

# SAFARI 2000

## Synthesis Workshop



Hosted by

**UNIVERSITY** *of* **VIRGINIA**

Department of Environmental Sciences  
Charlottesville, VA

October 7 – October 11, 2002

## Monday October 7, 2001

Opening Session of the SAFARI 2000 Synthesis Workshop

### **Relevance of SAFARI 2000 Science to National and International Program Goals**

08:15 – 08:45 Morning Registration and Coffee, Foyer of Clark Hall

08:50 – 09:00 Administrative Housekeeping

09:00 – 09:10

Official Welcome to the University of Virginia/Opening of the Synthesis Workshop  
*Prof. Gene Block*, Provost, University of Virginia

09:10 – 09:30

SAFARI 2000 – Past, Present, Future  
*Asst. Prof. Robert J. Swap*, University of Virginia

09:30 – 09:50

Relevance of SAFARI 2000 to the NASA ESE  
*Dr. Diane Wickland*, NASA HQ and *Prof. Chris O. Justice*, University of Maryland

09:50 – 10:10

Relevance of SAFARI 2000 to South Africa's National Research Foundation, the Department of Arts, Culture, Science and Technology  
*Prof. Harold Annegarn*, University of the Witwatersrand and *Dr. Bob Scholes*, CSIR

10:10 – 10:40

**Special Invited Address**  
Relevance of SAFARI 2000 to Regional Environmental Policy in Light of the WSSD and the African Process  
*Ms. Rejoice Mabudafhasi*, The Hon. Deputy Minister of Environmental Affairs and Tourism, Republic of South Africa and Chair of the African Process

10:40 – 11:00 Break and Group Picture

### **Aircraft Science to Date**

11:00 – 11:20

The NASA ER-2  
*Dr. Michael D. King*, NASA GSFC

11:20 – 11:40

Vertical profiles of light scattering, light absorption and single-scattering albedo during the dry, biomass burning season in southern Africa and comparisons of in situ and remote sensing measurements of aerosol optical depths  
*B. I. Magi, P. V. Hobbs, B. Schmid and J. Redemann*

11:40 – 12:00

Key findings from the UKMO C-130 during SAFARI 2000  
*J. Haywood, P. Formenti, A. Keil and G. Myhre*

12:00 – 12:20

SAWS Aerocommanders during SAFARI 2000: Some preliminary findings  
*S.J. Piketh*, University of the Witwatersrand

12:30 – 13:30 Lunch

## **Afternoon Session Plenary: Examples of SAFARI Science Synthesis Components**

13:45 – 14:00

APINA activities towards development of a regional policy on air pollution in southern Africa

*S. Simukanga, A. M. van Tienhoven, B. Chipindu and K. Hicks*

14:00 – 14:15

Channelling SAFARI 2000 results for developing regional policy on the environment for southern Africa

*J. J. Cumbane, A. M. van Tienhoven, S. Simukanga, B. Chipindo and K. Hicks*

14:15 – 14:30

Zambia's participation in Southern African Regional Science Initiative (SAFARI 2000). A summary of activities

*M. Mukelabai, J. L. Privette, J. Kanyanga, R. J. Swap and R. Mugara*

14:30 – 14:50

Data coordination and distribution by NASA's SAFARI data team

*J. E. Nickeson, D. L. Landis, J. L. Privette and J. T. Morisette*

14:50 – 15:10

Implementation of the integrated information technology at the National Disaster Management Centre: Relevance to SAFARI 2000

*D. Sakulski and R. Weinmann*

15:10 – 15:25

Metadata Collection and Archiving

*R. B. Cook*

15:25 – 15:40      Break

15:45 – 16:00

Validation of the MODIS LAI and FPAR Products and their relationship to canopy structure along the southern Africa Kalahari transect

*J. L. Privette, M. Mukelabai, K. F. Huemmrich, R. B. Myneni and Y. Knyazikhin*

16:00 – 16:15

Emissions and evolution of trace gases and particles from savanna fires in southern Africa

*P. Sinha, P. V. Hobbs, R. J. Yokelson, I. T. Bertschi, T. J. Christian, D. R. Blake, S. Gao, T. W. Kirchstetter, T. Novakov, and P. Pilewskie*

16:15 – 16:30

Remote sensing observations of carbon monoxide in the 'River of Smoke' on September 6, 2000 and comparisons to in-situ measurements

*M. L. McCourt, W. W. McMillan, H. E. Revercomb, R. O. Knuteson, R. J. Yokelson*

16:30 – 16:45

A Qualitative assessment of MODIS data for burned area mapping in Namibia

*J. L. Le Roux and D. P. Roy*

16:45 – 17:00

Lidar observations depicting tropospheric aerosol transport over South Africa during the ARREX and SAFARI-2000 experiments

*J. R. Campbell, E. J. Welton, J. D. Spinhirne, Q. Ji, S. Tsay, S. J. Piketh, M. Barenbrug and B. N. Holben*

17:00 – 17:15

Integration of ground-based, remote sensed, and modelling activities related to biomass burning and emission estimates over southern Africa

*C. Hély, S. Alleaume, K. K. Caylor, R. J. Swap and H.H. Shugart*

17:15 – 17:30 Break

17:30 Poster Session/ Reception in 'Old' Clark Mural Room; Refer to titles listed below  
2 Min. Presentations by Authors starting at 17:30; Dinner is on your own

Seasonal variability of aerosol single scattering albedo at biomass burning sites in southern Africa and Amazonia  
*T. F. Eck, B. N. Holben, M. M. Mukelabai, O. Dubovik, A. Smirnov, J. S. Schafer and I. Slutsker*

Seasonal and inter-annual carbon & water dynamics of savanna systems in southern Africa  
*N. P. Hanan, R. J. Scholes and J. L. Privette*

The impact of land use on the belowground carbon budget of the Miombo woodlands region  
*S. Walker and P. Desanker*

Mapping land cover and land use change in Zimbabwe  
*D. Kwesha and J. Mambo*

Climatic and synoptic controls for haze layers along the eastern coastal region of southern Africa  
*D. C. Stein, R. J. Swap, S. J. Piketh, T. Elias, B. G. Doddridge and R. T. Bruintjes*

Variability in tropical tropospheric ozone from the 1998-2000 SHADOZ (Southern Hemisphere Additional OZonesondes) data  
*J. C. Witte, A. M. Thompson, F. J. Schmidlin, S. J. Oltmans and G. J. R. Coetzee*

Recommended trace gas emission factors for the production and use of biofuels  
*R. J. Yokelson, I. T. Bertschi, T. J. Christian, D. E. Ward and W. M. Hao*

The role of heterogeneous processes in modifying the chemical composition of wet deposition in a semi-arid area of South Africa  
*J. N. Mphopya, J. J. Pienaar, C. Galy-Lacaux and V. Pont*

Bare ground and bovines: Effects of grazing history and intensity on savanna soils and vegetation  
*C. J. W. Feral and H. E. Epstein*

Validation of the MODIS active fire product over southern Africa with ASTER data  
*J. T. Morisette, L. Giglio, I. Csizsar and C. O. Justice*

Characterization of southern African aerosols through compound specific isotope analysis and trajectory study  
*K. A. Billmark, R. J. Swap and S. A. Macko*

Evaluation of the MODIS BRDF/Albedo products over Zambia using aircraft and tower-based measurements  
*J. L. Privette, M. Mukelabai, C. Gatebe and C. Schaaf*

Airborne multi-spectral measurements of surface-atmosphere anisotropy for several surfaces and ecosystem over southern Africa using Cloud Absorption Radiometer (CAR)  
*C. K. Gatebe, M. D. King, S. Platnick, G. T. Arnold, E. F. Vermote, and B. Schmid*

Transport and diffusion in southern African anticyclonic gyre circulation  
*W. Zhakata, S. J. Piketh, G. D. Djolov and H. J. Annegarn*

Mozambique Floods 2000 Impact On Biodiversity Of Limpopo River Basin  
*A. Siteo, M. Ferrão, N. Ribeiro, R. Bandeira, T. Chiconela, L. Nhamucho and G. Albano*

## Tuesday October 8, 2002

### Morning Session: Ecosystem and Land Processes

08:45 – 09:00

Overview of MISR SAFARI 2000 validation/calibration activities and some early results

*M. C. Helmlinger*

09:00 – 09:15

Tree cover mapping in the Kalahari Transect using multi-resolution data sets

*M. C. Hansen*

09:15 – 09:30

Tree canopy effects on simulated water stress in southern African savannas

*K. Caylor and H. H. Shugart*

09:30 – 09:45

Directional effects on observations of land surface temperature with AVHRR over Africa

*A. C. Pinheiro, J.L. Privette, R. Mahoney and C.J. Tucker*

09:45 – 10:00

An overview of the SAFARI 2000 investigations of biogenic volatile organic carbon emissions

*L. Otter, A. Guenther, J. Greenberg, P. Harley, C. Wiedinmyer, G. Fleming, S. Owen, A. James, N. Hewitt, and E. Veenendaal*

10:00 – 10:15

Nitrogen isotopic signatures of soils and plants along land-use gradients in the Kalahari.

*J. N. Aranibar, S. A. Macko, I. C. Anderson, J. Ramotsho, H. H. Shugart*

10:15 – 10:30

On the Temporal Dynamics of Coupled Water and Carbon Exchange in an African Savanna: Implications for Predictions over Meteorological and Climate Time Scales

*John D. Albertson, Christopher A. Williams, Todd M. Scanlon*

10:30 – 10:45      Break

10:45 – 11:00

Mapping of Ecological Change along the Okavango Delta, implications for water loss?

*S. Ringrose, A. Jellema, P. Wolski, W. Timmermans, T. Meyer and E. Kabikwa*

11:00 – 11:15

Assessment of the Vegetational Response to Flooding in the Okavango Delta, Botswana using Landsat and EO-1 Remotely Sensed Data

*A. Neuenschwander, M. M. Crawford and S. Ringrose*

11:15 – 11:30

Influencing policy decisions through remote sensing: South African ISRDS and Umlindi approaches

*B. M. Petja, H. J. Annegarn, T. S. Newby and T.A.Saidi*

11:30 – 11:45

The Use Of Remote Sensing To Evaluate Environmental Impacts Of Mining In The Central Rand

*N. F. Mphphu, H. J. Annegarn and M. J. Viljoen*

11:45 – 12:00

Derivation of the effective value of the surface albedo for improving the estimation of the aerosol radiative forcing from ground-based remote sensing.

*T. Elias*

12:00 – 13:00 Lunch

13:00 – 14:00 Walking Tour of the University

### **Afternoon Session: Fuel, Fires and Emissions**

14:00 – 14:15

Mapping of southern Africa biomass burning - the regional Moderate Resolution Imaging Spectroradiometer (MODIS) burned area product, validation results, product intercomparison and sensitivity analysis

*D. P. Roy, S. Korontzi, C. O. Justice, T. Landmann, J. Le Roux, S. Makungwa, K. Dunham, R. Dutoit, K. Gumbo, A. Zacarias, P. Mushove, P. Dube, B. Tacheba, P. Frost, J. Morissette, D. Davies*

14:15 – 14:30

Biomass burning parameters of four experimental fires in the Western Province, Zambia

*J. M. C. Pereira, A. C. L. Sa, J. M. N. Silva, D. E. Ward and N. Ribeiro*

14:30 – 14:45

Recommended Trace Gas Emission Factors For African Savanna Fires and Post-Emission Transformations

*R. J. Yokelson, I. T. Bertschi, T. J. Christian, P. V. Hobbs, D. E. Ward and W. M. Hao*

14:45 – 15:00

Summary of a Few Smoke Emissions Studies in Zambia

*D. E. Ward*

15:00 – 15:15

Improved regional fire emissions estimates from Kruger National Park (KNP) biofuels

*T. Landmann and S. Korontzi*

15:15 – 15:30

A dynamic emissions model for savannas

*R. J. Scholes and T. Landmann*

15:30 – 15:45 Break

15:45 – 16:00

Emissions of volatile and particulate compounds from experimental burns of southern African biofuels

*W. C. Keene, J. M. Lobert, J. R. Maben, D. H. Scharffe, P. J. Crutzen, C. Brain, C. Hely, T. Landmann and D. Kayambazinthu*

16:00 – 16:15

Estimating emissions of carbonaceous compounds from southern African fires: A re-analysis of modeling techniques

*K. Caylor, C. Hely, S. Alleaume, R. J. Swap, H. H. Shugart*

16:15 – 16:30

Coordinated airborne, spaceborne, and ground-based measurements of massive, thick aerosol layers during the dry season in southern Africa

*B. Schmid, J. Redemann, P. B. Russell, P. V. Hobbs, D. L. Hlavka, M. J. McGill, B. N. Holben, E. J. Welton, J. Campbell, O. Torres, R. A. Kahn, D. J. Diner, M. C. Helmlinger, D. A. Chu, C. Robles Gonzalez, and G. de Leeuw*

16:30 – 16:45

Comparison of in-situ observations of southern African aerosols to MODIS aerosol products during SAFARI 2000

*R. J. Swap, D. L. Richardson, S. Alleaume, A. Chu, D. C. Stein, S. J. Piketh, H.J. Annegarn, and C. Ichoku*

16:45 – 17:00

Characterization of the optical properties of atmospheric aerosols over Inhaca Island, Mozambique

*A. J. Queface, S. J. Piketh, H. J. Annegarn, B. N. Holben, R. J. Uthui and R. J. Swap*

17:00 – 17:15

Validation of Version-4 MODIS aerosol optical depth retrievals in SAFARI region

*D. A. Chu, L. A. Remer, Y. J. Kaufman, C. Ichoku*

17:15 – 17:30

Calculations of aerosol radiative forcing in the SAFARI region from MODIS Data

*L.A. Remer, C. Ichoku, Y.J. Kaufman, D.A. Chu*

## Wednesday October 9, 2002

### **Morning Session: Atmospheric Processes and Transport**

08:30 – 08:45

The meteorology, climate and air transport of southern Africa during SAFARI 2000

*T. M. Freiman, M. R. Jury, H. Riphagen, S. Medcalf and R. J. Swap*

08:45 – 09:00

Tropospheric ozone over southern Africa during SAFARI 2000: Transport pathways and associated synoptic features

*P. M. Bundi, S. J. Piketh, A. M. Thompson, H. J. Annegarn*

09:00 – 09:15

Lusaka, Zambia, during SAFARI 2000: Evidence for convergence of local and imported ozone pollution

*A. M. Thompson, J. C. Witte, T. M. Freiman, N. A. Phahlane and G. J. R. Coetzee*

09:15 – 09:30

Biomass burning and anthropogenic aerosol effects on cloud microphysics and precipitation development

*R. T. Bruintjes*

09:30 – 09:45

Cloud condensation nuclei and cloud processes over southern Africa

*K.E. Ross, S.J. Piketh, R.T. Bruintjes, R.P. Burger and V. Salazar*

09:45 – 10:00

MODIS cloud science and validation activities during SAFARI 2000

*S. E. Platnick, M. D. King and T. Arnold*

10:00 – 10:15

Satellite Remote Sensing of Industrial Atmospheric Emissions

*C. Rautenbach, H. J. Annegarn, M. A. Kneen*

### **Preliminary Breakout Group Discussions**

- 10:00 – 11:15 Combined Break/Preliminary Breakout Group Discussions with participants being back at the Cavalier Inn and ready to leave by 11:30
- Ecosystem Dynamics** – R. Scholes and H. Shugart to lead – K. Caylor to record  
**Fire Fuel and Emission** – C. Justice to designate lead – C. Hely to record  
**Aerosols and Trace Gases** – H. Annegarn to lead – C. Rautenbach and D. Stein to record  
**Clouds and Radiation** – S. Platnick and R. Bruintjes to lead – K. Ross to record  
**Data Group** – J. Nickeson to lead – R. Cook to record  
**Policy** – S. Simukanga to lead – J. J. Cumbane to record
- 11:30 – 16:30 FIELD TRIPS to either Monticello or Humpback Rocks; Pick up box lunch before you leave
- 18:45 Board Buses at Best Western Cavalier Inn for Group Dinner on Downtown Mall
- 19:00 – 21:00 Dinner at the Blue Light Grill

### **Thursday October 10, 2002**

- 09:00 – 12:00 Breakout Groups: Focus on Synthesizing Results and Suggesting Next Steps; Groups will be located in both Old and New Clark Hall
- Ecosystem Dynamics** – R. Scholes and H. Shugart to lead – K. Caylor to record  
**Fire Fuel and Emission** – C. Justice to designate lead – C. Hely to record  
**Aerosols and Trace Gases** – H. Annegarn to lead – C. Rautenbach and K. Billmark to record  
**Clouds and Radiation** – S. Platnick and R. Bruintjes to lead – K. Ross to record  
**Data Group** – J. Nickeson to lead, R. Cook to record
- 12:00 – 14:00 Lunch at the Colonnade Club
- 14:00 – 15:30 Breakout Groups Continued; Emphasis on creating group presentations for Fri. AM plenary
- 18:00 – 20:00 Group Dinner at Biltmore Hotel
- 20:00 SAFARI-Related graduate students and interested others invited to join UVA graduate students after dinner for social time at the Biltmore Grill

### **Friday October 11, 2002**

- 08:45 – 09:00 Opening
- 09:00 – 09:20 Report Back: Ecosystem Dynamics – R. Scholes/H. Shugart to lead, K. Caylor to record
- 09:20 – 09:40 Report Back: Fire Fuel and Emissions – C. Justice to designate lead, C. Hely to record
- 09:40 – 10:00 Report Back: Aerosols & Trace Gases – H. Annegarn lead, C. Rautenbach/K. Billmark
- 10:00 – 10:20 Report Back: Clouds and Radiation – S. Platnick/R. Bruintjes to lead, K. Ross to record
- 10:20 – 10:40 Break



- 10:40 – 11:00 Report Back: Policy – Stephen Simukanga to lead, J.J. Cumbane to record
- 11:00 – 11:20 Report Back: Data Group – J. Nickeson to lead, R. Cook to record
- 11:20 – 11:40 Implications for Next Effort in SAFARI CD-Rom Series
- 11:40 – 12:00 Discussion: Chapter Synthesis/Paper Submission for SAFARI 2000 Synthesis Workshop Book
- 12:00 – 12:20 Wrap-up and Closing of Workshop
- 12:20 – 13:00 Lunch
- 13:30 Buses Leave for BWI
- 13:30 Informal Meeting of Synthesis Chapter Leads

EXTRA INFORMATION:

E-Mail/Internet Location:

For those of you who need to check e-mail via the Internet, the library has several computers that allow you to access your email account without having a UVA ID. The Science and Engineering Library is located in 'Old' Clark Hall (straight through doors at the front of the building).

It is open during the following times:

**Mon – Thur:** 8am until 10pm

**Friday:** 8am until 6 pm

**Saturday:** 12pm until 5pm

**Sunday:** 1pm until 10pm