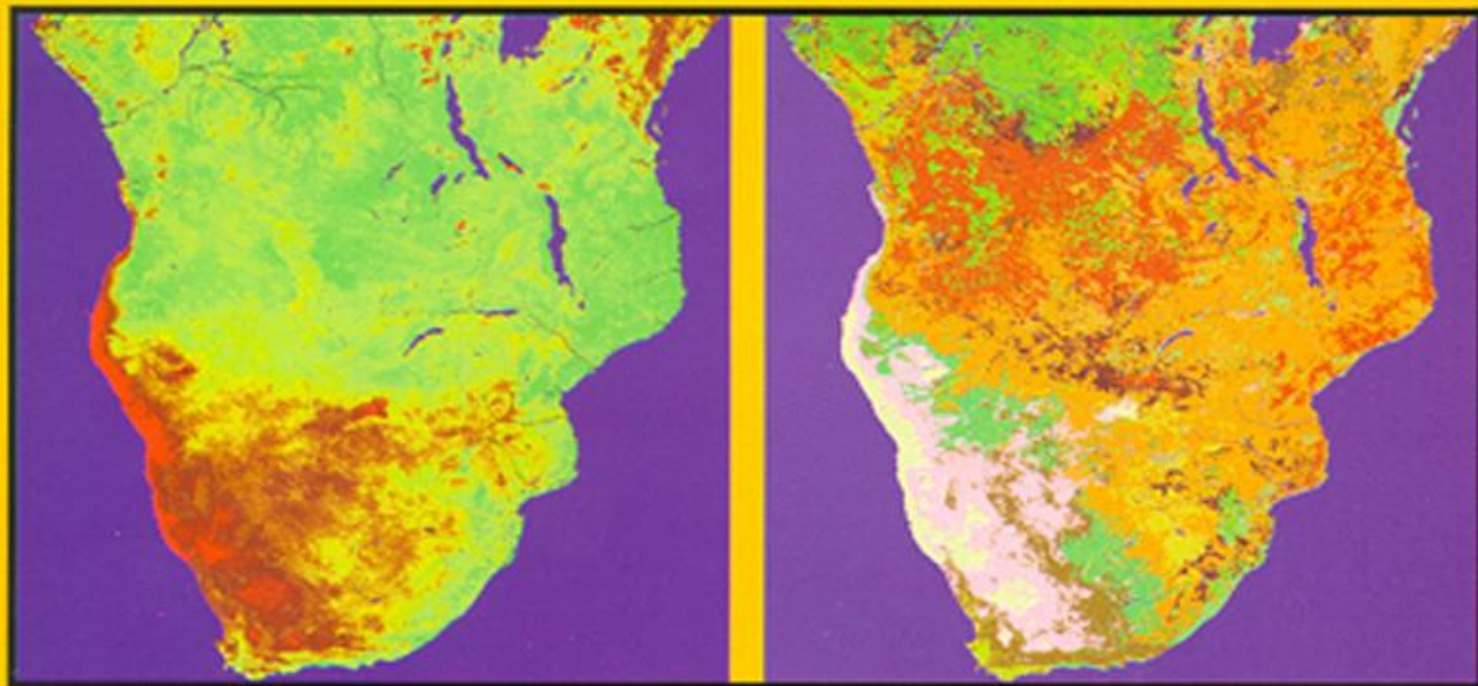
Data were collated from various international data archives and from individuals, and processed to be accessible using a web browser on a CD-ROM (this was 1995-1996).



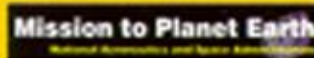
LAND USE AND
COVER CHANGE



LUCC CD-ROM Series. N° 1: MIOMBO



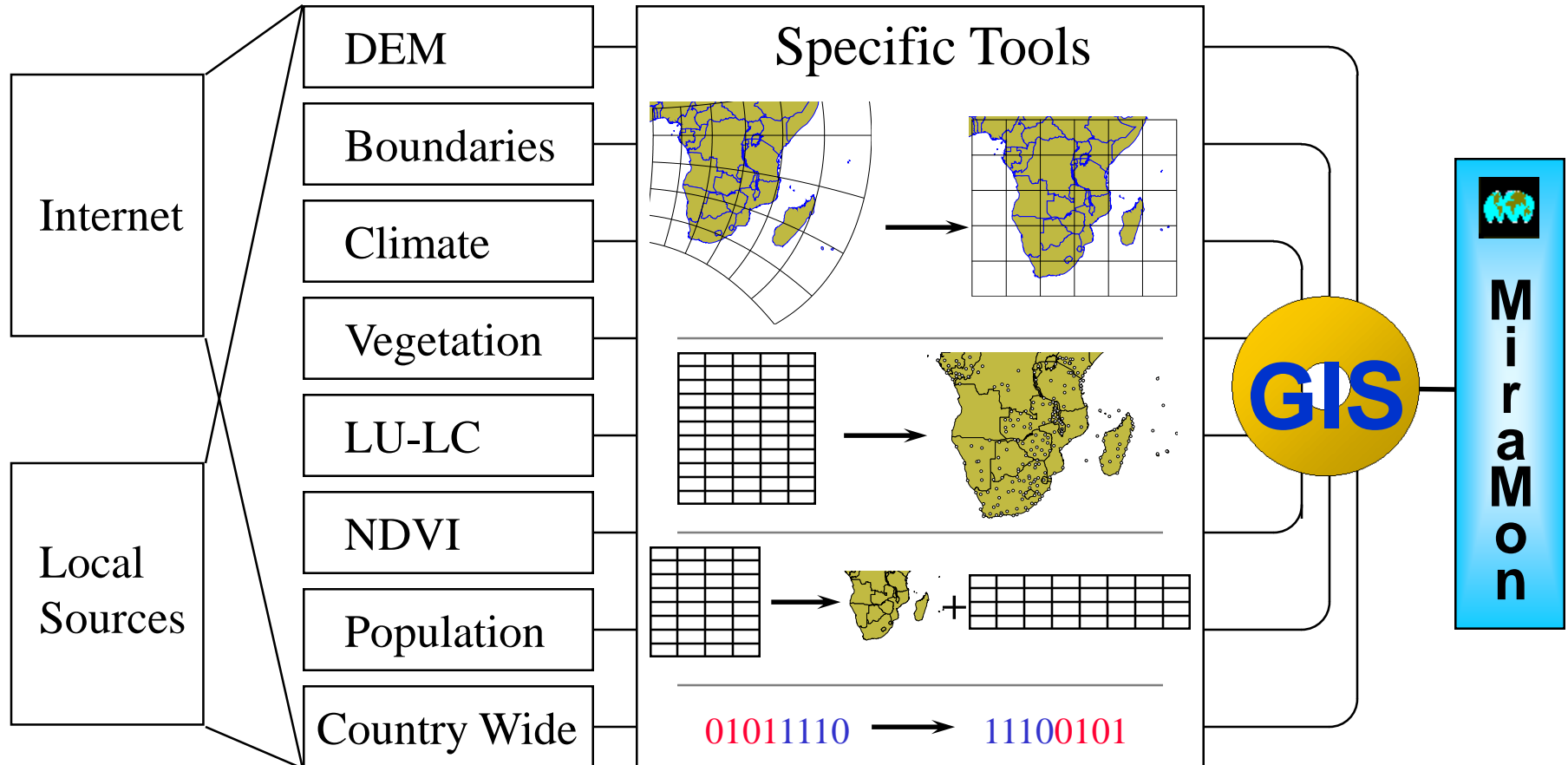
Also sponsored by:



Generalitat de Catalunya
Institut Cartogràfic de Catalunya

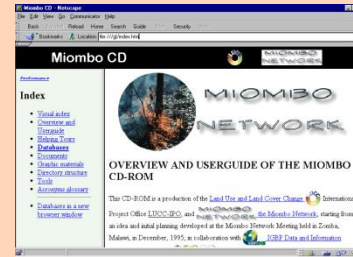


CD Design: Data Integration



Tools to Access Data on the CD

Web Browser



MiraMon GLS



MiraDades

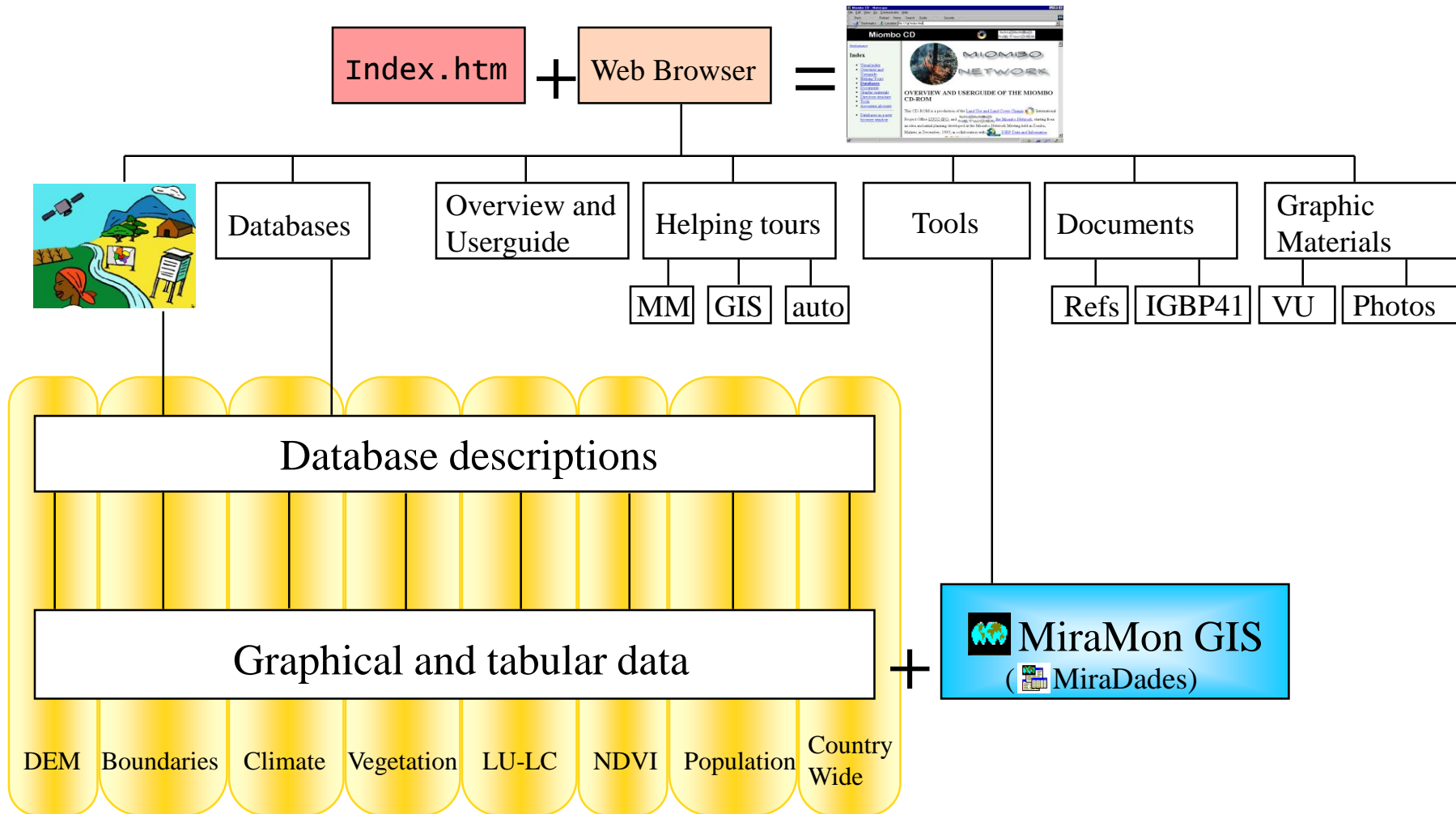
Adobe Acrobat

Display
Zoom
Query by loc. & attribute
Print

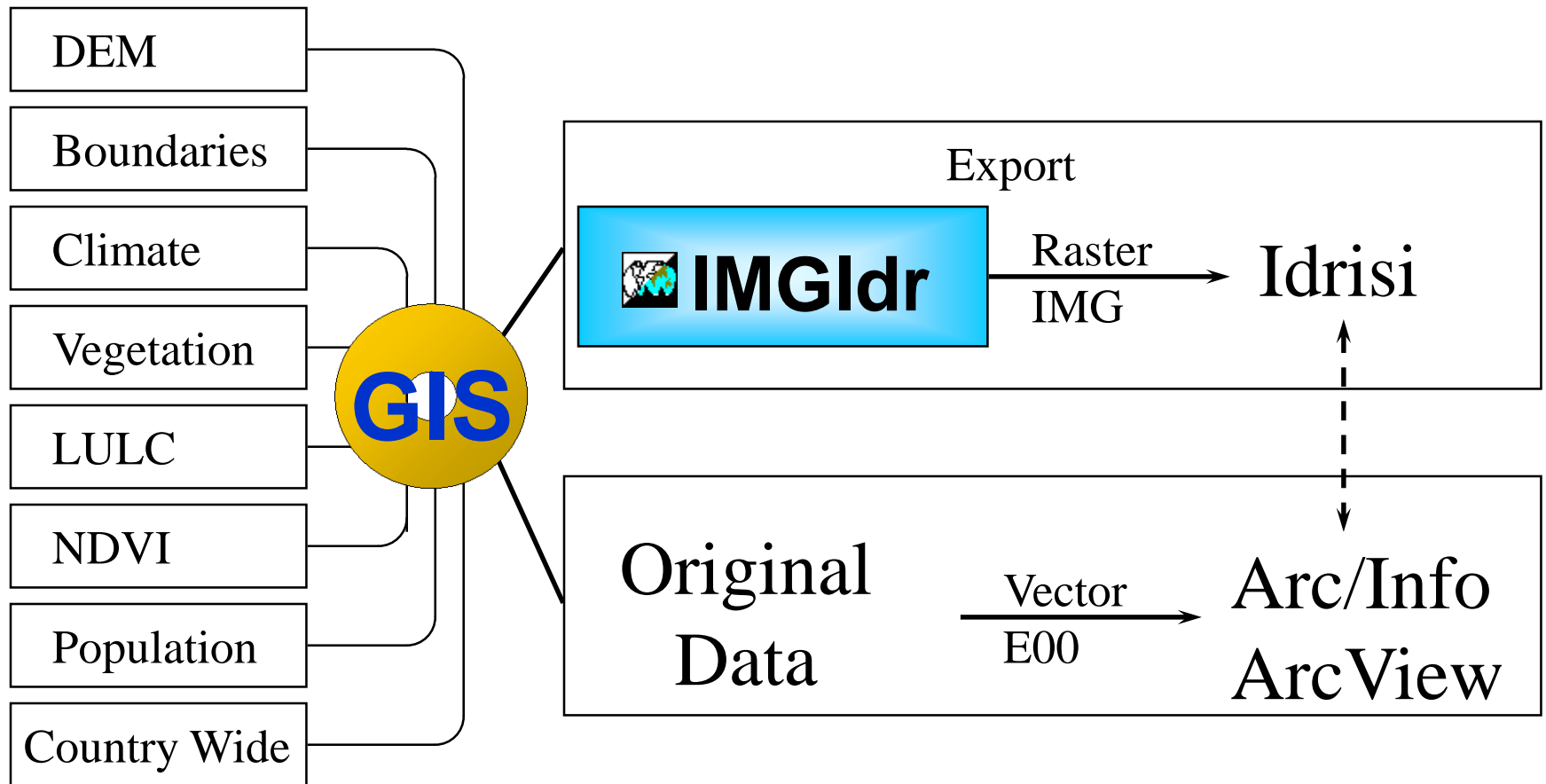
Digitization Import/Export Analysis

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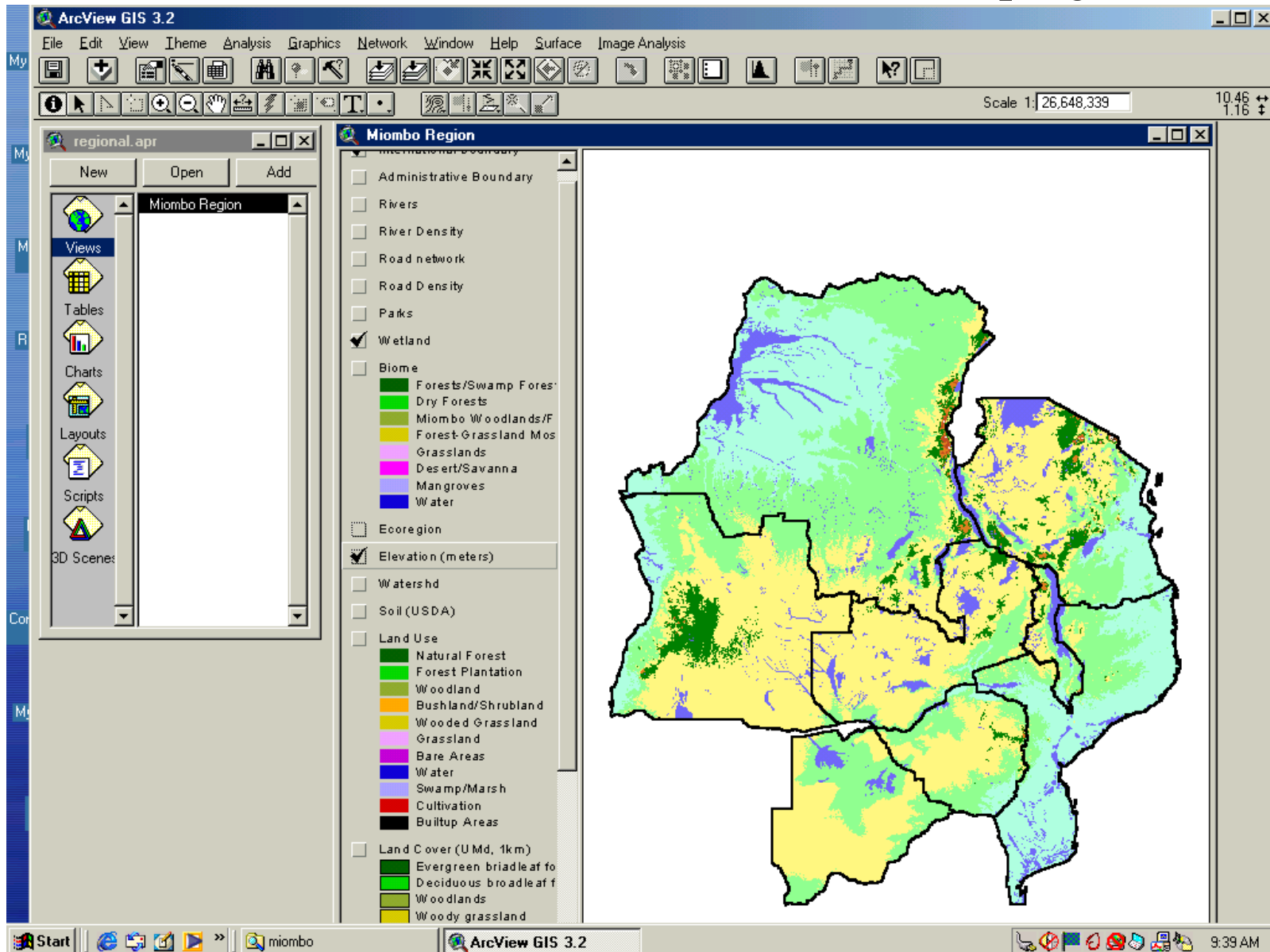
Viewing the CD from a single starting point



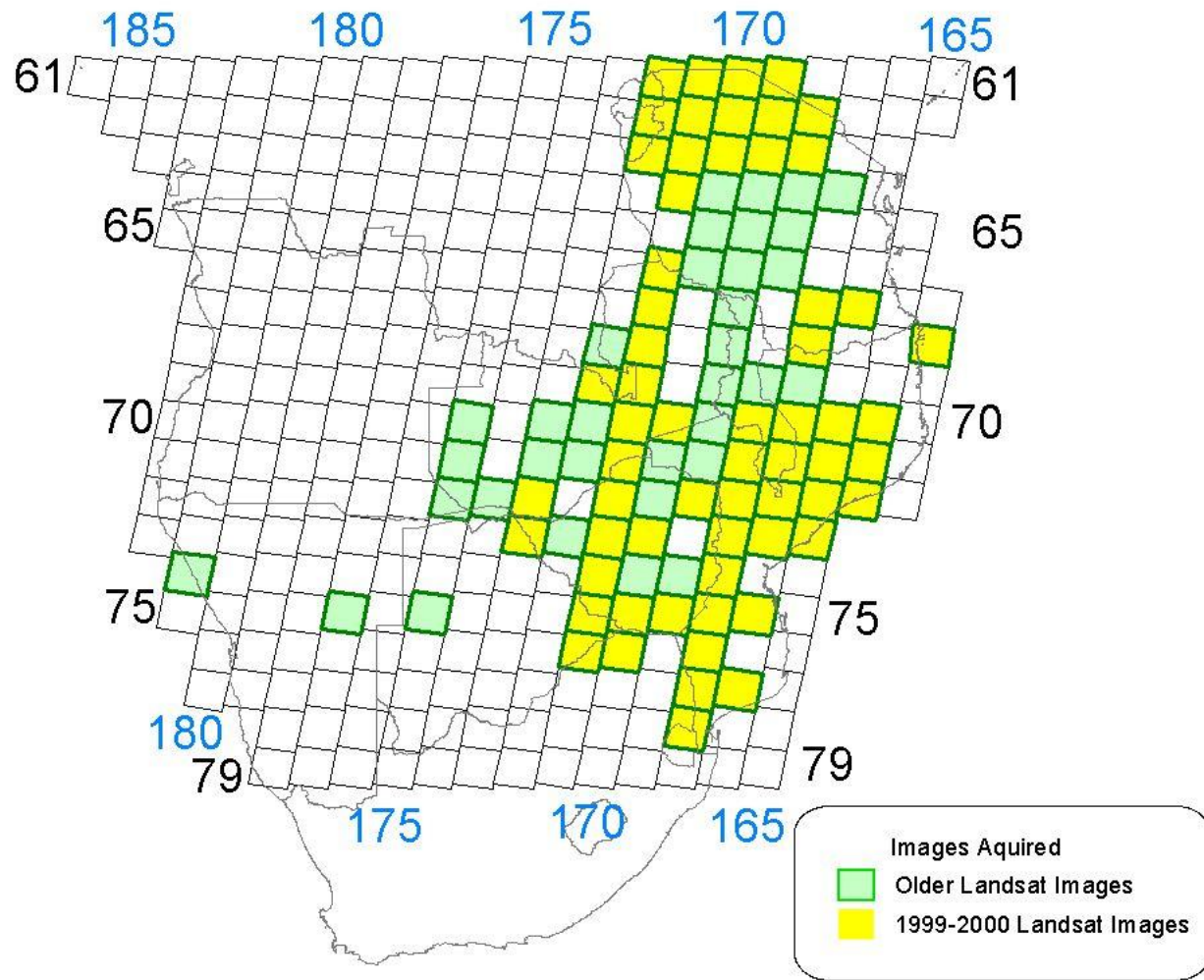
Postprocessing Data from the CD



New Spatial Data Bundle – for Miombo Region, to be available online and CD-ROM in progress



Miombo Landsat 5 and 7 Data Archive



** (Also have ~1990 Landsat 5 data for area boxed from Earthsat)

Miombo Data Server set up in collaboration with MSU-TRFIC.

(<http://www.bsrsi.msu.edu/trfic/MIOMBO/>)



MIOMBO Network: TRFIC Data Hosting - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Personal Bar Search Favorites History Mail Print Edit Discuss

Links Customize Links Free Hotmail Windows Windows Media

Address <http://www.bsrsi.msu.edu/trfic/MIOMBO/> Go



TROPICAL RAIN FOREST INFORMATION CENTER
Data and Data Services Hosting for the MIOMBO Network

The [Tropical Rain Forest Information Center](#) (TRFIC) supports the [MIOMBO Network](#) through EOS data hosting services. MIOMBO scientists can access browse products and order Landsat data hosted through this site. In addition, TRFIC has developed a mission-planning tool that allows MIOMBO project managers and scientists to identify and order, through TRFIC, Landsat ETM+ data in the US National Archive.

[Mission Planning Tool: \(Landsat 7 ETM+ Data Only\)](#)

Below is the list of Landsat 5 TM data being hosted by TRFIC for the MIOMBO Network. The 'Date of Acquisition' links go to browse products of the data.

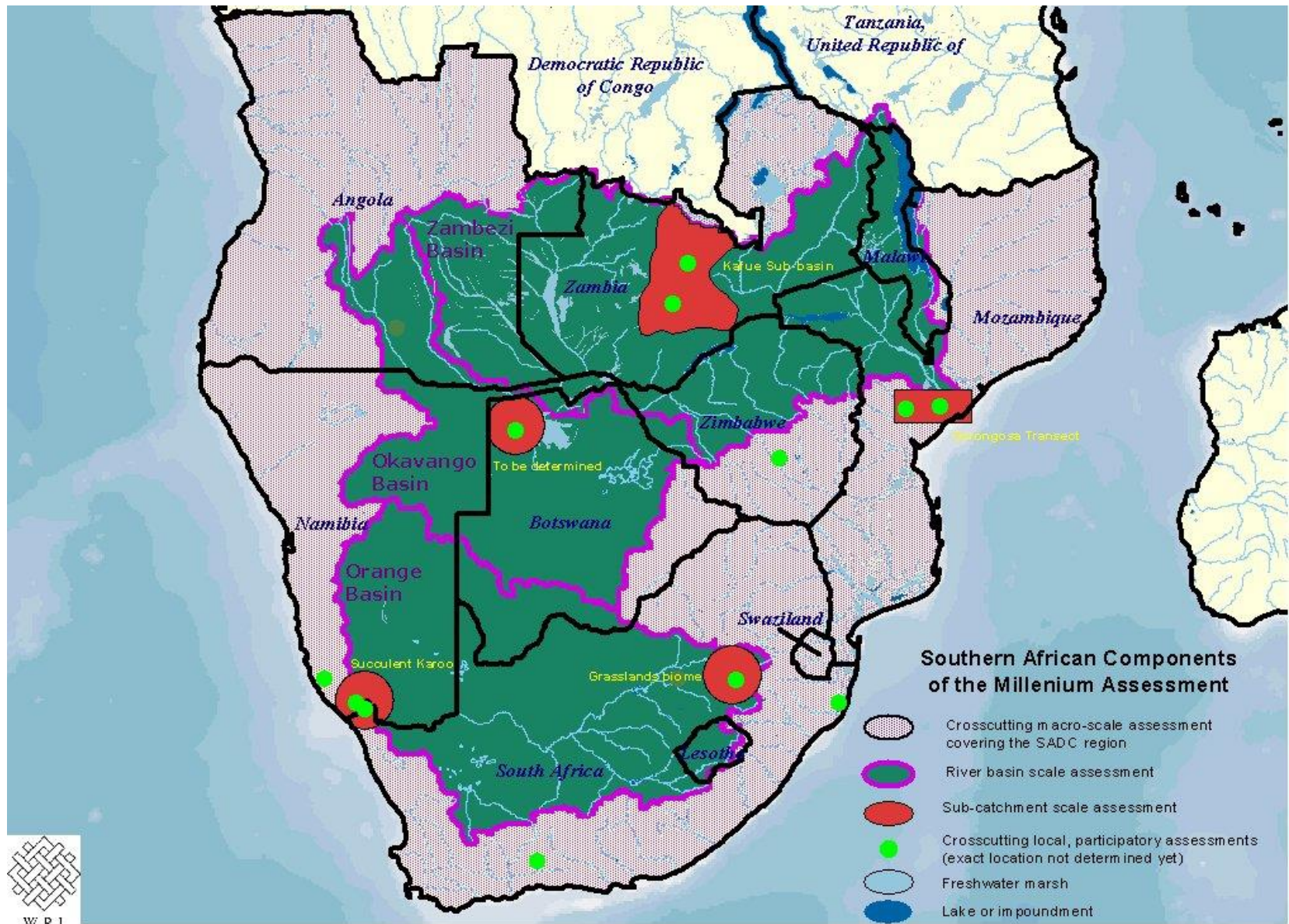
Please order the data using this [order form](#).

WRS2 Path	WRS2 Row	Date of Acquisition	Bands
167	70	02/29/88	7
167	71	11/27/88	7
167	71	02/08/92	7
167	71	06/16/95	7
167	73	07/29/88	7

Southern Africa Millennium Assessment Project

Regional – SADC level
3 major river basins
several nested local/smaller basin studies

Miombo Contribution to Millennium Assessment in S/Africa



Southern African Basin and Regional MA Projects

- 1: Zambezi basin assessment
Desanker/Kwesha et al.
- 2: Okavango basin assessment
Bendsen
- 3: Gariep basin assessment
Van Jaarsveld et al.
- 4: Gorongosa-Marromeu complex assessment
Lynam et al.
- 5: Southern African regional-scale assessment
Scholes et al.

Objectives

- Integrate formal and informal knowledge about ecosystem dynamics, the impact of ecosystem change on the quality and quantity of ecosystem goods and services, and linkages between social and ecological systems at multiple spatial scales;
- Provide scientific information to guide land use and environmental planning decisions in the SADC region;
- Identify information essential for sustainable resources utilization and management;
- Develop methods to undertake cross-sectoral assessments and effectively integrate information at different scales;
- Build the capacity of local resource users and decision makers at regional, national and local level to carry out integrated ecosystem assessments and act on their findings;
- Increase access to data and scientific information to enable the different stakeholders to make wise environmental decisions and to comply with international environmental agreements;
- Assess the present condition, changes and trends in ecosystems, develop plausible future scenarios of change in the drivers of these, and determine the consequences for the long-term capacity of ecosystems to provide goods and services;
- Develop options to improve the management of ecosystems to ensure their sustainability and to satisfy human needs.

Miombo GOFC Workshop, Maputo 2000 - National Reps selected



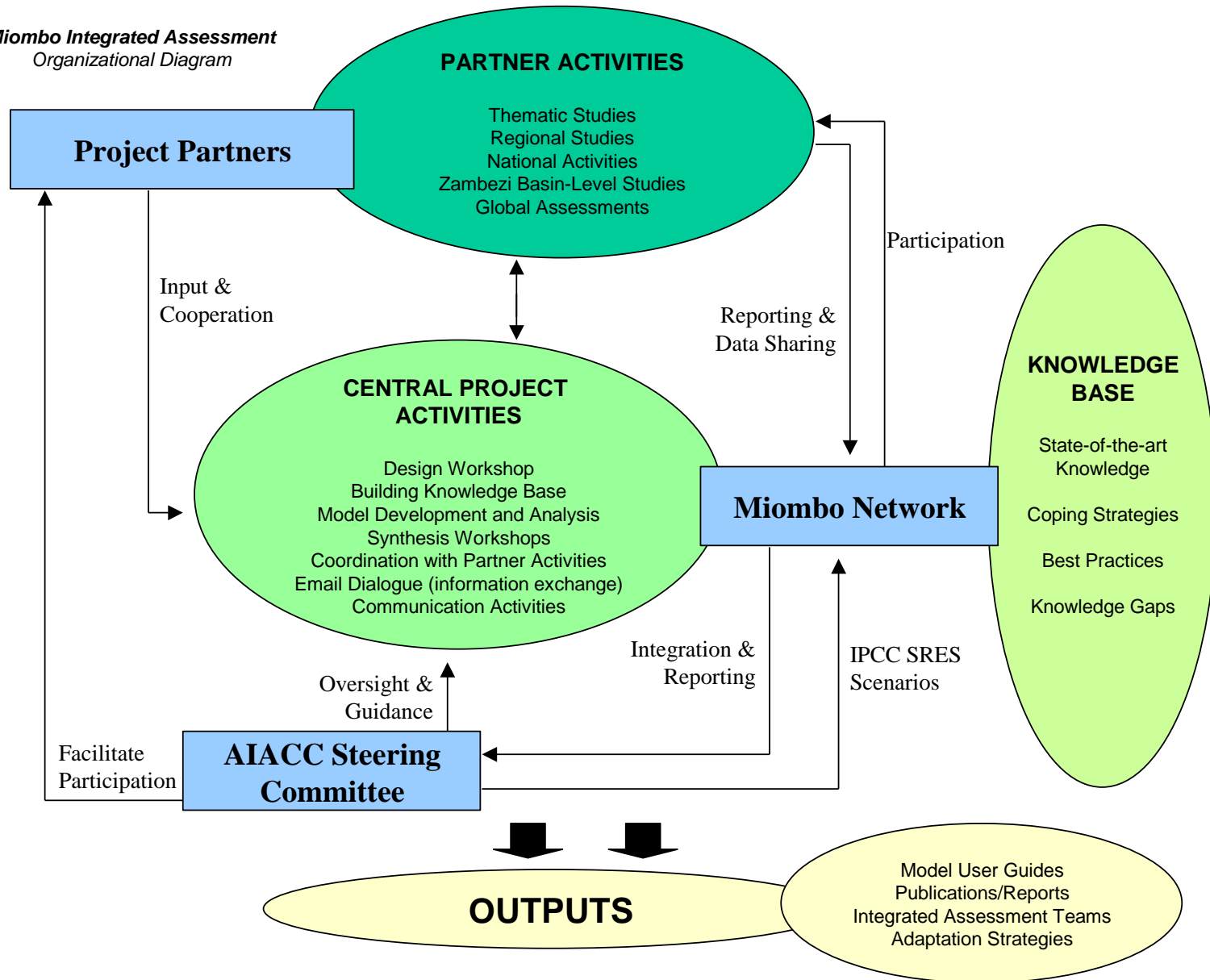
(Paulos Mwale (SADC); Pius Yanda; Dominick Kwesha; Manuel Ferrao)
PACOM 5th Meeting Nairobi June 2002

Miombo AIACC: Goals and Objectives

The overall goal of this project is to assess vulnerability to climate variability and extreme events in the Miombo region, mainly in terms of life, livelihoods, land use as a basis for production and livelihoods, to guide adaptation. Specific objectives are to:

1. Develop a regional integrated assessment team for the Miombo region and establish a summer institute on climate change.
2. Develop critical datasets, a regional integrated model and other tools for analyzing impacts and adaptation for the region.
3. Conduct case studies of recent droughts and floods in countries of the region (Zambezi River Basin)
4. Apply the data, models and case study results in assessing vulnerability of life and livelihoods in the Zambezi/Miombo region under future climate change, with particular emphasis on droughts and floods.
5. Identify critical adaptation plans of action across scales within the Zambezi River Basin – Miombo Region.

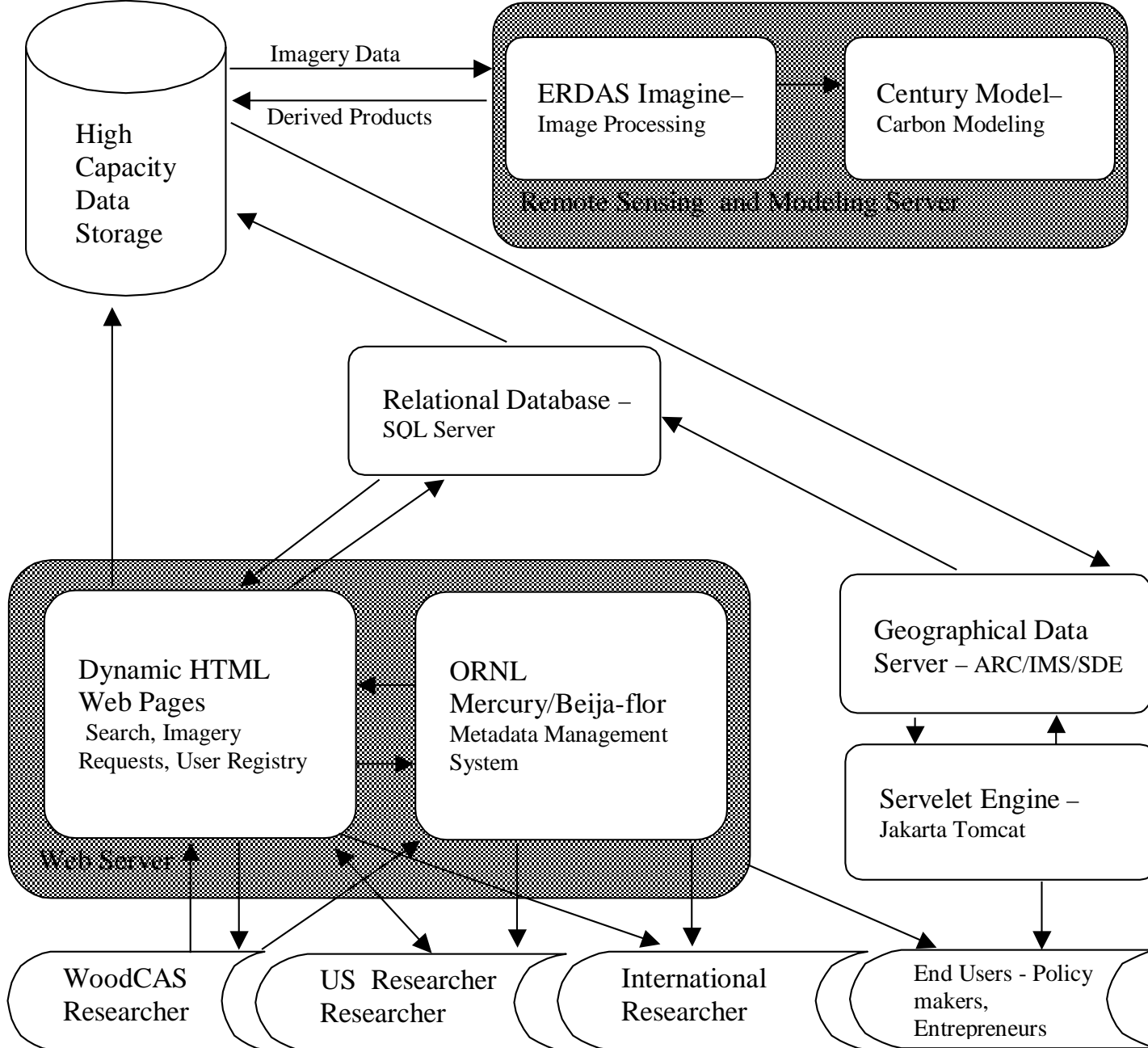
**Miombo Integrated Assessment
Organizational Diagram**



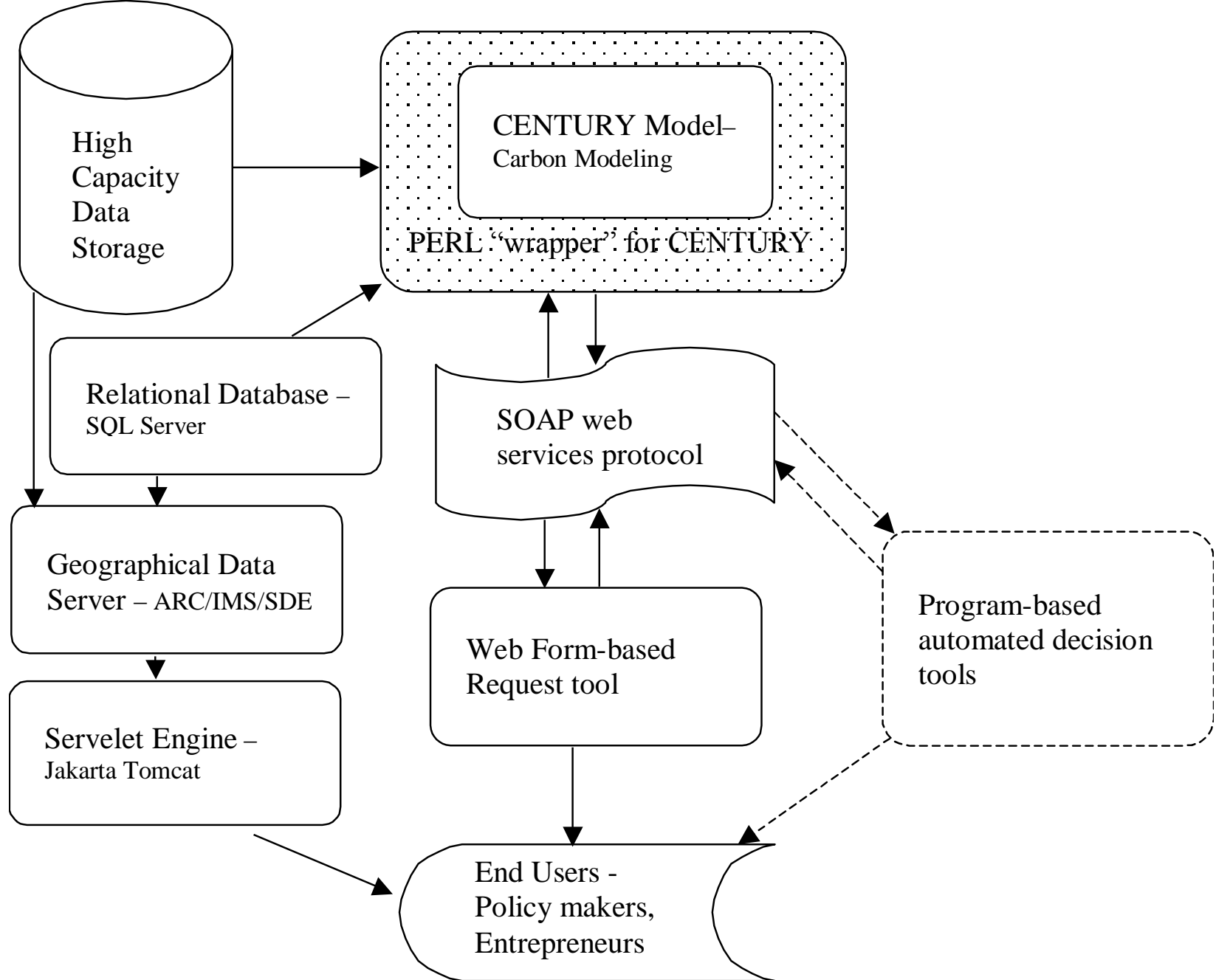
Woodland Carbon

Objectives

1. Establish a regional observatory of land cover/land use change (LCLUC) that includes a set of Landsat MSS, TM and ETM, to provide a basis for collaborative assessment of land cover change at the regional level (we are calling this system **WoodCAS** – woodland carbon accounting system).
2. Develop baseline land cover products for **major gaps** identified for the Southern Africa region, as well as regional products that highlight hot spots of land use change and major drivers of change.
3. Collate **forest inventory data** from forest plantations in the region as well as soil carbon information as basis for a carbon accounting model and system.
4. Implement **carbon models** based on CENTURY for belowground carbon and biomass-based approaches for aboveground carbon (**VYTL**) for use in predicting spatially explicit carbon accounts and potential for carbon improvement, for the southern Africa region.
5. Develop a **decision support tool** that would be accessible **via the web**, and would enable exploration of carbon projects in landscapes of the region.



Information system design for the dry forest LULUC and carbon accounting system



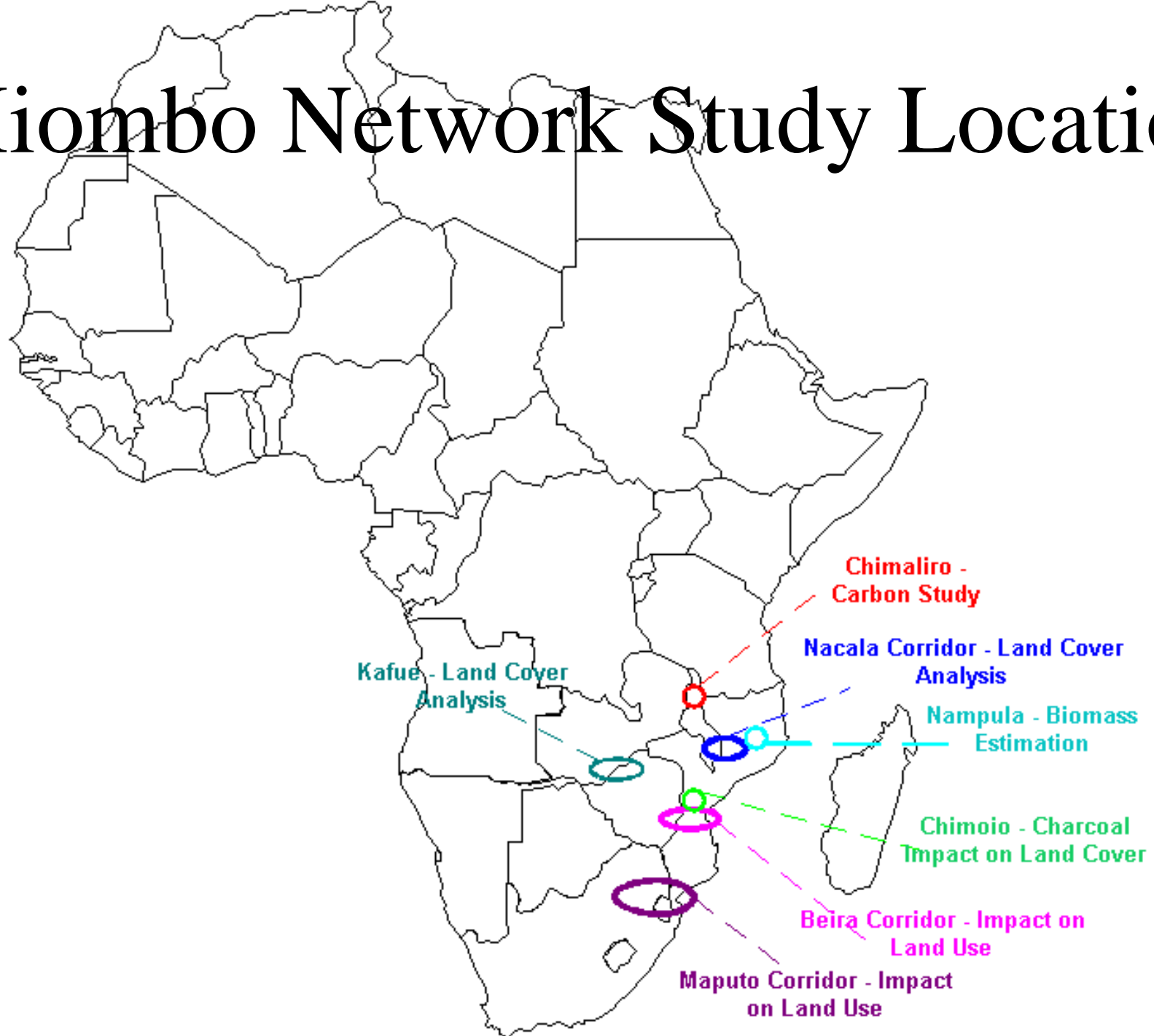
Design of the Decision Support System for Carbon Accounting via the Web
SCOPE Forest Management in Information Age Meeting Dec 15-18, 2002, Woods Hole

Decision support Models for Carbon

– to be accessible via Internet

- Use state of the art inputs and models, easily update and customize to new policy constraints and guidelines, e.g. issues related to carbon trading needs
- Force standards in data classification, archival, availability etc
- Overcome capacity constraints in individual countries with fairly similar forests/woodland ecosystems
- Processing to be distributed across network to overcome computer limitations locally

Miombo Network Study Locations



Linking Land Use with Carbon Assessment

Carbon Stocks of various African Ecosystems

(Woomer *et al* 1997)

- Total carbon stock is lower in miombo
- BUT Belowground stocks proportionately more dominant

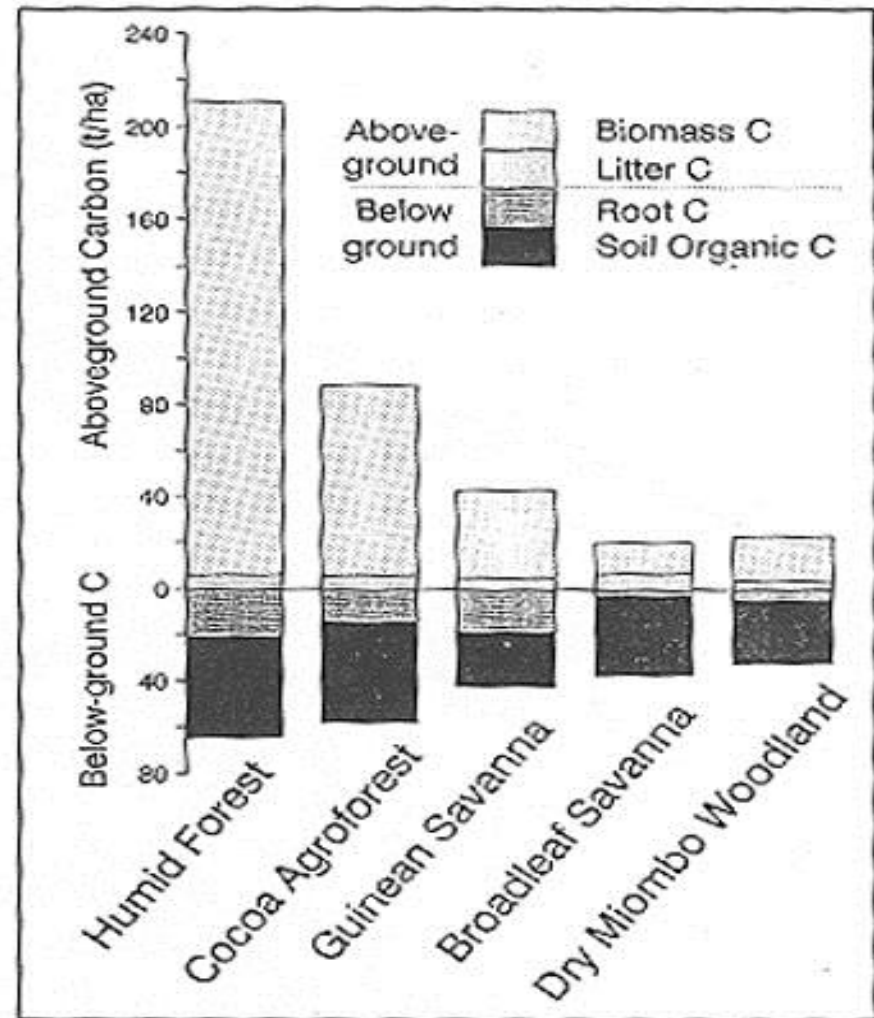
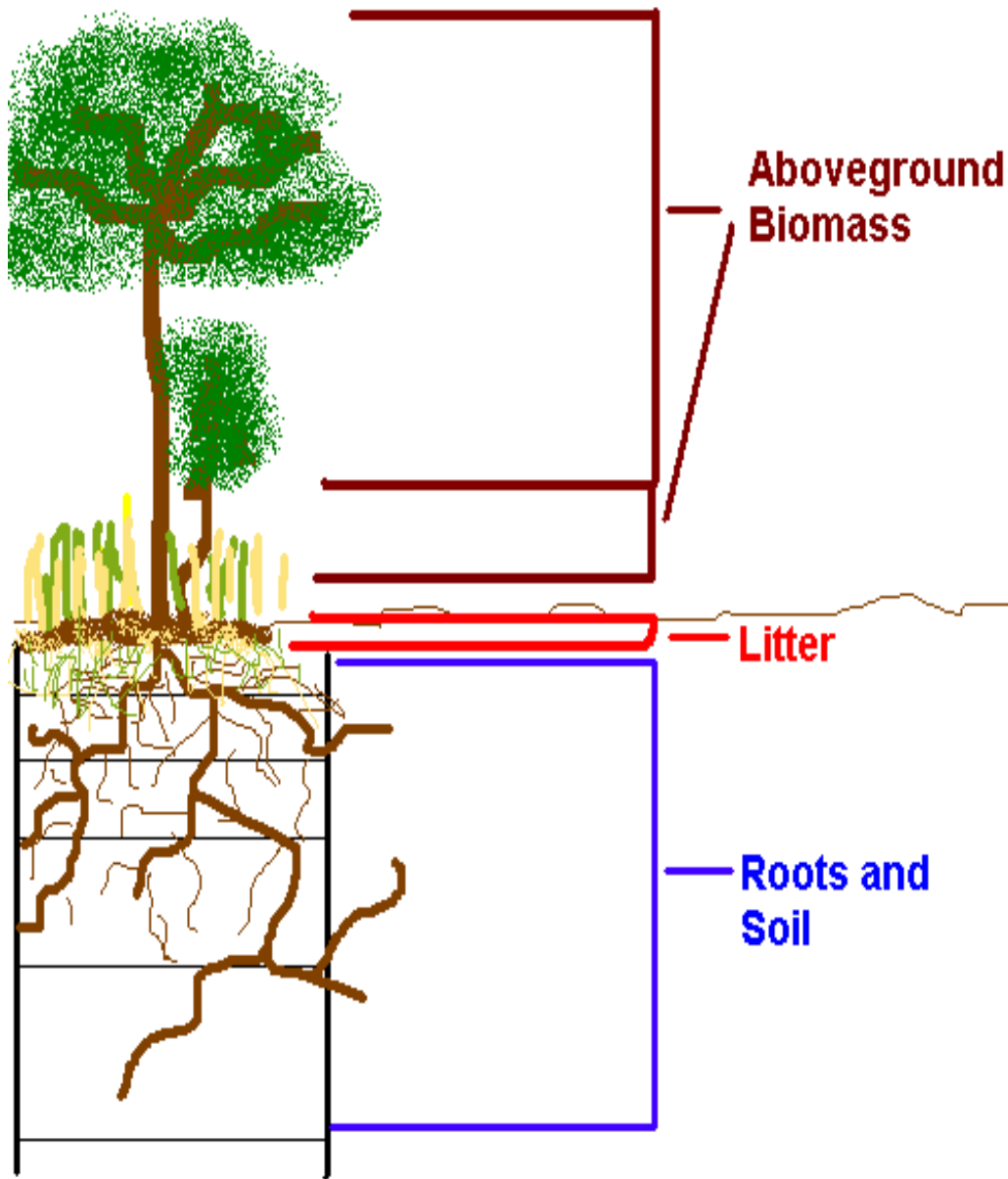


Figure 1. Carbon stocks in selected ecosystems in Africa; forest (J. Kotto-Same and Meekam, personal communication); Guinean savanna, broadleaf savanna and miombo woodland (Woomer and Swift, 1994); soil C from 0-20 cm.

Components sampled in 1 x 1 m plot:



Soil and Roots
Sampled
at 6 depths:

- 0-10 cm
- 10-20 cm
- 20-40 cm
- 40-60 cm
- 60-100 cm
- 100-150 cm

Carbon stock in one hectare of miombo and agriculture

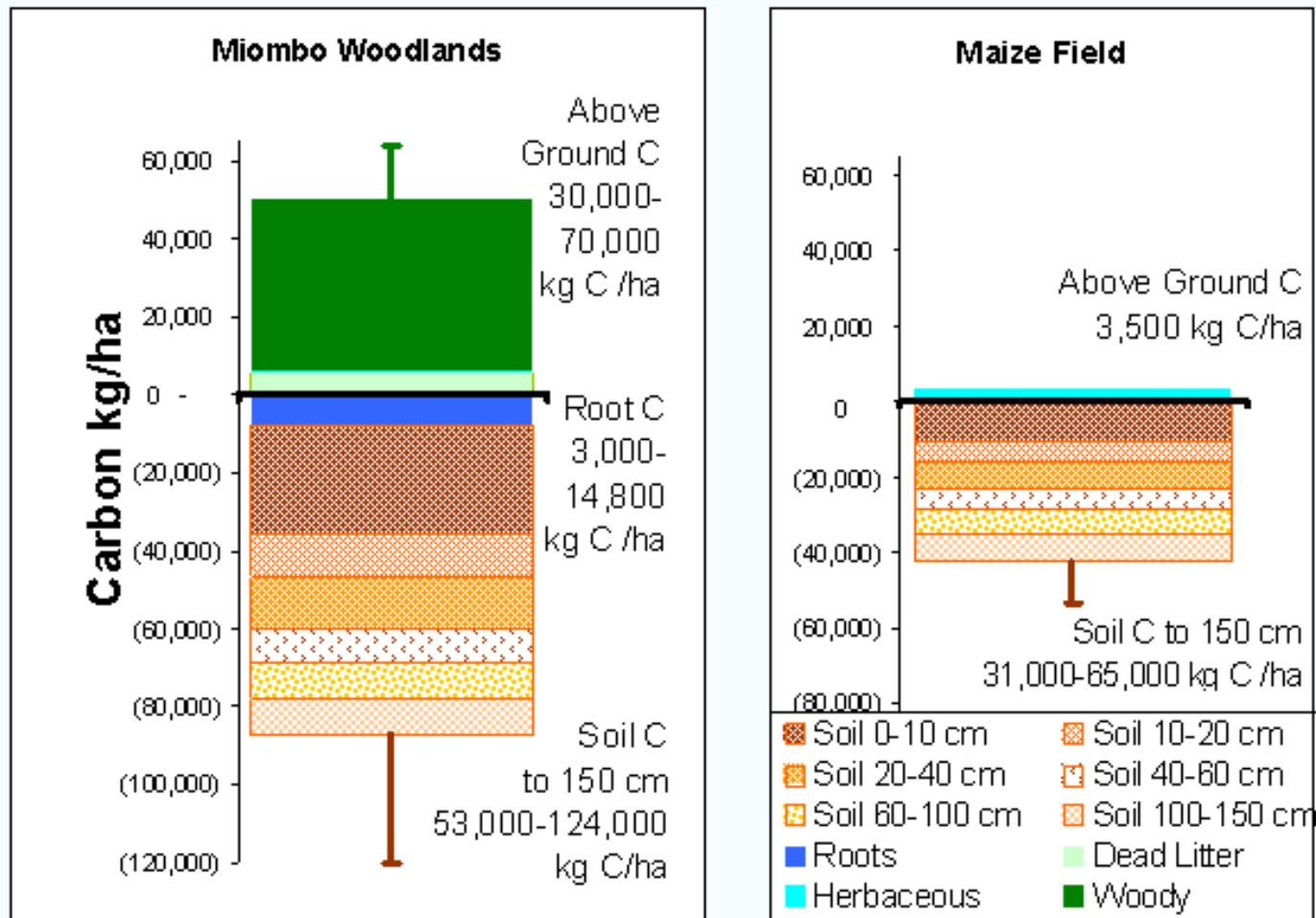


Figure 2. Carbon stock in one hectare of Miombo woodland and agriculture field (Walker and Desanker , *in press*; Sarah Walker, Masters Thesis, University of Virginia, November 2002)

- Part of ongoing studies to calibrate soil carbon under different land use histories

Nitrogen stock in one hectare of miombo and agriculture

