

Description (and original Python code) of a script created to process MODIS active fires data. Half way between a “scientific paper” and a user manual. A sort of Active Fires for Dummies!

# UQ 1.4.1 Python Script

A MODIS “active fires” processing tool

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MAPUTO, AUGUST 2014



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## Abstract

Wildfires are a “hot” issue in Mozambique. Yearly more than 10 millions hectares of land are affected by fires. The author started in 2011 developing a framework (SAMOQUE - <https://www.facebook.com/samoque>) and tools to implement an early warning and monitoring system to provide Mozambican Government (Ministry of Agriculture) with Decision Support tools to fight this human-induced hazard.

The present document describes one of these tools: an office automation package to analyse, daily fires occurrences in the country based on MODIS “active fires” ([http://modis-fire.umd.edu/AF\\_getdata.html](http://modis-fire.umd.edu/AF_getdata.html)) data.

The package, an ArcGIS 10.1 Python script, developed by the author, include a suite of embedded tools to carry out: data import (MODIS “active fires” data), processing (integration with other spatially explicit data and with “active fires” historical data starting from 2001) and outputs (Maps, Graphs and Tables).

## Introduction

UQ1dot4dot1 is an ArcGIS 10.1 Python script (see the interface in Figure 8, and the code in “Annex I - The code”) developed to process “active fires”. The script is supposed to be launched once a day after NASA data acquisition. The raw data is supposed to be downloaded daily, via FTP, from the NASA server <ftp://nrt1.modaps.eosdis.nasa.gov>.

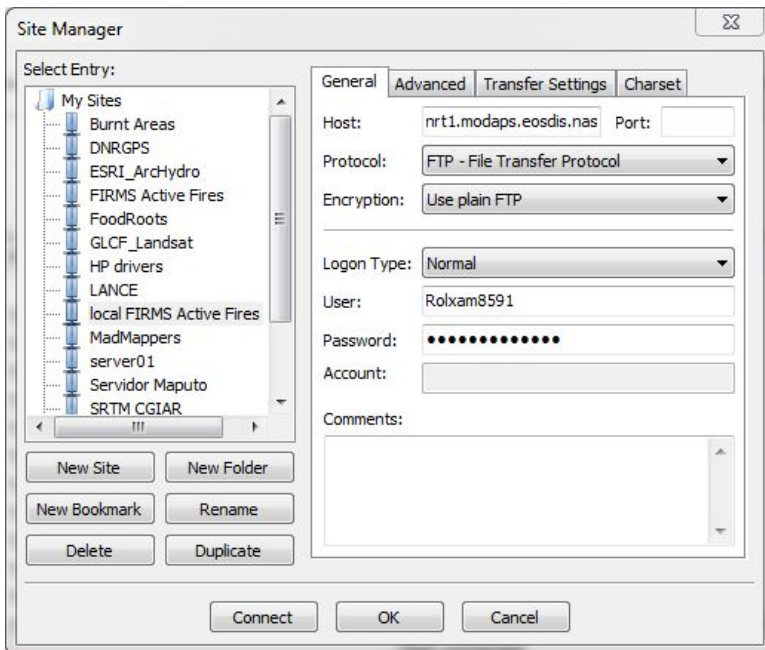


FIGURE 1 - FIRMS SERVER CONNECTION VIA FILEZILLA

“Active Fires” Users must be registered NASA users to get login and password. Registration and access to the data is at no cost.

An FTP client software (like Filezilla) will be enough to download the text files including all the daily fires for a selected region of the world.

In Figure 1 is shown the Filezilla configuration page to setup the connection to the FIRMS server (logon parameters are of the author)

In Figure 2 is the list of text files downloaded from NASA.

Once the file(s) has been downloaded on the user’s PC, UQ1dot4dot1 can be launched either from ArcMap or ArcCatalog.

Filename	Filesize	Filetype	Last modified
..			
Southern_Africa_MCD14DL_2014192.txt	882,767	TXT File	7/12/2014 7:12:54 ...
Southern_Africa_MCD14DL_2014191.txt	629,445	TXT File	7/11/2014 4:27:31 ...
Southern_Africa_MCD14DL_2014190.txt	821,879	TXT File	7/10/2014 3:06:33 ...
Southern_Africa_MCD14DL_2014189.txt	486,445	TXT File	7/9/2014 8:07:35 AM
Southern_Africa_MCD14DL_2014188.txt	583,405	TXT File	7/8/2014 1:37:44 PM
Southern_Africa_MCD14DL_2014187.txt	416,386	TXT File	7/7/2014 12:54:12 ...
Southern_Africa_MCD14DL_2014186.txt	603,337	TXT File	7/6/2014 5:54:35 PM

FIGURE 2 - FIRMS TEXT FILES WITH "ACTIVE FIRES" DATA

The scripts requires five inputs:

1. The FIRMS (NASA) text file
2. The geodatabase (to store script outputs) containing active fires data
3. The geodatabase (to read input data) with the so-called Micropol data (see The script run for about 5-10 minutes (depending from CPU, network, etc.).
4. The location of the WGET batch file to dowload Lance MODIS imageries
5. The baseline directory of the daily buletin

During the run a number of messages are displayed in the ArcGIS control window to monitor the processing (and locate bugs, see Annex II - the running code output messages).

At the end of each run, usually once a day, several layers and tables are updated (actually deleting the previous version and replacing with the new one) all using the prefix “UQ” and the annual archive is updated (by adding the fires of the day). The present version produces:

3JPEGs for Web/publishing purposes.

One PDF document including maps (from ArcGIS) and tables (from MS-ACCESS 2013)

## The Active Fires data

The near real-time (NRT) active fire locations are processed by LANCE using the standard MODIS MOD14/MYD14 Fire and Thermal Anomalies product. Each active fire location represents the center of a 1km pixel that is flagged by the algorithm as containing one or more fires within the pixel. Data older than the last 7 days, can be obtained from the Archive Download Tool; the tool provides NRT data and, as it becomes available, it is replaced with the

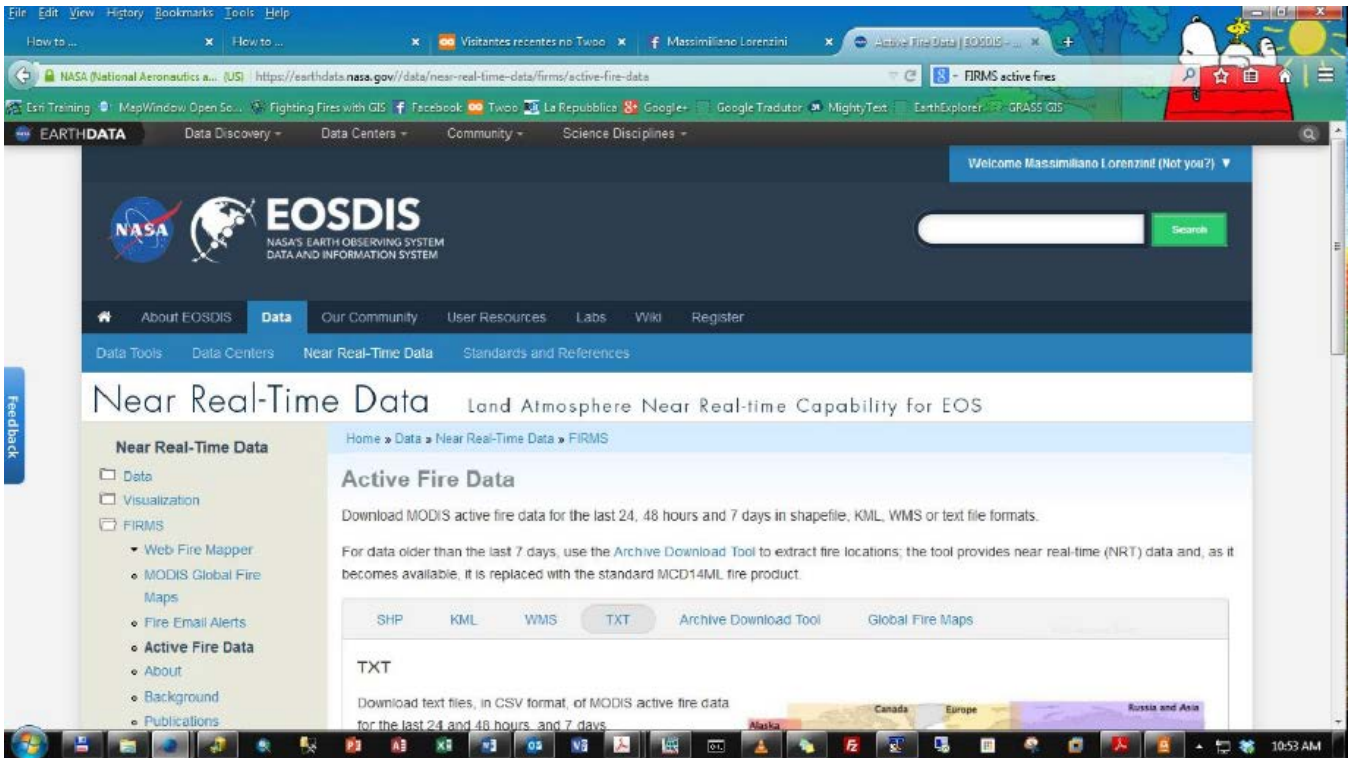


FIGURE 4 - [HTTPS://EARTHDATA.NASA.GOV/DATA/NEAR-REAL-TIME-DATA/FIRMS](https://earthdata.nasa.gov/data/near-real-time-data/firms)

standard MCD14ML fire product. FIRMS also offers monthly MODIS Burned Area (MCD45) images through Web Fire Mapper.

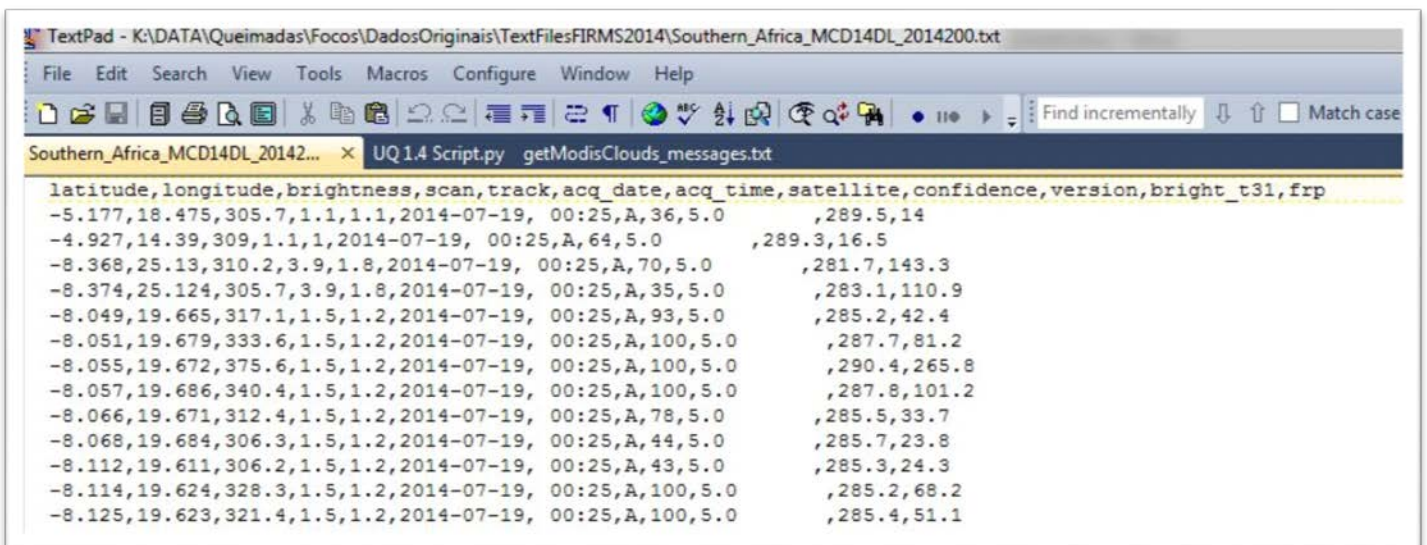


FIGURE 3 - FIRMS TEXTFILE'S CONTENT

## The Script

UQ1dot4dot1 is a relatively simple Python script originally generated by ArcGIS ModelBuilder (with the ModelBuilder export function) and then deeply modified by the author.

ModelBuilder is a very powerful tool to streamline geoprocessing tasks. It is also a valuable mean to share/disseminate a methodology. However has limitations that can be bypassed by moving into the scripting realm.

In Figure 5, we show the original ModelBuilder module to process just the actual “active fires” data of the day.

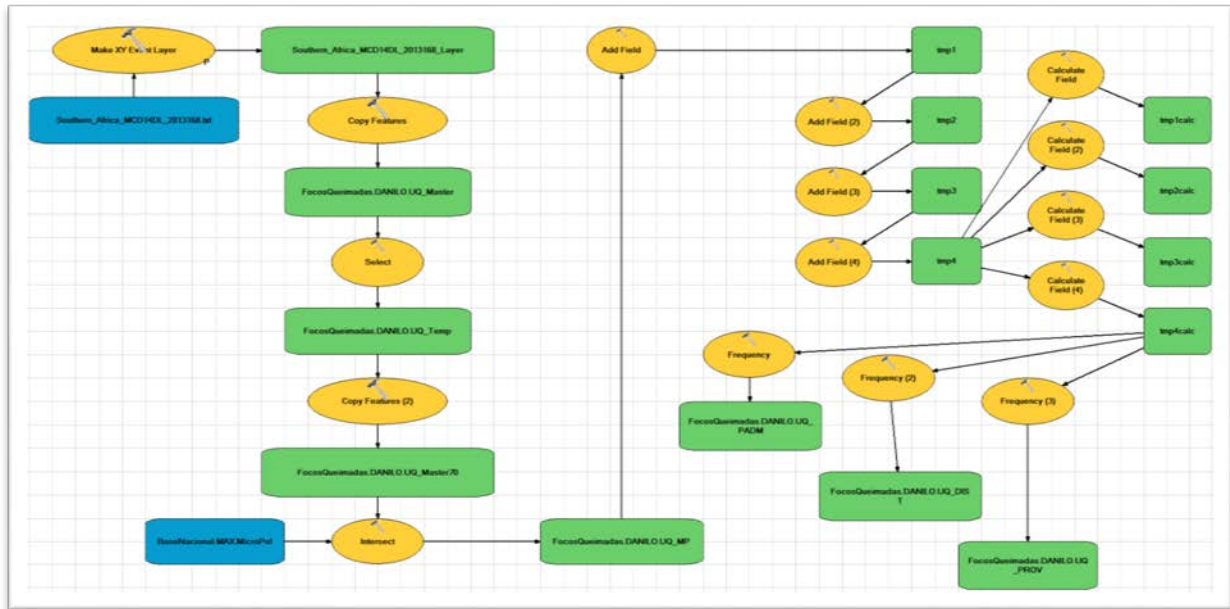


FIGURE 5 - THE ORIGINAL UQ1DOT1 MODELBUILDER MODULE

The actual code of UQ1dot4dot1 is presented in “Annex I - The code”.

## The Script setup @ DIRN

UQ1dot4dot1 and its companions getModisClouds.bat and UQ\_Report.accdb, were conceived and developed having in mind one main user: the Ministry of Agriculture of Mozambique (MINAG). Within MINAG the Department of Natural Resources Inventories (DIRN) is the office where most of the forestry data is collected and stored in a number of geodatabases.

UQ1dot4dot1 is tailored around the structure and physical location of these geodatabases and cannot be considered a general purpose utility directly transferrable into other environments; this because some layers’ names and tables’ columns are “proprietary” of DIRN and are hardcoded within the script.

However moving UQ1dot4dot1 in a new system in a different location (even another country) would not be so complex provided the existence of the layer MicroPol (see Annex V - MicroPol (in portuguese)) by adapting few lines of the code according to MicroPol attribute table structure and the physical location of few files.

Following are some pre-requisites and DIRN environmental variables to run the script.

The Figure 6 illustrates the tree structure of directories where most of UQ1dot4dot1 reads/writes data.

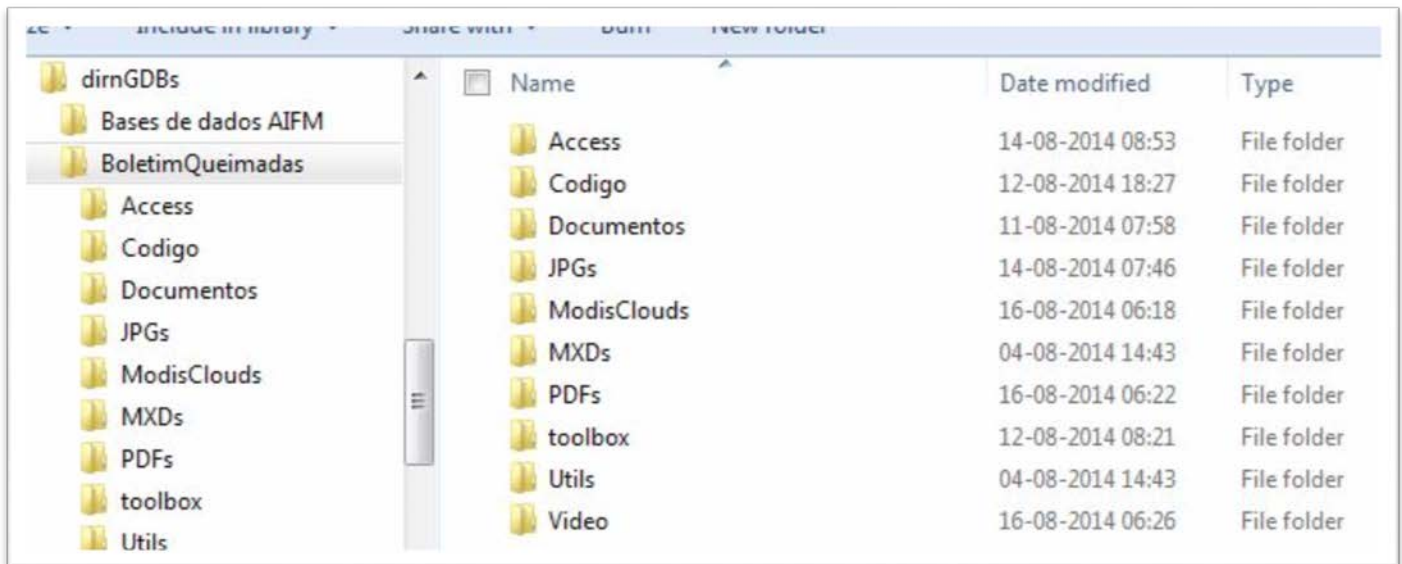


FIGURE 6 - "BOLETIM QUEIMADAS" DIRECTORIES'S TREE

- 1) The script code `UQ1dot4dot1.py` is stored in the network drive/folder `X:\BoletimQueimadas\Codigo`  
Moving/renaming/deleting this file will kill the application
- 2) The script Interface (ArcGIS tool) is stored in the network toolbox `X:\BoletimQueimadas\toolbox\BUQ.tbx`  
the interface can be moved or renamed to any other location with no harm, provided that it will still point to the script mentioned before.
- 3) The two geodatabases `FocosQueimadas` and `BaseNacional` have to be accessed with the "sa" (System Administrator) SQL Server credentials. This is the user who created the original layers and tables and the only one authorized to delete/modify them. Actually UQ1dot4dot1, at each run deletes and rebuilds all `UQ_***` layers and tables replacing them with the new data.
- 4) The latest version (1.4.1) of UQ has embedded mapping functionality. Actually UQ1dot4dot1 opens, update and export (in JPEG format) three map documents (ArcMap 10.1 compositions), namely:
  - a) `UQ1DOT4DOT1_Main.mdx`
  - b) `UQ1DOT4DOT1_Critical.mdx`
  - c) `UQ1DOT4DOT1_MODIS_TA.mdx`

These map documents are stored in the network drive/folder `X:\BoletimQueimadas\MXD`s. These maps rely on the `UQ_***` tables/layers that will be described in the paragraph 0. This component of UQ1dot4dot1 will export the JPEG files in the same folder.
- 5) The `getModisClouds.bat` is located in network drive/folder `X:\BoletimQueimadas\Codigo` (network folder specifically created to store LANCE MODIS imageries) and at version 1.4.1. of UQ is embedded in the main python script.
- 6) `getModisClouds.bat` expects to find a folder `X:\BoletimQueimadas\ModisClouds\UQClouds` to update last day imageries.



7) at version 1.4.1. of UQ I also embedded a call to a predefined MS ACCESS 2013 database, called

`UQ_Report.accdb`, located in the directory `X:\BoletimQueimadas\Access`.

By opening this database and executing a macro, UQ1dot4dot1 produces a set of tables in PDF format related to fires occurrences by Administrative Units and Protected Areas.

## Running the Scripts

### UQ1dot4dot1 companion: getModisClouds.bat

While `UQ1DOT4DOT1_Main.mdx` and `UQ1DOT4DOT1_Critical.mdx` depend exclusively from the script and its input variables, `UQ1DOT4DOT1_MODIS_TA.mdx` uses, as input data, satellite images downloaded from a NASA website, namely <http://lance-modis.eosdis.nasa.gov/imagery/>. LANCE publishes daily different MODIS band combinations at various resolutions, namely 2 km, 1km, 500 m and 250 m.

The Figure 12 shows in A4 format the 2 km resolution “natural colours” MODIS image.

The process of downloading LANCE imageries, in geoTIFF format, has been automated via a simple DOS script that relies on an OpenSource utility called `Wget` (<https://www.gnu.org/software/wget/>). In Text Box 1 we present an excerpt from from the official GNUWget documentation about `Wget` features.

Text Box 2 illustrates the `getModisClouds.bat` script, limited to the 2 km resolution datasets extraction. The script launches `Wget` for the three windows composing Mozambique (named by LANCE FAS\_NMozambique, FAS\_SMozambique and FAS\_Zambia) for both TERRA and AQUA satellite.

`getModisClouds.bat` requires the Julian date (day of the year numbered from 1 to 365) parameter to identify the correct date to be downloaded.

The repository folder is currently hardcoded within the script and includes a special sub-folder, called `UQClouds`, updated daily with the 6 latest imageries. UQ1dot4dot1 uses the `UQClouds` folder by opening, updating and exporting the `UQ1DOT4DOT1_MODIS_TA.mdx` map document with the latest UQ imageries, to produce the map output shown in Figure 12.

At version 1.4.1 of UQ `getModisClouds.bat` is embedded in the main python scripts (see the code in page 34).

As stated earlier, version 1.4.1 of UQ, also includes a call to the Microsoft Access 2013 database `UQ_Report.accdb` to produce PDF Tables (the python call in page 36).

The complete DOS shell script messages are shown in “Annex III - getModisClouds.bat @ work”.

## Wget OVERVIEW

“GNU Wget is a free utility for non-interactive download of files from the Web. It supports http, https, and ftp protocols, as well as retrieval through http proxies.

This chapter is a partial overview of Wget’s features.

- Wget is non-interactive, meaning that it can work in the background, while the user is not logged on. This allows you to start a retrieval and disconnect from the system, letting Wget finish the work. By contrast, most of the Web browsers require constant user’s presence, which can be a great hindrance when transferring a lot of data.
- Wget can follow links in html and xhtml pages and create local versions of remote web sites, fully recreating the directory structure of the original site. This is sometimes referred to as “recursive downloading.” While doing that, Wget respects the Robot Exclusion Standard (‘/robots.txt’). Wget can be instructed to convert the links in downloaded html files to the local files for offline viewing.
- File name wildcard matching and recursive mirroring of directories are available when retrieving via ftp. Wget can read the time-stamp information given by both http and ftp servers, and store it locally. Thus Wget can see if the remote file has changed since last retrieval, and automatically retrieve the new version if it has. This makes Wget suitable for mirroring of ftp sites, as well as home pages.
- Wget has been designed for robustness over slow or unstable network connections; if a download fails due to a network problem, it will keep retrying until the whole file has been retrieved. If the server supports regetting, it will instruct the server to continue the download from where it left off.
- Wget supports proxy servers, which can lighten the network load, speed up retrieval and provide access behind firewalls. Wget uses the passive ftp downloading by default, active ftp being an option.
- Wget supports IP version 6, the next generation of IP. IPv6 is autodetected at compile-time, and can be disabled at either build or run time. Binaries built with IPv6 support work well in both IPv4-only and dual family environments.”
- Built-in features offer mechanisms to tune which links you wish to follow (see Chapter 4 [Following Links], page 25).
- The progress of individual downloads is traced using a progress gauge. Interactive downloads are tracked using a “thermometer”-style gauge, whereas non-interactive ones are traced with dots, each dot representing a fixed amount of data received (1KB by default). Either gauge can be customized to your preferences.
- Most of the features are fully configurable, either through command line options, or via the initialization file ‘.wgetrc’ (see Chapter 6 [Startup File], page 31). Wget allows you to define global startup files (‘/usr/local/etc/wgetrc’ by default) for site settings.

Finally, GNU Wget is free software. This means that everyone may use it, redistribute it and/or modify it under the terms of the GNU General Public License, as published by the Free Software Foundation (see the file ‘COPYING’ that came with GNU Wget, for details).”

TEXT BOX 1

## getModisClouds.bat

```

REM #####C:
CD "\PROGRAM FILES (X86)\GNUWIN32\BIN"

WGET -O T:\MODIS_CLOUDS\FAS_NMOZAMBIQUE.2014%1.TERRA.2KM.TIF "HTTP://LANCE-
MODIS.EOSDIS.NASA.GOV/IMAGERY/SUBSETS/?SUBSET=FAS_NMOZAMBIQUE.2014%1.TERRA.2KM.TIF"

COPY /Y T:\MODIS_CLOUDS\FAS_NMOZAMBIQUE.2014%1.TERRA.2KM.TIF
T:\MODIS_CLOUDS\UQ_CLOUDS\FAS_NMOZAMBIQUE.UQ.TERRA.2KM.TIF

WGET -O T:\MODIS_CLOUDS\FAS_SMOZAMBIQUE.2014%1.TERRA.2KM.TIF "HTTP://LANCE-
MODIS.EOSDIS.NASA.GOV/IMAGERY/SUBSETS/?SUBSET=FAS_SMOZAMBIQUE.2014%1.TERRA.2KM.TIF"

COPY /Y T:\MODIS_CLOUDS\FAS_SMOZAMBIQUE.2014%1.TERRA.2KM.TIF
T:\MODIS_CLOUDS\UQ_CLOUDS\FAS_SMOZAMBIQUE.UQ.TERRA.2KM.TIF

WGET -O T:\MODIS_CLOUDS\FAS_ZAMBIA.2014%1.TERRA.2KM.TIF "HTTP://LANCE-
MODIS.EOSDIS.NASA.GOV/IMAGERY/SUBSETS/?SUBSET=FAS_ZAMBIA.2014%1.TERRA.2KM.TIF"

COPY /Y T:\MODIS_CLOUDS\FAS_ZAMBIA.2014%1.TERRA.2KM.TIF T:\MODIS_CLOUDS\UQ_CLOUDS\FAS_ZAMBIA.UQ.TERRA.2KM.TIF

WGET -O T:\MODIS_CLOUDS\FAS_NMOZAMBIQUE.2014%1.AQUA.2KM.TIF "HTTP://LANCE-
MODIS.EOSDIS.NASA.GOV/IMAGERY/SUBSETS/?SUBSET=FAS_NMOZAMBIQUE.2014%1.AQUA.2KM.TIF"

COPY /Y T:\MODIS_CLOUDS\FAS_NMOZAMBIQUE.2014%1.AQUA.2KM.TIF
T:\MODIS_CLOUDS\UQ_CLOUDS\FAS_NMOZAMBIQUE.UQ.AQUA.2KM.TIF

WGET -O T:\MODIS_CLOUDS\FAS_SMOZAMBIQUE.2014%1.AQUA.2KM.TIF "HTTP://LANCE-
MODIS.EOSDIS.NASA.GOV/IMAGERY/SUBSETS/?SUBSET=FAS_SMOZAMBIQUE.2014%1.AQUA.2KM.TIF"

COPY /Y T:\MODIS_CLOUDS\FAS_SMOZAMBIQUE.2014%1.AQUA.2KM.TIF
T:\MODIS_CLOUDS\UQ_CLOUDS\FAS_SMOZAMBIQUE.UQ.AQUA.2KM.TIF

WGET -O T:\MODIS_CLOUDS\FAS_ZAMBIA.2014%1.AQUA.2KM.TIF "HTTP://LANCE-
MODIS.EOSDIS.NASA.GOV/IMAGERY/SUBSETS/?SUBSET=FAS_ZAMBIA.2014%1.AQUA.2KM.TIF"

COPY /Y T:\MODIS_CLOUDS\FAS_ZAMBIA.2014%1.AQUA.2KM.TIF T:\MODIS_CLOUDS\UQ_CLOUDS\FAS_ZAMBIA.UQ.AQUA.2KM.TIF

```

TEXT BOX 2

## UQ1dot4dot1 @ work

The UQ1dot4dot1 can be launched either from ArcCatalog or from ArcMap. The Figure 7 shows the toolbox “BUQ” in ArcCatalog including the script (actually, the screen capture comes from the author’s developing machine and not from the DIRN computer; names may vary slightly in the two environments).

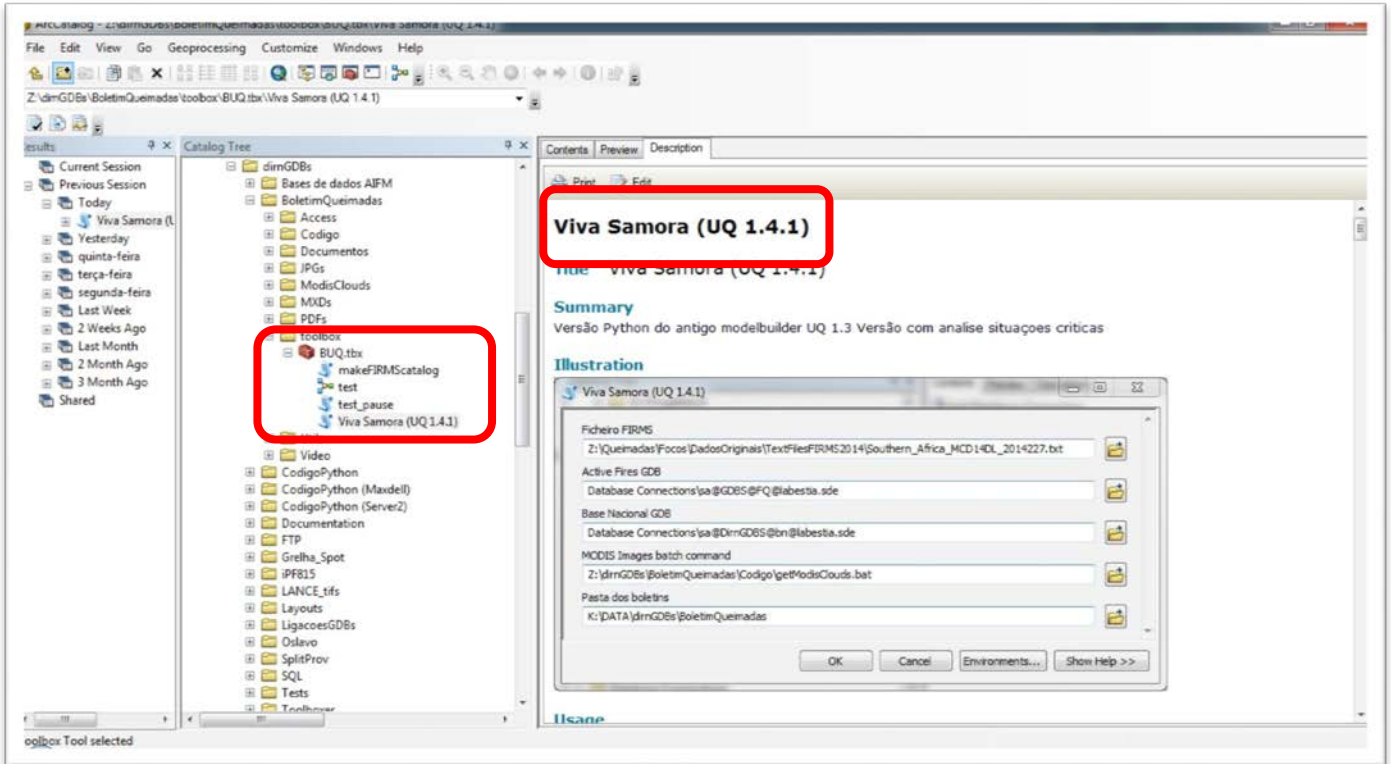


Figure 7 - The UQ1dot4dot1 toolbox & script

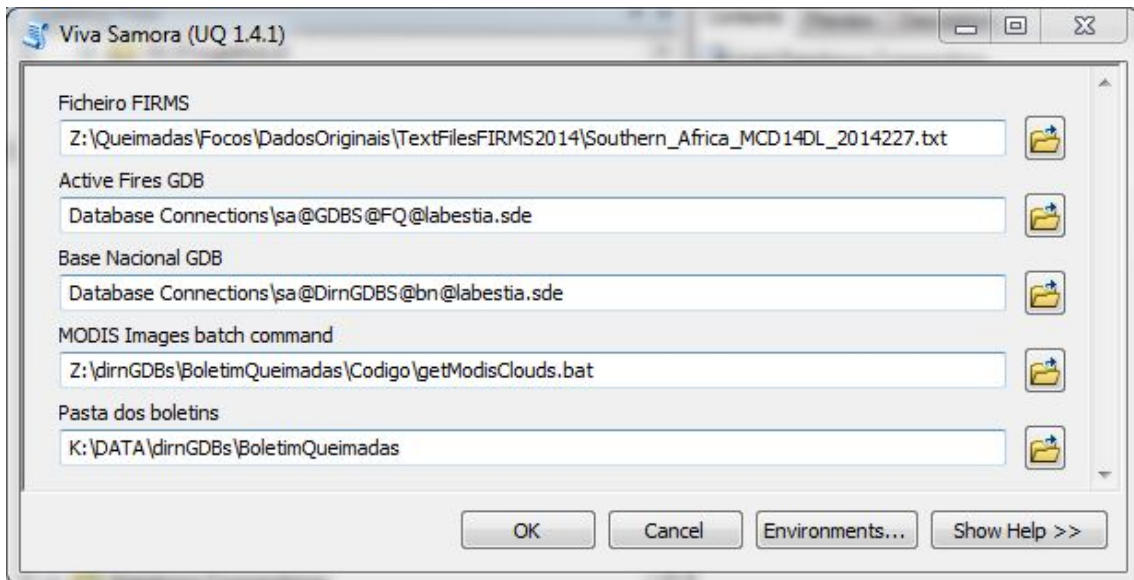


FIGURE 8 - UQ1DOT4DOT1 INTERFACE

Figure 8 illustrates the interface with the three input variables:

1. The **Ficheiro (file) FIRMS** is the NASA text file; this file may be stored anywhere in the local or in a network hard disk.

2. The **Active Fires GDB** is the geodatabase (to store script outputs) containing active fires data; as far as this geodatabase is an ENTERPRISE geodatabase (based on SQL Server, Oracle, Postgres, etc. RDBMS engine) it is mandatory to establish a connection to the underlying RDBMS with the same credentials of the data owner (criator). In our case, SQL Server architecture (**Server2\DirnGDBS** instance **FocosQueimadas** database), the user **MUST** be "sa".
3. The **Base Nacional GDB** is the geodatabase (to read input data) with the so-called MicroPol data (see Annex V - MicroPol (in portuguese)); as far as this geodatabase is an ENTERPRISE geodatabase (based on SQL Server, Oracle, Postgres, etc. RDBMS engine) it is mandatory to establish a connection to the underlying RDBMS with the same credentials of the data owner (criator). In our case, SQL Server architecture (**Server2\DirnGDBS** instance **BaseNacional** database), the user **MUST** be "sa".
4. The **MODIS Images batch command** points to the actual location of the **getModisClouds.bat** file.
5. The **Pasta dos boletins** is the root directory where all apps components are stored.

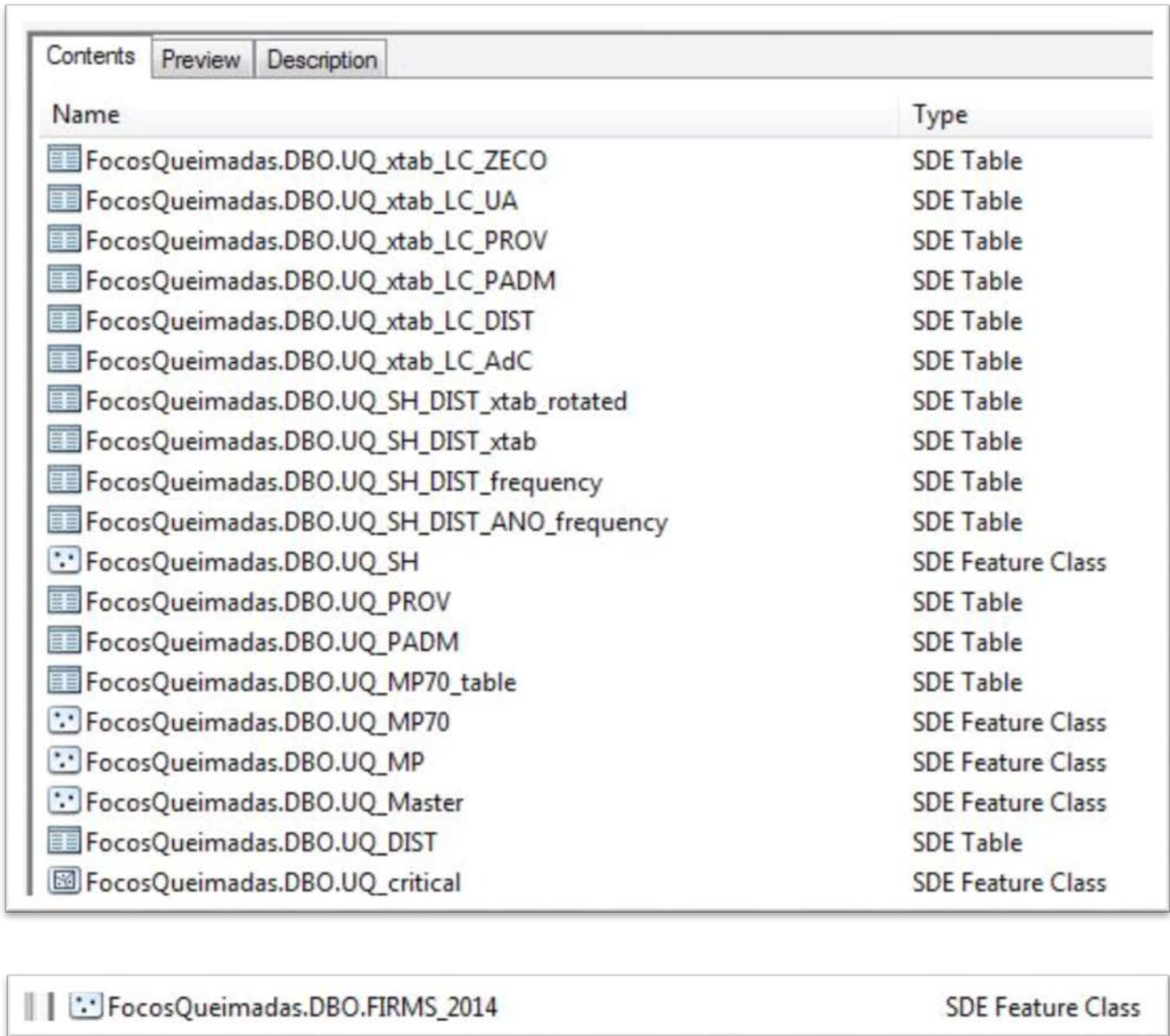
The script run for about 20 minutes (depending from CPU, network, etc.). The outputs are described in the next two paragraphs.

### UQ1dot4dot1: the geodatabase outputs

UQ1dot4dot1 acquires MODIS data distributed by NASA in simple text format and convert them into consumable GIS data. There are two main families of outputs:

- ✚ **GIS layers**, point and polygon features classes
- ✚ **Tables**, stored in the geodatabase as SQL Server tables and therefore usable either in a GIS context (by joining the tables to existing layers) or as standalone tables with software like Microsoft OFFICE (Access, Excel, Word, etc.) or any other application (i.e. statistical packages such as SPSS) able to connect via OLEDB or ODBC to SQL Server.

Following is a detailed explanation of the different outputs.



## 1. The layers

### 1.1. UQ\_Master

This layer is the simple transposition of the raw FIRMS text file into ArcGIS. The script adds and fills few new fields related to the date (breaking it down into day, month, year and Julian day) and the confidence class:

- (
- 1 = original MODIS Confidence <30 -
- 2 = original MODIS Confidence between 30 and 70
- 3 = original MODIS Confidence >= 70
- )

FIELD	DATA TYPE
confclas	Short Integer
Ano	Long Integer
Mes	Short Integer
dia	Short Integer
diadoano	Long Integer

The layer covers all southern Africa.

## 1.2. UQ\_MP

This layer derives from the “intersection” of UQ\_Master with MicroPol. Consequently the points are only Mozambican “active fires” and each point inherits all the information contained in Micropol.

## 1.3. UQ\_MP70

Derived from the previous layer but filtered by the condition “confidence  $\geq 70$ ”. A conservative approach to retain “active fires” data<sup>1</sup>.

## 1.4. UQ\_critical

This polygon layer is simply the “Districts” layer with associated

- ✚ the current day number of “active fires” ,
- ✚ the average number of fire recorded in the same day over the period 2001-2013 and
- ✚ the difference between the two (alert variable).

## 1.5. FIRMS\_2014

This is the cumulative (from 1<sup>st</sup> of January) **UQ\_Master** dataset. On the 31<sup>st</sup> of December it will complete the year dataset that will be added to the historical series (On the 1<sup>st</sup> of January 2015 the historical series will include the years 2001-2014).

## 2. The tables

### 2.1. UQ\_xxxx

#### 2.1.1. UQ\_MP70\_table

Due to the inability of Microsoft ACCESS in opening SQL Server tables containing the geometry (“shape”) of a layer, I decided to “export” the tabular component of **UQ\_MP70** as raw table to be consumed by ACCESS (customizable crosstab queries & reports).

#### 2.1.2. UQ\_PADM

Current day frequency of “active fires” reported by “Postos Administrativos”. It can be easily joined (through the common field **CODIGOPADM**) to the “**POSTOSADMINISTRATIVOS**” layer in “**BaseNacional**” GDB to make maps of the “active fires” occurrences at this administrative level

#### 2.1.3. UQ\_DIST

Current day frequency of “active fires” reported by “Distritos”. It can be easily joined (through the common field **CODIGODIST**) to the “**DISTRITOS**” layer in

<sup>1</sup> Actually, setting the confidence threshold to 70 was an arbitrary decision of the author and should be calibrated with direct observations of the phenomenon. During the 2014 peak season, we should be able to collect enough field data to determine the most appropriate reliability factor of NASA-MODIS observations.

"BaseNacional" GDB to make maps of the "active fires" occurrences at this administrative level

#### 2.1.4. UQ\_PROV

Current day frequency of "active fires" reported by "Provincias". It can be easily joined (through the common field CODIGOPROV) to the "PROVINCIAS" layer in "BaseNacional" GDB to make maps of the "active fires" occurrences at this administrative level

### 2.2. UQ\_xtab\_xxxx

All cross-tabulation outputs are produced for non-GIS applications such as Microsoft Office Access or Excel or statistical packages such as SPSS or R.

#### 2.2.1. UQ\_xtab\_LC\_UA

This is the crosstab table reporting the number of "active fires" recorded in the day distributed over Administrative Units (UA), in rows, and Land cover classes (LC) in columns. Administrative Units are reported at all three levels (Provincia, Distrito & Posto Administrativo)

#### 2.2.2. UQ\_xtab\_LC\_PADM

This is the crosstab table reporting the number of "active fires" recorded in the day distributed over "Postos Administrativos" (PADM), in rows, and Land cover classes (LC) in columns.

#### 2.2.3. UQ\_xtab\_LC\_DIST

This is the crosstab table reporting the number of "active fires" recorded in the day distributed over "Distritos" (DIST), in rows, and Land cover classes (LC) in columns.

#### 2.2.4. UQ\_xtab\_LC\_PROV

This is the crosstab table reporting the number of "active fires" recorded in the day distributed over "Provincias" (PROV), in rows, and Land cover classes (LC) in columns.

#### 2.2.5. UQ\_xtab\_LC\_ZECO

This is the crosstab table reporting the number of "active fires" recorded in the day distributed over "Ecological Zones" (ZECO), in rows, and Land cover classes (LC) in columns.

#### 2.2.6. UQ\_xtab\_LC\_AdC



This is the crosstab table reporting the number of “active fires” recorded in the day distributed over “Protected Areas” (AdC), in rows, and Land cover classes (LC) in columns.

Please note that the row with no conservation area name/code means “the rest of the country”, outside the protected area network (see Figure 9)

Contents		Preview	Description												
	NOME	Codigo AdC	1CXF	1FC	2FD	2FE	2FXC	2GL	2SL	2TK	2WD	2WE	4HF	4SF	4WF
▶			9	7	79	20	22	80	46	1	116	0	9	9	3
	Coutada Oficial Nº 13	CDC009	0	0	14	0	0	5	2	0	9	0	0	0	0
	Coutada Oficial Nº 15	CDC011	0	0	0	0	0	0	0	0	6	0	0	0	0
	Coutada Oficial Nº 5	CDC002	0	0	0	0	0	1	0	0	0	0	0	0	0
	Coutada Oficial Nº 6	CDC003	0	1	0	2	0	2	0	0	13	3	2	0	0
	Coutada Oficial Nº 7	CDC004	0	0	0	0	0	2	0	0	5	0	0	0	0
	Coutada Oficial Nº 9	CDC005	0	0	7	1	1	0	0	0	6	0	0	0	0
	Parque Nacional de Gorongosa	PAN001	0	0	0	0	0	0	1	0	1	0	0	0	0
	Parque Nacional do Limpopo	PAN006	0	0	0	0	0	0	2	0	0	0	0	0	0

FIGURE 9 - FIRES OBSERVED IN THE CONSERVATION AREAS

### 2.3. UQ\_SH\_xxxx

This group of tables includes historical data observations related to the same day over the past 13 years (2001-2013).

#### 2.3.1. UQ\_SH\_DIST\_frequency

This table reports, by district, the total occurrences over the time-series and the annual mean value (calculated over the historical period)

#### 2.3.2. UQ\_SH\_DIST\_ANO\_frequency

This table reports, by district, total number of “active fires” reported each year in the historical series.)

#### 2.3.3. UQ\_SH\_DIST\_xtab

Same as previous table but in the form of cross-tabulation report: districts in rows and years in columns.

#### 2.3.4. UQ\_SH\_DIST\_xtab\_rotated

Same as table 2.3.3 but with rotated row/columns.

UQ1dot4dot1: the Mapping outputs

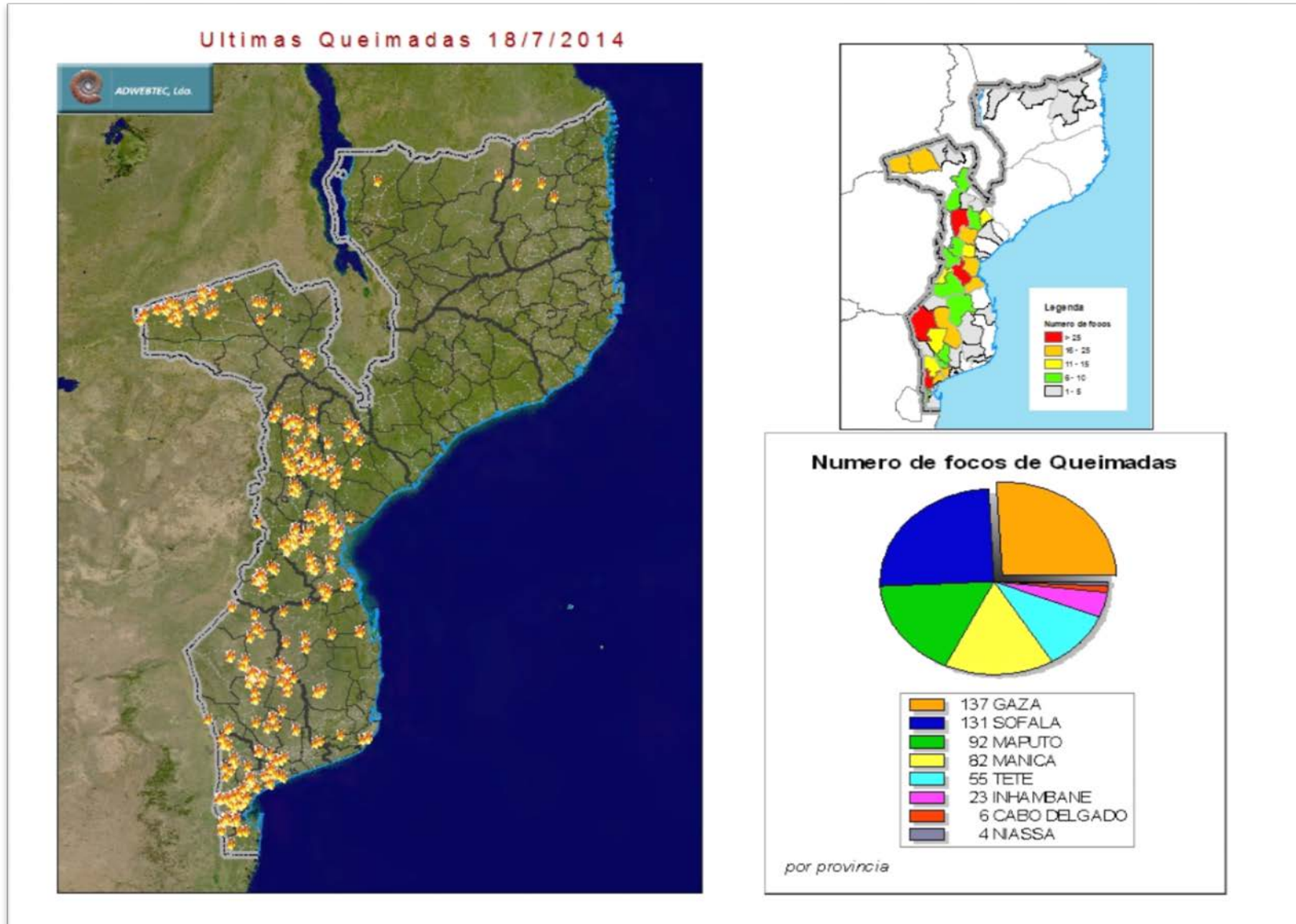


FIGURE 10 - UQ1DOT4DOT1\_MAIN.MDX

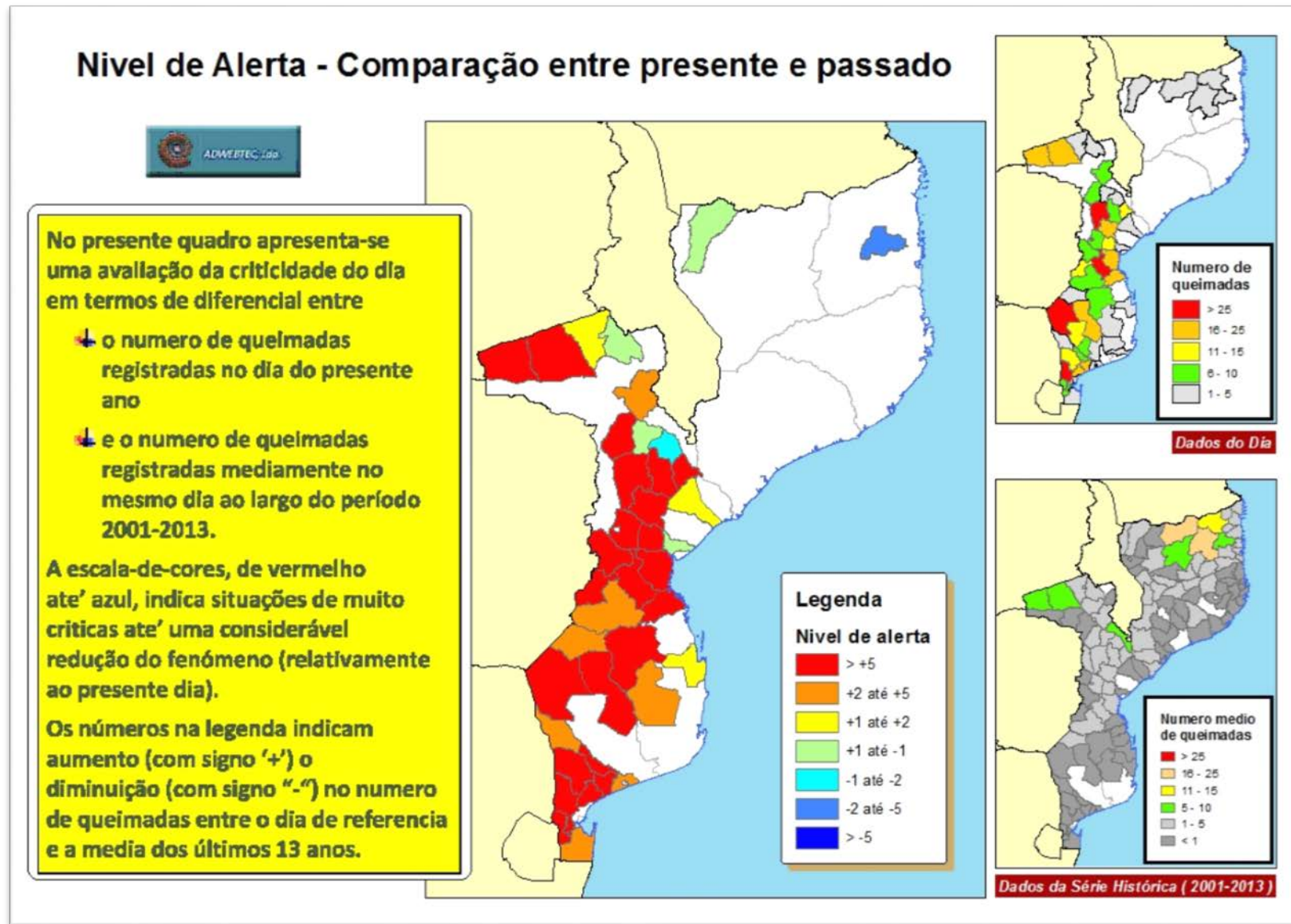


FIGURE 11 - UQ1DOT4\_CRITICAL

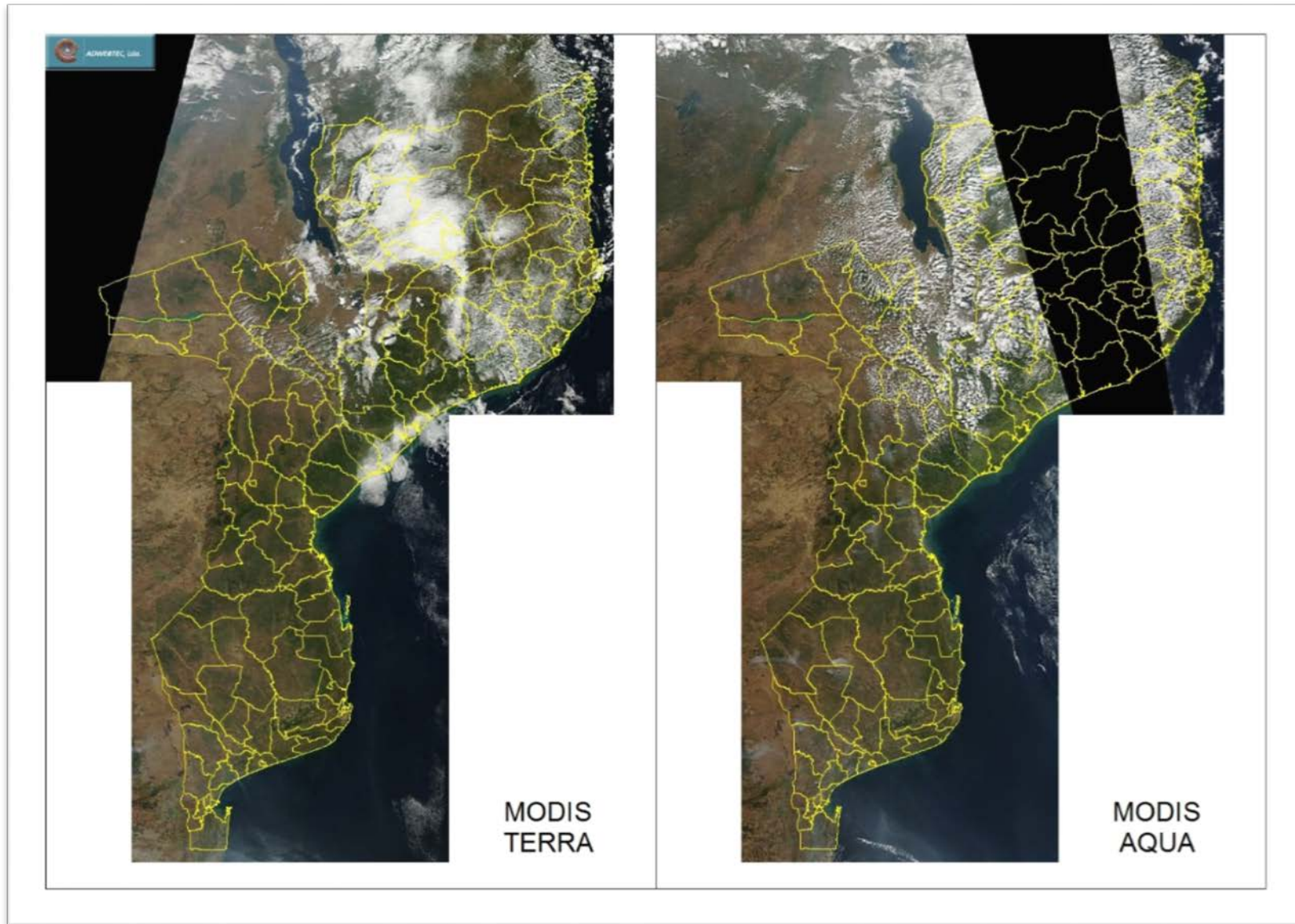


FIGURE 12 - UQ1DOT4DOT1\_MODIS\_TA

### UQ1dot1dot4dot1: final PDF package

With version 1.4.1 I introduced a ready-to-distribute PDF output component. Based on the “driven pages” experience and some Access macroing skills, UQ now produces a PDF output, namely `UQdd_mm_yy.PDF`, stored in the `X:\BoletimQueimadas\PDFs` directory.

Actually, this file can be converted with Adobe Acrobat in JPEGs and, via “Freemake Video Converter”, I produce a video (flv format) presentation that I publish, in an experimental phase in my SAMOQUE Facebook page (<https://www.facebook.com/samoque>).

### The message/log window

Both for diagnostic purposes and for data processing flow check UQ1dot4dot1 has an exhaustive log. Each step (more than 50) outputs a message about its successful completion.

The “Annex II - the running code output messages” shows theUQ1dot4dot1 log.

## Annex I - The code

```

1 ## -*- coding: utf-8 -*-
2 # -----
3 # UQ 1.4.1 script.py
4 # Created on: 2014-08-04 22:32
5 # (originally generated by ArcGIS/ModelBuilder)
6 # Usage: UQ 1.4 script.py <Southern_Africa_MCD14DL_2014068_txt>
7 # Description:
8 # Process FIRMS text files to produce Mozambique Active Fires layers/tables
9 #
10 # Version 1.4 includes
11 # 1) UQ_* tables/layers of the day
12 # 2) UQ_SH_* tables/layers of the historical data
13 # 3) UQ_*.JPG three jpegs for publication
14 #
15 # Version 1.4.1 includes
16 # 1) UQ_*.PDF three pdfs for publication
17 # 2) ACCESS tables @ District and AdC level
18 # 3) an overall UQ_[current_date].PDF for publication
19 #
20 # completely soft-coded! all files/directoris/GDBS via GUI (5 inputs)
21 #
22 # by M.Lorenzini
23 # -----
24
25 # Set the necessary product code
26 import arcpy, os
27 import shlex, subprocess
28
29 # Script arguments
30 inputTxt = arcpy.GetParameterAsText(0)
31 workingGDB = arcpy.GetParameterAsText(1)
32 BN_GDB = arcpy.GetParameterAsText(2)
33 modisBatchCommand = arcpy.GetParameterAsText(3)
34 outBaseDir = arcpy.GetParameterAsText(4)

```

```
35
36 # Local variables:
37 inputTxt_Layer = inputTxt
38 UQ_Master = workingGDB + "/FocosQueimadas.DBO.UQ_Master"
39 UQ_Master_Layer = inputTxt_Layer
40 UQ_MP = workingGDB + "/FocosQueimadas.DBO.UQ_MP"
41 UQ_Temp_Layer = "UQ_MP_Layer"
42 UQ_Temp = workingGDB + "/FocosQueimadas.DBO.UQ_Temp"
43 UQ_MP70 = workingGDB + "/FocosQueimadas.DBO.UQ_MP70"
44 UQ_PADM = workingGDB + "/FocosQueimadas.DBO.UQ_PADM"
45 UQ_DIST = workingGDB + "/FocosQueimadas.DBO.UQ_DIST"
46 UQ_PROV = workingGDB + "/FocosQueimadas.DBO.UQ_PROV"
47 UQ_LC_UA_temp = workingGDB + "/FocosQueimadas.DBO.UQ_LC_UA_temp"
48 UQ_LC__ADC_temp = workingGDB + "/FocosQueimadas.DBO.UQ_LC__ADC_temp"
49 UQ_xtab_LC_UA = workingGDB + "/FocosQueimadas.DBO.UQ_xtab_LC_UA"
50 UQ_xtab_LC_AdC = workingGDB + "/FocosQueimadas.DBO.UQ_xtab_LC_AdC"
51 UQ_xtab_LC_PADM = workingGDB + "/FocosQueimadas.DBO.UQ_xtab_LC_PADM"
52 UQ_xtab_LC_DIST = workingGDB + "/FocosQueimadas.DBO.UQ_xtab_LC_DIST"
53 UQ_xtab_LC_PROV = workingGDB + "/FocosQueimadas.DBO.UQ_xtab_LC_PROV"
54 UQ_xtab_LC_ZECO = workingGDB + "/FocosQueimadas.DBO.UQ_xtab_LC_ZECO"
55 UQ_LC_PADM_temp = workingGDB + "/FocosQueimadas.DBO.UQ_LC_PADM_temp"
56 UQ_LC_DIST_temp = workingGDB + "/FocosQueimadas.DBO.UQ_LC_DIST_temp"
57 UQ_LC_PROV_temp = workingGDB + "/FocosQueimadas.DBO.UQ_LC_PROV_temp"
58 UQ_LC_ZECO_temp = workingGDB + "/FocosQueimadas.DBO.UQ_LC_ZECO_temp"
59 UQ_MP70_table = workingGDB + "/FocosQueimadas.DBO.UQ_MP70_table"
60 UQ_MP70temp = workingGDB + "/FocosQueimadas.DBO.UQ_MP70temp"
61 FIRMS_catalogPrefix = workingGDB + "/FocosQueimadas.DBO.FIRMS_"
62 MicroPol_Nacional = BN_GDB + "/BaseNacional.DANILO.MicroPol_Nacional"
63 BaseNacional_DANILO_LS_Legend = BN_GDB + "/BaseNacional.DANILO.LS_Legend"
64 BaseNacional_DANILO_LR_Legend = BN_GDB + "/BaseNacional.DANILO.LR_Legend"
65 distritos = BN_GDB + "/BaseNacional.MAX.UnidadesAdministrativas/BaseNacional.MAX.distritos"
66 UQ_distritos_Layer = "UQ_critical1"
67 UQ_critical = workingGDB + "/FocosQueimadas.DBO.UQ_critical"
68
69 UQ_SH = workingGDB + "/FocosQueimadas.DBO.UQ_SH"
70 SH = workingGDB + "/FocosQueimadas.DBO.AF_2000_2013_MP"
71 UQ_SH_DIST_ANO_frequency = workingGDB + "/FocosQueimadas.DBO.UQ_SH_DIST_ANO_frequency"
```

```

72 UQ_ANO_SH_DIST_frequency = workingGDB + "/FocosQueimadas.DBO.UQ_ANO_SH_DIST_frequency"
73 UQ_SH_DIST_xtab          = workingGDB + "/FocosQueimadas.DBO.UQ_SH_DIST_xtab"
74 UQ_SH_DIST_xtab_rotated = workingGDB + "/FocosQueimadas.DBO.UQ_SH_DIST_xtab_rotated"
75 UQ_SH_DIST_frequency    = workingGDB + "/FocosQueimadas.DBO.UQ_SH_DIST_frequency"
76
77 arcpy.AddMessage("#####")
78 arcpy.AddMessage("Welcome to " + "'Viva Samora (UQ 1.4.1)'" + " - by AdWebTec")
79 arcpy.AddMessage("#####")
80
81 # Process: Make XY Event Layer
82 arcpy.AddMessage("1) Creating Layer " + inputTxt_Layer)
83 arcpy.MakeXYEventLayer_management(inputTxt, "longitude", "latitude", inputTxt_Layer,
84 "GEOGCS['GCS_WGS_1984',DATUM['D_WGS_1984',SPHEROID['WGS_1984',6378137.0,298.257223563]],PRIMEM['Greenwich',0.0
85 ],UNIT['Degree',0.0174532925199433]];-400 -400 1000000000;-100000 10000;-100000 10000;8.98315284119522E-
86 09;0.001;0.001;IsHighPrecision", "")
87
88 # Process: Copy Features
89 arcpy.AddMessage("2) Creating " + UQ_Master)
90 if arcpy.Exists(UQ_Master):
91     arcpy.Delete_management(UQ_Master)
92     arcpy.AddMessage("2.a) " + UQ_Master + " deleted! Replacing...")
93 arcpy.CopyFeatures_management(inputTxt_Layer, UQ_Master,"#", "0", "0", "0")
94
95 # Process: Add Field
96 arcpy.AddMessage("3) Adding Field \'confclas\'")
97 arcpy.AddField_management(UQ_Master, "confclas", "SHORT", "", "", "", "Classe de confiança", "NULLABLE",
98 "NON_REQUIRED", "")
99
100 # Process: Calculate Field
101 arcpy.AddMessage("4) Calculating field \'confclas\'")
102 arcpy.CalculateField_management(UQ_Master, "confclas", "cc", "VB", "dim cc\\ncc = 3\\nif [confidence] <30
103 then\\ncc = 1\\nelseif [confidence] >= 30 and [confidence] < 70 then\\ncc = 2\\nelse\\ncc = 3\\nend
104 if\\n\\n")
105
106 # Process: Add Field
107 arcpy.AddMessage("5) Adding Field \'Ano\'")
108 arcpy.AddField_management(UQ_Master, "Ano", "LONG", "", "", "", "Ano", "NULLABLE", "NON_REQUIRED", "")

```



```

109
110 # Process: Add Field
111 arcpy.AddMessage("6) Adding Field \'Mes\'")
112 arcpy.AddField_management(UQ_Master, "Mes", "SHORT", "", "", "", "Mes", "NULLABLE", "NON_REQUIRED", "")
113
114 # Process: Add Field
115 arcpy.AddMessage("7) Adding Field \'dia\'")
116 arcpy.AddField_management(UQ_Master, "dia", "SHORT", "", "", "", "Dia", "NULLABLE", "NON_REQUIRED", "")
117
118 # Process: Add Field
119 arcpy.AddMessage("8) Adding Field \'Dia do Ano\'")
120 arcpy.AddField_management(UQ_Master, "diadoano", "LONG", "", "", "", "Dia do Ano", "NULLABLE", "NON_REQUIRED",
121 "")
122
123 # Process: Calculate Field
124 arcpy.AddMessage("9) Calculating Field \'Ano\'")
125 arcpy.CalculateField_management(UQ_Master, "Ano", "CInt (DatePart (\'yyyy\', [acq_date] ))", "VB", "")
126
127 # Process: Calculate Field
128 arcpy.AddMessage("10) Calculating Field \'Mes\'")
129 arcpy.CalculateField_management(UQ_Master, "Mes", "DatePart (\'m\', [acq_date] )", "VB", "")
130
131 # Process: Calculate Field
132 arcpy.AddMessage("11) Calculating Field \'dia\'")
133 arcpy.CalculateField_management(UQ_Master, "dia", "DatePart (\'d\', [acq_date] )", "VB", "")
134
135 # Process: Calculate Field
136 arcpy.AddMessage("12) Calculating Field \'Dia do Ano\'")
137 arcpy.CalculateField_management(UQ_Master, "diadoano", "CInt(DatePart ( \'y\', [acq_date] ))", "VB", "")
138
139 # Process: Intersect
140 intTuple = "" + UQ_Master + "\' #;\'" + MicroPol_Nacional + "\' #"
141 arcpy.AddMessage(".... intTuple = " + intTuple)
142 arcpy.AddMessage("13) Intersecting " + UQ_Master + " with " + MicroPol_Nacional + " to create " + UQ_MP)
143 if arcpy.Exists(UQ_MP):
144     arcpy.AddMessage("13.a) Deleting " + UQ_MP)
145     arcpy.Delete_management(UQ_MP)

```

```
146 arcpy.Intersect_analysis(intTuple, UQ_MP,"ALL","1 Meters","INPUT")
147
148 # Process: Make Feature Layer
149 arcpy.AddMessage("14) Making Feature Layer " + UQ_Temp_Layer)
150 arcpy.MakeFeatureLayer_management(UQ_MP, UQ_Temp_Layer, "", "", "latitude latitude VISIBLE NONE;longitude
151 longitude VISIBLE NONE;brightness brightness VISIBLE NONE;scan scan VISIBLE NONE;track track VISIBLE
152 NONE;acq_date acq_date VISIBLE NONE;acq_time acq_time VISIBLE NONE;satellite satellite VISIBLE NONE;confidence
153 confidence VISIBLE NONE;version version VISIBLE NONE;bright_t31 bright_t31 VISIBLE NONE;frp frp VISIBLE
154 NONE;Shape Shape VISIBLE NONE;confclas confclas VISIBLE NONE;FID_BaseNacional_DANILO FID_BaseNacional_DANILO
155 VISIBLE NONE;FID_postadm FID_postadm VISIBLE NONE;DISTRITO DISTRITO VISIBLE NONE;PROVINCIA PROVINCIA VISIBLE
156 NONE;POSTOADMINISTRATIVO POSTOADMINISTRATIVO VISIBLE NONE;CodigoPADM CodigoPADM VISIBLE NONE;CodigoPROV
157 CodigoPROV VISIBLE NONE;CodigoDIST CodigoDIST VISIBLE NONE;CodigoPAIS CodigoPAIS VISIBLE
158 NONE;adm250gz_region_Shape_STAre_10 adm250gz_region_Shape_STAre_10 VISIBLE NONE;adm250gz_region_Shape_STLen_11
159 adm250gz_region_Shape_STLen_11 VISIBLE NONE;FID_AdC_Master_04082013 FID_AdC_Master_04082013 VISIBLE NONE;NOME
160 NOME VISIBLE NONE;NOME_DIVIS NOME_DIVIS VISIBLE NONE;TIPO_DIVIS TIPO_DIVIS VISIBLE NONE;CATEGORÍA CATEGORÍA
161 VISIBLE NONE;CodigoAdC CodigoAdC VISIBLE NONE;Shape_STArea__ Shape_STArea__ VISIBLE NONE;Shape_STLength__
162 Shape_STLength__ VISIBLE NONE;Shape_STArea_1 Shape_STArea_1 VISIBLE NONE;Shape_STLength_1 Shape_STLength_1
163 VISIBLE NONE;FID_LandUnits_master FID_LandUnits_master VISIBLE NONE;LU_CODE LU_CODE VISIBLE NONE;ELEV_RANGE
164 ELEV_RANGE VISIBLE NONE;ELEV_DESC ELEV_DESC VISIBLE NONE;ELEVTYPE_DESC ELEVTYPE_DESC VISIBLE NONE;SLOPE_RANGE
165 SLOPE_RANGE VISIBLE NONE;SLOPE_DESC SLOPE_DESC VISIBLE NONE;RELINT_RANGE RELINT_RANGE VISIBLE NONE;RELINT_DESC
166 RELINT_DESC VISIBLE NONE;ML_DESC ML_DESC VISIBLE NONE;MML_DESC MML_DESC VISIBLE NONE;LANDFORM_DESC
167 LANDFORM_DESC VISIBLE NONE;REGSLP_RANGE REGSLP_RANGE VISIBLE NONE;REGSLP_DESC REGSLP_DESC VISIBLE
168 NONE;DISS_RANGE DISS_RANGE VISIBLE NONE;DISS_DESC DISS_DESC VISIBLE NONE;GEHA_DESC GEHA_DESC VISIBLE
169 NONE;NEWA_DESC NEWA_DESC VISIBLE NONE;L1_A L1_A VISIBLE NONE;L1_B L1_B VISIBLE NONE;L1_C L1_C VISIBLE
170 NONE;GENLITHO1_DOM GENLITHO1_DOM VISIBLE NONE;L2_A L2_A VISIBLE NONE;L2_B L2_B VISIBLE NONE;L2_C L2_C VISIBLE
171 NONE;GENLITHO2_DOM GENLITHO2_DOM VISIBLE NONE;L3_A L3_A VISIBLE NONE;L3_B L3_B VISIBLE NONE;L3_C L3_C VISIBLE
172 NONE;GENLITHO3_DOM GENLITHO3_DOM VISIBLE NONE;S1 S1 VISIBLE NONE;SOIL1_DOM SOIL1_DOM VISIBLE NONE;S2 S2
173 VISIBLE NONE;SOIL2_DOM SOIL2_DOM VISIBLE NONE;S3 S3 VISIBLE NONE;SOIL3_DOM SOIL3_DOM VISIBLE NONE;S4 S4
174 VISIBLE NONE;SOIL4_DOM SOIL4_DOM VISIBLE NONE;S5 S5 VISIBLE NONE;SOIL5_DOM SOIL5_DOM VISIBLE NONE;FZ1_CODE
175 FZ1_CODE VISIBLE NONE;FZ1_DOM FZ1_DOM VISIBLE NONE;FZ2_CODE FZ2_CODE VISIBLE NONE;FZ2_DOM FZ2_DOM VISIBLE
176 NONE;FZ3_CODE FZ3_CODE VISIBLE NONE;FZ3_DOM FZ3_DOM VISIBLE NONE;ELEV_MIN ELEV_MIN VISIBLE NONE;ELEV_MAX
177 ELEV_MAX VISIBLE NONE;ELEV_MEAN ELEV_MEAN VISIBLE NONE;ELEV_STD ELEV_STD VISIBLE NONE;ELEV_MEDIAN ELEV_MEDIAN
178 VISIBLE NONE;SLOPE_MIN SLOPE_MIN VISIBLE NONE;SLOPE_MAX SLOPE_MAX VISIBLE NONE;SLOPE_MEAN SLOPE_MEAN VISIBLE
179 NONE;SLOPE_STD SLOPE_STD VISIBLE NONE;SLOPE_MEDIAN SLOPE_MEDIAN VISIBLE NONE;RELINT_MEAN RELINT_MEAN VISIBLE
180 NONE;RELINT_STD RELINT_STD VISIBLE NONE;RELINT_MEDIAN RELINT_MEDIAN VISIBLE NONE;RAIN_MEAN RAIN_MEAN VISIBLE
181 NONE;RAIN_STD RAIN_STD VISIBLE NONE;TEMPMIN_MEAN TEMPMIN_MEAN VISIBLE NONE;TEMPMIN_STD TEMPMIN_STD VISIBLE
182 NONE;TEMPMAX_MEAN TEMPMAX_MEAN VISIBLE NONE;TEMPMAX_STD TEMPMAX_STD VISIBLE NONE;EVAPOT_MEAN EVAPOT_MEAN
```

```

183 VISIBLE NONE;EVAPOT_STD EVAPOT_STD VISIBLE NONE;LS_CODE LS_CODE VISIBLE NONE;SHAPE_STArea_12 SHAPE_STArea_12
184 VISIBLE NONE;SHAPE_STLength_12 SHAPE_STLength_12 VISIBLE NONE;FID_LCAIFM2005_master FID_LCAIFM2005_master
185 VISIBLE NONE;LC_PRI LC_PRI VISIBLE NONE;LC_SEC LC_SEC VISIBLE NONE;LC_TER LC_TER VISIBLE NONE;NOTE_ NOTE_
186 VISIBLE NONE;AUTOR AUTOR VISIBLE NONE;LC_PRI_PER LC_PRI_PER VISIBLE NONE;LC_SEC_PER LC_SEC_PER VISIBLE
187 NONE;LC_TER_PER LC_TER_PER VISIBLE NONE;HECTARES HECTARES VISIBLE NONE;POLY_ID POLY_ID VISIBLE
188 NONE;Shape_STArea_12_13 Shape_STArea_12_13 VISIBLE NONE;Shape_STLength_12_13 Shape_STLength_12_13 VISIBLE
189 NONE;adm250gz_region_Shape_STArea__ adm250gz_region_Shape_STArea__ VISIBLE
190 NONE;adm250gz_region_Shape_STLength_ adm250gz_region_Shape_STLength_ VISIBLE
191 NONE;adm250gz_region_Shape_STArea_1 adm250gz_region_Shape_STArea_1 VISIBLE
192 NONE;adm250gz_region_Shape_STLength1 adm250gz_region_Shape_STLength1 VISIBLE NONE")
193
194 # Process: Add Join
195 arcpy.AddMessage("15) Adding First Join to " + UQ_Temp_Layer)
196 arcpy.AddJoin_management(UQ_Temp_Layer, "LS_CODE", BaseNacional_DANILO_LS_Legend, "LS_CODE", "KEEP_ALL")
197
198 # Process: Add Join
199 arcpy.AddMessage("16) Adding Second Join to " + UQ_Temp_Layer)
200 arcpy.AddJoin_management(UQ_Temp_Layer, "BaseNacional.DANILO.LS_Legend.LRE_CODE",
201 BaseNacional_DANILO_LR_Legend, "LRE_CODE", "KEEP_ALL")
202
203 # Process: Copy Features
204 arcpy.AddMessage("17) Copying Features from " + UQ_Temp_Layer + " to " + UQ_MP70temp)
205 if arcpy.Exists(UQ_MP70temp):
206     arcpy.AddMessage("17.a) Deleting " + UQ_MP70temp)
207     arcpy.Delete_management(UQ_MP70temp)
208 arcpy.CopyFeatures_management(UQ_Temp_Layer, UQ_MP70temp)
209
210 # Process: Select
211 arcpy.AddMessage("18) Selecting Features from " + UQ_MP70temp + " to create " + UQ_MP70)
212 if arcpy.Exists(UQ_MP70):
213     arcpy.AddMessage("18.a) Start Deleting process of " + UQ_MP70)
214     AF_workspace = workingGDB
215     user_name = "DBO"
216     AF_users = arcpy.ListUsers(AF_workspace)
217     icount = 0
218     for item in AF_users:
219         arcpy.AddMessage(str(item.ID) + " - " + item.Name + " - " + user_name + " - " + str(icount))

```

```
220     if icount == 0:
221         userid = item.ID
222         if item.Name == user_name and icount >= 1:
223             arcpy.DisconnectUser(AF_workspace, userid)
224             arcpy.AddMessage("18.b) " + user_name + " successfully disconnected")
225             arcpy.AcceptConnections(AF_workspace, True)
226             arcpy.Delete_management(UQ_MP70)
227             arcpy.AddMessage("18.c1) UNLOCKED - " + UQ_MP70 + " successfully deleted")
228         else:
229             arcpy.Delete_management(UQ_MP70)
230             arcpy.AddMessage("18.c2) NO LOCK - " + UQ_MP70 + " successfully deleted")
231     icount = icount + 1
232 arcpy.Select_analysis(UQ_MP70temp, UQ_MP70, "FocosQueimadas_DBO_UQ_MP_co_15 = 3")
233
234 # Process: Frequency
235 arcpy.AddMessage("19) Calculating Frequency \'UQ_PADM\'")
236 if arcpy.Exists(UQ_PADM):
237     arcpy.AddMessage("19.a) Deleting " + UQ_PADM)
238     arcpy.Delete_management(UQ_PADM)
239 arcpy.Frequency_analysis(UQ_MP70, UQ_PADM, "FocosQueimadas_DBO_UQ_MP_PO_24;FocosQueimadas_DBO_UQ_MP_Co_25",
240 "")
241
242 # Process: Frequency
243 arcpy.AddMessage("20) Calculating Frequency \'UQ_DIST\'")
244 if arcpy.Exists(UQ_DIST):
245     arcpy.AddMessage("20.a) Deleting " + UQ_DIST)
246     arcpy.Delete_management(UQ_DIST)
247 arcpy.Frequency_analysis(UQ_MP70, UQ_DIST,
248 "FocosQueimadas_DBO_UQ_MP_PR_23;FocosQueimadas_DBO_UQ_MP_DI_22;FocosQueimadas_DBO_UQ_MP_Co_26;FocosQueimadas_D
249 BO_UQ_MP_Co_27", "")
250
251 # Process: Frequency
252 arcpy.AddMessage("21) Calculating Frequency \'UQ_PROV\'")
253 if arcpy.Exists(UQ_PROV):
254     arcpy.AddMessage("21.a) Deleting " + UQ_PROV)
255     arcpy.Delete_management(UQ_PROV)
```

```
256 arcpy.Frequency_analysis(UQ_MP70, UQ_PROV, "FocosQueimadas_DBO_UQ_MP_PR_23;FocosQueimadas_DBO_UQ_MP_Co_26",
257 "")
258
259 # Process: Frequency
260 arcpy.AddMessage("22) Calculating Frequency \'UQ_LC_UA_temp\'")
261 if arcpy.Exists(UQ_LC_UA_temp):
262     arcpy.AddMessage("22.a) Deleting " + UQ_LC_UA_temp)
263     arcpy.Delete_management(UQ_LC_UA_temp)
264 arcpy.Frequency_analysis(UQ_MP70, UQ_LC_UA_temp,
265 "FocosQueimadas_DBO_UQ_MP_DI_22;FocosQueimadas_DBO_UQ_MP_PR_23;FocosQueimadas_DBO_UQ_MP_PO_24;FocosQueimadas_D
266 BO_UQ_MP_Co_25;FocosQueimadas_DBO_UQ_MP_Co_27;FocosQueimadas_DBO_UQ_MP_Co_26;FocosQueimadas_DBO_UQ_MP_LC_112",
267 "")
268
269 # Process: Frequency
270 arcpy.AddMessage("23) Calculating Frequency \'UQ_LC__ADC_temp\'")
271 if arcpy.Exists(UQ_LC__ADC_temp):
272     arcpy.AddMessage("23.a) Deleting " + UQ_LC__ADC_temp)
273     arcpy.Delete_management(UQ_LC__ADC_temp)
274 arcpy.Frequency_analysis(UQ_MP70, UQ_LC__ADC_temp,
275 "FocosQueimadas_DBO_UQ_MP_LC_112;FocosQueimadas_DBO_UQ_MP_NO_32;FocosQueimadas_DBO_UQ_MP_Co_36", "")
276
277 # Process: Frequency
278 arcpy.AddMessage("24) Calculating Frequency \'UQ_LC_PADM_temp\'")
279 if arcpy.Exists(UQ_LC_PADM_temp):
280     arcpy.AddMessage("24.a) Deleting " + UQ_LC_PADM_temp)
281     arcpy.Delete_management(UQ_LC_PADM_temp)
282 arcpy.Frequency_analysis(UQ_MP70, UQ_LC_PADM_temp,
283 "FocosQueimadas_DBO_UQ_MP_PO_24;FocosQueimadas_DBO_UQ_MP_Co_25;FocosQueimadas_DBO_UQ_MP_LC_112", "")
284
285 # Process: Frequency
286 arcpy.AddMessage("25) Calculating Frequency \'UQ_LC_DIST_temp\'")
287 if arcpy.Exists(UQ_LC_DIST_temp):
288     arcpy.AddMessage("25.a) Deleting " + UQ_LC_DIST_temp)
289     arcpy.Delete_management(UQ_LC_DIST_temp)
290 arcpy.Frequency_analysis(UQ_MP70, UQ_LC_DIST_temp,
291 "FocosQueimadas_DBO_UQ_MP_DI_22;FocosQueimadas_DBO_UQ_MP_Co_27;FocosQueimadas_DBO_UQ_MP_LC_112", "")
292
```

```
293 # Process: Frequency
294 arcpy.AddMessage("26) Calculating Frequency \'UQ_LC_PROV_temp\'")
295 if arcpy.Exists(UQ_LC_PROV_temp):
296     arcpy.AddMessage("26.a) Deleting " + UQ_LC_PROV_temp)
297     arcpy.Delete_management(UQ_LC_PROV_temp)
298 arcpy.Frequency_analysis(UQ_MP70, UQ_LC_PROV_temp,
299 "FocosQueimadas_DBO_UQ_MP_PR_23;FocosQueimadas_DBO_UQ_MP_Co_26;FocosQueimadas_DBO_UQ_MP_LC_112", "")
300
301 # Process: Frequency
302 arcpy.AddMessage("27) Calculating Frequency \'UQ_LC_ZECO_temp\'")
303 if arcpy.Exists(UQ_LC_ZECO_temp):
304     arcpy.AddMessage("27.a) Deleting " + UQ_LC_ZECO_temp)
305     arcpy.Delete_management(UQ_LC_ZECO_temp)
306 arcpy.Frequency_analysis(UQ_MP70, UQ_LC_ZECO_temp,
307 "FocosQueimadas_DBO_UQ_MP_LC_112;BaseNacional_DANILO_LR_Lege_144;BaseNacional_DANILO_LR_Lege_143", "")
308
309 # Process: Pivot Table
310 arcpy.AddMessage("28) Calculating Pivot Table \'UQ_xtab_LC_UA\'")
311 if arcpy.Exists(UQ_xtab_LC_UA):
312     arcpy.AddMessage("28.a) Deleting " + UQ_xtab_LC_UA)
313     arcpy.Delete_management(UQ_xtab_LC_UA)
314 arcpy.PivotTable_management(UQ_LC_UA_temp,
315 "FocosQueimadas_DBO_UQ_MP_DI_2;FocosQueimadas_DBO_UQ_MP_PR_3;FocosQueimadas_DBO_UQ_MP_PO_4;FocosQueimadas_DBO_
316 UQ_MP_Co_5;FocosQueimadas_DBO_UQ_MP_Co_6;FocosQueimadas_DBO_UQ_MP_Co_7", "FocosQueimadas_DBO_UQ_MP_LC_8",
317 "FREQUENCY", UQ_xtab_LC_UA)
318
319 # Process: Pivot Table
320 arcpy.AddMessage("29) Calculating Pivot Table \'UQ_xtab_LC_AdC\'")
321 if arcpy.Exists(UQ_xtab_LC_AdC):
322     arcpy.AddMessage("29.a) Deleting " + UQ_xtab_LC_AdC)
323     arcpy.Delete_management(UQ_xtab_LC_AdC)
324 arcpy.PivotTable_management(UQ_LC__ADC_temp, "FocosQueimadas_DBO_UQ_MP_NO_3;FocosQueimadas_DBO_UQ_MP_Co_4",
325 "FocosQueimadas_DBO_UQ_MP_LC_2", "FREQUENCY", UQ_xtab_LC_AdC)
326
327 # Process: Pivot Table
328 arcpy.AddMessage("30) Calculating Pivot Table \'UQ_xtab_LC_PADM\'")
329 if arcpy.Exists(UQ_xtab_LC_PADM):
```

```
330     arcpy.AddMessage("30.a) Deleting " + UQ_xtab_LC_PADM)
331     arcpy.Delete_management(UQ_xtab_LC_PADM)
332 arcpy.PivotTable_management(UQ_LC_PADM_temp, "FocosQueimadas_DBO_UQ_MP_PO_2;FocosQueimadas_DBO_UQ_MP_Co_3",
333 "FocosQueimadas_DBO_UQ_MP_LC_4", "FREQUENCY", UQ_xtab_LC_PADM)
334
335 # Process: Pivot Table
336 arcpy.AddMessage("31) Calculating Pivot Table \'UQ_xtab_LC_DIST\'")
337 if arcpy.Exists(UQ_xtab_LC_DIST):
338     arcpy.AddMessage("31.a) Deleting " + UQ_xtab_LC_DIST)
339     arcpy.Delete_management(UQ_xtab_LC_DIST)
340 arcpy.PivotTable_management(UQ_LC_DIST_temp, "FocosQueimadas_DBO_UQ_MP_DI_2;FocosQueimadas_DBO_UQ_MP_Co_3",
341 "FocosQueimadas_DBO_UQ_MP_LC_4", "FREQUENCY", UQ_xtab_LC_DIST)
342
343 # Process: Pivot Table
344 arcpy.AddMessage("32) Calculating Pivot Table \'UQ_xtab_LC_PROV\'")
345 if arcpy.Exists(UQ_xtab_LC_PROV):
346     arcpy.AddMessage("32.a) Deleting " + UQ_xtab_LC_PROV)
347     arcpy.Delete_management(UQ_xtab_LC_PROV)
348 arcpy.PivotTable_management(UQ_LC_PROV_temp, "FocosQueimadas_DBO_UQ_MP_PR_2;FocosQueimadas_DBO_UQ_MP_Co_3",
349 "FocosQueimadas_DBO_UQ_MP_LC_4", "FREQUENCY", UQ_xtab_LC_PROV)
350
351 # Process: Pivot Table)
352 arcpy.AddMessage("33) Calculating Pivot Table \'UQ_xtab_LC_ZECO\'")
353 if arcpy.Exists(UQ_xtab_LC_ZECO):
354     arcpy.AddMessage("33.a) Deleting " + UQ_xtab_LC_ZECO)
355     arcpy.Delete_management(UQ_xtab_LC_ZECO)
356 arcpy.PivotTable_management(UQ_LC_ZECO_temp, "BaseNacional_DANILO_LR_Lege_3;BaseNacional_DANILO_LR_Lege_4",
357 "FocosQueimadas_DBO_UQ_MP_LC_2", "FREQUENCY", UQ_xtab_LC_ZECO)
358
359 # Process: Copy Rows
360 arcpy.AddMessage("34) Copying Rows \'UQ_MP70_table\'")
361 if arcpy.Exists(UQ_MP70_table):
362     arcpy.AddMessage("34.a) Deleting " + UQ_MP70_table)
363     arcpy.Delete_management(UQ_MP70_table)
364 arcpy.CopyRows_management(UQ_MP70, UQ_MP70_table, "")
365
366 # Se siamo arrivati qui buttiamo tutti i *_temp!
```

```

367 arcpy.Delete_management(UQ_LC_UA_temp)
368 arcpy.Delete_management(UQ_LC__ADC_temp)
369 arcpy.Delete_management(UQ_LC_PADM_temp)
370 arcpy.Delete_management(UQ_LC_DIST_temp)
371 arcpy.Delete_management(UQ_LC_PROV_temp)
372 arcpy.Delete_management(UQ_LC_ZECO_temp)
373 arcpy.Delete_management(UQ_MP70temp)
374 # Archiving
375 arcpy.AddMessage("#####")
376 arcpy.AddMessage("35) Archiving \'UQ_Master\'")
377 result = int(arcpy.GetCount_management(UQ_Master).getOutput(0))
378 arcpy.AddMessage("35.a) Records count in \'UQ_Master\' = " +
379 arcpy.GetCount_management(UQ_Master).getOutput(0))
380 if result > 0:
381     cur = arcpy.SearchCursor(UQ_Master)
382     for row in cur:
383         if row.OBJECTID == 1:
384             arcpy.AddMessage(row.diadoano)
385             catname = FIRMS_catalogPrefix + str(row.Ano)
386             ontemAno = str(row.Ano)
387             ontemMes = str(row.Mes)
388             ontemDia = str(row.dia)
389             ontemDDA = str(row.diadoano)
390             if row.diadoano == 1:
391                 if arcpy.Exists(catname):
392                     arcpy.AddMessage("35.b) Deleting " + catname)
393                     arcpy.Delete_management(catname)
394                     arcpy.Copy_management(UQ_Master, catname , "")
395             else:
396                 arcpy.Append_management(UQ_Master, catname, "NO_TEST", "", "")
397     del cur, row
398
399 #####
400 # Historical Data Processing
401 arcpy.AddMessage("#####")
402 arcpy.AddMessage("36) Starting Historical Data Processing")

```



```
403 rows = arcpy.SearchCursor(UQ_MP70, "", "", "FocosQueimadas_DBO_UQ_MP_di_18;FocosQueimadas_DBO_UQ_MP_Me_17",
404 "")
405
406 # Initialize feature classes & tables
407 arcpy.AddMessage("37) Initialize feature classes & tables")
408 if arcpy.Exists(UQ_SH):
409     arcpy.AddMessage("37.a) Deleting " + UQ_SH)
410     arcpy.Delete_management(UQ_SH)
411 if arcpy.Exists(UQ_SH_DIST_ANO_frequency):
412     arcpy.AddMessage("37.b) Deleting " + UQ_SH_DIST_ANO_frequency)
413     arcpy.Delete_management(UQ_SH_DIST_ANO_frequency)
414 if arcpy.Exists(UQ_SH_DIST_xtab):
415     arcpy.AddMessage("37.c) Deleting " + UQ_SH_DIST_xtab)
416     arcpy.Delete_management(UQ_SH_DIST_xtab)
417 if arcpy.Exists(UQ_SH_DIST_xtab_rotated):
418     arcpy.AddMessage("37.d) Deleting " + UQ_SH_DIST_xtab_rotated)
419     arcpy.Delete_management(UQ_SH_DIST_xtab_rotated)
420 if arcpy.Exists(UQ_SH_DIST_frequency):
421     arcpy.AddMessage("37.e) Deleting " + UQ_SH_DIST_frequency)
422     arcpy.Delete_management(UQ_SH_DIST_frequency)
423
424 # Iterate through the rows in the cursor
425 #
426 irow = 0
427 for row in rows:
428     if irow < 1:
429         pass
430     else:
431         break
432     irow = irow + 1
433 SQLString = ' "Mes" = ' + str(row.FocosQueimadas_DBO_UQ_MP_Me_17) + ' and "dia" = ' +
434 str(row.FocosQueimadas_DBO_UQ_MP_di_18)
435 arcpy.AddMessage("37.f) SQLString = " + SQLString)
436
437 # Make a layer and select fires occurred in the past in the same day/month
438 arcpy.AddMessage("38) Making a layer and select fires occurred in the past in the same day/month")
439 arcpy.MakeFeatureLayer_management(SH, 'SH_lyr')
```

```
440 arcpy.SelectLayerByAttribute_management("SH_lyr", "NEW_SELECTION", SQLString )
441
442 # Write the selected features to a new featureclass
443 arcpy.AddMessage("39) Writing the selected features to a new featureclass: " + UQ_SH)
444 arcpy.CopyFeatures_management("SH_lyr", UQ_SH)
445
446 # Process: Frequency
447 arcpy.AddMessage("40) Calculating Frequency " + UQ_SH_DIST_ANO_frequency)
448 arcpy.Frequency_analysis(UQ_SH, UQ_SH_DIST_ANO_frequency, "DISTRITO;CodigoDIST;Ano", "")
449
450 # Process: Pivot Table x mapa
451 arcpy.AddMessage("41) Calculating Pivot Table (for map): " + UQ_SH_DIST_xtab)
452 arcpy.PivotTable_management(UQ_SH_DIST_ANO_frequency, "CodigoDIST", "Ano", "FREQUENCY", UQ_SH_DIST_xtab)
453
454 # Process: Pivot Table x grafico
455 arcpy.AddMessage("42) Calculating Pivot Table (for graphic): " + UQ_SH_DIST_xtab_rotated)
456 arcpy.PivotTable_management(UQ_SH_DIST_ANO_frequency, "Ano", "DISTRITO", "FREQUENCY", UQ_SH_DIST_xtab_rotated)
457
458 # Process: Frequency (2)
459 arcpy.AddMessage("43) Calculating Frequency " + UQ_SH_DIST_frequency)
460 arcpy.Frequency_analysis(UQ_SH, UQ_SH_DIST_frequency, "CodigoDIST", "")
461
462 ## Process: Add Field Media
463 arcpy.AddMessage("44) Adding field \"Media\" in table " + UQ_SH_DIST_frequency)
464 arcpy.AddField_management(UQ_SH_DIST_frequency, "Media", "DOUBLE", "", "", "", "No. medio de queimadas 2001 -
465 2013", "NULLABLE", "NON_REQUIRED", "")
466
467 ## Process: Calculate Field Media
468 arcpy.AddMessage("45) Calculating field \"Media\" in table " + UQ_SH_DIST_frequency)
469 arcpy.CalculateField_management(UQ_SH_DIST_frequency, "Media", "[FREQUENCY] * 1.0 / 13", "VB", "")
470
471 #####
472 # Awareness Analysis Data Processing
473 arcpy.AddMessage("#####")
474 arcpy.AddMessage("46) Starting Awareness Analysis Data Processing")
475
476 # Process: Make Feature Layer
```

```

477 arcpy.AddMessage("47) Awareness Analysis Data Processing - MakeFeatureLayer_management")
478 arcpy.MakeFeatureLayer_management(distritos, UQ_distritos_Layer, "", "", "OBJECTID OBJECTID VISIBLE
479 NONE;DISTRITO DISTRITO VISIBLE NONE;PROVINCIA PROVINCIA VISIBLE NONE;CodigoDIST CodigoDIST VISIBLE
480 NONE;CodigoPROV CodigoPROV VISIBLE NONE;CodigoPAIS CodigoPAIS VISIBLE NONE;adm250gz_region_Shape
481 adm250gz_region_Shape VISIBLE NONE;adm250gz_region_Shape.STArea() adm250gz_region_Shape.STArea() VISIBLE
482 NONE;adm250gz_region_Shape.STLength() adm250gz_region_Shape.STLength() VISIBLE NONE")
483
484 # Process: Add Join
485 arcpy.AddMessage("48) Awareness Analysis Data Processing - AddJoin_management (1)")
486 arcpy.AddJoin_management(UQ_distritos_Layer, "CodigoDIST", UQ_DIST, "FocosQueimadas_DBO_UQ_MP_Co_5",
487 "KEEP_ALL")
488
489 # Process: Add Join (2)
490 arcpy.AddMessage("49) Awareness Analysis Data Processing - AddJoin_management (2)")
491 arcpy.AddJoin_management(UQ_distritos_Layer, "BaseNacional.MAX.distritos.CodigoDIST", UQ_SH_DIST_frequency,
492 "CodigoDIST", "KEEP_ALL")
493
494 # Process: Copy Features
495 arcpy.AddMessage("50) Awareness Analysis Data Processing - CopyFeatures_management")
496 if arcpy.Exists(UQ_critical):
497     arcpy.AddMessage("50.a) Deleting " + UQ_critical)
498     arcpy.Delete_management(UQ_critical)
499 arcpy.CopyFeatures_management(UQ_distritos_Layer, UQ_critical, "", "0", "0", "0")
500
501 # Process: Add Field
502 arcpy.AddMessage("51) Awareness Analysis Data Processing - AddField_management")
503 arcpy.AddField_management(UQ_critical, "critical", "DOUBLE", "", "", "", "", "NULLABLE", "NON_REQUIRED", "")
504
505 # Process: Calculate Field
506 arcpy.AddMessage("52) Awareness Analysis Data Processing - CalculateField_management")
507 arcpy.CalculateField_management(UQ_critical, "critical", "( [FocosQueimadas_DBO_UQ_DIST__8] * 1.0) -
508 [FocosQueimadas_DBO_UQ_SH_DI_16]", "VB", "")
509
510 #####
511 # download MODIS Terra & Aqua 2km resolution images
512 arcpy.AddMessage("#####")
513 arcpy.AddMessage("53) Running script " + modisBatchCommand + " to download MODIS images (2km res.)")

```

```

514 ##ontemDia = '11'
515 if len(ontemDia) < 2:
516     ontemDia = "0" + ontemDia
517 ##ontemMes = '8'
518 if len(ontemMes) < 2:
519     ontemMes = "0" + ontemMes
520 ##ontemAno = '2014'
521 ##ontemDDA = '223'
522
523 mysubstring = '' + modisBatchCommand + ' ' + str(ontemDDA) + ''
524 command_line = 'start cmd /c ' + mysubstring
525 arcpy.AddMessage("53.a) Awareness Analysis Data Processing - " + command_line)
526 argsImport = shlex.split(command_line)
527 pipeI = subprocess.Popen(argsImport, stdout=subprocess.PIPE, shell=True)
528 pipeI.stdout.read()
529 pipeI.wait()
530
531 #####
532 # O U T P U T S
533 outJPEGDir = outBaseDir + "\\JPGs"
534 outPDF_Dir = outBaseDir + "\\PDFs"
535 outMXDsDir = outBaseDir + "\\MXDs"
536 outACC_Dir = outBaseDir + "\\Access"
537 #####
538 # JPEG & PDFs production
539 arcpy.AddMessage("#####")
540 arcpy.AddMessage("54) Exporting MXDs to JPEGs")
541 mxdMain = arcpy.mapping.MapDocument(outMXDsDir + "\\UQ1dot4_main.mxd")
542 mxdMainAuthorName = mxdMain.author
543 mxdMain.title = "Ultimas Queimadas " + ontemDia + r"/" + ontemMes + r"/" + ontemAno
544 outJPEGMain = outJPEGDir + "\\UQ_mxd1Main.jpg"
545 outPDF_Main = outPDF_Dir + "\\UQ_mxd1Main.pdf"
546 arcpy.AddMessage("Exporting UQ1dot4_main.mxd (Author = " + mxdMainAuthorName + ") to " + outJPEGMain + " & " +
547 outPDF_Main)
548 arcpy.mapping.ExportToJPEG(mxdMain, outJPEGMain)
549 arcpy.mapping.ExportToPDF(mxdMain, outPDF_Main)
550

```

```

551 mxdCrit = arcpy.mapping.MapDocument(outMXDsDir + "\\UQ1dot4_Critical.mxd")
552 mxdCritAuthorName = mxdCrit.author
553 mxdCrit.title = "Dia " + ontemDia + r"/" + ontemMes + r"/" + ontemAno + " vs. os dias " + ontemDia + r"/" +
554 ontemMes + " dos ultimos 13 anos"
555 outJPEGCrit = outJPEGDir + "\\UQ_mxd2Crit.jpg"
556 outPDF_Crit = outPDF_Dir + "\\UQ_mxd2Crit.pdf"
557 arcpy.AddMessage("Exporting UQ1dot4_critical.mxd (Author = " + mxdCritAuthorName + ") to " + outJPEGCrit + " &
558 " + outPDF_Crit)
559 arcpy.mapping.ExportToJPEG(mxdCrit, outJPEGCrit)
560 arcpy.mapping.ExportToPDF(mxdCrit, outPDF_Crit)
561
562 mxdModis = arcpy.mapping.MapDocument(outMXDsDir + "\\UQ1dot4_MODIS_TA.mxd")
563 mxdModisAuthorName = mxdModis.author
564 mxdModis.title = "Dia " + ontemDia + r"/" + ontemMes + r"/" + ontemAno
565 outJPEGModis = outJPEGDir + "\\UQ_mxd3Modis.jpg"
566 outPDF_Modis = outPDF_Dir + "\\UQ_mxd3Modis.pdf"
567 arcpy.AddMessage("Exporting UQ1dot4_MODIS_TA.mxd (Author = " + mxdModisAuthorName + ") to " + outJPEGModis + "
568 & " + outPDF_Modis)
569 arcpy.mapping.ExportToJPEG(mxdModis, outJPEGModis)
570 arcpy.mapping.ExportToPDF(mxdModis, outPDF_Modis)
571
572 #####
573 # ACCESS Report production
574 arcpy.AddMessage("#####")
575 arcpy.AddMessage("55) Producing ACCESS Reports")
576 subACCESSstring = outACC_Dir + "\\UQ_Report.accdb"
577 command_line = 'C:\\Program Files\\Microsoft Office\\Office15\\MSACCESS.EXE" ' + '\"' + subACCESSstring +
578 '\" /Excl /X Rep2Pdf /nostartup'
579 arcpy.AddMessage(command_line)
580 argsAccess = shlex.split(command_line)
581 # print args
582 pipeA = subprocess.Popen(argsAccess, stdout=subprocess.PIPE, shell=True)
583 pipeA.stdout.read()
584 pipeA.wait()
585
586 #####
587 # F I N A L Report production

```

```
588 #####
589 # Create a new, empty pdf document in the specified output location folder
590 arcpy.AddMessage("#####")
591 arcpy.AddMessage("56) Final PDF Report production")
592 finalpdf_filename = outPDF_Dir + "\\UQ" + ontemDia + "_" + ontemMes + "_" + ontemAno + ".pdf"
593 if os.path.exists(finalpdf_filename):
594     os.remove(finalpdf_filename)
595 finalPdf = arcpy.mapping.PDFDocumentCreate(finalpdf_filename)
596
597 # Add the UQ_Table_Prov to the pdf
598 if os.path.exists(outPDF_Dir + "\\Cover page Boletim.pdf"):
599     arcpy.AddMessage("56.a) " + outPDF_Dir + " exists!")
600     finalPdf.appendPages(outPDF_Dir + "\\Cover page Boletim.pdf")
601
602 # Add the mxd1Main to the pdf
603 if os.path.exists(outPDF_Main):
604     arcpy.AddMessage("56.b) " + outPDF_Main + " exists!")
605     finalPdf.appendPages(outPDF_Main)
606
607 # Add the mxd2Critical to the pdf
608 if os.path.exists(outPDF_Crit):
609     arcpy.AddMessage("56.c) " + outPDF_Crit + " exists!")
610     finalPdf.appendPages(outPDF_Crit)
611
612 # Add the mxd3Modis to the pdf
613 if os.path.exists(outPDF_Modis):
614     arcpy.AddMessage("56.d) " + outPDF_Modis + " exists!")
615     finalPdf.appendPages(outPDF_Modis)
616
617 # Add the UQ_Table_Prov to the pdf
618 if os.path.exists(outPDF_Dir + "\\UQ_Table_Prov.pdf"):
619     arcpy.AddMessage("56.e) " + outPDF_Dir + "\UQ_Table_Prov.pdf exists!")
620     finalPdf.appendPages(outPDF_Dir + "\\UQ_Table_Prov.pdf")
621
622 # Add the UQ_Table_UA to the pdf
623 if os.path.exists(outPDF_Dir + "\\UQ_Table_UA.pdf"):
624     arcpy.AddMessage("56.f) " + outPDF_Dir + "\UQ_Table_UA.pdf exists!")
```

```
625     finalPdf.appendPages(outPDF_Dir + "\\UQ_Table_UA.pdf")
626
627 # Add the UQ_Table_AdC to the pdf (if exists!)
628 if os.path.exists(outPDF_Dir + "\\UQ_Table_AdC.pdf"):
629     arcpy.AddMessage("56.g) " + outPDF_Dir + "\UQ_Table_AdC.pdf exists!")
630     finalPdf.appendPages(outPDF_Dir + "\\UQ_Table_AdC.pdf")
```

## Annex II - the running code output messages

```

Executing: UQ1dot4dot1Script Z:\Queimadas\Focos\DadosOriginais\TextFilesFIRMS2014\Southern_Africa_MCD14DL_2014223.txt
"Database Connections\sa@GDBS@FQ@labestia.sde" "Database Connections\sa@DirnGDBS@bn@labestia.sde"
Z:\dirnGDBs\BoletimQueimadas\Codigo\getModisClouds.bat Z:\dirnGDBs\BoletimQueimadas
Start Time: Thu Aug 14 08:15:01 2014
Running script UQ1dot4dot1Script...
#####
Welcome to 'Viva Samora (UQ 1.4.1)' - by AdWebTec
#####
1) Creating Layer Z:\Queimadas\Focos\DadosOriginais\TextFilesFIRMS2014\Southern_Africa_MCD14DL_2014223.txt
2) Creating Database Connections\sa@GDBS@FQ@labestia.sde\FocosQueimadas.DBO.UQ_Master
3) Adding Field 'confclas'
4) Calculating field 'confclas'
5) Adding Field 'Ano'
6) Adding Field 'Mes'
7) Adding Field 'dia'
8) Adding Field 'Dia do Ano'
9) Calculating Field 'Ano'
10) Calculating Field 'Mes'
11) Calculating Field 'dia'
12) Calculating Field 'Dia do Ano'
.... intTuple = 'Database Connections\sa@GDBS@FQ@labestia.sde\FocosQueimadas.DBO.UQ_Master' #;'Database
Connections\sa@DirnGDBS@bn@labestia.sde/BaseNacional.DANILO.MicroPol_Nacional' #
13) Intersecting Database Connections\sa@GDBS@FQ@labestia.sde\FocosQueimadas.DBO.UQ_Master with Database
Connections\sa@DirnGDBS@bn@labestia.sde/BaseNacional.DANILO.MicroPol_Nacional to create Database
Connections\sa@GDBS@FQ@labestia.sde\FocosQueimadas.DBO.UQ_MP
14) Making Feature Layer UQ_MP_Layer
15) Adding First Join to UQ_MP_Layer
16) Adding Second Join to UQ_MP_Layer
17) Copying Features from UQ_MP_Layer to Database Connections\sa@GDBS@FQ@labestia.sde\FocosQueimadas.DBO.UQ_MP70temp
18) Selecting Features from Database Connections\sa@GDBS@FQ@labestia.sde\FocosQueimadas.DBO.UQ_MP70temp to create Database
Connections\sa@GDBS@FQ@labestia.sde\FocosQueimadas.DBO.UQ_MP70
19) Calculating Frequency 'UQ_PADM'
20) Calculating Frequency 'UQ_DIST'
21) Calculating Frequency 'UQ_PROV'
22) Calculating Frequency 'UQ_LC_UA_temp'
23) Calculating Frequency 'UQ_LC__ADC_temp'
24) Calculating Frequency 'UQ_LC_PADM_temp'
25) Calculating Frequency 'UQ_LC_DIST_temp'

```



```

26) Calculating Frequency 'UQ_LC_PROV_temp'
27) Calculating Frequency 'UQ_LC_ZECO_temp'
28) Calculating Pivot Table 'UQ_xtab_LC_UA'
29) Calculating Pivot Table 'UQ_xtab_LC_AdC'
30) Calculating Pivot Table 'UQ_xtab_LC_PADM'
31) Calculating Pivot Table 'UQ_xtab_LC_DIST'
32) Calculating Pivot Table 'UQ_xtab_LC_PROV'
33) Calculating Pivot Table 'UQ_xtab_LC_ZECO'
34) Copying Rows 'UQ_MP70_table'
#####
35) Archiving 'UQ_Master'
35.a) Records count in 'UQ_Master' = 5426
223
#####
36) Starting Historical Data Processing
37) Initialize feature classes & tables
37.f) SQLString = "Mes" = 8 and "dia" = 11
38) Making a layer and select fires occurred in the past in the same day/month
39) Writing the selected features to a new featureclass: Database
Connections\sa@GDBS@FQ@labestia.sde/FocosQueimadas.DBO.UQ_SH
40) Calculating Frequency Database Connections\sa@GDBS@FQ@labestia.sde/FocosQueimadas.DBO.UQ_SH_DIST_ANO_frequency
41) Calculating Pivot Table (for map): Database Connections\sa@GDBS@FQ@labestia.sde/FocosQueimadas.DBO.UQ_SH_DIST_xtab
42) Calculating Pivot Table (for graphic): Database
Connections\sa@GDBS@FQ@labestia.sde/FocosQueimadas.DBO.UQ_SH_DIST_xtab_rotated
43) Calculating Frequency Database Connections\sa@GDBS@FQ@labestia.sde/FocosQueimadas.DBO.UQ_SH_DIST_frequency
44) Adding field "Media" in table Database Connections\sa@GDBS@FQ@labestia.sde/FocosQueimadas.DBO.UQ_SH_DIST_frequency
45) Calculating field "Media" in table Database
Connections\sa@GDBS@FQ@labestia.sde/FocosQueimadas.DBO.UQ_SH_DIST_frequency
#####
46) Starting Awareness Analysis Data Processing
47) Awareness Analysis Data Processing - MakeFeatureLayer_management
48) Awareness Analysis Data Processing - AddJoin_management (1)
49) Awareness Analysis Data Processing - AddJoin_management (2)
50) Awareness Analysis Data Processing - CopyFeatures_management
51) Awareness Analysis Data Processing - AddField_management
52) Awareness Analysis Data Processing - CalculateField_management
#####
53) Running script Z:\dirnGDBs\BoletimQueimadas\Codigo\getModisClouds.bat to download MODIS images (2km res.)
53.a) Awareness Analysis Data Processing - start cmd /c "Z:\dirnGDBs\BoletimQueimadas\Codigo\getModisClouds.bat 223"
#####
54) Exporting MXDs to JPEGs

```

```
Exporting UQ1dot4_main.mxd (Author = Massimiliano Lorenzini) to Z:\dirnGDBs\BoletimQueimadas\JPGs\UQ_mxd1Main.jpg &
Z:\dirnGDBs\BoletimQueimadas\PDFs\UQ_mxd1Main.pdf
Exporting UQ1dot4_critical.mxd (Author = Massimiliano Lorenzini) to Z:\dirnGDBs\BoletimQueimadas\JPGs\UQ_mxd2Crit.jpg &
Z:\dirnGDBs\BoletimQueimadas\PDFs\UQ_mxd2Crit.pdf
Exporting UQ1dot4_MODIS_TA.mxd (Author = Massimiliano Lorenzini) to Z:\dirnGDBs\BoletimQueimadas\JPGs\UQ_mxd3Modis.jpg &
Z:\dirnGDBs\BoletimQueimadas\PDFs\UQ_mxd3Modis.pdf
#####
55) Producing ACCESS Reports
"C:\Program Files\Microsoft Office\Office15\MSACCESS.EXE" "Z:\dirnGDBs\BoletimQueimadas\Access\UQ_Report.accdb" /Excl /X
Rep2Pdf /nostartup
#####
56) Final PDF Report production
56.a) Z:\dirnGDBs\BoletimQueimadas\PDFs exists!
56.b) Z:\dirnGDBs\BoletimQueimadas\PDFs\UQ_mxd1Main.pdf exists!
56.c) Z:\dirnGDBs\BoletimQueimadas\PDFs\UQ_mxd2Crit.pdf exists!
56.d) Z:\dirnGDBs\BoletimQueimadas\PDFs\UQ_mxd3Modis.pdf exists!
56.e) Z:\dirnGDBs\BoletimQueimadas\PDFs\UQ_Table_Prov.pdf exists!
56.f) Z:\dirnGDBs\BoletimQueimadas\PDFs\UQ_Table_UA.pdf exists!
56.g) Z:\dirnGDBs\BoletimQueimadas\PDFs\UQ_Table_AdC.pdf exists!
Completed script UQ1dot4dot1Script...
Succeeded at Thu Aug 14 08:34:11 2014 (Elapsed Time: 19 minutes 10 seconds)
```

## Annex III - getModisClouds.bat @ work

```

1  Microsoft Windows [Version 6.1.7601]
2  Copyright (c) 2009 Microsoft Corporation. All rights reserved.
3
4  C:\Users\RolXam>y:
5
6  Y:\>cd data
7
8  Y:\DATA>cd dirngdbs
9
10 Y:\DATA\dirngdbs>getmodiscclouds 200
11
12 Y:\DATA\dirngdbs>REM #####
13
14 Y:\DATA\dirngdbs>c:
15
16 C:\Users\RolXam>cd "\Program Files (x86)\GnuWin32\bin"
17
18 C:\Program Files (x86)\GnuWin32\bin>wget -O t:\ModisClouds\FAS_NMozambique.2014200.terra.2km.tif "http://lance-modis.eosdis.nasa.gov/imagery/subsets/?subset=FAS
19 _NMozambique.2014200.terra.2km.tif"
20 SYSTEM_WGETRC = c:/progra~1/wget/etc/wgetrc
21 syswgetrc = C:\Program Files (x86)\GnuWin32/etc/wgetrc
22 --2014-07-20 05:52:59-- http://lance-modis.eosdis.nasa.gov/imagery/subsets/?subset=FAS_NMozambique.2014200.terra.2km.tif
23 Resolving lance-modis.eosdis.nasa.gov... 198.118.194.39
24 Connecting to lance-modis.eosdis.nasa.gov|198.118.194.39|:80... connected.
25 HTTP request sent, awaiting response... 200 OK
26 Length: unspecified [image/tiff]
27 Saving to: `t:/ModisClouds/FAS_NMozambique.2014200.terra.2km.tif'
28
29 [          <=>                               ] 619,771      109K/s   in 7.9s
30
31 2014-07-20 05:53:10 (76.7 KB/s) - `t:/ModisClouds/FAS_NMozambique.2014200.terra.2km.tif' saved [619771]
32
33
34 C:\Program Files (x86)\GnuWin32\bin>copy /Y t:\ModisClouds\FAS_NMozambique.2014200.terra.2km.tif t:\ModisClouds\UQCLOUDS\FAS_NMozambique.UQ.terra.2km.tif
35     1 file(s) copied.
36
37 C:\Program Files (x86)\GnuWin32\bin>wget -O t:\ModisClouds\FAS_SMozambique.2014200.terra.2km.tif "http://lance-modis.eosdis.nasa.gov/imagery/subsets/?subset=FAS
38 _SMozambique.2014200.terra.2km.tif"
39 SYSTEM_WGETRC = c:/progra~1/wget/etc/wgetrc
40 syswgetrc = C:\Program Files (x86)\GnuWin32/etc/wgetrc
41 --2014-07-20 05:53:10-- http://lance-modis.eosdis.nasa.gov/imagery/subsets/?subset=FAS_SMozambique.2014200.terra.2km.tif
42 Resolving lance-modis.eosdis.nasa.gov... 198.118.194.39
43 Connecting to lance-modis.eosdis.nasa.gov|198.118.194.39|:80... connected.
44 HTTP request sent, awaiting response... 200 OK
45 Length: unspecified [image/tiff]
46 Saving to: `t:/ModisClouds/FAS_SMozambique.2014200.terra.2km.tif'
47
48 [          <=>                               ] 631,077      90.4K/s   in 7.3s
49
50 2014-07-20 05:53:18 (84.5 KB/s) - `t:/ModisClouds/FAS_SMozambique.2014200.terra.2km.tif' saved [631077]

```

```

51
52
53 C:\Program Files (x86)\GnuWin32\bin>copy /Y t:\ModisClouds\FAS_SMOzambique.2014200.terra.2km.tif t:\ModisClouds\UQClouds\FAS_SMOzambique.UQ.terra.2km.tif
54     1 file(s) copied.
55
56 C:\Program Files (x86)\GnuWin32\bin>wget -O t:\ModisClouds\FAS_Zambia.2014200.terra.2km.tif "http://lance-modis.eosdis.nasa.gov/imagery/subsets/?subset=FAS_Zamb
57 ia.2014200.terra.2km.tif"
58 SYSTEM_WGETRC = c:/progra~1/wget/etc/wgetrc
59 syswgetrc = C:\Program Files (x86)\GnuWin32/etc/wgetrc
60 --2014-07-20 05:53:19-- http://lance-modis.eosdis.nasa.gov/imagery/subsets/?subset=FAS_Zambia.2014200.terra.2km.tif
61 Resolving lance-modis.eosdis.nasa.gov... 198.118.194.39
62 Connecting to lance-modis.eosdis.nasa.gov|198.118.194.39|:80... connected.
63 HTTP request sent, awaiting response... 200 OK
64 Length: unspecified [image/tiff]
65 Saving to: `t:/ModisClouds/FAS_Zambia.2014200.terra.2km.tif'
66
67 [                                     <=>                                     ] 638,561      131K/s   in 6.8s
68
69 2014-07-20 05:53:27 (92.2 KB/s) - `t:/ModisClouds/FAS_Zambia.2014200.terra.2km.tif' saved [638561]
70
71
72 C:\Program Files (x86)\GnuWin32\bin>copy /Y t:\ModisClouds\FAS_Zambia.2014200.terra.2km.tif t:\ModisClouds\UQClouds\FAS_Zambia.UQ.terra.2km.tif
73     1 file(s) copied.
74
75 C:\Program Files (x86)\GnuWin32\bin>wget -O t:\ModisClouds\FAS_NMOzambique.2014200.aqua.2km.tif "http://lance-modis.eosdis.nasa.gov/imagery/subsets/?subset=FAS_
76 NMOzambique.2014200.aqua.2km.tif"
77 SYSTEM_WGETRC = c:/progra~1/wget/etc/wgetrc
78 syswgetrc = C:\Program Files (x86)\GnuWin32/etc/wgetrc
79 --2014-07-20 05:53:27-- http://lance-modis.eosdis.nasa.gov/imagery/subsets/?subset=FAS_NMOzambique.2014200.aqua.2km.tif
80 Resolving lance-modis.eosdis.nasa.gov... 198.118.194.39
81 Connecting to lance-modis.eosdis.nasa.gov|198.118.194.39|:80... connected.
82 HTTP request sent, awaiting response... 200 OK
83 Length: unspecified [image/tiff]
84 Saving to: `t:/ModisClouds/FAS_NMOzambique.2014200.aqua.2km.tif'
85
86 [                                     <=>                                     ] 619,771      110K/s   in 7.0s
87
88 2014-07-20 05:53:35 (86.5 KB/s) - `t:/ModisClouds/FAS_NMOzambique.2014200.aqua.2km.tif' saved [619771]
89
90
91 C:\Program Files (x86)\GnuWin32\bin>copy /Y t:\ModisClouds\FAS_NMOzambique.2014200.aqua.2km.tif t:\ModisClouds\UQClouds\FAS_NMOzambique.UQ.aqua.2km.tif
92     1 file(s) copied.
93
94 C:\Program Files (x86)\GnuWin32\bin>wget -O t:\ModisClouds\FAS_SMOzambique.2014200.aqua.2km.tif "http://lance-modis.eosdis.nasa.gov/imagery/subsets/?subset=FAS_
95 SMOzambique.2014200.aqua.2km.tif"
96 SYSTEM_WGETRC = c:/progra~1/wget/etc/wgetrc
97 syswgetrc = C:\Program Files (x86)\GnuWin32/etc/wgetrc
98 --2014-07-20 05:53:36-- http://lance-modis.eosdis.nasa.gov/imagery/subsets/?subset=FAS_SMOzambique.2014200.aqua.2km.tif
99 Resolving lance-modis.eosdis.nasa.gov... 198.118.194.39
100 Connecting to lance-modis.eosdis.nasa.gov|198.118.194.39|:80... connected.
101 HTTP request sent, awaiting response... 200 OK
102 Length: unspecified [image/tiff]
103 Saving to: `t:/ModisClouds/FAS_SMOzambique.2014200.aqua.2km.tif'
104
105 [                                     <=>                                     ] 631,077      113K/s   in 7.6s
106
107 2014-07-20 05:53:45 (81.6 KB/s) - `t:/ModisClouds/FAS_SMOzambique.2014200.aqua.2km.tif' saved [631077]

```

```

108
109
110 C:\Program Files (x86)\GnuWin32\bin>copy /Y t:\ModisClouds\FAS_SMozambique.2014200.aqua.2km.tif t:\ModisClouds\UQClouds\FAS_SMozambique.UQ.aqua.2km.tif
111     1 file(s) copied.
112
113 C:\Program Files (x86)\GnuWin32\bin>wget -O t:\ModisClouds\FAS_Zambia.2014200.aqua.2km.tif "http://lance-modis.eosdis.nasa.gov/imagery/subsets/?subset=FAS_Zambi
114 a.2014200.aqua.2km.tif"
115 SYSTEM_WGETRC = c:/progra~1/wget/etc/wgetrc
116 syswgetrc = C:\Program Files (x86)\GnuWin32/etc/wgetrc
117 --2014-07-20 05:53:45-- http://lance-modis.eosdis.nasa.gov/imagery/subsets/?subset=FAS_Zambia.2014200.aqua.2km.tif
118 Resolving lance-modis.eosdis.nasa.gov... 198.118.194.39
119 Connecting to lance-modis.eosdis.nasa.gov|198.118.194.39|:80... connected.
120 HTTP request sent, awaiting response... 200 OK
121 Length: unspecified [image/tiff]
122 Saving to: `t:/ModisClouds/FAS_Zambia.2014200.aqua.2km.tif'
123
124 [          ] 638,561      108K/s   in 8.5s
125
126 2014-07-20 05:53:55 (73.2 KB/s) - `t:/ModisClouds/FAS_Zambia.2014200.aqua.2km.tif' saved [638561]
127
128
129 C:\Program Files (x86)\GnuWin32\bin>copy /Y t:\ModisClouds\FAS_Zambia.2014200.aqua.2km.tif t:\ModisClouds\UQClouds\FAS_Zambia.UQ.aqua.2km.tif
130     1 file(s) copied.
131
132 C:\Program Files (x86)\GnuWin32\bin>REM #####
133 #####
134
135 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_NMozambique.2014200.terra.1km.tif "http://lance-modis.e
136 osdis.nasa.gov/imagery/subsets/?subset=FAS_NMozambique.2014200.terra.1km.tif"
137
138 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_NMozambique.2014200.terra.1km.tif t:\ModisClouds\UQClouds\FAS_NMozambique.UQ.terra.1km.tif
139
140 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_SMozambique.2014200.terra.1km.tif "http://lance-modis.e
141 osdis.nasa.gov/imagery/subsets/?subset=FAS_SMozambique.2014200.terra.1km.tif"
142
143 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_SMozambique.2014200.terra.1km.tif t:\ModisClouds\UQClouds\FAS_SMozambique.UQ.terra.1km.tif
144
145 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_Zambia.2014200.terra.1km.tif "http://lance-modis.eosdis
146 .nasa.gov/imagery/subsets/?subset=FAS_Zambia.2014200.terra.1km.tif"
147
148 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_Zambia.2014200.terra.1km.tif t:\ModisClouds\UQClouds\FAS_Zambia.UQ.terra.1km.tif
149
150 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_NMozambique.2014200.aqua.1km.tif "http://lance-modis.eo
151 sdis.nasa.gov/imagery/subsets/?subset=FAS_NMozambique.2014200.aqua.1km.tif"
152
153 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_NMozambique.2014200.aqua.1km.tif t:\ModisClouds\UQClouds\FAS_NMozambique.UQ.aqua.1km.tif
154
155 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_SMozambique.2014200.aqua.1km.tif "http://lance-modis.eo
156 sdis.nasa.gov/imagery/subsets/?subset=FAS_SMozambique.2014200.aqua.1km.tif"
157
158 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_SMozambique.2014200.aqua.1km.tif t:\ModisClouds\UQClouds\FAS_SMozambique.UQ.aqua.1km.tif
159
160 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_Zambia.2014200.aqua.1km.tif "http://lance-modis.eosdis.
161 nasa.gov/imagery/subsets/?subset=FAS_Zambia.2014200.aqua.1km.tif"
162
163 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_Zambia.2014200.aqua.1km.tif t:\ModisClouds\UQClouds\FAS_Zambia.UQ.aqua.1km.tif
164

```

```
165 C:\Program Files (x86)\GnuWin32\bin>REM #####
166 #####
167
168 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_NMozambique.2014200.terra.500m.tif "http://lance-modis.
169 eosdis.nasa.gov/imagery/subsets/?subset=FAS_NMozambique.2014200.terra.500m.tif"
170
171 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_NMozambique.2014200.terra.500m.tif t:\ModisClouds\UQClouds\FAS_NMozambique.UQ.terra.500m.tif
172
173
174 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_SMozambique.2014200.terra.500m.tif "http://lance-modis.
175 eosdis.nasa.gov/imagery/subsets/?subset=FAS_SMozambique.2014200.terra.500m.tif"
176
177 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_SMozambique.2014200.terra.500m.tif t:\ModisClouds\UQClouds\FAS_SMozambique.UQ.terra.500m.tif
178
179
180 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_Zambia.2014200.terra.500m.tif "http://lance-modis.eosdi
181 s.nasa.gov/imagery/subsets/?subset=FAS_Zambia.2014200.terra.500m.tif"
182
183 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_Zambia.2014200.terra.500m.tif t:\ModisClouds\UQClouds\FAS_Zambia.UQ.terra.500m.tif
184
185 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_NMozambique.2014200.aqua.500m.tif "http://lance-modis.e
186 osdis.nasa.gov/imagery/subsets/?subset=FAS_NMozambique.2014200.aqua.500m.tif"
187
188 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_NMozambique.2014200.aqua.500m.tif t:\ModisClouds\UQClouds\FAS_NMozambique.UQ.aqua.500m.tif
189
190 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_SMozambique.2014200.aqua.500m.tif "http://lance-modis.e
191 osdis.nasa.gov/imagery/subsets/?subset=FAS_SMozambique.2014200.aqua.500m.tif"
192
193 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_SMozambique.2014200.aqua.500m.tif t:\ModisClouds\UQClouds\FAS_SMozambique.UQ.aqua.500m.tif
194
195 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_Zambia.2014200.aqua.500m.tif "http://lance-modis.eosdis
196 .nasa.gov/imagery/subsets/?subset=FAS_Zambia.2014200.aqua.500m.tif"
197
198 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_Zambia.2014200.aqua.500m.tif t:\ModisClouds\UQClouds\FAS_Zambia.UQ.aqua.500m.tif
199
200 C:\Program Files (x86)\GnuWin32\bin>REM #####
201 #####
202
203 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_NMozambique.2014200.terra.250m.tif "http://lance-modis.
204 eosdis.nasa.gov/imagery/subsets/?subset=FAS_NMozambique.2014200.terra.250m.tif"
205
206 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_NMozambique.2014200.terra.250m.tif t:\ModisClouds\UQClouds\FAS_NMozambique.UQ.terra.250m.tif
207
208
209 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_SMozambique.2014200.terra.250m.tif "http://lance-modis.
210 eosdis.nasa.gov/imagery/subsets/?subset=FAS_SMozambique.2014200.terra.250m.tif"
211
212 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_SMozambique.2014200.terra.250m.tif t:\ModisClouds\UQClouds\FAS_SMozambique.UQ.terra.250m.tif
213
214
215 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_Zambia.2014200.terra.250m.tif "http://lance-modis.eosdi
216 s.nasa.gov/imagery/subsets/?subset=FAS_Zambia.2014200.terra.250m.tif"
217
218 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_Zambia.2014200.terra.250m.tif t:\ModisClouds\UQClouds\FAS_Zambia.UQ.terra.250m.tif
219
220 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_NMozambique.2014200.aqua.250m.tif "http://lance-modis.e
221 osdis.nasa.gov/imagery/subsets/?subset=FAS_NMozambique.2014200.aqua.250m.tif"
```

```
222
223 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_NMozambique.2014200.aqua.250m.tif t:\ModisClouds\UQClouds\FAS_NMozambique.UQ.aqua.250m.tif
224
225 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_SMozambique.2014200.aqua.250m.tif "http://lance-modis.e
226 osdis.nasa.gov/imagery/subsets/?subset=FAS_SMozambique.2014200.aqua.250m.tif"
227
228 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_SMozambique.2014200.aqua.250m.tif t:\ModisClouds\UQClouds\FAS_SMozambique.UQ.aqua.250m.tif
229
230 C:\Program Files (x86)\GnuWin32\bin>REM "C:\Program Files (x86)\GnuWin32\bin\wget" -O t:\ModisClouds\FAS_Zambia.2014200.aqua.250m.tif "http://lance-modis.eosdis
231 .nasa.gov/imagery/subsets/?subset=FAS_Zambia.2014200.aqua.250m.tif"
232
233 C:\Program Files (x86)\GnuWin32\bin>REM copy /Y t:\ModisClouds\FAS_Zambia.2014200.aqua.250m.tif t:\ModisClouds\UQClouds\FAS_Zambia.UQ.aqua.250m.tif
234
235 C:\Program Files (x86)\GnuWin32\bin>
```

## Annex IV - NASA - LANCE FIRMS MODIS Active Fire Text files

### Contents:

1. How to download the Active Fire Text files
2. Naming Convention of the Active Fire Text files
3. About the Active Fire Text files
4. Downloading the text files and incorporating them into ESRI ArcMap and ArcView
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### How to download the Active Fire Text files

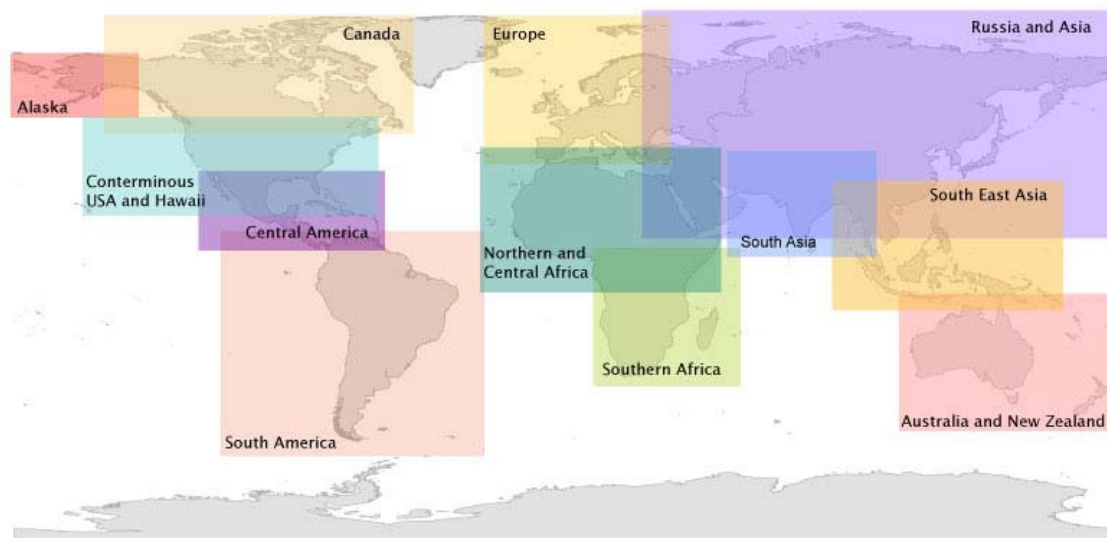
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To access the ftp site you need to be registered in the NASA EOSDIS User Registration System. If you already have an account, you can download the Text files from: <ftp://nrt1.modaps.eosdis.nasa.gov/FIRMS/> on the primary system and <ftp://nrt2.modaps.eosdis.nasa.gov/FIRMS/> on the backup system.

If you need to register go to: <https://users.eosdis.nasa.gov/urs>

Please note: registration for access to the FTP site at University of Maryland will not be carried across to LANCE FIRMS and users will have to create an account in EOSDIS if they do not already have one.

The MODIS Active Fire Text files are available as global and regional files. Please refer to the following image to determine which region you are interested in.





The Active Fire Text files are posted on an FTP site at approximately 00:00 UTC each morning. The file continues to be updated as is processed through the day (so the text file changes throughout the day). If you want to use the Active Fire Text files in near-real time, you should check what time of day the Aqua or Terra satellite passes over your area (see <http://earthdata.nasa.gov/data/nrt-data/help/faq#rapid6>). The file should be updated within three hours of satellite overpass.

## 1. Naming Convention of the Active Fire Text files

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The naming convention for the Active Fire Text files begins with the region name (except for the Global files), MODIS active fire product name, and the Julian day. For example:

CS\_Africa\_MCD14DL\_2011041.txt

“2011” is the year and “041” is the Julian day of the active fire detection. This equates to March 10, 2011.

A Julian Day Calendar and converter can be found at:

<http://earthdata.nasa.gov/data/nrt-data/help/faq/julian-day-calendar>

## 2. About the Active Fire Text Files

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The attribute fields are as follows:

1. Latitude
2. Longitude
3. Brightness Temperature (Kelvin)
4. Along scan pixel size
5. Along track pixel size
6. Date of acquisition
7. Time of acquisition (UTC)
8. Satellite (A=Aqua and T=Terra)
9. Confidence (0 – 100%)
10. Version (Collection and source)
11. Brightness T31 (Kelvin)
12. FRP (Fire Radiative Power) (MW)

Notes:

- The along scan and along track pixel sizes are included. Although the algorithm produces 1km fire pixels, MODIS pixels get bigger toward the edge of scan.
- The confidence value is based on a collection of intermediate algorithm quantities used in the detection process. A detection confidence intended to help users gauge the quality of individual hotspot/fire pixels. This confidence estimate, which ranges between 0 and 100%, is used to assign one of the three fire classes (low-confidence fire, nominal-

confidence fire, or high-confidence fire) to all fire pixels within the fire mask. The confidence field has been improved with Collection 5 to more accurately identify questionable hotspot/fire pixels.

- **Version:** Refers to collection and source. The number before the decimal refers to the collection (e.g. MODIS Collection 5). The number after the decimal indicates the source of Level 1B data; data processed in near-real time by NASA-LANCE Rapid Response will have the source code “.0”. Data sourced from MODAPS (with a 2 month lag) and processed by FIRMS using the standard MOD14 thermal anomalies algorithm will have a source code “.1”. For example, data with the version listed as “5.0” is collection 5 and processed by Rapid Response; 5.1 is Collection 5 data processed by MODAPS. For more information on collections and on the differences between Rapid Response and MODAPS, please see <http://earthdata.nasa.gov/data/nrt-data/help/faq#firms35>
- **Brightness Temperature:** Brightness temperature of the fire pixel measured in Kelvin.
- **Brightness Temperature Channel 31:** Channel 31 brightness temperature of the fire pixel measured in Kelvin.
- **FRP (Fire Radiative Power):** Depicts the pixel-integrated fire radiative power in MW (MegaWatts).

### 3. Citation Information

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The data and graphics from FIRMS can be used freely. Please acknowledge NASA/LANCE - FIRMS as the data source and read the disclaimer (see below) for more information about using this data.

For online reference, please use: NASA LANCE - FIRMS, 2012. MODIS Active Fire Detections. Data set. Available on-line [<http://earthdata.nasa.gov/data/nrt-data/firms>].

### 4. Disclaimer

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The LANCE system is operated by the NASA/GSFC Earth Science Data Information System (ESDIS). The information presented through the LANCE Rapid Response system and the LANCE FIRMS are provided “as is” and users bear all responsibility and liability for their use of data, and for any loss of business or profits, or for any indirect, incidental or consequential damages arising out of any use of, or inability to use, the data, even if NASA or ESDIS were previously

advised of the possibility of such damages, or for any other claim by you or any other person. ESDIS makes no representations or warranties of any kind, express or implied, including implied warranties of fitness for a particular purpose or merchantability, or with respect to the accuracy of or the absence or the presence or defects or errors in data, databases of other information. The designations employed in the data do not imply the expression of any opinion whatsoever on the part of ESDIS concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. For more information please contact the LANCE User Services at [support@earthdata.nasa.gov](mailto:support@earthdata.nasa.gov)

## Annex V - MicroPol (in portuguese)

O **MicroPol** é um layer “de trabalho” criado para facilitar as mais comuns análises abrangendo alguns das camadas armazenadas no GDB BaseNacional. No específico, a versão actual de **MicroPol** inclui os layers relativos á:

- Postos Administrativos
- Land Cover 2005
- Land Regions (Zonas Ecológicas derivadas pela agregação de Land Units)
- Areas de Conservação

**MicroPol** é o resultado da “união” dos quatro layers mencionados acima resultando num conjunto de polígonos, cada um caracterizado para uma combinação unívoca dos layers participantes. A ilustração na página seguinte brinda uma explicação gráfica do processo de “união”.

### Aplicações

**MicroPol** contem já uma informação muito valiosa, é dizer, a área de cada combinação como ilustrado na [Tabela 1](#) aonde podemos apreciar que o micro - polígono evidenciado na ilustração em página 53 tem as seguintes propriedades:

- ✓ Pertence ao posto administrativo de Gilé
- ✓ Tem uma cobertura/uso da terra correspondente a “(Semi-) Deciduous Forests” (Florestas densas decíduas);
- ✓ Está adentro da Reserva Nacional do Gilé;
- ✓ Pertence á Land Unit com código ZMBS 132/19;
- ✓ Tem uma área de 94342207 metros quadros correspondentes á 94,342 Km<sup>2</sup> ou 9.432.2 hectares.

	Posto Administrativo	Land cover class	Nome Area Protegida	Codigo Land Unit	Area (m2)
	GILE	(Semi-) Deciduous forests	Reserva Nacional do Gilé	ZMBS 132/19	94,342,207

**Tabela 1**

A tabela de atributos associada á **MicroPol** contem estas informações por cada micro – polígono pode facilmente ser utilizada para criar qualquer tabela cruzada que for preciso de acordo as possíveis combinações ilustradas em [Tabela 2](#).

	Postos Administrativos	Land Cover 2005	Land Units	Áreas de Conservação
Postos Administrativos		X	X	X
Land Cover 2005	X		X	X
Land Units	X	X		X
Áreas de Conservação	X	X	X	

Tabela 2 - Possíveis combinações entre os layers de [MicroPol](#)

## MicroPol em combinação com outros layers

Por além das propriedades implícitas do layer, é importante realçar a sua utilidade em conjunto com outros dados tabulares e/o espaciais.

O seguinte prospecto permite apreciar varias áreas temáticas aonde o utilizo de **MicroPol** leva á resultados de grande relevância:

Área temática	MicroPol +	Resultados
<b>Florestas</b>		
<b>Áreas</b>	Tabela de agregação Land Cover => Tipos Florestais	<ul style="list-style-type: none"> <li>✓ Áreas dos Tipos Florestais por: <ul style="list-style-type: none"> <li>○ Unidades administrativas</li> <li>○ Áreas de conservação</li> <li>○ Zonas ecológicas</li> </ul> </li> <li>✓ Definição de florestas produtivas</li> </ul>
<b>Biomassa/Volumes</b>	<ul style="list-style-type: none"> <li>✓ Tabela de agregação Land Cover =&gt; Tipos Florestais</li> <li>✓ Tabela de volumes médios por tipo florestal</li> <li>✓ Tabela de valores médios de biomassa de acordo ao Tipo Florestal e á Zona Ecológica</li> </ul>	Biomassa e/o volumes (totais, comerciais) dos Tipos Florestais por: <ul style="list-style-type: none"> <li>✓ Unidades administrativas e/o</li> <li>✓ Áreas de conservação e/o</li> <li>✓ Zonas ecológicas</li> </ul>
<b>Queimadas</b>		
<b>Áreas</b>	Raster das áreas queimadas mensais	Áreas queimadas em relação á: <ul style="list-style-type: none"> <li>✓ Unidades administrativas e/o</li> <li>✓ Classes de cobertura da terra e/o</li> <li>✓ Áreas de conservação e/o</li> <li>✓ Zonas Ecológicas</li> </ul>
	<ul style="list-style-type: none"> <li>✓ Raster das áreas queimadas mensais</li> <li>✓ Tabela de agregação Land Cover =&gt; Tipos Florestais</li> </ul>	Áreas queimadas em relação á: <ul style="list-style-type: none"> <li>✓ Unidades administrativas e/o</li> <li>✓ Tipos Florestais e/o</li> <li>✓ Áreas de conservação e/o</li> <li>✓ Zonas Ecológicas</li> </ul>
<b>Focos</b>	Pontos (diários ou agregados históricos) dos focos das queimadas	Frequência dos focos em relação á: <ul style="list-style-type: none"> <li>✓ Unidades administrativas e/o</li> <li>✓ Classes de cobertura da terra e/o</li> <li>✓ Áreas de conservação e/o</li> <li>✓ Zonas Ecológicas</li> </ul>
	<ul style="list-style-type: none"> <li>✓ Pontos (diários ou agregados históricos) dos focos das queimadas</li> <li>✓ Tabela de agregação Land Cover =&gt; Tipos Florestais</li> </ul>	Frequência dos focos em relação á: <ul style="list-style-type: none"> <li>✓ Unidades administrativas e/o</li> <li>✓ Tipos Florestais e/o</li> <li>✓ Áreas de conservação e/o</li> <li>✓ Zonas Ecológicas</li> </ul>
<b>Outras Áreas?</b>		

# Estrutura de MicroPol

