

**MESA SADC THEMA
TOOLBOX PLUG-IN FOR ILWIS 3.7
INSTALLATION, CONFIGURATION AND USER
GUIDE
XML Version 1.0**

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Abstract

Monitoring for Environment and Security in Africa (MESA) is a follow-up initiative to the African Monitoring of the Environment for Sustainable Development (AMESD) programme. It contributes to the Joint Africa-EU Strategy (JAES) 6th Partnership on Climate Change and Environment and builds on the AMESD programme achievements. The initiative is focused on using Earth Observation (EO) data and information products for environmental management and sustainable development, and is specifically designed for African users at continental, regional and national levels, covering 5 African Regions and 50 countries. The project's reliance on proven satellite and land-based monitoring technologies is also consistent with the JAES 8th Partnership on Science, Information Society and Space. In the SADC region, the theme is "Agricultural and Environmental Resource Management"

MESA SADC-Thematic Action

The SADC thematic action is developing four information services namely Agriculture, Drought, Wildfire and Flood (new) in order to address the already prioritized decision needs for SADC region. The Agricultural Service monitors the state of the crops and rangeland. The Drought Service monitors drought during the whole year and provide drought outlooks. The Fire Service provides a daily fire risk indication, detection and follow-up active fires (in real time) and burnt area assessments during the fire season. The flood Service provides earth observation products for monitoring the status before, during and after a flood event. In order for the user community to handle and process the data from these services the "MESA-SADC -Toolbox" has been developed.

The MESA-SADC Toolbox allows the user to import a multitude of data from MESA SADC Thema disseminated via "EUMETCast-GEONETCast" into the freeware and open source RS-GIS ILWIS package and its existing processing capability can be used for further analysis.

This document is providing a description where to download all the freeware utilities, how to install and configure them. The Toolbox developed is an open utility. It can be easily modified and tuned to fit the specific user needs without programming skills. Next to this description also an overview is presented on the various data types disseminated that can be imported and processed. Finally the document provides hands on exercises how to use the utilities offered and is exploring the "MESA-SADC" products. The exercises currently provided are focusing on the data from the three services of agriculture, drought and fire. The flood service is still under development

The utilities provided are extensively tested using various operating systems, such as Windows Vista, XP (various service packages) and Windows-7 and have found to be performing in a stable manner. The toolbox currently does not work under LINUX. In case unexpected behaviour or bugs are observed, additions to the functionality are required or if you have developed new utilities that you want to share, please contact Farai Maxwell Marumbwa, email: farai@mesasadc.org/ maxmarumbwa@gmail.com

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Further information with respect to the MESA-SADC Thema and Products can be obtained from:
www.mesasadc.org

Further information with respect to the overall MESA programme can be obtained from:
<http://pages.au.int/MESA>

Background

As from July 2011 environmental data relevant for agricultural, drought and fire analysis from the SADC region are operationally produced and disseminated to the global user community using GEONETCast. Users anywhere in the world can have access to this data stream using a (low cost) ground receiving station. There is no need for an Internet connection to be able to receive large volumes of environmental related data.

The data for the SADC region is mainly decadal data and after the end of each 10 day period, the products are disseminated. The majority of the products are produced at BDMS but for the wildfire and the seasonal weather forecasts services other organizations are collaborating within the MESA SADC programme, such as SADC-CSC, CSIR and SAWS from South Africa.

In order for the User Community to easily ingest the data and products from the SADC region an Open Source and freely available Toolbox has been produced. This toolbox allows the import of the various products into a common GIS-RS environment for further analysis.

As the overall number of images and products delivered through GEONETCast is growing steadily, it was concluded that it would be much easier for the Users from Southern Africa to develop a Toolbox (Updated from the AMESD SADC Thema toolbox) that would only allow import of the products from the SADC region. This Toolbox is identical in design as the so called GEONETCast Toolbox, which allows import of an extensive number of images and products disseminated via GEONETCast. Interested Users can also obtain this toolbox freely. For further information on these utilities consult <http://www.itc.nl/Pub/WRS/WRS-GEONETCast> or <http://52north.org/communities/earth-observation>.

Most of the products adhere to the details presented in the table below and cover the Southern African (land) region.

Version 1 products	
Lat/Long - WGS 84 (pixel size: 1x1km)	
Corner Coordinates (degrees):	
ulx = 11	uly = 6
lrx = 41	lry = -35
Version 2 products	
Lat/Long - WGS 84 (pixel size: 1x1km)	
Corner Coordinates (degrees):	
ulx = 11	uly = 6
lrx = 60	lry = -35

Further details are presented in this document. Note that an archive, containing the last three months of products, is available to the User Community as well.

Glossary

52North-----	52°North-Initiative for Geospatial Open Source Software GmbH (Germany)
ARC-----	Agricultural Research Council (South-Africa)
AMESD-----	African Monitoring of the Environment for Sustainable Development
AU-----	African Union
BCA-- -----	Botswana College of Agriculture (Botswana)
BDMS -----	Botswana Department of Meteorological Services (Botswana)
CSIR -----	Council for Scientific and Industrial Research (South-Africa)
CB -----	Capacity Building
EC-----	European Commission
EO-----	Earth Observation
EUMETSAT-----	European Organisation for the Exploitation of Meteorological Satellites
ITC-----	Faculty of Geo-Information Science and Earth Observation, University of Twente (Netherlands)
JRC-----	Joint Research Centre (of the EC)
MARS-----	Monitoring Agricultural Resources (JRC Unit)
MESA	Monitoring for Environment and Security in Africa
Meraka Institute-----	African Advanced Institute for Information and Communication Technology (Division of CSIR)
SAC-----	Satellite Application Centre (Division of CSIR), now SANSA
SADC-----	Southern African Development Community
SAWS	South African Weather Service
TA-----	Technical Assistance
TE-----	Technical Expert
UB-----	University of Botswana
UZ-----	University of Zimbabwe

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1. GENERAL INSTALLATION AND CONFIGURATION INSTRUCTIONS

1.1 INTRODUCTION

Follow the instructions provided below to install ILWIS Version 3.7, the MESA_SADC-Toolbox and a number of other free software utilities, in order to work with the MESA SADC Thema data provided via GEONETCast. Read the instructions provided below carefully and proceed with the installation of the various utilities. In case you want to use the MESA_SADC-Toolbox, be aware that at this moment it is not running under LINUX-Ubuntu. Furthermore this MESA_SADC-Toolbox version is not downwards compatible; you need to use at least ILWIS Version 3.7.

1.2 DOWNLOAD ILWIS

<http://52north.org/>

From this location select the navigation tab: "Downloads" and select "<http://52North.org/download/ILWIS>". Select the latest (multiple file) ILWIS372 version and download the ZIP file(s), save the file(s) in a temporary directory on your hard disk. Unzip the file and run the ILWIS setup. When you intend to use the MESA_SADC-Toolbox **do not install ILWIS3.7 under the default installation directory "C:\Program Files"** as this might cause problems with respect to administration rights (especially under Windows 7) when creating temporary files and because the toolbox is utilizing DOS batch routines, which can be affected by the space in the directory file name "program files". Select as your installation "drive:\directory" a location where you have the proper administrative rights (e.g. "D:\ILWIS_3.7"). In the "ILWIS_3.7" directory a shortcut to the "ILWIS.exe" can be created, you can copy this shortcut to the desktop of your system.

Please take into consideration straight from the start the following golden rules when using ILWIS:

- Don't use spaces in file names, instead use underscores;
- Do not use numbers as file names;
- Do not work in multiple output directories;
- Start ILWIS, navigate to your working directory and close ILWIS. Open ILWIS again to ensure that your current working directory is also the actual ILWIS working directory.

1.3 DOWNLOAD THE MESA-SADC TOOLBOX

www.mesasadc.org

From the MESA SADC Thema website navigate to the resources tab. Under software download the "MESA SADC Toolbox".

<http://52north.org/>

To download the MESA_SADC-Toolbox from the 52North website: Select from the 52north.org website the navigation tab: "Earth Observation". Additional information is provided over there as well as the link to the download area. You can also directly download the Toolbox from <http://52north.org/downloads/earth-observation>, select MESA_SADC. Download the file: "MESA-SADC-Toolbox.zip" available over there and store it in a temporary directory. Eventually download other resources provided over there.

After the download is completed, copy this ZIP file in the ILWIS sub-directory "\Extensions". There is no need to unzip the file! ILWIS automatically detects the ZIP file in this directory then unzips the file and installs the plug-in when a new instance of ILWIS is started. Afterwards the ZIP file is deleted in this "\Extensions" sub-directory!

Start ILWIS and in the Operation-Tree of ILWIS the "MESA-SADC" tab will appear (see also figure 1.1). Double click the "MESA-SADC" tab and the subsequent "Toolbox" tab and various (sub) menus are now at your disposal. These options can be used to import MESA SADC Thema data sets that are disseminated via EUMETCast-GEONETCast, a system that uses digital video broadcast (DVB) to deliver environmental data worldwide. Keep checking the "MESA SADC Thema" website (www.mesasadc.org) or the "Earth Observation" community web pages (<http://52north.org/>)

[communities/earth-observation/](#)) for new (toolbox) developments. Modifications and added functionality for the MESA-SADC -Toolbox are made available on these websites on an ad hoc basis, so check if you are working with the latest version. The XML configuration number, currently 1.0, is given on the lower left hand portion of the MESA_SADC-Toolbox opening screen.

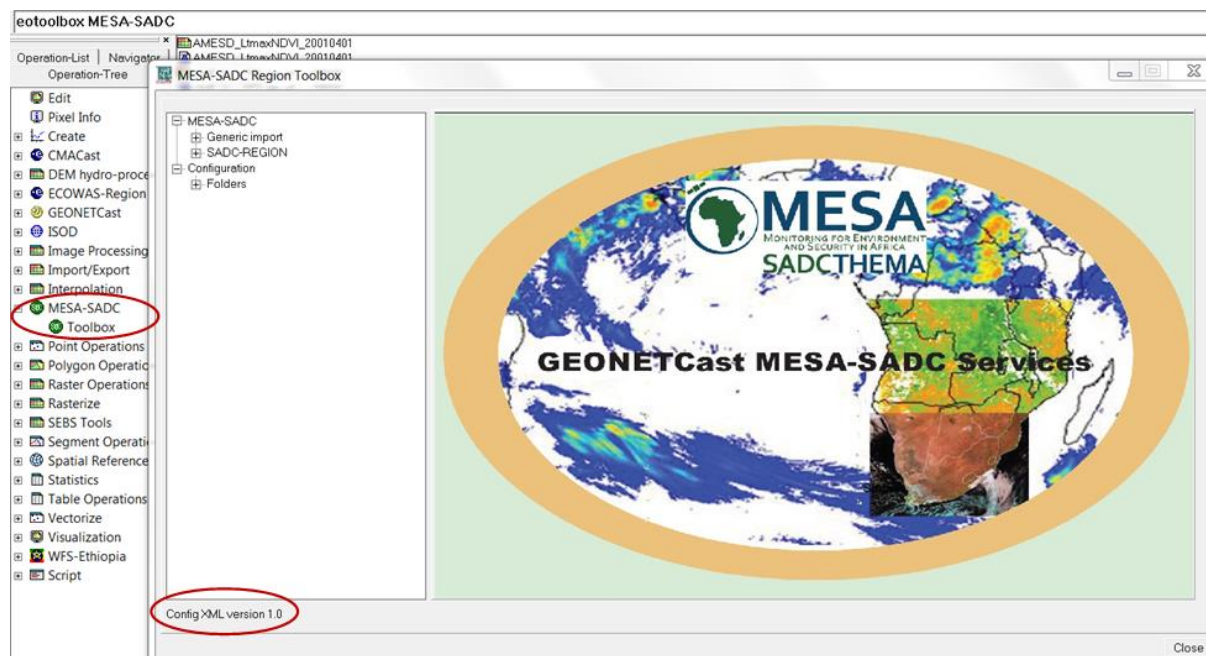


Figure 1.3.1: The MESA-SADC main and sub menu structure under ILWIS3.7

Close ILWIS as you might need to install additional utilities. Check if you have already installed IrfanView. If this is not case use the link below and follow the additional installation instructions.

1.4 DOWNLOAD IRFANVIEW

<http://www.irfanview.com/>

For some product visualizations that do not require import into an ILWIS data format (for example AP07: Graph of Rainfall Events in the Current Season), use is made of IrfanView. Download the setup executable and save it in a temporary directory on your hard disk.

After the download has been completed run the setup, there is no need to create shortcuts, use the option: "For all users" and select the default Installation folder. Click "Next" three times, just use the default settings, "Don't install Google Desktop Search", click "Next" two times and after the installation has been completed, press "Done".

An instance of IrfanView can be started to check if the installation has been successful, the program can be stopped.

1.5 CONCLUDING REMARKS

With ILWIS, the MESA-SADC Toolbox plug-in and the other necessary utility-software installed you still need to continue with the MESA-SADC Toolbox configuration settings which are further described in the next chapter.

Note that also use can be made of other freeware utilities for pre or post processing of the MESA SADC products such as SPIRITS. Links to these resources are provided in Appendix 4.

2. OVERVIEW OF THE MESA SADC TOOLBOX ARCHITECTURE

2.1 INTRODUCTION

The MESA SADC Toolbox Config XML version 1.0 allows import of various MESA SADC Thema products through a Graphical User Interface (GUI). Here the toolbox architecture is described into more detail. Once the toolbox is installed and ILWIS is newly started the “ MESA SADC toolbox” should appear as a menu item under the ILWIS Operation Tree (see figure 2.1).

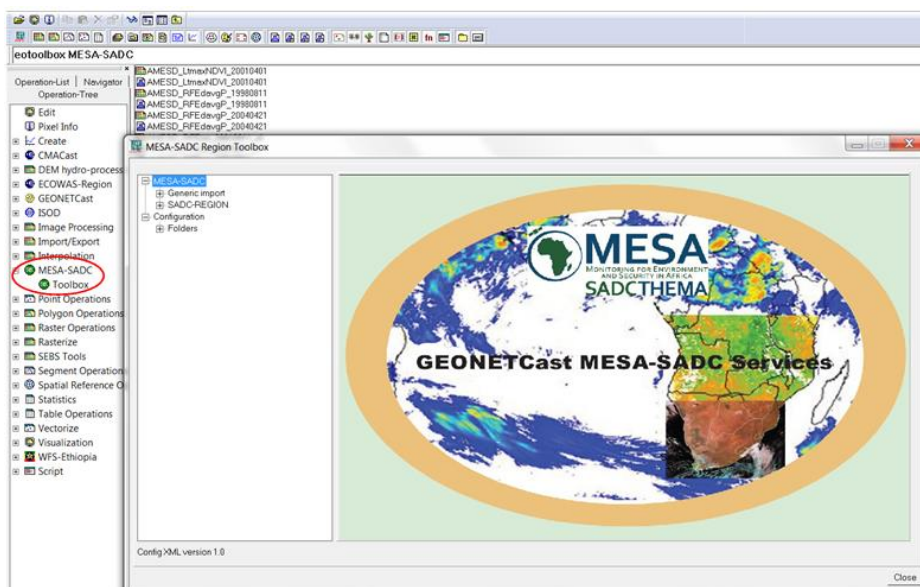


Figure 2.1.1: The MESA-SADC Toolbox plug-in Graphical User Interface

2.2 STRUCTURE OF THE MESA-SADC TOOLBOX

To operate the MESA-SADC toolbox, the file “MESA-SADC -toolbox.zip” is copied under the ILWIS sub-directory \Extensions. Once a new event of ILWIS37 is started this ZIP file is extracted and the content is stored in the sub-directory “MESA-SADC-Toolbox” within the same “\Extensions” sub-directory. Within the MESA-SADC-Toolbox sub-directory a number of other sub-directories appear (see figure 2.2).

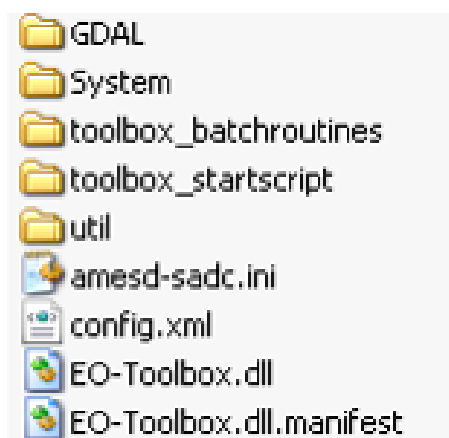


Figure 2.2.1: Toolbox sub-directory structure

The folder “\GDAL” (Geospatial Data Abstraction Library) contains a translator library for raster geospatial data formats that is released under an X/MIT style Open Source license by the Open Source Geospatial Foundation (<http://www.gdal.org>).

The folder “\System” is storing the ILWIS service objects. Service objects are used by data objects; they contain accessories required by data objects besides the data itself. Upon installation of the toolbox, these objects are copied to the main ILWIS directory \System.

The folder “*Toolbox_batchroutines*” provides the batch files that are used to execute most of the actual operations. These files can be opened and modified using a text editor.

The folder “*Toolbox_startscript*” contains an “*MESA-SADC*” sub-directory, which is providing the ILWIS scripts. Upon selection of an import routine, from the MESA-SADC Toolbox User Interface a script is called and this script subsequently calls a batch file which executes the operation. The scripts can also be opened and modified using ILWIS. Further information is provided in chapter 2.6.

In the root of the “*Util*” folder ILWIS service objects are stored, like lookup tables, georeferences, domains, etc. Furthermore a number of executables are stored here that are used by various toolbox batch routines, such as the *7z.exe*. The sub-directory “*Maps*” is containing a segment-polygon file of all countries and for Africa as well as a number of map views. The sub-directory “*Wget*” is containing a utility to extract information from the Web and FTP sites, which will be used for future web mapping services.

The file “*config.xml*” contains the MESA-SADC-toolbox GUI menu structure. This file can be edited using a text editor. In case the user wants to add new routines, this XML file can be adapted and modified. The resulting menu will be adapted accordingly when a new instance of the Toolbox is started. This allows users that do not have programming experiences to adapt the toolbox to their own preferences. A more detailed description is provided below in chapter 2.3.

The file “*mesa-sadc.ini*” contains the settings of the input and output directories for each “*folderid*” that is defined in the “*Config.xml*”. This file is storing the settings as defined from the Toolbox menu: Configuration and Folders. Further information on the input and output folder settings is provided in chapter 2.4.

The file “*EO-Toolbox.dll*” contains the layout of the User Interface of the MESA-SADC toolbox and generates the full ILWIS command string that executes the script, batch file and defines and passes the parameters that are used, like the time stamp, input drive, input directory, output drive, output directory, ILWIS directory, etc. Up to 9 parameters are used to execute a Toolbox operation.

The file “*EO-Toolbox.dll.manifest*” is used by the operating system to load the appropriate DLL.

NOTE: As from ILWIS3.8 a new version of the “*EO-Toolbox.dll*” has to be used. This file can be downloaded from the “Earth Observation Downloads Area” (<http://52north.org/communities/earth-observation/>). When using ILWIS38, copy this file into the ILWIS directory “*Extensions\MESA-SADC-Toolbox*”. Eventually overwrite the existing “*EO-Toolbox.dll*”. The MESA_SADC-Toolbox plug-in should now appear in the Operation-Tree, identical to figure 2.1 when activating ILWIS.

2.3 STRUCTURE OF THE CONFIG.XML

One of the main criteria during the development of this utility was to make the toolbox as open as possible, allowing persons with no programming background to make modifications. As indicated before, all scripts and batch routines used can be adapted by the user. Next to this, the user can also modify the menu of the Toolbox GUI. The file that generates the user interface, “*Config.xml*”, can be opened using a text editor.

The structure of the file is kept as simple as possible. The “*Level*” is defining the main (Level1) and sub menu structure (Level2 – Level “N”). For the “*Level value=*” a menu name can be defined. Within a certain Level a “*Product value=*” can be specified, which will generate the name of the respective (sub) menu.

The string starting with “*Product value=*” contains mostly a number of other items, like “*script*”, “*format*”, “*type*”, “*folderid*” and “*comment*”.

- Script : The item script defines the sub-directory where the respective ILWIS script is located and the name of the script that should be executed;
- Format : The text string that can be entered here will appear in the popup window when importing a certain image or product. It is used to ensure that e.g. the appropriate “time

stamp” is entered on the user interface (see the “Date” on figure 2.3). For the various images and products these can have a different formats, in the example of figure 2.3 the “Date” stamp expected should have the format “yyyymmddhhmm” (yyyy=year, mm=month, hh=hour and mm=minute). Also jjj=Julian day, dec=Decade are used, e.g. “yyyymmdecdec”;

- Type : This is the only part of the toolbox that does not allow user modification without programming experiences. Various forms, that generate the pop-up windows are available within the “EO-ToolboxUI.dll” and are called by their specific names given. These forms generate the appearance of the popup windows when importing a specific product. The popup menu that is given in figure 2.3 is generated from a “type” called: “ymdhm”;
- Folderid : This item generates a folder item in the “mesa-sadc.ini” file. From the main Toolbox menu, Configuration and Folders option, this Folder item is now available and can now be further specified by defining the appropriate input and output directories. As example a “folderid” of “SADC_fire” is given. When opening the “mesa-sadc.ini” file, using a text editor, an item [SADC_fire] is added and the input and output folders can now be specified here as well by providing the relevant directory names, like:

Input Folder = E:\MESA_SADC
Output Folder= E:\MESA_SADC\output

- Comment : Additional information (one line of text) can be provided in the popup menu to notify the user on any specific information that might be relevant. In figure 2.3 a comment string is added showing the temporal resolution of the MODIS-AFIS fire product-Terra.

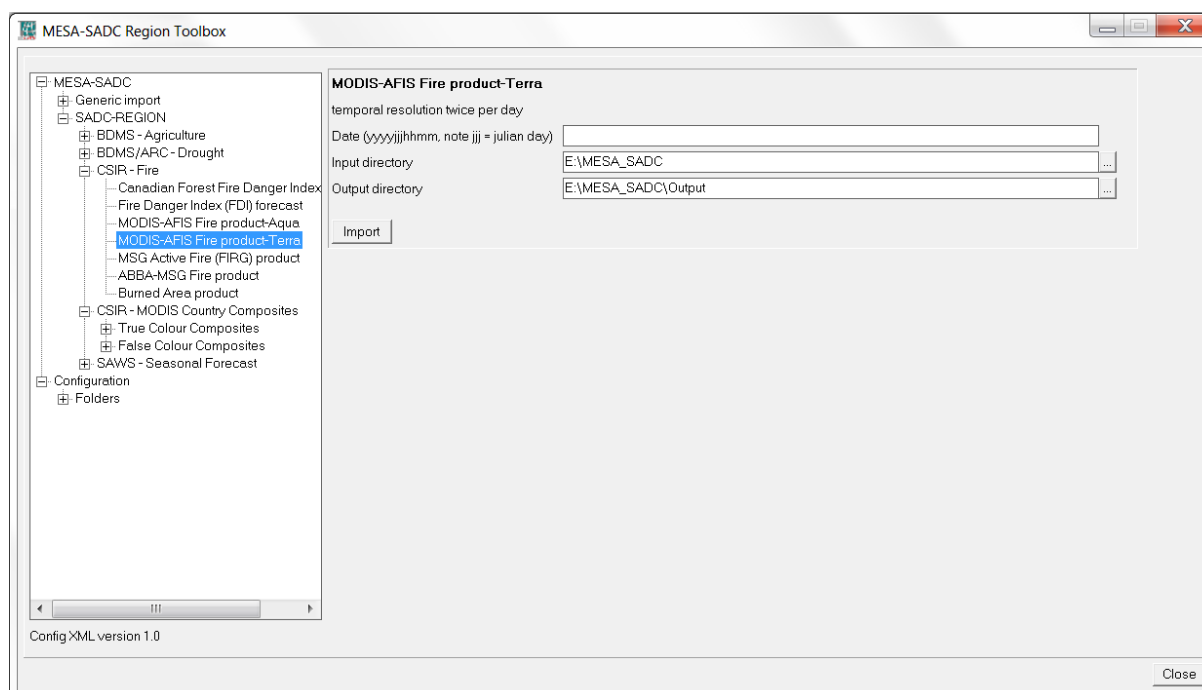


Figure 2.3.1: Popup menu for import, MODIS-AFIS fire product-Terra

Other syntax used in the config.xml is:

```
< Start of a new line
/> End of a line
<Level... Start of a new level
</Level"n"> End of level "n"
```

Note that all the text should be entered between quotation marks “”.

The first few lines of the config.xml are:

```
1: < MESA_SADC >
2: <Version id="1.0"/>
```

3: <Path value="Extensions\MESA-SADC-Toolbox" infile="mesa-sadc.ini"/>

Line 1 provides the link to the plug-in and the menu name, note that this is also the last line of the XML. Line 2 provides the opportunity to indicate a version number, useful if modifications are done to the original XML. The version number is also shown in the main MESA-SADC toolbox menu, in the lower left hand corner. Line 3 refers the “mesa-sadc.ini” file, which provides the links to the input and output directories.

After changes are made to the config.xml the file should be saved and a new instance of the Toolbox should be started, showing the adaptations. Before modifying the file first make a backup!

2.4 GENERAL MESA-SADC TOOLBOX CONFIGURATION - FOLDER SETTINGS

For you to conveniently work with the MESA-SADC Toolbox the MESA-SADC products (on your local area network) and the local system output (working) directories need to be defined. From the main MESA-SADC Toolbox menu, select “Configuration” and the sub-menu “Folders”. In figure 2.4 below the in- and output directory for the SADC_drought is used as example (“E” is the local system hard disk). Note that use can be made of a “Network Mapping”

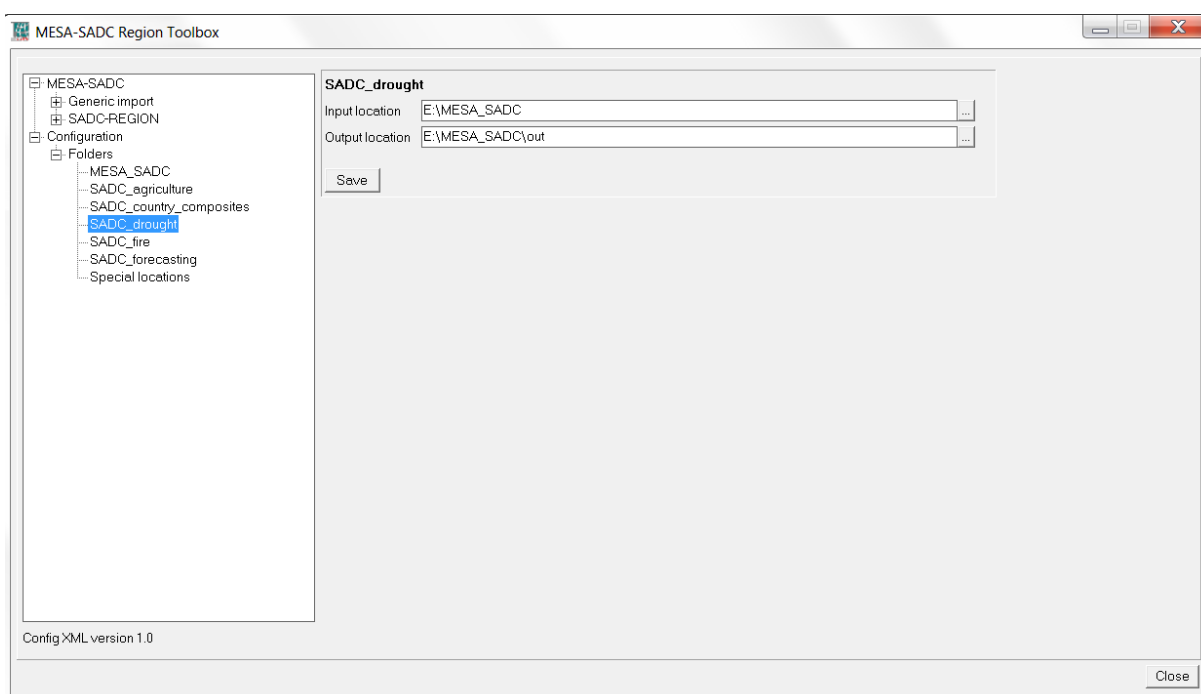


Figure 2.4.1: Setting of the in and output directory structure for MESA-Drought products.

There is a “Special locations” folder to select the location of an executable. Currently the location of “IrfanView” and “i_view32.exe” (or newer version) needs to be specified. This freeware utility is used for visualization of pictures that are not transformed into an ILWIS data format. Make sure that this folder and executable are always correctly specified.

2.5 STRUCTURE OF THE MESA SADC TOOLBOX SCRIPTS

Most of the ILWIS scripts, situated within the directory “\Toolbox_startscripts\MESA_SADC”, contain a single line having an identical structure. Below an example is given of air temperature from ground measurements (gT) script:

```
!%7\Extensions\MESA-SADC-Toolbox\toolbox_batch routines\sadc_gT.bat %1 %2 %3 %4 %5 %6 %7 %8
```

The command line starts with: ! This syntax (!) instructs ILWIS to start an external application. The application that should be started is situated in “%7\Extensions\MESA-SADC-Toolbox\toolbox_batchroutines\” and called “*sadc_gT.bat*”. This is a DOS batch routine which should be executed. The parameters required to execute the batch routine are given as %1 to %8:

%1 Longfilename	remark: the time stamp entered for the specific product
%2 InputDrive	remark: input data drive, can also be a network mapping
%3 InputDir	remark: input data directory
%4 OutputDrive	remark: output data drive
%5 OutputDir	remark: output data directory
%6 gdalDir	remark: location of GDAL directory within toolbox
%7 IlwDir	remark: location of the ILWIS directory
%8 UtilDir	remark: location of the Util directory within toolbox

A number of these parameters are generated by the “EO-Toolbox.dll”, such as gdalDir, IlwDir and UtilDir as these are fixed locations within the toolbox. Other parameters require user interaction, such as longfilename, InputDrive, InputDir, OutputDrive, OutputDir, as these change based on the user preferences. These parameters can be interactively provided in the popup menu when importing an image or product, see e.g. figure 2.3 above. The Date field provides the “Longfilename”, input and output drive and directory for the “InputDrive”, “InputDir”, “OutputDrive” and “OutputDir” respectively.

When pressing the “Import” button of the popup menu (see again figure 2.3) a command line is generated which is executed. Using the script example above of importing an air temperature (gT) map, the following command line is generated and executed:

**!C:\ILWIS\Ilwis372\Extensions\MESA-SADC-Toolbox\toolbox_batchroutines\sadc_gT.bat
20110301 C: SADC DATA C: MESA-SADC_out\Agriculture C:\ILWIS\Ilwis372\Extensions\
MESA-SADC-Toolbox\GDAL\bin C:\ILWIS\Ilwis372 C:\ILWIS\Ilwis372\Extensions\MESA-SADC-
Toolbox\util**

The parameters are now defined as follows:

%1 Longfilename	20110301
%2 InputDrive	C:
%3 InputDir	SADC DATA
%4 OutputDrive	C:
%5 OutputDir	MESA-SADC_out\Agriculture
%6 gdalDir	C:\ILWIS\Ilwis372\Extensions\MESA-SADC-Toolbox\GDAL\bin
%7 IlwDir	C:\ILWIS\Ilwis372
%8 UtilDir	C:\ILWIS\Ilwis372\Extensions\MESA-SADC-Toolbox\util

Now with all parameters set the batch file “*sadc_gT.bat*”, situated in the ILWIS subdirectory \Extensions\MESA-SADC-Toolbox\toolbox_batchroutines\ can be executed. Starting the command with the !, ILWIS knows it has to execute an external command, given the fact that the extension is “.bat”, Windows knows it has to execute this file using the Batch command line processor.

For a number of visualization routines for viewing picture products (in png format) (eg Graph of Rainfall Events in Current Season) “IrfanView” is used. In these cases an additional parameter is defined as %9, called “IrfanViewDir”. This parameter defines the location of the IrfanView directory and executable. It can be specified under “Configuration”, “Folders” and “Special locations” options from the MESA_SADC Toolbox User Interface.

2.6 STRUCTURE OF THE ILWIS GEONETCAST-TOOLBOX BATCH ROUTINES

As is the case with the ILWIS scripts, also most of the batch files follow a similar structure. As an example a “*Current Conditions - Air Temperature Map*” import routine is given below. The first 4 lines (see line numbers) are giving some remarks. From line 5 to line 13 in the batch file, the parameters are passed, originating from the ILWIS script, to the batch file using the “SET” command. This command displays, sets, or removes Windows Environment Variables. Once these parameters are known the actual import routine can start. Special attention should be given to lines 5 and 6. The time

stamp is defined as longfilename1 and is set in line 5. In line 6 this time stamp is used, starting from position 0, for 8 characters. In this case if a time stamp is used, like 20110511 (as yyyyymmdddecdec), the whole time stamp will be set as "shortfilename1", as this has a length of 8 characters. This allows flexibility in selections of portions of strings, but does not have any influence for this specific import routine, here longfilename and shortfilename1 are the same.

Lines 14 to 16 ensure that the application moves to the appropriate output directory. Line 17 prints the output directory. Once in the output directory (set in lines 14 to 16), line 18 copies the requested input data, using the appropriate time stamp, note %shortfilename1%. The copied file is unzipped in line 19 and imported into ILWIS format in line 20, using GDAL. Once the file is in ILWIS format, ILWIS is executed from the command prompt in line 21 (ilwis.exe" -C setgrf) to set the georeference of the imported map. Lines 22 – 28 are deleting the files that have become obsolete.

Start of batch file listing: *sadc_gT.bat* (Current Conditions - Air Temperature Map)

```
-----
1 rem input string required: 20110501, 20110511, or 20110521
2 rem for sadc region only
3 rem filename string expected is AMESD_SADC_gRFEdmax____20110501_SAfri_v1.zip
4 rem using georeference sadc_region.grf

5 set longfilename=%1
6 set shortfilename1=%longfilename:~0,8%
7 set InputDrive=%2
8 set InputDir=%3
9 set OutputDrive=%4
10 set OutputDir=%5
11 set gdalDir=%6
12 set IlwDir=%7
13 set UtilDir=%8

14 cd\
15 %OutputDrive%
16 cd %OutputDir%

17 echo *%OutputDir%*
18 Copy nputDrive%\%inputDir%\AMESD_SADC_gRFEdmax____%shortfilename1%_SAfri_v1.zip

19 "%UtilDir%\7z" e AMESD_SADC_gRFEdmax____%shortfilename1%_SAfri_v1.zip

20 "%GDALDir%\gdal_translate.exe" -of ilwis AMESD_SADC_gRFEdmax____%shortfilename1%_
   SAfri_v1.tif %OutputDrive%\%OutputDir%\AMESD_gRFEdmax_%shortfilename1%.mpr

21 "%IlwDir%\ilwis.exe" -C setgrf %OutputDrive%\%OutputDir%\AMESD_gRFEdmax_
   %shortfilename1%.mpr %UtilDir%\sadc_region.grf;

22 del %OutputDrive%\%OutputDir%\AMESD_gRFEdmax_%shortfilename1%.csy
23 del %OutputDrive%\%OutputDir%\AMESD_gRFEdmax_%shortfilename1%.grf
24 del %OutputDrive%\%OutputDir%\AMESD_SADC_gRFEdmax____%shortfilename1%_SAfri_v1.tif
25 del %OutputDrive%\%OutputDir%\AMESD_gRFEdmax_%shortfilename1%.mpr.aux.xml
26 del %OutputDrive%\%OutputDir%\AMESD_SADC_gRFEdmax____%shortfilename1%_SAfri_v1.zip
27 del %OutputDrive%\%OutputDir%\product_info.htm
28 del %OutputDrive%\%OutputDir%\AMESD_SADC_gRFEdmax____%shortfilename1%_SAfri_v1.jpg
-----
```

End of Batch file listing.

Although the content of the batch files can vary significantly, the sequence of activities is mostly the same:

- Some remarks are given at the start of the batch file
- Setting of the environment variables, passing over the parameters from the ILWIS scripts

- Copy the original data to a local disk
- Import of the data into ILWIS format
- Execute various ILWIS routines from the command prompt
- Delete obsolete files

2.7 ADVANCED USE

If certain operations have to be repeated on a continuous basis, e.g. import of a certain products, e.g. for which basically only the time stamp has to be modified, it is advised to copy the command line string that is generated through the graphical user interface, available from the command line, in the main menu of ILWIS, to the WINDOWS command line processor (CMD.exe). Delete the “!” from the start of the string and execute the expression. Within the string the date stamp can be easily modified. Also from the main menu of ILWIS, the command line history can be checked. Select the appropriate string generated through the graphical user interface, modify the time stamp and execute the expression again.

2.8 CONCLUDING REMARK

With all the configuration settings provided you are now ready to utilize the MESA-SADC Toolbox and explore the MESA-SADC data that is delivered via DVB Broadcast. Note that the latest 3 decades of MESA-SADC products are also available on the MESA SADC Thema website www.mesasadc.org.

3. EXPLORING THE MESA-SADC THEMA PRODUCTS USING THE MESA-SADC TOOLBOX

3.1 INTRODUCTION

The MESA-SADC Toolbox provides an open and flexible integrated solution to manage the MESA-SADC Thema products, and bring them together in a common GIS and RS environment for further processing. A full list of the MESA SADC Thema products and acronyms is listed in appendix 1 and for the abbreviations used have a look at appendix 2. Appendix 3 is providing further information on the file naming convention of the various products. Appendix 4 provides information on other freeware utilities that can be used in conjunction with ILWIS. Finally appendix 5 is describing how to organize the sample data on your local system to smoothly conduct the hands-on exercises provided below. Ensure that the input and output directories follow the description provided in appendix 5. In the last section of the “Abstract” (page 3 of this document) you find the locations to download the sample data.

3.2 IMPORT OF AGRICULTURE SERVICE PRODUCTS (ONSET OF RAINS MAP & NDVI)

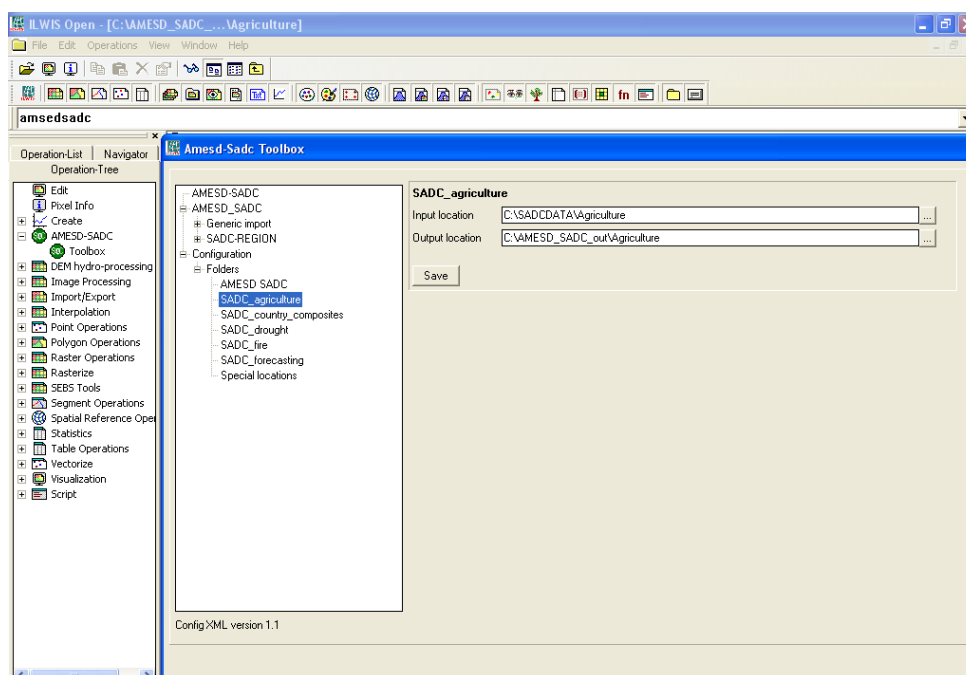
The MESA SADC Thema Agricultural Products are decadal products, in order to import the various products the “Date” format here should be specified as: `yyyymmdecdec`, where `dec` stand for decade. There are three decades for a given month, specified as 01, 11 and 21, for the first 10 days, the second series of 10 days and the remaining days for the last decade of the month respectively. To import a product for the second decade of August 2011, the “Date” stamp to be entered should be: 20110811. For visualization of the imported products standard look-up tables are available as “Representations” (DMPc, NDVI1, NDVIDavgP, gTdavg, RFEC, etc).

3.2.1 Importing Onset of rains map

Open ILWIS and use the Navigator to select your working directory. See also ellipses indicated in the figure below pointing to the main menu items that will be used during this exercise. Note that in this figure the active working directory is “C:\MESA_SADC_out\Agriculture”. Some ancillary files needed during the exercises are already located in (C:\SADCDATA\Agriculture). Close ILWIS and open ILWIS again. It should now open in your working directory (C:\MESA_SADC_out\agriculture).

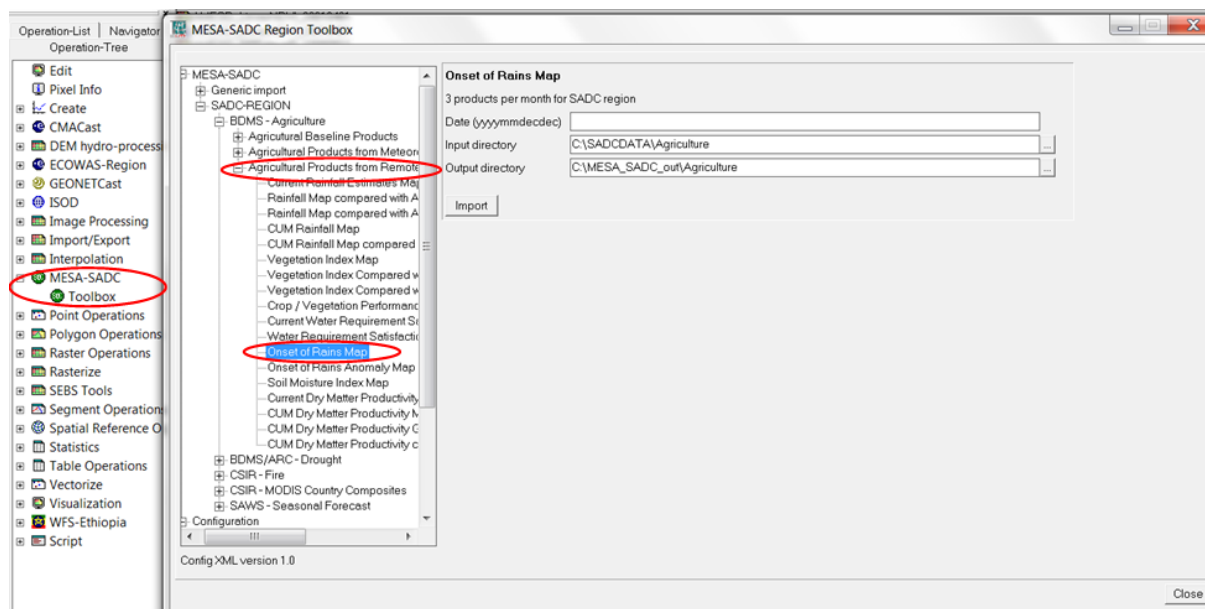
The first step is to configure the input and output directories. From the “MESA-SADC” and “Toolbox” main menu select the option “Configuration” and “Folder” and select “SADC_agriculture”. Browse to the appropriate data input and output locations and in this case the input location with the agriculture products is C:\SADCDATA\Agriculture. Here as output location “C:\MESA_SADC_out\Agriculture” is used. Press “Save” to store the settings. See also the figure 3.2.1 below.

Figure 3.2.1: Input and output directory specification using the Toolbox Folder configuration



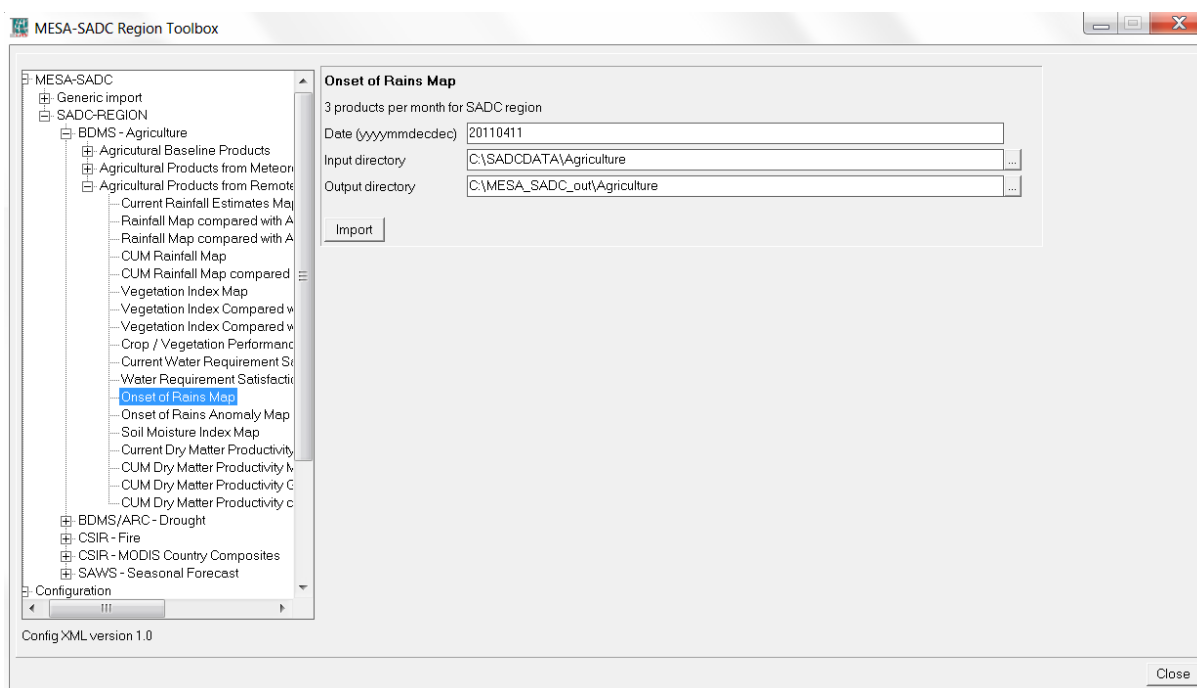
After configuration of the input and output directory, the toolbox is now ready for importing the products. From the Toolbox select “SADC REGION” >>”BDMS-Agriculture”>>”Agricultural products from remote sensing” and select “Onset of Rains Map”, as shown below in figure 3.2.2.

Figure 3.2.2: The main ILWIS menu and the toolbox configuration for importing Onset of rains



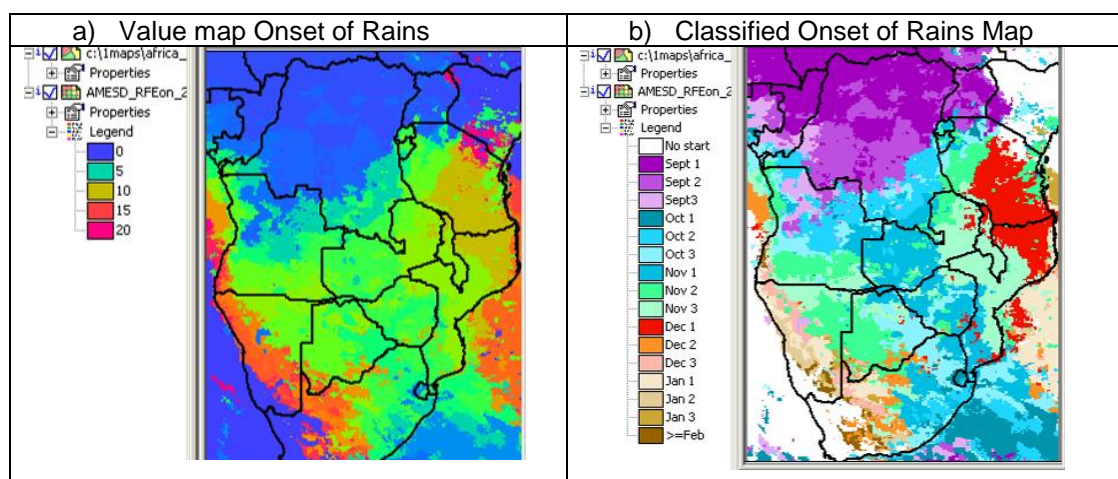
The “Onset of Rains Map” for the second decade of April 2011 will be used as an example. See figure 3.2.3 below.

Figure 3.2.3: Importing onset of rains map



Specify the time stamp according to the format required in the “Date” field (“yyyymmddccdec” is in this case “20110411”). Press “Import” to start the import. Note that during import a command window is activated, have also a look at what is displayed in this window. Close the MESA-SADC Toolbox window. Upon completion of the import, select from the ILWIS main menu, the option “Window” and from the drop down menu “Refresh F5”. This import routine results in two maps a value (AMESD_RFEon_20110411) map and a classified map (AMESD_RFEon_20110411_cl). Open both maps and add the SADC country boundaries located in the ILWIS subdirectory (Extensions\MESA-SADC-Toolbox\util\maps). Have a look at the map contents (values or class names). To do so, move the cursor of the mouse, keeping the left mouse button pressed, over the active map window.

Figure 3.2.4: The imported Onset of Rains Maps in ILWIS



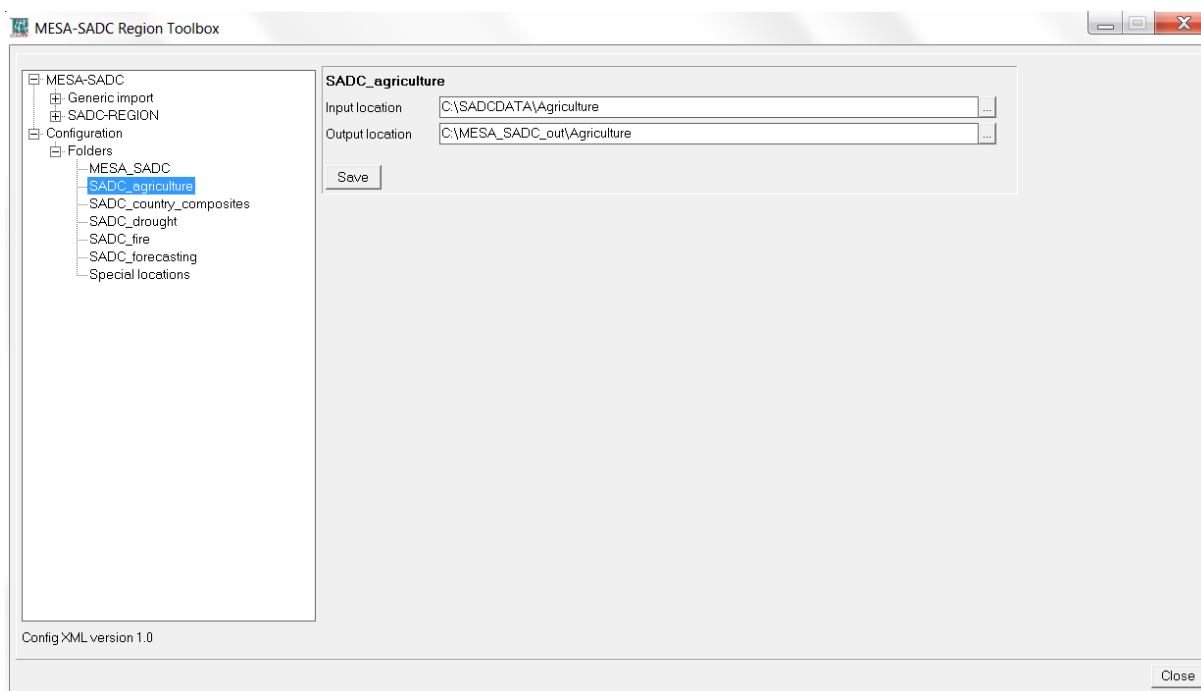
The values of the map range from 0 to 24 depending on the date of the product (time of the season). 0 means that the season is yet to start, 1 means the rain season started during the first decade of September, a value of 2 implies that the rainy season started during the second decade of September and so on. The toolbox has a routine for decoding these values to the actual months and decades (AMESD_RFEon_20110411_cl). The starting date of the rainy season is a critical parameter, especially for farmers in regions with growing seasons that typically do not exceed a 90 days duration.

If the season starts late, it is unlikely that it will end late as well, thus yields will be affected due to lack of sufficient growing days.

3.2.2 Import of a 10-day NDVI product

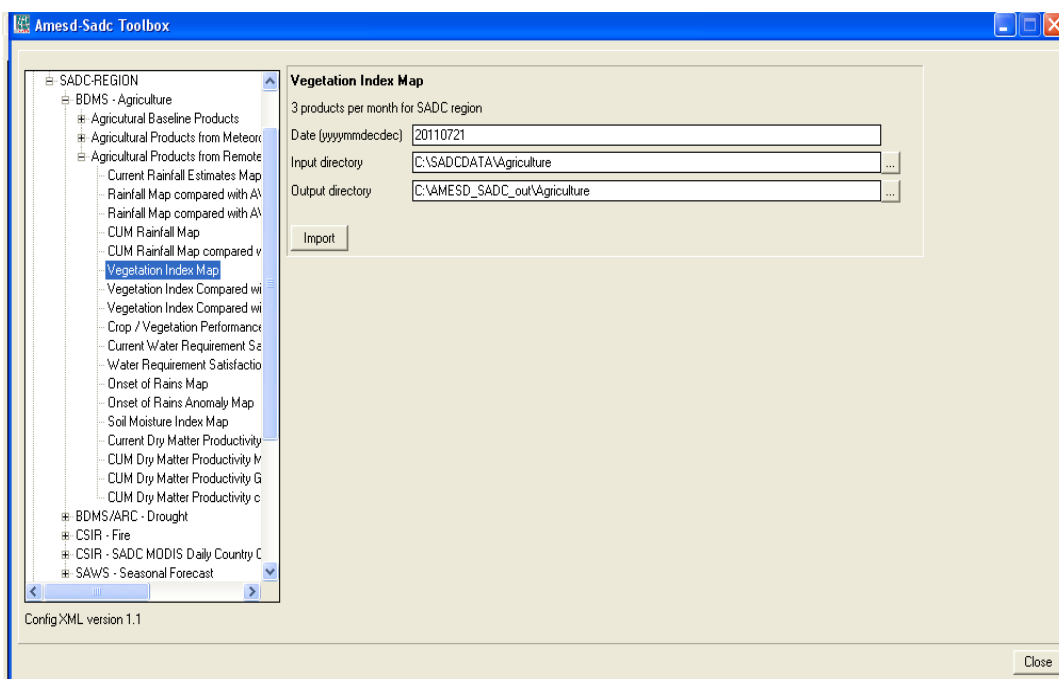
Before starting to import the NDVI you need to check the settings of the directories that contain the raw data/NDVI product. From the “MESA-SADC” and “Toolbox” main menu select the option “Configuration” and “Folder” and select “SADC_agriculture”. Browse to the appropriate data input and output locations and in this case the NDVI data is stored in “C:\SADCDATA\Agriculture” and the output location “C:\MESA-SADC_out\Agriculture” is used. Press “Save” to store the settings. See also the figure below.

Figure 3.2.5: Input and output directory specification using the Toolbox Folders option



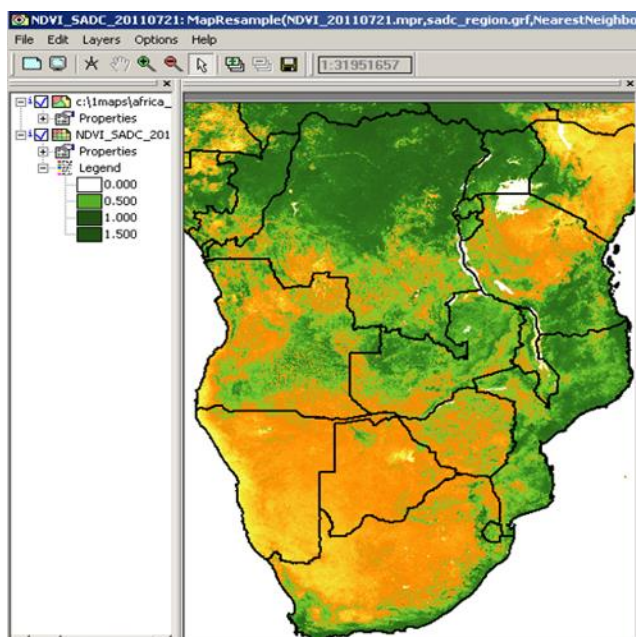
For the exercise use is made of the S-10 NDVI. From the “MESA-SADC” and “Toolbox” menu select “SADC-REGION”, “BDMS-agriculture”, “Agricultural products from remote sensing” and subsequently “Vegetation index map”. Select as the “Date” “20110721”, note that here use is made of the data for the third decade of July 2011 (20110721). See also the figure below.

Figure 3.2.6: NDVI / Vegetation Index Map import window



Press “*Import*” to start the import. Note that during import a command window is activated, have also a look at what is displayed in this window. After completion of the import, update the ILWIS catalogue (from the main ILWIS menu, select “*Window*” and “*Refresh F5*”) and note the file that has been created. Select the imported NDVI map, and display the map using as “*Representation*” “*NDVI1*”. See also figure 3.2.7. Move the mouse while keeping the left mouse button pressed over the active map display window.

Figure 3.2.7: The imported NDVI map



In a similar way the other agriculture products disseminated via EUMETCast-GEONETCast can be imported. Continue to import a few other products, e.g the “*Air temperature map*” (gT) (from meteorological ground measurements), “*Current Rainfall Estimates Map*” (from meteorological ground measurements) (gRFE) etc. In order to conduct the import select from the “*MESA-SADC*” and

“Toolbox” menu “SADC REGION”, “BDMS-Agriculture”, “Agricultural Products from Meteorological Ground Measurements” and subsequently the required import routine for the product you want to import (gT, gRFE, etc). Use the appropriate Representations for the products, e.g. for the gT: “gTemp”, for the gRFE: “RFE”. Consult again appendix 1 providing the information on MESA SADC Thema products and the acronyms used.

3.2.3 Import of Time series graph products

Introduction

While difference images show the spatial distribution of plant growth and rainfall anomalies, Time series charts help to understand the development of vegetation on a long-term basis. The time series graphs are generated at the district level for areas that have agricultural activity (as defined by the agricultural mask)

The following time series products are provided by the agriculture service.

AP07: Graph of Rainfall Events in the Current Season

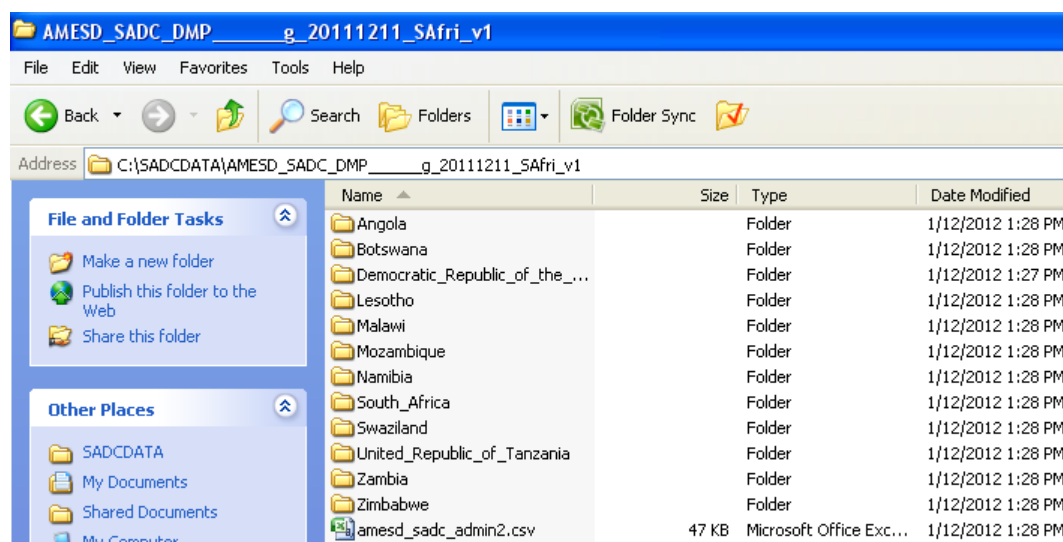
AP12: Graph of Cumulate Rainfall of the current season compared to the LTA, LTMax, LTMin

AP22: Crop / Vegetation performance Graphs

AP30: Cumulate dry matter productivity graphs

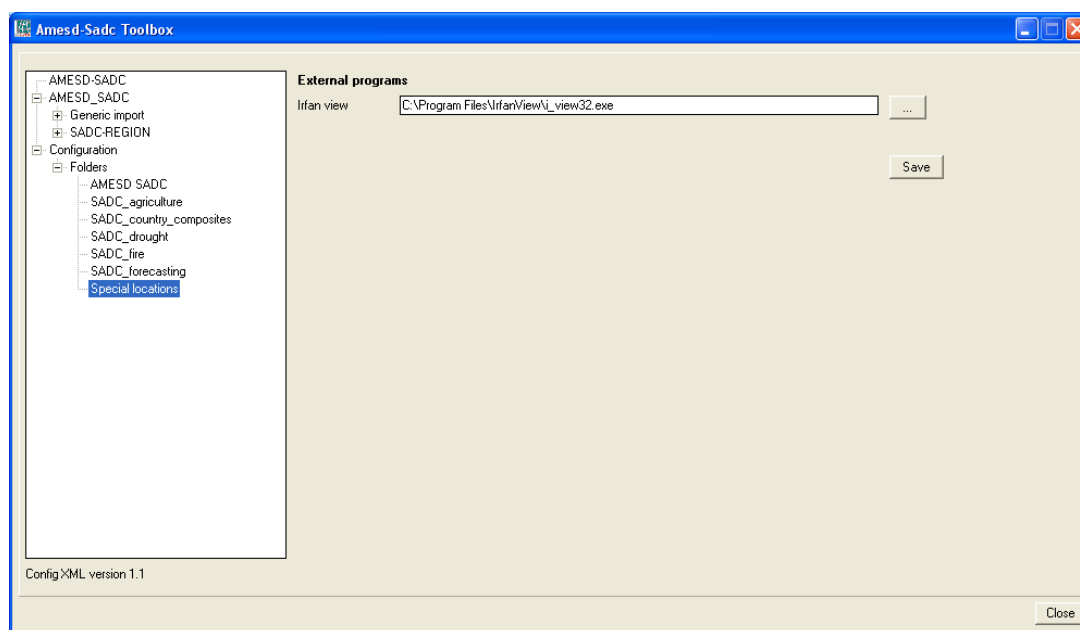
The time series products are disseminated as one zipped file for the whole SADC region. Within the main folder, there are subfolders for various countries and a csv file which contains the information of the District ID (Mask ID), and the corresponding ADM2_Name (district), ADM1_Name (province) and ADM2_Name (Country) as shown below. Please have a look at the amesd_sadc_admin2.csv

Figure 3.2.8: The directory structure for time series graph products



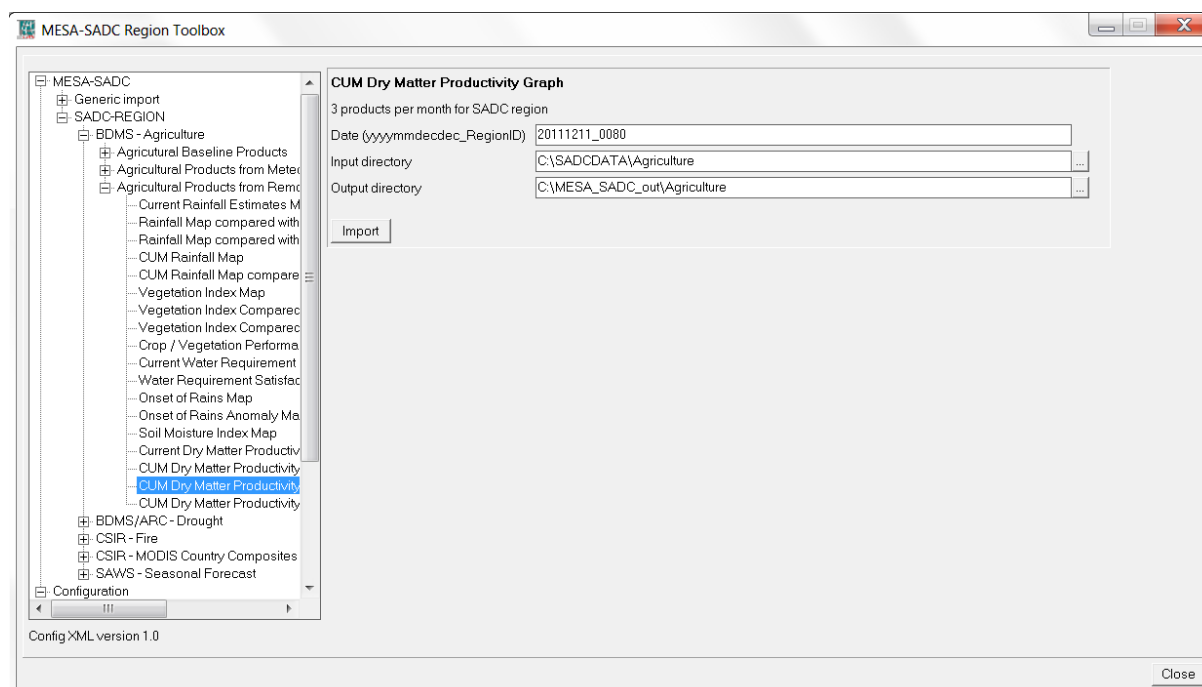
In order to import these products please make sure that Irfan View is installed on your machine. This application is used for the visualisation of the png files. If the software is installed the next step is to configure the location of the “Irfan View.exe” and save the path as shown below.

Figure 3.2.9: Configuration of the Irfan View exe



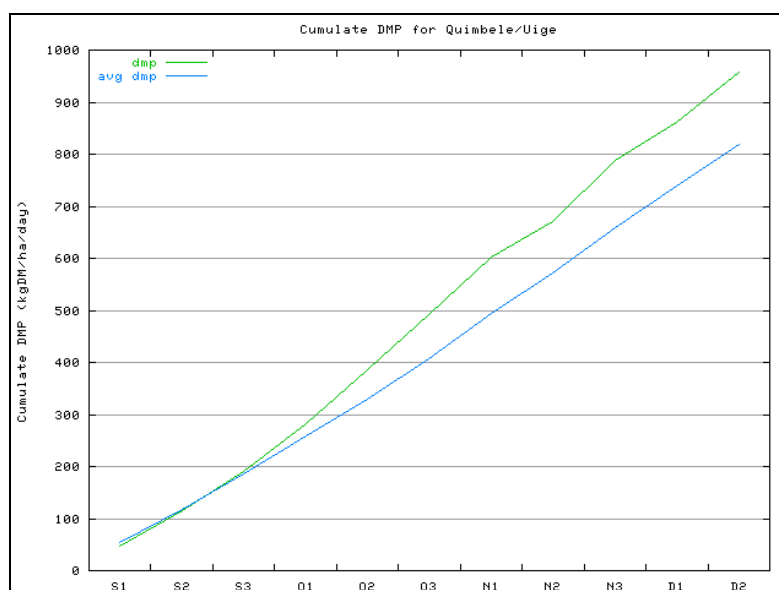
Once the configuration is Ok try to import few graphs from your own country. In the example below the DMP cumulative graph for the second Dekad of December 2011 of Quimbele district, Angola is used for demonstration. Please refer to the amesd_sadc_admin2.csv for your Region ID (district)

Figure 3.2.10: Cumulative dry matter Productivity graph import window



After importing you should have a graph like the one below.

Figure 3.2.11: Imported Cumulative dry matter Productivity graph

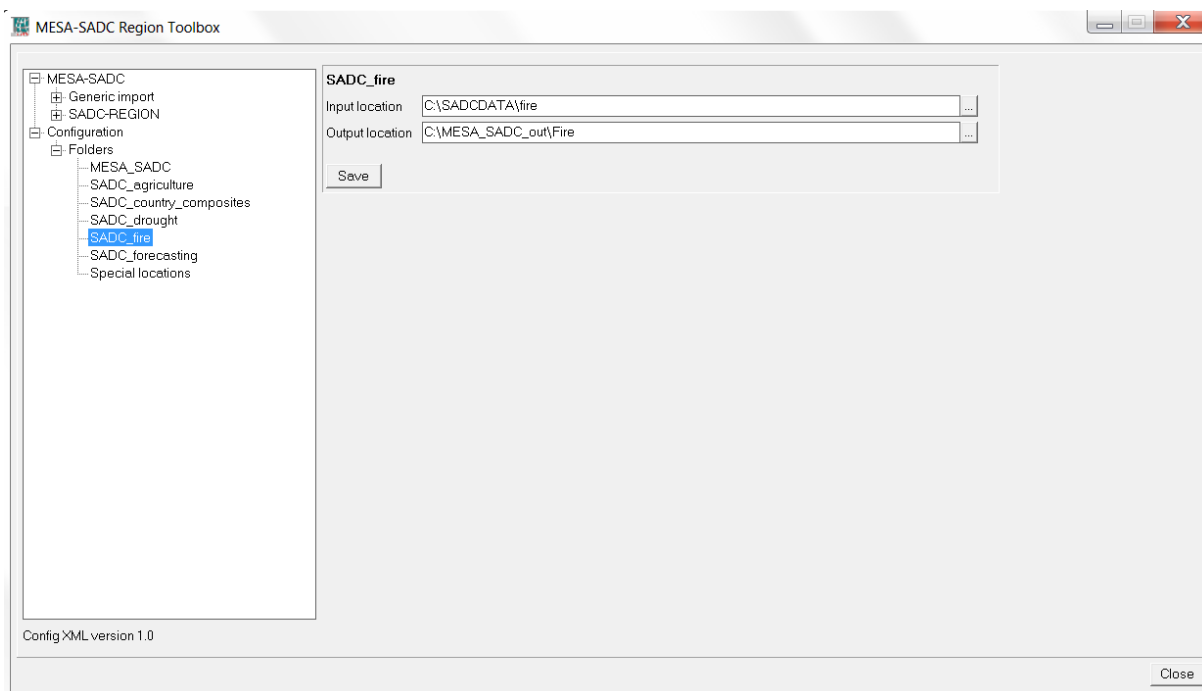


The time series are done during the agricultural season which has been defined from September to April. In the Graph above, S1 is the first dekad of September, S3, Third dekad of September and so on. The advantage of these graphs is that they can be easily slotted directly into an agricultural report. The original data that is used for generating the graphs is also disseminated as a csv file.

3.3 IMPORT OF FIRE SERVICE PRODUCTS

Before starting to import the various MESA-SADC Thema Fire service products you need to check the settings of the directories that contain the raw data. From the “MESA-SADC” and “Toolbox” main menu select the option “Configuration” and “Folder” and select “SADC_fire”. Browse to the appropriate data input and output locations and for this exercise the data and products are stored in the directory “C:\SADCDATA\Fire”, where “C:” is the designated hard disk drive location. Here as output location “C:\MESA_SADC_out\Fire” is used. Press “Save” to store the settings.

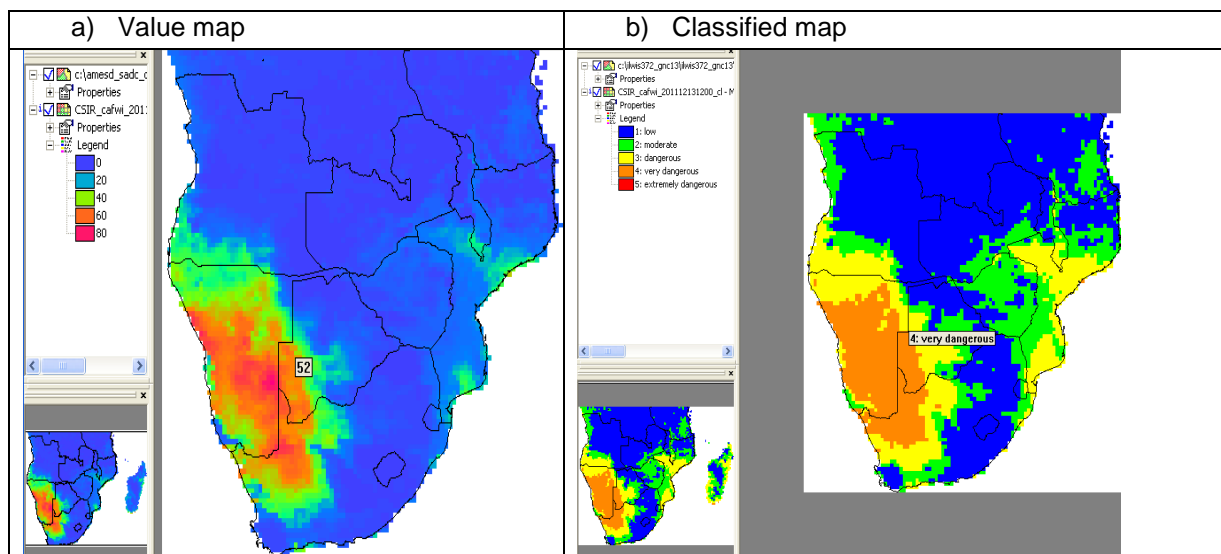
Figure 3.3.1: Input and output directory specification for importing fire data



3.3.1 Importing Canadian Forest Fire Danger Index (CFWI).

From the “MESA-SADC” and “Toolbox” main menu select the “SADC REGION”, “CSIR-Fire”. Select the “Canadian Forest Fire Danger Index” to import the CFWI product. Note the “Date” format; specify an appropriate time stamp, here “20111213” is used. As there is one product a day the convention of the time stamp (for hhmm) is ‘1200’. Press “Import” to execute the import. Two maps are created as a result of the import of the Canadian Forest Fire Danger Index, a map with the prefix “val_” showing the original fire danger values and a map having a prefix “cl_”, showing the associated danger classification. Display both maps, for the “CSIR_cafwi_201112131200_val” a “pseudo” “Representation” can be used, for the “CSIR_cafwi_201112131200_cl” the default “Representation” should be used. Add also the country boundaries (SADC country) located in the ILWIS subdirectory *Extensions\MESA-SADC-Toolbox\util\maps* (tick off info and activate the boundaries only option). With the left mouse button pressed over the active map window to inspect the values / fire danger class assignment. Your import results should resemble those of Figure 3.3.2.

Figure 3.3.2: CAWFI, fire danger values (left) and associated fire danger classification (right)

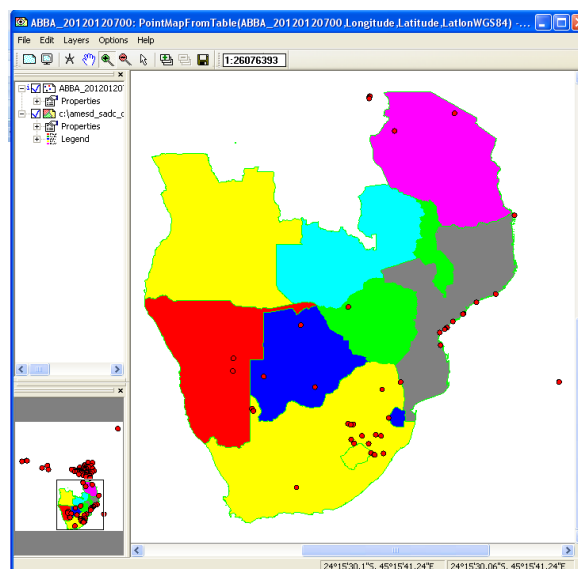


3.3.2 Importing the MSG Active Fire (FIR) product

The MSG satellite thermal spectral channels are used to extract hotspots. This is not the standard Eumetsat product, but the Wildfire Automated Biomass Burning Algorithm (WF_ABBA) product generated by the University of Wisconsin Madison. The Wildfire Automated Biomass Burning Algorithm (WF_ABBA) provides fire detections and fire characteristics instantaneous fire size, instantaneous fire temperature, and fire radiative power).

From the “MESA-SADC” and “Toolbox” main menu select the “SADC REGION”, “CSIR-Fire”. Select the “ABBA-MSG Fire product. Note the “Date” format; specify an appropriate date stamp, here “20120120700” is used. Note the format: yyyyjjjhhmm, which stand for year (yyyy), Julian day (jjj) hour (hh) and minute (mm). Press “Import” to execute the import. Refresh the ILWIS catalogue (select from the main ILWIS menu “Window” and “Refresh”) and open the map view “ABBA_20120120700”. Your import results should resemble those of Figure 3.3.3.

Figure 3.3.3: Imported MSG Active Fire (FIR) product shown as a map view

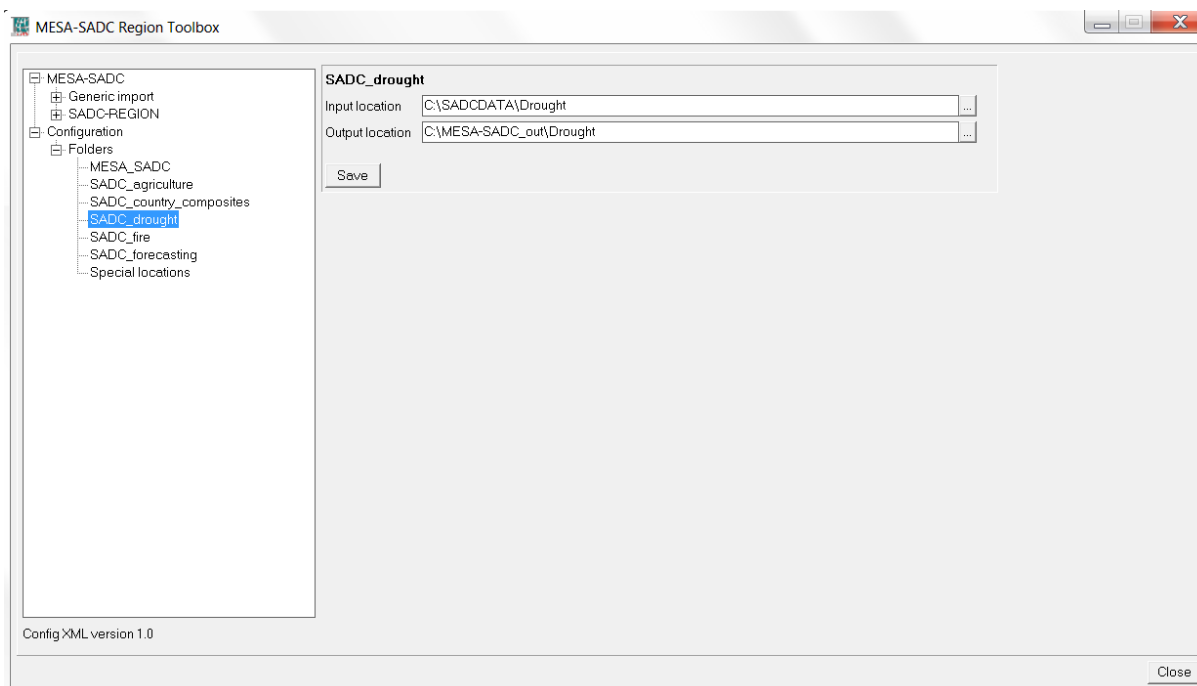


Following similar steps as described above to import the remaining fire products.

3.4 IMPORTING DROUGHT SERVICE PRODUCTS

Before starting to import the drought products you need to check the settings of the directories that contain the raw data (Drought products). From the “MESA-SADC” and “Toolbox” main menu select the option “Configuration” and “Folder” and select “SADC_drought”. Browse to the appropriate data input and output locations and in this case the drought data is stored in “C:\SADCDATA\Drought” and the output location “C:\MESA-SADC_out\Drought” is used. Press “Save” to store the settings. See also the figure below.

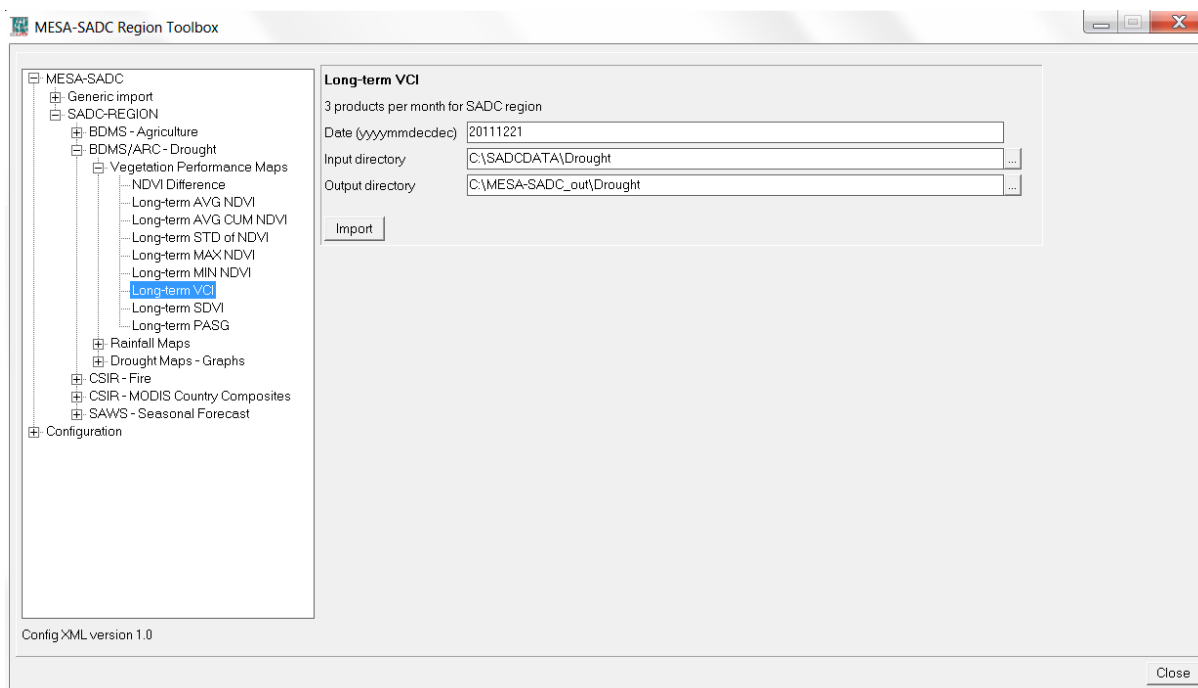
Figure 3.4.1: Input and output directory specification using the Toolbox Folder Configuration



3.4.1 Importing Vegetation Condition Index (VCI) product

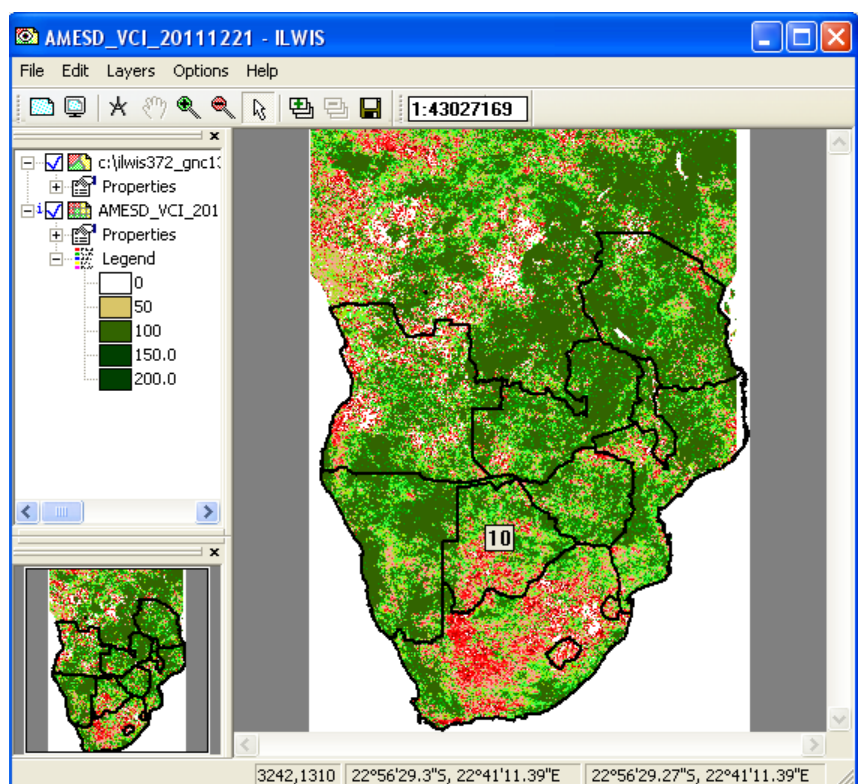
From the “MESA-SADC” and “Toolbox” main menu select “SADC-REGION”, “BDMS/ARC drought”, Vegetation performance maps and “Long-term VCI” to import the VCI product. Select for the “Date”, use is made here of the data for the third decade of December 2011 (20111221). See figure 3.4.2 below.

Figure 3.4.2: Importing Long-term VCI



Press “*Import*” to start the import. Note that during import a command window is activated, have also a look at what is displayed in this window. After completion of the import, update the ILWIS catalogue (from the main ILWIS menu, select “*Window*” and “*Refresh F5*”) and note the file that has been created: AMESD_VCI_20111221. Display this map, using as “*Representation*” “VCI”, also add the country boundaries (no info, boundaries only using a black colour). Check the values obtained, note that these are in percentage. Different degrees of a drought severity are indicated by VCI values below 50%. A VCI threshold of 36% signifies an extreme drought condition (Liu and Kogan, 1996). When done close the Map

Figure 3.4.3: Import results for Long-term VCI



Have a look at the different VCI values and import other drought products.

3.5 IMPORTING LONG RANGE FORECAST (LFR) DATA

3.5.1 Introduction

The LRF service comes in as a support service to the three main services. “Long Range Forecasting” is already mature on the thematic level and operationally produced by the South African Weather Services. Three monthly rainfall and temperature forecasts updated every month are used.

Integration the LRF in the 3 main services (agriculture, drought and fire) will enable users to:

- Embed a “Seasonal Crop Outlook” in their bulletins and reports which will give an idea about the risk for crop failure at the end of the growing season;
- Generate a “Seasonal Drought Risk Outlook” - map which will give an idea about the risk for sustained drought;
- Embed the “Seasonal Fire Risk Outlook” in the bulletins and reports, which can give an idea of the areas having a high fire risk.

The full list of the products is shown below.

LONG RANGE FORECAST SUPPORT SERVICE		Acronym
1.a	LRF01: Probabilistic Seasonal Rainfall Forecast (Above-Normal)	RAIN_AN.fcst
b	LRF01: Probabilistic Seasonal Rainfall Forecast (Below-normal)	RAIN_BN.fcst
c	LRF01: Probabilistic Seasonal Rainfall Forecast (Normal)	RAIN_NN.fcst
2.a	LRF02: Probabilistic Seasonal Maximum Temperature Forecast (Above-Normal)	TX_AN.fcst
b	LRF02: Probabilistic Seasonal Maximum Temperature Forecast (Below-normal)	TX_BN.fcst
c	LRF02: Probabilistic Seasonal Maximum Temperature Forecast (Normal)	TX_NN.fcst
3.a	LRF03: Probabilistic Seasonal Minimum Temperature Forecast (Above-Normal)	TN_AN.fcst
b	LRF03: Probabilistic Seasonal Minimum Temperature Forecast (Below-normal)	TN_BN.fcst
c	LRF03: Probabilistic Seasonal Minimum Temperature Forecast (Normal)	TN_NN.fcst

File name example

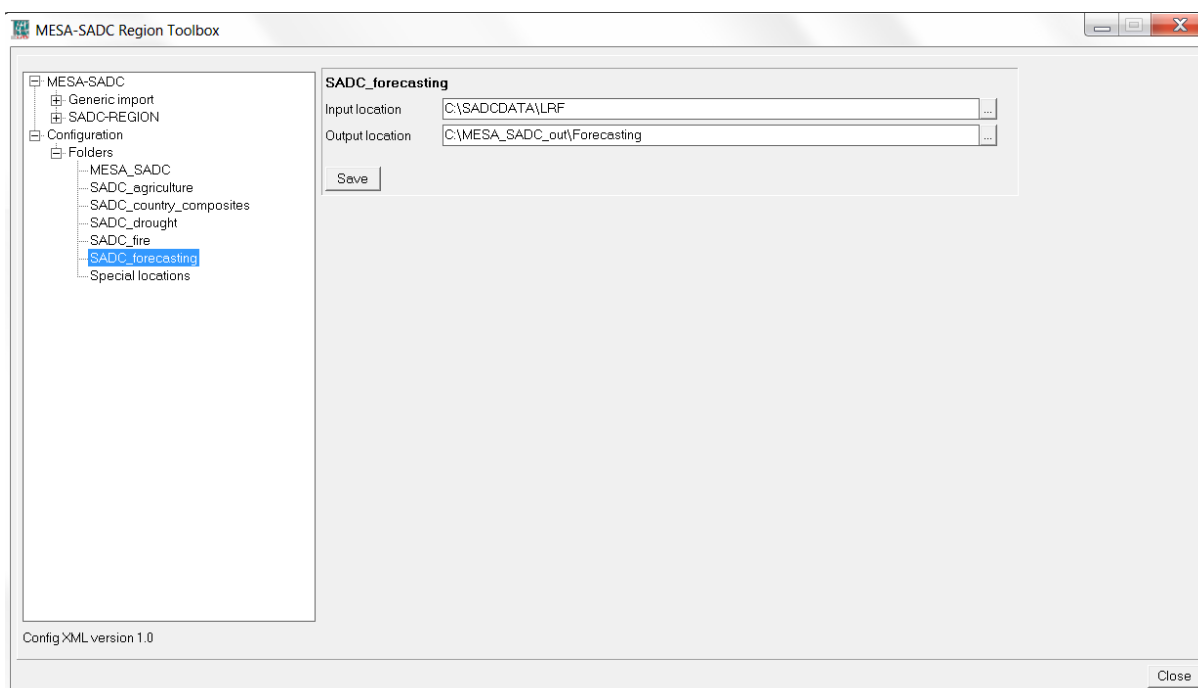
AMESD_SADC_ augMM.sonRAIN_AN.fcst.txt

In the file name example above, Aug is the actual month , son (September, October, November) is the predicted period

3.5.2 Importing the Seasonal Rainfall Forecast

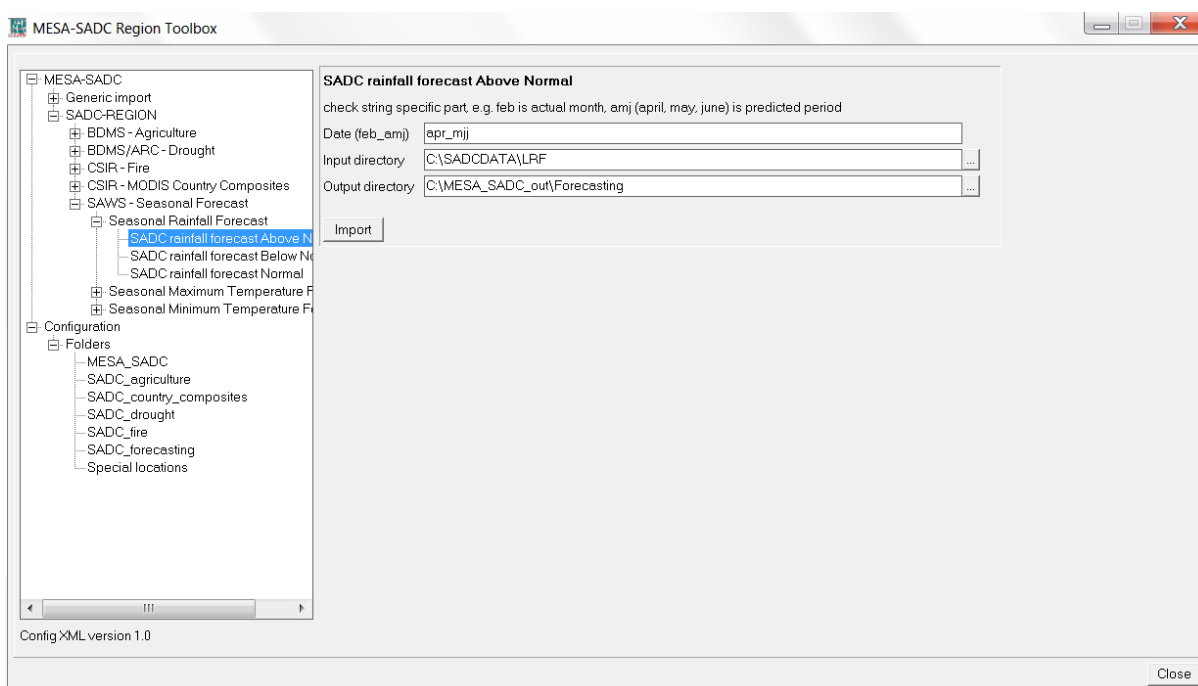
As with the previous products, before starting to import the Forecast products you need to check the settings of the directories that contain the raw data (LRF Products). From the “MESA-SADC” and “Toolbox” main menu select the option “Configuration” and “Folder” and select “SADC_forecasting”. Browse to the appropriate data input and output locations and in this case the LRF data is stored in “C:\SADCDATA\LRF” and the output location “C:\MESA_SADC_out\Forecasting” is used. Press “Save” to store the settings. See also the figure below.

Figure 3.5.1: Input and output directory specification for LRF



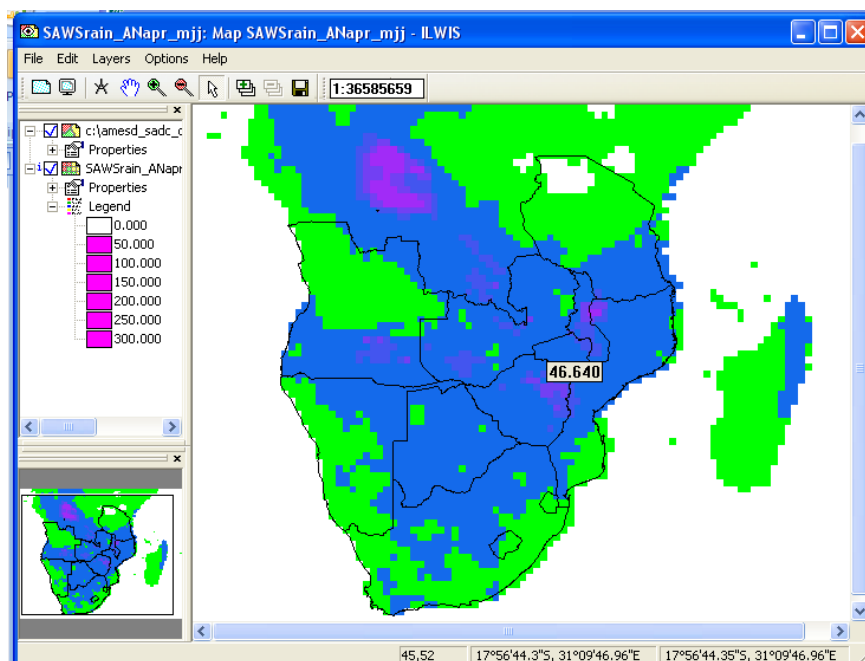
From the “MESA-SADC” and “Toolbox” main menu select “SADC-REGION”, “SAWS-seasonal forecasts”, “Seasonal rainfall forecasts” and “SADC rainfall forecasts above normal” . Select for the “Date”, here apr (April) is the Current / actual month mjj (May, June, July) is the predicted month Figure 3.5.2 below.

Figure 3.5.2: Importing rainfall forecasts above normal



Press “Import” to start the import. Note that during import a command window is activated, have also a look at what is displayed in this window. After completion of the import, note the file that has been created: SAWSrains_ANapr_mjj. Display this map, using as “Representation” “saws_P_AN”, also add the country boundaries (no info, boundaries only using a black colour). Your results should be similar to the map presented below.

Figure 3.5.3: Imported above rainfall forecast product shown as a map view



Check the values obtained, note that these are in percentage. These percentages represent the chances of getting above normal rainfall. Using the similar steps other LRF products can be imported.

APPENDICES

Appendix 1: Current products supported by the MESA-SADC toolbox, XML version 1.0

Agricultural Service	Acronym
AP01: Agriculture Mask	AGRIC_MASK
AP02: Crop Statistics Map	CROP_STATS
AP03: Crop Specific Maps	CROP_SPECI
AP04: Current Conditions Rainfall Map	gRFE_____
AP05: Current Condition Cumulate Rainfall Map	gRFEdc_____
AP06: Current Conditions - Air Temperature Map	gT_____
AP07: Graph of Rainfall Events in the Current Season	gRFE_____g
AP08: Map of current Rainfall compared with the LTA, Max and Min values (mm)	gRFEdc_____
AP09: Map of current Rainfall compared with the LTA, Max and Min values (%)	gRFEdavgP_, gRFEdmax_, gRFEdmin_
AP10: Map of current Cumulate Rainfall compared with the LTA, Max and Min values (mm)	gRFEdavg_, gRFEdmax_, gRFEdmin_
AP11: Map of current Cumulate Rainfall compared with the LTA, Max and Min values (%)	gRFEdAvgP, gRFEdmaxP, gRFEdminP
AP12: Graph of Cumulate Rainfall of the current season compared to the LTA, LTMax, LTMin	gRFEdc_____g
AP13: Map of current Air Temperature compared with the LTA, Max and Min values (oC)	gTdavg_____, gTdmax_____, gTdmin_____
AP14: Current Rainfall Estimates Map	RFE_____
AP15: Rainfall Estimates Compared with average [difference]	RFEdavg_____
AP16: Rainfall Estimates Compared with average [%]	RFEdavgP_____
AP17: Cumulate Rainfall Map	RFEdc_____
AP18: Cumulate Rainfall Map compared with Average (% Anomaly)	RFEdcAvgP_____
AP19: Vegetation Index Map	N/A already disseminated
AP20: Vegetation Index Compared with average [difference]	NDVIdavg_____
AP21: Vegetation Index Compared with average [%]	NDVIdavgP_____
AP22: Crop / Vegetation performance Graphs	CNDVI_____g
AP23: Current Water Requirements Satisfaction Index (WRSI) Map	WRSI_____
AP24: WRSI Anomaly maps	WRSIAn_____
AP25: Onset of Rains Maps	RFEon_____
AP26: Onset of rains anomaly maps	RFEonAn_____
AP27: Soil Moisture Index Maps	SMI_____
AP28: Current dry matter productivity map	N/A already disseminated
AP29: Cumulate dry matter productivity map	DMPc_____
AP30: Cumulate dry matter productivity graphs	DMP_____g
AP31: Cumulate dry matter productivity comparison with average maps(%)	DMPcdavgP_____

Drought Service	Acronym
DP01: NDVI difference	NDVId____
DP02: Long-term average NDVI	Ltavg_NDVI
DP03: Long-term average cumulative NDVI	LtavgcNDVI
DP04: Long-term standard deviation of NDVI	Ltsd_NDVI
DP05: Long-term maximum of NDVI	Ltmax_NDVI
DP06: Long-term minimum of NDVI	Ltmin_NDVI
DP07: VCI	VCI____
DP08: SDVI	SDVI____
DP09: PASG	PASG____
DP10: Total cumulative rainfall – monthly, seasonal	RFE_cmonth_,RFE css____
DP11: Long-term average rainfall – Ten-daily	Pltavg_RFE
DP12: Percentage of long-term average rainfall – Ten-daily or longer period	Pltavg_RFE
DP13: Drought risk map (Boolean type)	DRrisk__b
DP14: Drought risk map (Graded type)	DRrisk__gd
DP15: Graphs – based on average value of summarizing polygon	DRavg____g
DP16: Graphs – Based on area within polygon where an index is lower than a specific cut-off value.	DRlower__g

Fire service Service	Acronym
FP01: MSG Active Fire Product	MSG_W_ABBA
FP02: MODIS Burned Area product	MODIS_BA__
FP03: Canadian Fire Weather Index	CFWI____
FP04: Lowveld Forest Fire Index	LFDI____
FP05: MODIS True Colour Images	MODIS_TC__
MODIS-AFIS Fire product-Aqua	N/A already disseminated
MODIS-AFIS Fire product-Terra	N/A already disseminated

Long Range Forecast (LRF) Support Service	Acronym
LRF01: Seasonal Rainfall Forecast (Above-Normal)	RAIN_AN.fcst
Seasonal Rainfall Forecast (Below-normal)	RAIN_BN.fcst
Seasonal Rainfall Forecast (Normal)	RAIN_AN.fcst
LRF02: Seasonal Maximum Temperature Forecast (Above-Normal)	TX_AN.fcst
Seasonal Maximum Temperature Forecast (Below-normal)	TX_BN.fcst
Seasonal Maximum Temperature Forecast (Normal)	TX_NN.fcst
LRF03: Seasonal Minimum Temperature Forecast (Above-Normal)	TN_AN.fcst
Seasonal Minimum Temperature Forecast (Below-normal)	TN_BN.fcst
Seasonal Minimum Temperature Forecast (Normal)	TN_NN.fcst

Appendix 2: List of abbreviations and product acronyms

Abbreviation	Full name
<i>T</i>	<i>Temperature</i>
<i>TN</i>	<i>Seasonal minimum Temperature</i>
<i>TX</i>	<i>Seasonal maximum Temperature</i>
<i>RFE</i>	<i>Rain</i>
<i>c</i>	<i>Cumulative</i>
<i>P</i>	<i>Percentage</i>
<i>avg</i>	<i>Average</i>
<i>max</i>	<i>Maximum</i>
<i>An</i>	<i>Anomaly</i>
<i>AN</i>	<i>Above normal</i>
<i>NN</i>	<i>Normal</i>
<i>BN</i>	<i>Below normal</i>
<i>on</i>	<i>Onset of Rains</i>
<i>LRF3</i>	<i>Long range forecast over three months</i>
<i>Lt</i>	<i>Long term</i>
<i>sd</i>	<i>Standard deviation</i>
<i>Ss</i>	<i>seasonal</i>
<i>DR</i>	<i>drought</i>
<i>b</i>	<i>Boolean</i>
<i>gd</i>	<i>graded</i>
<i>g (prefix)</i>	<i>ground</i>
<i>g (suffix)</i>	<i>graph</i>
<i>Speci</i>	<i>Specific</i>
<i>CFWI</i>	<i>Canadian Fire Weather Index</i>
<i>LFFDI</i>	<i>Lowveld Forest Fire danger index</i>
<i>DRrout3</i>	<i>Drought risk out lookmap for 3 month</i>

Appendix 3: MESA SADC Thema file naming convention

10	1	10	1	8	1	5	1	3		2	1	2
AMESD_SADC MESA_SADC *	—	Product	—	Decade	—	ROI	—	District ID	—	v1	.	zip

AMESD_SADC: AFRICAN MONITORING OF ENVIRONMENT FOR SUSTAINABLE DEVELOPMENT

MESA_SADC: MONITORING FOR ENVIRONMENT AND SECURITY IN AFRICA

Product: *PRODUCT_ACRONYM*

AGRIC_MASK
gRFE_____
RFEavgP__

Decade: *DECADE (start date)*

20050901

/example, YYYYMMDD/

ROI: *REGION_OF_INTEREST*

SAfric

District ID: District ID (*for products with graphs*)

...

v1: *FILE_NAME_VERSION*

v1

zip: *FILE_NAME_EXTENSION*

zip

FILE NAME EXAMPLE:

AMESD_THEMA_DMPcdavg____20100901_SAfri_001_v1.zip

Note: * All new products developed under MESA project follow the same naming convention but start with MESA_SADC

Appendix 4: Other freeware utilities that can be used in conjunction with ILWIS

SPIRITS SOFTWARE

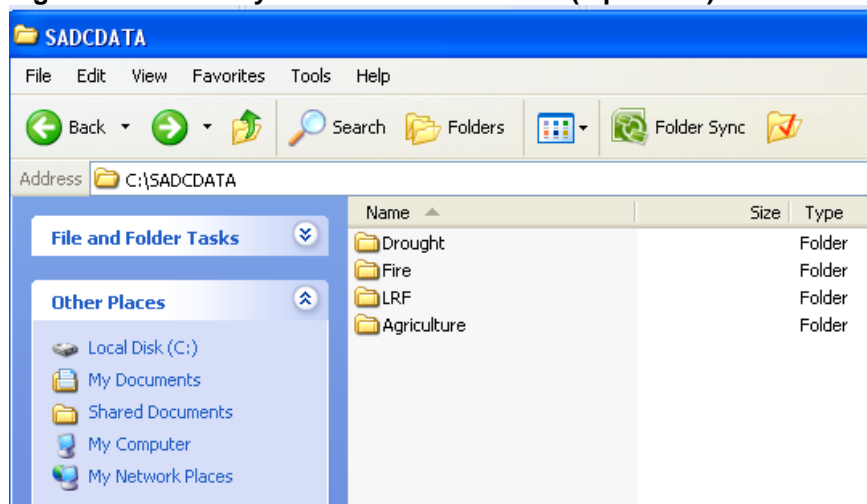
<http://spirits.jrc.ec.europa.eu>

Appendix 5: Storing sample data for exercises

Configuration of the input directory

Create a directory, ideally on the C:\ drive and name it “SADCDATA”. Unzip the agriculture, drought, fire and LRF directories and drop them into the SADCDATA directory (see figure 5.1).

Figure 5.1: Directory structure for exercises (Input data)



Configuration of the output directory

For storing the imported products create a directory on the C:\ drive and name it “AMESD_SADC_out”. Create the following sub-directories: Agriculture, Drought, Fire and Forecasting. The directory structure should resemble the one shown below.

Figure 5.2: Directory structure for exercises (Output data)

