SAFARI 2000 SHADOZ Ozonesonde Data, Zambia and Regional Sites, Dry Season 2000

Abstract

Ozonesonde launches were made by the **S**outhern **H**emisphere **AD**ditional **OZ**onesondes **(SHADOZ)** group as part of the SAFARI 2000 Dry Season Campaign in September 2000 (Thompson et al., 2002) at Lusaka, Zambia. Data from on-going SHADOZ regional measurements at Irene (South Africa), La Réunion Island, and Ascension Island sites are also included. These ozonesonde data files contain profiles of ozone partial pressures, as well as temperature, pressure, and humidity values up to 35 km in altitude (around 5 hPa in pressure coordinates). These ozonsondes, which are a suite of balloon-borne instruments, capture the troposphere and lower stratospheric portion of the atmosphere. During the campaign, ozonesondes were launched daily at Lusaka during the height of the burning season and in a region of active biomass burning activity. Plots of sonde vertical profiles and air mass back trajectories are included.

Background Information

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Project: SAFARI 2000/SAVE

Data Set Title: SAFARI 2000 SHADOZ Ozonesonde Data, Zambia and Regional Sites, Dry Season 2000

Site: Lusaka, Zambia, Africa
Westernmost Longitude: 28.32 **Easternmost Longitude:** 28.32
Northernmost Latitude: -15.42
Southernmost Latitude: -15.42
Elevation: 1280 m

Site: Ascension Island Observatory
Westernmost Longitude: -14.42
Easternmost Longitude: -14.42
Northernmost Latitude: -7.98
Southernmost Latitude: -7.98
Elevation: 91 m

Site: Irene, South Africa Station
Westernmost Longitude: 28.22 **Easternmost Longitude:** 28.22
Northernmost Latitude: -25.90
Southernmost Latitude: -25.90
Elevation: 1524 m

Site: La Réunion Observatory
Westernmost Longitude: 55.48 **Easternmost Longitude:** 55.48
Northernmost Latitude: -21.06
Southernmost Latitude: -21.06
Elevation: 24 m

Data Set Citation:

Thompson, A. and J. Witte. 2004. SAFARI 2000 SHADOZ Ozonesonde Data, Zambia and Regional Sites, Dry Season 2000. Data set. Available on-line [http://daac.ornl.gov/] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A.

Web Site:
http://croc.gsfc.nasa.gov/shadoz/

Data File Information

The data files are stored as ASCII table files, one file per flight, in space-separated-value format. Files with the letter 'b' after the date are the second launch on that day. The data files and the .gif files of vertical profile plots and air mass trajectory images are compressed in a separate .zip file per measurement site.

Lusaka, Zambia Flights - September 2000

Data File Names	Vertical Profile Plots	Air Parcel History Images
safari2k_20000906.dat	safari2k_20000906.gif	safari2k_20000906_ktj.gif
safari2k_20000907.dat	safari2k_20000907.gif	safari2k_20000907_ktj.gif
safari2k_20000907b.dat	safari2k_20000907b.gif	safari2k_20000907b_ktj.gif
safari2k_20000908.dat	safari2k_20000908.gif	safari2k_20000908_ktj.gif
safari2k_20000909.dat	safari2k_20000909.gif	safari2k_20000909_ktj.gif
safari2k_20000909b.dat	safari2k_20000909b.gif	safari2k_20000909b_ktj.gif
safari2k_20000910.dat	safari2k_20000910.gif	safari2k_20000910_ktj.gif
safari2k_20000910b.dat	safari2k_20000910b.gif	safari2k_20000910b_ktj.gif
safari2k_20000911.dat	safari2k_20000911.gif	safari2k_20000911_ktj.gif

Ascension Island Observatory Flights - August and November 2000

Data File Names	Vertical Profile Plots	Air Parcel History Images
ascen_20000804.dat	ascen_20000804.gif	ascen_20000804_ktj.gif
ascen_20000810.dat	ascen_20000810.gif	ascen_20000810_ktj.gif
ascen_20000816.dat	ascen_20000816.gif	ascen_20000816_ktj.gif
ascen_20001102.dat	ascen_20001102.gif	ascen_20001102_ktj.gif
ascen_20001108.dat	ascen_20001108.gif	ascen_20001108_ktj.gif

Irene, South Africa Station - August to November 2000

Data File Names	Vertical Profile Plots	Air Parcel History Images
irene_20000802.dat	irene_20000802.gif	irene_20000802_ktj.gif
irene_20000816.dat	irene_20000816.gif	irene_20000816_ktj.gif
irene_20000823.dat	irene_20000823.gif	irene_20000823_ktj.gif
irene_20000830.dat	irene_20000830.gif	irene_20000830_ktj.gif
irene_20000901.dat	irene_20000901.gif	irene_20000901_ktj.gif
irene_20000904.dat	irene_20000904.gif	irene_20000904_ktj.gif
irene_20000905.dat	irene_20000905.gif	irene_20000905_ktj.gif
irene_20000906.dat	irene_20000906.gif	irene_20000906_ktj.gif
irene_20000907.dat	irene_20000907.gif	irene_20000907_ktj.gif
irene_20000908.dat	irene_20000908.gif	irene_20000908_ktj.gif
irene_20000911.dat	irene_20000911.gif	irene_20000911_ktj.gif
irene_20000927.dat	irene_20000927.gif	irene_20000927_ktj.gif
irene_20001004.dat	irene_20001004.gif	irene_20001004_ktj.gif
irene_20001011.dat	irene_20001011.gif	irene_20001011_ktj.gif
irene_20001025.dat	irene_20001025.gif	irene_20001025_ktj.gif
irene_20001101.dat	irene_20001101.gif	irene_20001101_ktj.gif

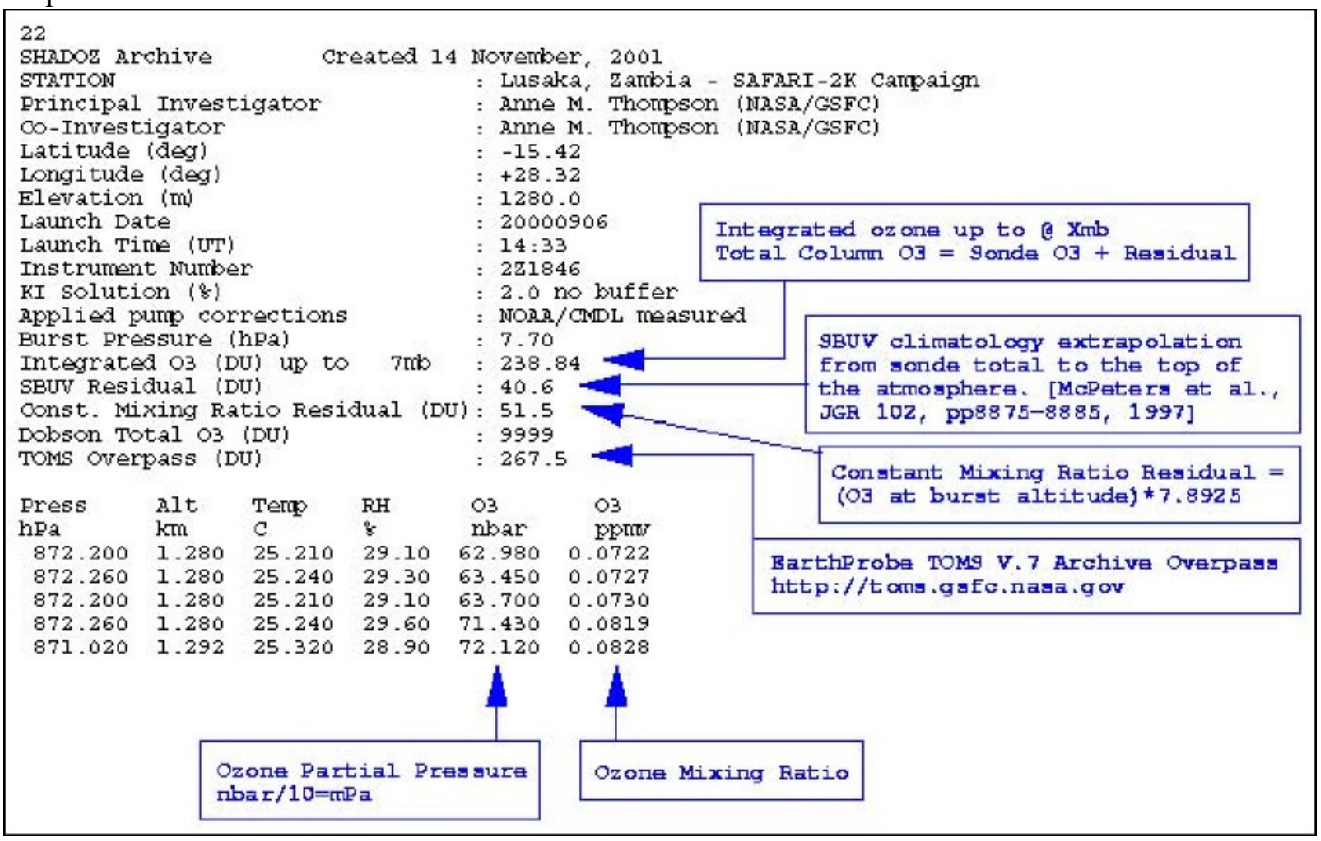
La Réunion Observatory - August to November 2000

Data File Names	Vertical Profile Plots	Air Parcel History Images
reunion_20000803.dat	reunion_20000803.gif	reunion_20000803_ktj.gif
reunion_20000810.dat	reunion_20000810.gif	reunion_20000810_ktj.gif
reunion_20000824.dat	reunion_20000824.gif	reunion_20000824_ktj.gif
reunion_20000830.dat	reunion_20000830.gif	reunion_20000830_ktj.gif
reunion_20001025.dat	reunion_20001025.gif	reunion_20001025_ktj.gif

reunion_20001102.dat	reunion_20001102.gif	reunion_20001102_ktj.gif

Data Files Format

The data files have descriptive headers, followed by the data records, as shown in the following sample header from a SAFARI data file.

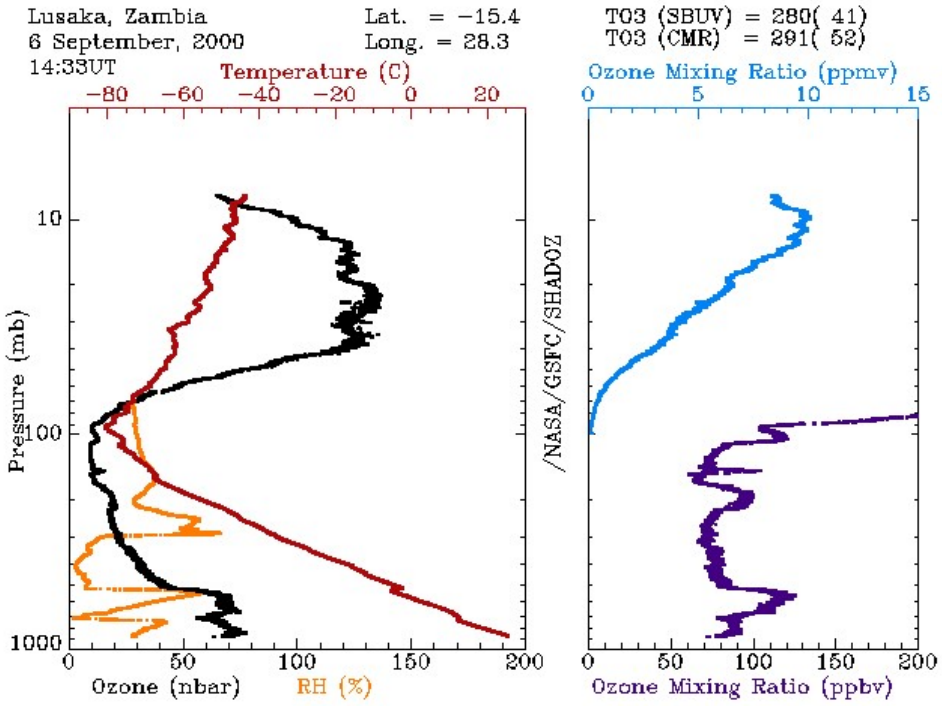


The files contain data records with the following columns:

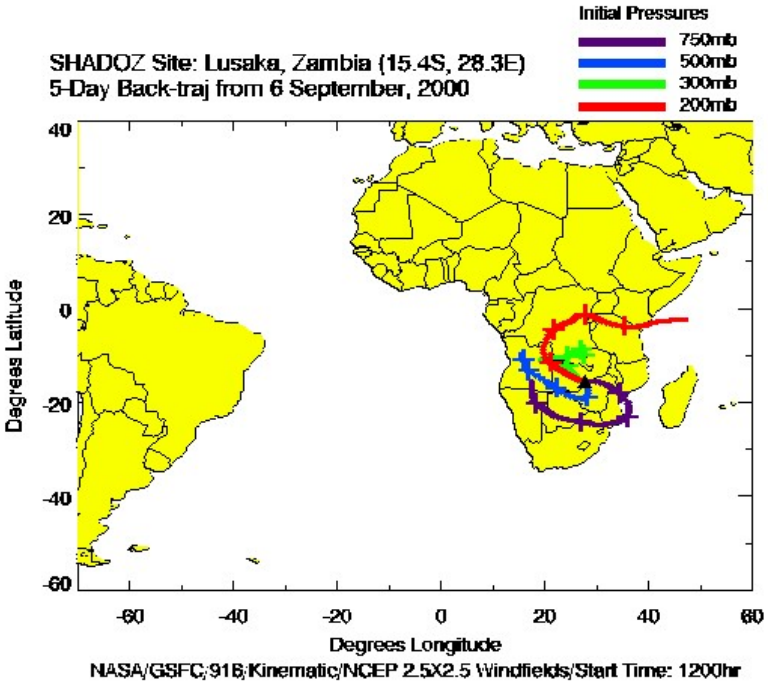
Column	Label	Definition	Units
1	Press	Air pressure	hPa
2	Alt	Altitude	km
3	Temp	Temperature	degrees Celsius

4	RH	Relative Humidity	%
5	O3	Ozone Partial Pressure	nbar
6	O3	Ozone Mixing Ratio	ppmv

Example Vertical Profile Plots



Example Air Parcel History Image



Measurement of Ozone Profiles at Lusaka

Ozonesondes are balloon-borne instruments measuring profile ozone, as well as temperature and pressure from an attached radiosonde, up to 35 km in height (around 5 hPa in pressure coordinates) capturing the troposphere and lower stratospheric portion of the atmosphere. During the campaign, ozonesondes were launched daily or twice daily during the height of the burning season and in a region of active biomass burning activity.

Ozone and temperature profiles recorded at 1 second intervals were determined with an electrochemical concentration cell ozonesonde (ENSCI 2Z) in combination with an RS-80/15 Vaisala radiosonde and a HumiCap humidity sensor (Thompson et al., 2000).

Ozonesondes were launched at the Zambian Meteorological Department (ZMD) in Lusaka, Zambia between September 6th and 11th, 2000. Two launches, at 0800 and 1200 UTC, were made on the 7th, 9th and 10th of September. Soundings were recorded up to an 8-10 hPa balloon burst; the first 7 September sounding lost sonde signal at 40 hPa when laboratory power failed.

Lusaka, Zambia Sonde Information

Ozonesonde Type: EnSci 2Z ECC
Radiosonde Type: Väisälä
KI Solution: 2% Unbuffered

During SAFARI-2000, the first ozonesonde launches were made in the heart of the south central African during the burning season.


Preparing balloon and sonde for launch. Sunset in Lusaka during burning season.

Measurement of Ozone Profiles at Regional Sites

During the campaign, ozonesondes were launched according to regular schedules and followed routine procedures at the regional sites as described at http://croc.gsfc.nasa.gov/shadoz/.

Ascension Is. Observatory Sonde Information
Ozonesonde Type: EnSci Z, 1Z, 2Z & Science Pump 6A
Radiosonde Type: Sippican MK-2 (for Z type) Vaisala (for 1Z, 2Z, 6A type)
KI Solution: 1% Buffered

Irene, South Africa Station Sonde Information
Ozonesonde Type: Science Pump ECC6A
Radiosonde Type: Väisälä
KI Solution: 1% buffere

La Réunion Observatory Sonde Information
Ozonesonde Type: EnSci Z & SPC 6A
Radiosonde Type: Vaisala
KI Solution: -> 04/98 1% Buffered, 05/98 -> 0.5% Buffered

Additional Sources of Information

Additional data for southern Africa sites that are not part of SAFARI can downloaded from the SHADOZ Web Site [http://croc.gsfc.nasa.gov/shadoz]. Those sites are located in Nairobi, Kenya; and Malindi, Kenya.

References:

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Revision Date: Wednesday, June 16, 2004