

# SAFARI 2000 Derived Soil Properties, 0.5-Deg (ISRIC-WISE)

## Summary:

The data set consists of a southern Africa subset of the ISRIC-WISE global data set of derived soil properties. Data files are available in both ASCII GRID and binary image files formats.

The World Inventory of Soil Emission Potentials (WISE) database currently contains data for over 4300 soil profiles collected mostly between 1950 and 1995. This database has been used to generate a series of uniform data sets of derived soil properties for each of the 106 soil units considered in the Soil Map of the World (FAO-UNESCO, 1974). These data sets were then linked to a 1/2 degree longitude by 1/2 degree latitude version of the edited and digital Soil Map of the World (FAO, 1995) to generate GIS raster image files for the following variables:

Total available water capacity (mm water per 1 m soil depth)

Soil organic carbon density (kg C/m<sup>2</sup> for 0-30 cm depth range)

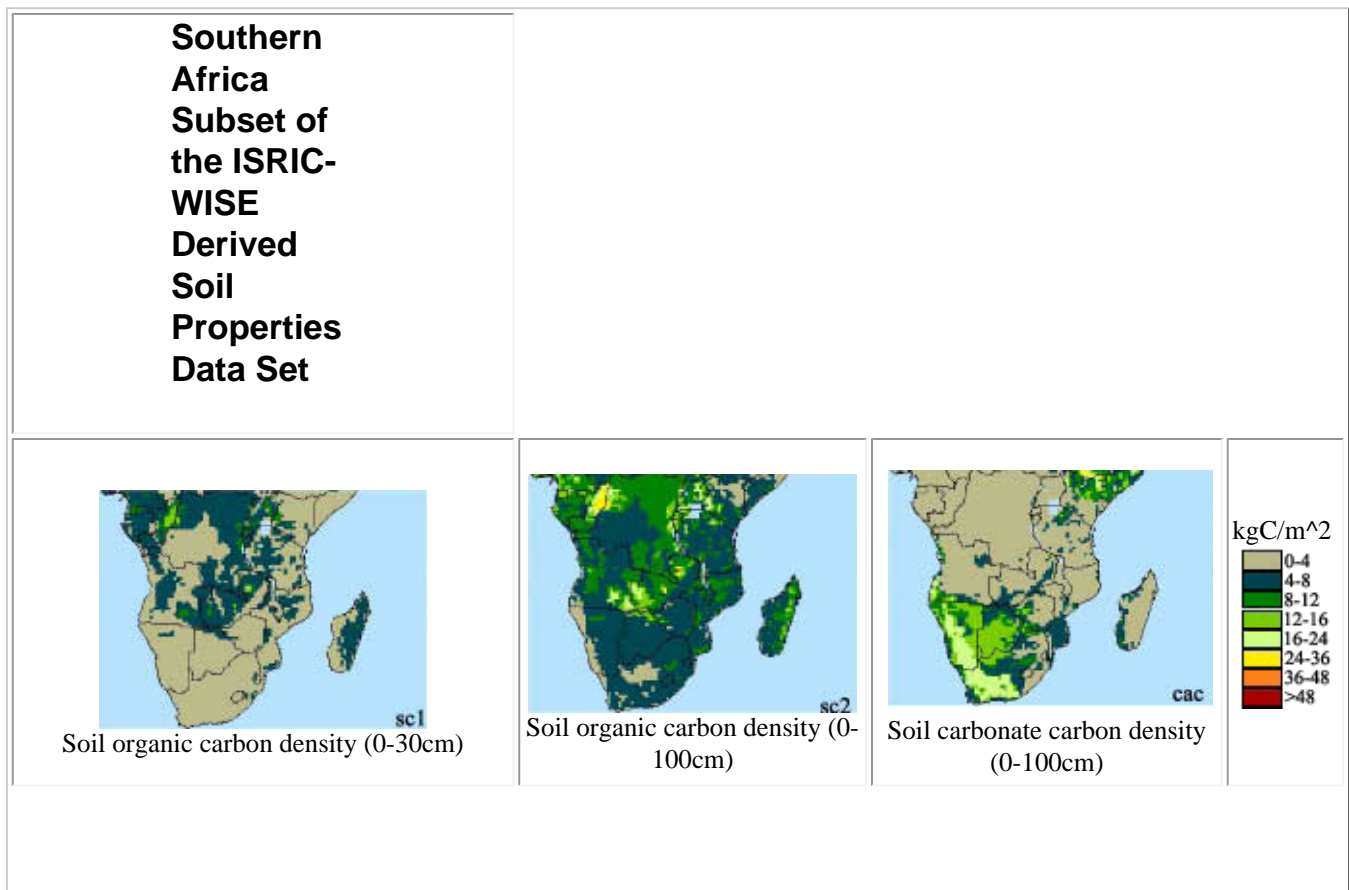
Soil organic carbon density (kg C/m<sup>2</sup> for 0-100 cm depth range)

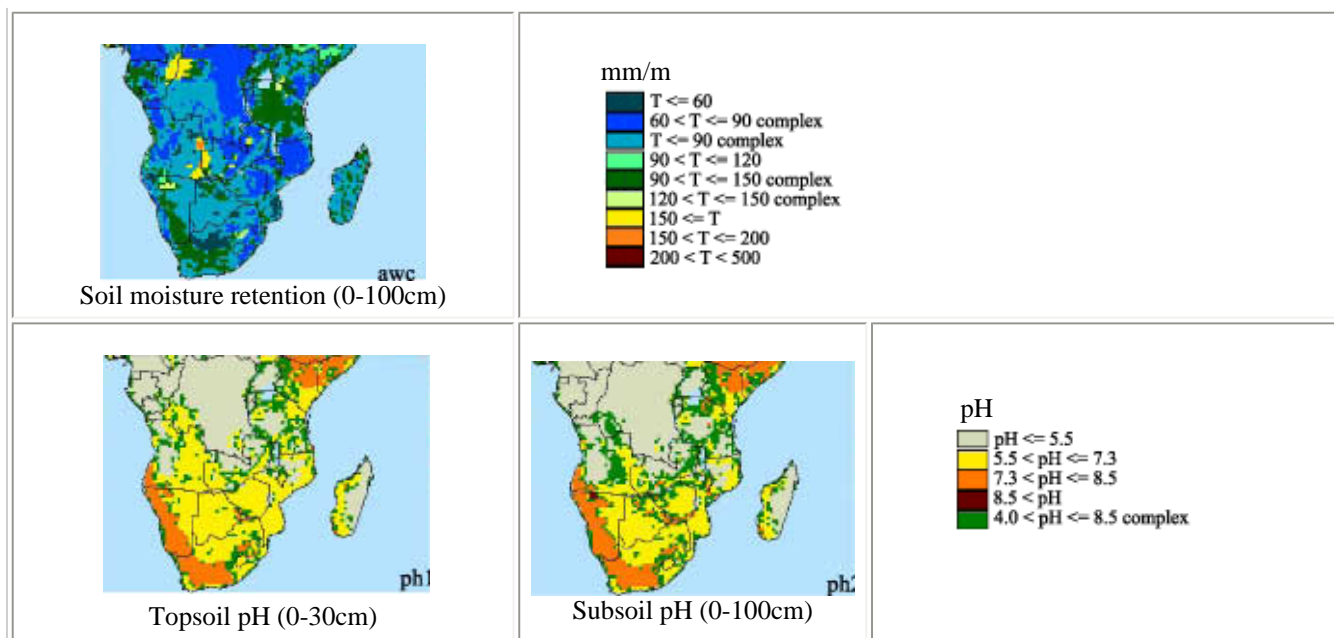
Soil carbonate carbon density (kg C/m<sup>2</sup> for 0-100 cm depth range)

Soil pH (0-30 cm depth range)

Soil pH (30-100 cm depth range)

## ISRIC-WISE Global Data Set of Derived Soil Properties, Southern Africa Subset





## Data Set Information:

The isric.tar.gz file contains a subset of the ISRIC-WISE Global Data Set of Derived Soil Properties on a 0.5 x 0.5 Degree Grid (Version 1.0). The subset is for southern Africa.

This README file contains information regarding:

1. Data format
2. Procedure used to create the southern Africa subset
3. Legend and data source

### DATA FORMAT

The downloadable file, isric.tar.gz, is a UNIX compressed tar file. Once the file is untarred there are 6 separate files:

1. wise\_cac.dat --> soil carbonate carbon density (0-100 cm)
2. wise\_ph1.dat --> topsoil pH (0-30 cm)
3. wise\_ph2.dat --> subsoil pH (30-100 cm)
4. wise\_sc1.dat --> soil organic carbon density (0-30 cm)
5. wise\_sc2.dat --> soil organic carbon density (0-100 cm)
6. wise\_awc.dat --> soil moisture retention (0-100 cm)

The data files are in ASCII Grid format for ArcInfo. Each file contains a single ASCII array with integer values. Coordinates listed below are in decimal degrees.

Rows 80  
Columns 110  
UpLeftX 5  
UpLeftY 5  
LoRightX 60  
LoRightY -35  
cellsize 0.5  
Projection geographic

The ASCII file consists of header information containing a set of keywords, followed by cell values in row-major order. The file format is

```
<NCOLS xxx>  
  
<NROWS xxx>  
  
<XLLCORNER xxx>  
  
<YLLCORNER xxx>  
  
<CELLSIZE xxx>  
  
{NODATA_VALUE xxx}  
  
row 1  
  
row 2  
  
...  
  
row n
```

where xxx is a number, and the keyword NODATA\_VALUE is optional and defaults to -9999. Row 1 of the data is at the top of the grid, row 2 is just under row 1 and so on. The end of each row of data from the grid is terminated with a carriage return in the file.

Although the nodata\_value is set to -9999 in the header portion of the data files that value does not actually occur in the data set. To import this file into ArcInfo use the following command at an ARC prompt:

```
ASCIIGRID <in_ascii_file> <out_grid> {INT | FLOAT}
```

#### Arguments

<in\_ascii\_file> - the ASCII file to be converted.

<out\_grid> - the name of the grid to be created.

{INT | FLOAT} - the data type of the output grid.

INT - an integer grid will be created.

FLOAT - a floating-point grid will be created.

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Binary File Information

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The ASCII data files have also been converted into binary image files that can be viewed in any standard image viewing package. The files are single-byte images, no header, 110 columns by 80 rows. Missing data (ASCII -9999) have been converted to the maximum value of 255.  
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#### PROCEDURE USED TO CREATE THE SOUTHERN AFRICA SUBSET

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The original data were provided as raster image files. The files were imported into ArcInfo and converted to grids using the IMAGEGRID command. Using GRID ( a raster- or cell-based geoprocessing toolbox that is integrated with ArcInfo) the SETWINDOW command was used to define the subarea of interest.

This subarea was defined by identifying the bounding coordinates as follows:

```
x_min 5 y_min -35 x_max 60 y_max 5
```

The "snap\_grid" option of the SETWINDOW command was used. This snaps the lower-left corner of the specified window to the lower-left corner of the nearest cell in the snap\_grid and snaps the upper-right corner of the specified window to the upper-right corner of the nearest cell in the snap\_grid. In this case the snap\_grid is the original data grid. The purpose of this is to ensure the proper registration of the newly set analysis window. The command format used is as follows:

```
SETWINDOW x_min y_min x_max y_max original_grid
```

Once the window was set, creating the new grid was simply a matter of setting the new subset grid equal to the original grid.

```
subset_grid = original_grid
```

An ASCII array was created from the new subset grid using the GRID command GRIDASCII.

```
file.dat = GRIDASCII(subset_grid)
```

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#### LEGEND & ADDITIONAL SOURCES OF INFORMATION

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The following legends are used in the original data:

**\*\*\*\*wise\_cac.dat & wise\_sc1.dat & wise\_sc2.dat\*\*\*\***

0: Background

1: 0-4 kg C m<sup>-2</sup>

2: 4-8 kg C m<sup>-2</sup>

3: 8-12 kg C m<sup>-2</sup>

4: 12-16 kg C m<sup>-2</sup>

5: 16-24 kg C m<sup>-2</sup>

6: 24-36 kg C m<sup>-2</sup>

7: 36-48 kg C m<sup>-2</sup>

8: >48 kg C m<sup>-2</sup>

9: Glaciers

10: Oceans & Inland waters

**\*\*\*\*wise\_ph1.dat & wise\_ph2.dat\*\*\*\***

0: Background

1:  $\text{pH} \leq 5.5$

2:  $5.5 < \text{pH} \leq 7.3$

3:  $7.3 < \text{pH}, +8.5$

4:  $8.5 < \text{pH}$

5:  $4.0 < \text{pH} \leq 8.5$  Complex unit

6: Glaciers

7: Oceans

**\*\*\*\* wise\_awc.dat\*\*\*\***

0: Background

1:  $T \leq 60 \text{mm/m}$  (>66% of grid;mm m-1)

2:  $60 < T \leq 90$  (>66% of grid;mm m-1)

3:  $90 < T \leq 120$  (>66% of grid;mm m-1)

4:  $120 < T \leq 150$  (>66% of grid;mm m-1)

5:  $150 < T \leq 200$  (>66% of grid;mm m-1)

6:  $200 < T < 500$  (>66% of grid;mm m-1)

7:  $T \leq 90$  Complex (>50% of grid;mm m-1)

8:  $90 < T \leq 150$  Complex (>50% of grid;mm m-1)

9:  $150 \leq T$  Complex (>50% of grid;mm m-1)

10: Glaciers (>66% of grid;mm m-1)

11: Oceans (>66% of grid;mm m-1)

Although not all of these categories may be represented in the subset of the data, the original legend has been retained.

The original data and documentation may be obtained upon request from the International Soil Reference and Information Centre (ISRIC). A pdf document describing the data and listing references may be downloaded from the ISRIC web site ( <http://www.isric.nl/WISE.htm> ).

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ORIGINAL DATA SET CITATION

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Batjes, N.H., 1996. Documentation to ISRIC-WISE global data set of derived soil properties on a 1/2 deg by 1/2 deg grid (Version 1.0).  
Working Paper and Preprint 96/05, ISRIC, Wageningen.