



CAPRA
Probabilistic Risk
Assessment Platform



User Manual Software IT-Precipitation

Precipitation data analyzer V1.0.0

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Universidad de los Andes – CAPRA PLATFORM

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Contents

Introduction	4
1.1. Introduction	5
1.2. Problem description.....	5
1.3. Analysis flow chart.....	5
Software Installation	6
2.1. Minimum installation requirements	7
2.2. Installation process.....	7
Graphical User Interface	8
3.1. General Description.....	9
3.2. Spreadsheets	10
Consolidado MENSUAL.....	10
Consolidado DIARIO	11
Procesamiento ANUAL	11
Procesamiento MENSUAL	13
Procesamiento DIARIO	15
Setting input data and files	16
4.1. Input parameters setting	17
Visualization output files	18
5.1. Output files and file format	19
Step by step tutorial	20
6.1. Step-by-step tutorial	21
6.1.1. Starting a new Project	21
6.1.2. Entering required data	21
6.1.3. Performing the simulation	23
6.1.4. Generating graphics	24
6.1.5. Generating the word document.....	30
Software limitations	31
7.1. Software limitations	32
Problems and errors	33
8.1. Problems and errors.....	34
References	35
9.1. References	36

Chapter 1

Introduction

1.1. Introduction

IT-Precipitation software was created for precipitation data analysis. It interprets all the basic available information, adjusts the formats, elaborates a completeness analysis, adjusts the available information and finally obtains all the related data statistics.

This manual is a guide to using *IT-Precipitation*. The manual provides an introduction and overview of the software, installation instructions, how to get started, its commands, a step-by-step example with one meteorological station and the problems and limitations of the software.

1.2. Problem description

Generally, precipitation data comes in numeric format which most of the times is not user friendly or is not the adequate way to present the information. As a result, the use of graphics has been widely extended. These graphics can show in a summarize way the different analysis around precipitation data such as annual, monthly and daily statistics. *IT-Precipitation* let the user create and edit multiple graphics in an easy way according to his or her necessities and requirements.

1.3. Analysis flow chart

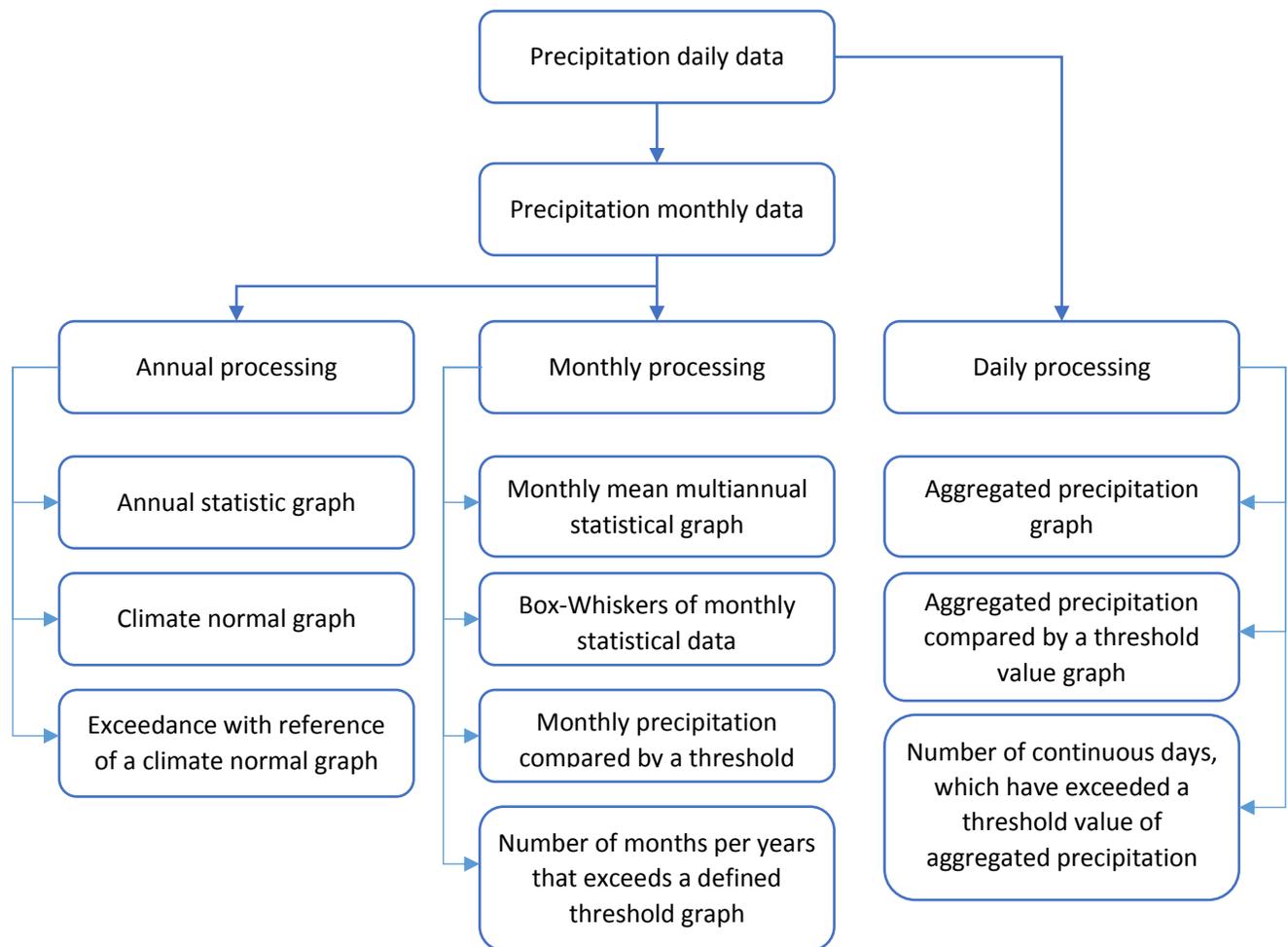


Figure 1. Flow chart of the software

Chapter 2

Software Installation

2.1. Minimum installation requirements

The following are the minimum hardware requirements for the *IT-Precipitation* installation (they correspond to the Microsoft Excel 2018 requirements):

- Processor x86 o x64 of minimum 1 GHz or higher or faster with SSE2
- Operating systems: Windows 7 or Higher
- Free hard drive capacity of 3 GB or Higher.
- 1 GB de RAM (32 bits); 2 GB de RAM (64 bits)

2.2. Installation process

1. Download the installation package from the CAPRA platform (<https://ecapra.org>)
2. Enter in windows explorer and select the file where the workbook is located.
3. Run the workbook in Microsoft Excel enabling the use of **Macros**.

Chapter 3

Graphical User Interface

3.1. General Description

IT-Precipitation is a Microsoft Excel workbook that allows the processing of precipitation data in a station or point. This is done by the use of Visual Basic for Applications (VBA) in order to validate and calculate statistics of annual, monthly and daily precipitation values and the generation of graphics that portray this information.

The general interface of the workbook is showed in Figure 2.

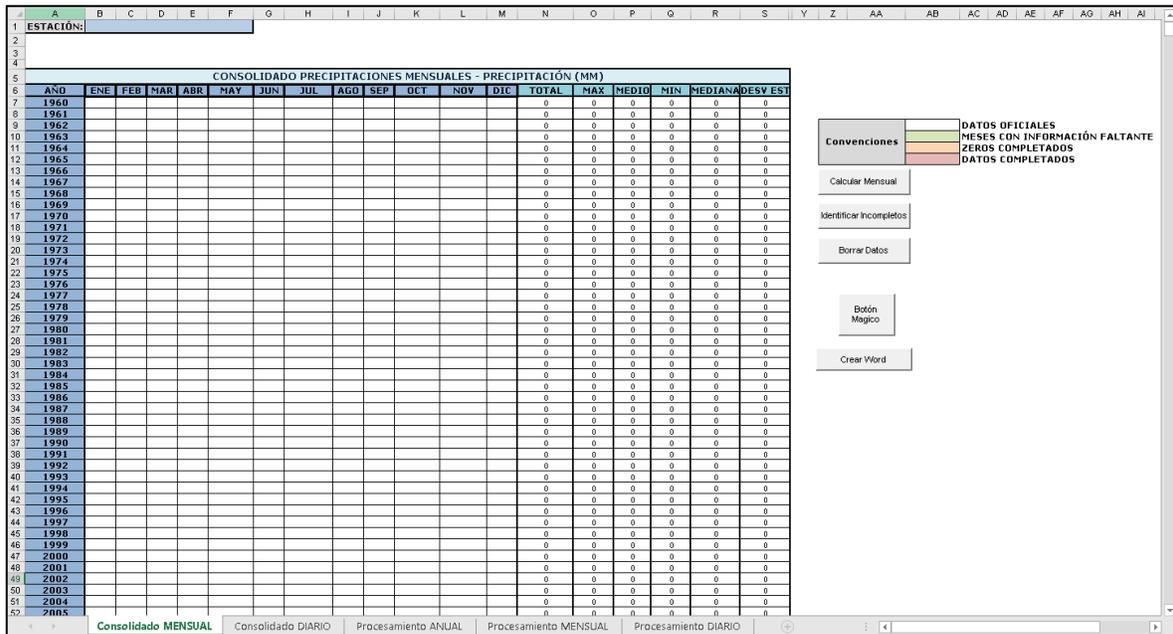


Figure 2. IT-Precipitation workbook general interface

It consists of the following five spreadsheets:

- Consolidado MENSUAL
- Consolidado DIARIO
- Procesamiento ANUAL
- Procesamiento MENSUAL
- Procesamiento DIARIO

In the next sections, the components of each one are explained. They are classified in inputs, user analysis options and results. Each one is marked in a color: orange, blue and green respectively.

3.2. Spreadsheets

Consolidado MENSUAL

This spreadsheet contains the monthly precipitation information. In Figure 3 each component is shown and later explained.

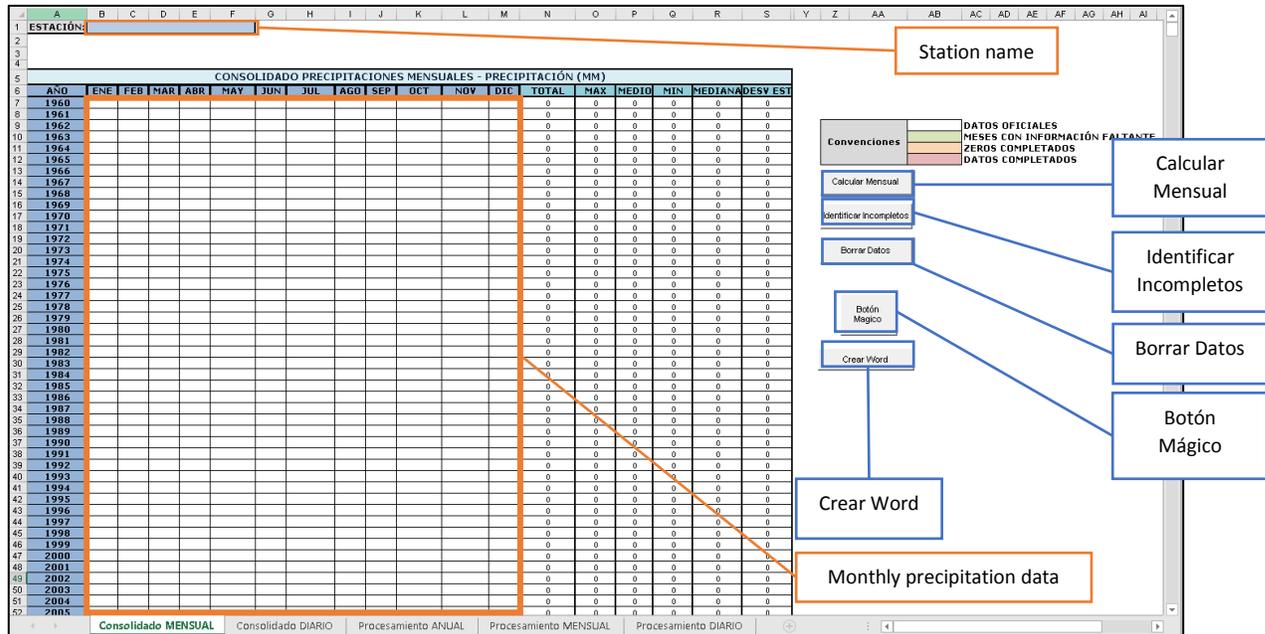


Figure 3. Consolidado MENSUAL spreadsheet components

- **Station Name:** Input text parameter with the name of the station or point.
- **Calcular Mensual:** Button that calculates the monthly precipitation data from daily data.
- **Identificar Incompletos:** Button that identifies missing months, it is only used when the user introduced monthly data and not daily values.
- **Borrar Datos:** Button that erases all the table and graphics information for the whole workbook.
- **Botón Mágico:** Button that performs the whole analysis, which includes the calculation of monthly data from daily values, the generation of all eleven graphics and the saving of information a Microsoft Word document.
- **Crear Word:** Saves the graphics of the last three spreadsheets (Procesamiento ANUAL, Procesamiento MENSUAL, Procesamiento DIARIO) into a Microsoft Word document.
- **Monthly precipitation data:** Table with the monthly precipitation values. It is calculated by daily values or the user can directly introduce it. It marks in green the missing values.

Consolidado DIARIO

This spreadsheet contains the daily precipitation information. In Figure 4 each component is shown and later explained.

The screenshot shows a spreadsheet with the following components:

- Station name:** Located in cell A1, containing the text "ESTACIÓ".
- Conventions:** A legend box with four categories:
 - DATOS OFICIALES (Green)
 - MESES CON INFORMACIÓN FALTANTE (Yellow)
 - ZEROS COMPLETADOS (Red)
 - DATOS COMPLETADOS (Blue)
- Identificar Incompletos:** A button located below the conventions legend.
- Daily precipitation data:** A table with columns for Año, Mes, Día, and Precipitación (mm/día). The data spans from January 1st to February 9th of the year 1960.

Año	Mes	Día	Precipitación (mm/día)
1960	1	1	
1960	1	2	
1960	1	3	
1960	1	4	
1960	1	5	
1960	1	6	
1960	1	7	
1960	1	8	
1960	1	9	
1960	1	10	
1960	1	11	
1960	1	12	
1960	1	13	
1960	1	14	
1960	1	15	
1960	1	16	
1960	1	17	
1960	1	18	
1960	1	19	
1960	1	20	
1960	1	21	
1960	1	22	
1960	1	23	
1960	1	24	
1960	1	25	
1960	1	26	
1960	1	27	
1960	1	28	
1960	1	29	
1960	1	30	
1960	1	31	
1960	2	1	
1960	2	2	
1960	2	3	
1960	2	4	
1960	2	5	
1960	2	6	
1960	2	7	
1960	2	8	
1960	2	9	

Figure 4. Consolidado DIARIO preadsheet components

- **Station Name:** Name of the station or point. It is the same of **consolidado MENSUAL**.
- **Identificar Incompletos:** Button that identifies missing days.
- **Daily precipitation data:** Table with the daily precipitation values. It is completed directly by the user. It marks in green the missing values.

Procesamiento ANUAL

This spreadsheet contains the annual precipitation graphics, which are generated from the information in **consolidado MENSUAL** spreadsheet. In Figure 5, Figure 6 and Figure 7 Figure 4 each component is shown and later explained

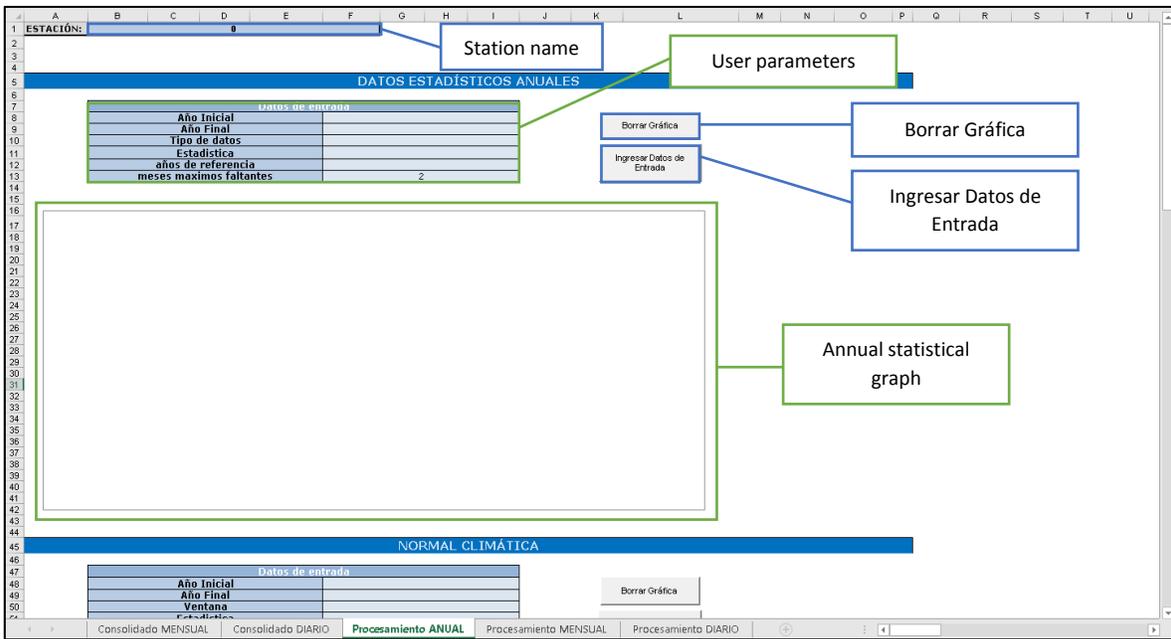


Figure 5. Annual statistical panel in Procesamiento ANUAL spreadsheet

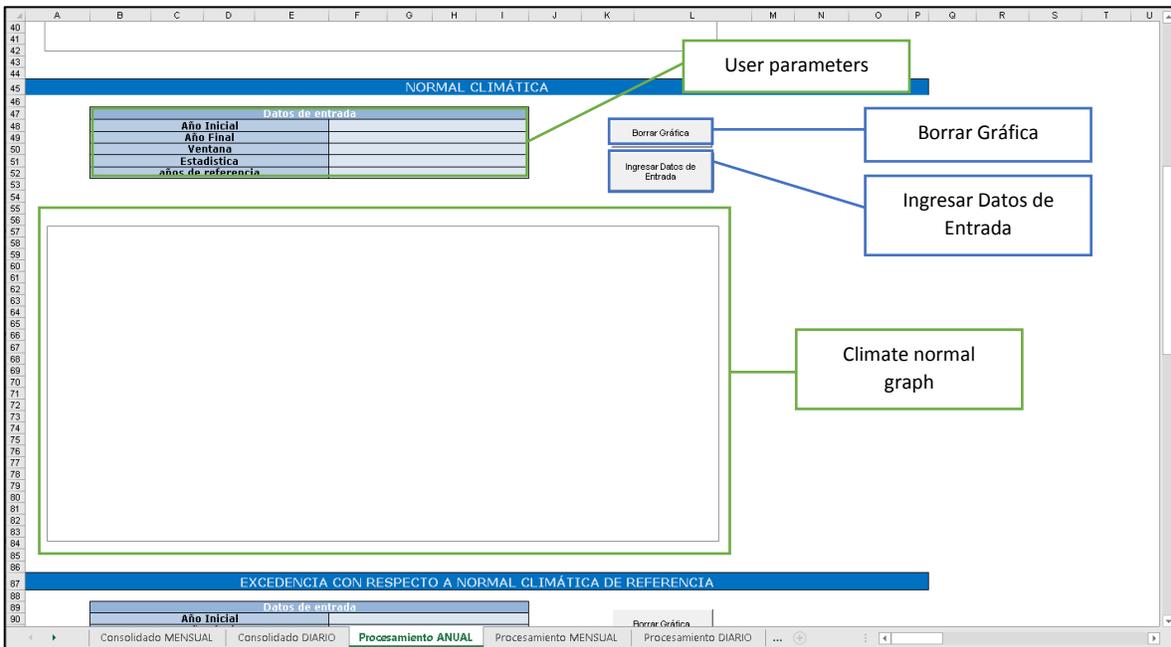


Figure 6. Climate normal panel in Procesamiento ANUAL spreadsheet

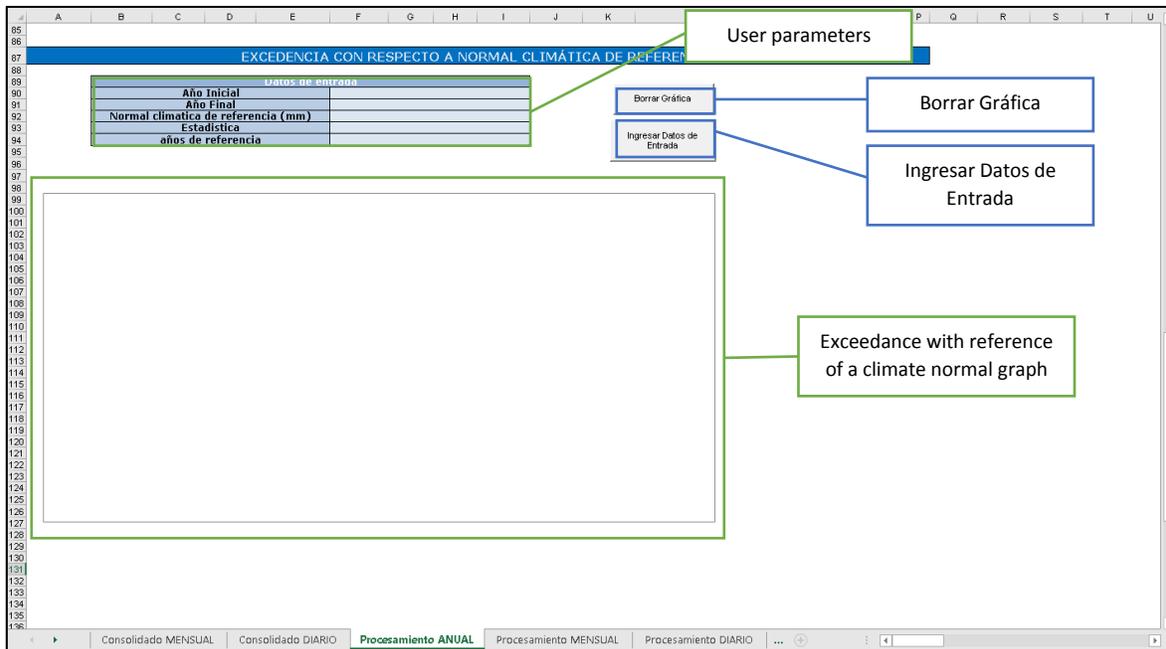


Figure 7. Exceedance with reference of a climate normal panel in Procesamiento ANUAL spreadsheet

- **Station Name:** Name of the station or point. It is the same of **consolidado MENSUAL**.
- **Borrar Gráfica:** Erase the corresponding graph.
- **Ingresar Datos de Entrada:** Activate the windows to enter the data for creating the desire graph.
- **User Parameters:** Table where user parameters about the graph are shown.
- **Graphs:** The graphs created according to user parameters. Each one is explained in the Step-by-Step tutorial section.

Procesamiento MENSUAL

This spreadsheet contains the monthly precipitation graphics, which are generated from the information in **consolidado MENSUAL** spreadsheet. In Figure 8 and Figure 9 Figure 4 each component is shown and later explained

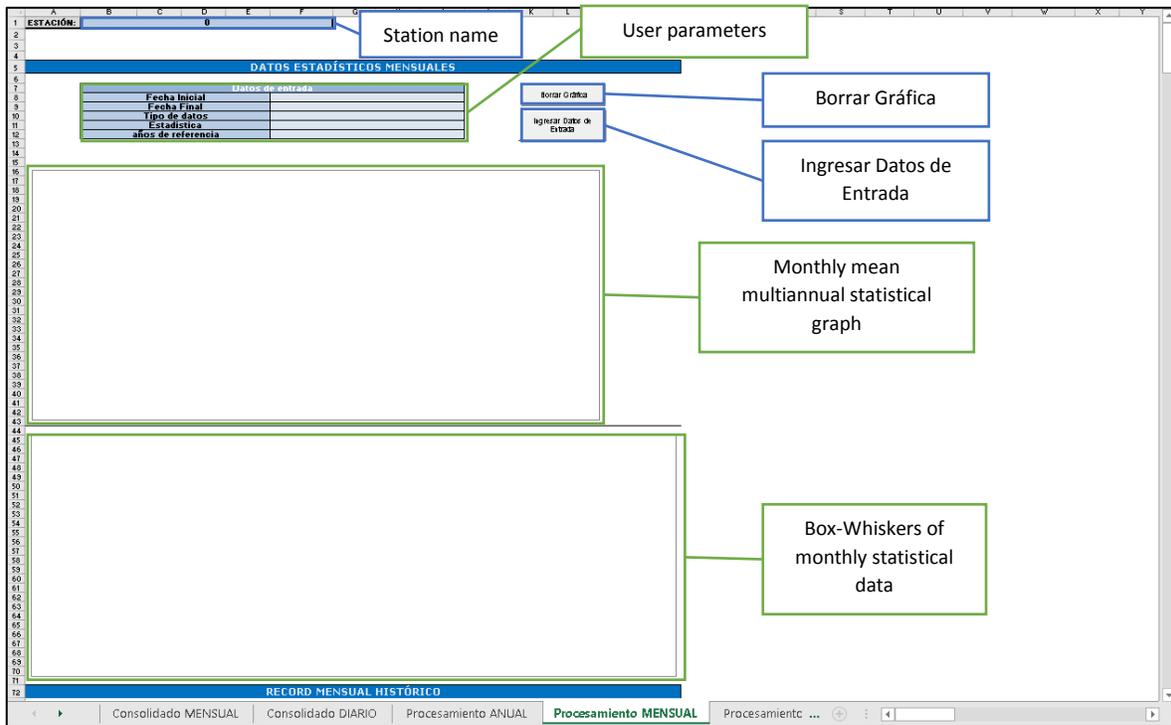


Figure 8. Monthly statistical panel in Procesamiento MENSUAL spreadsheet

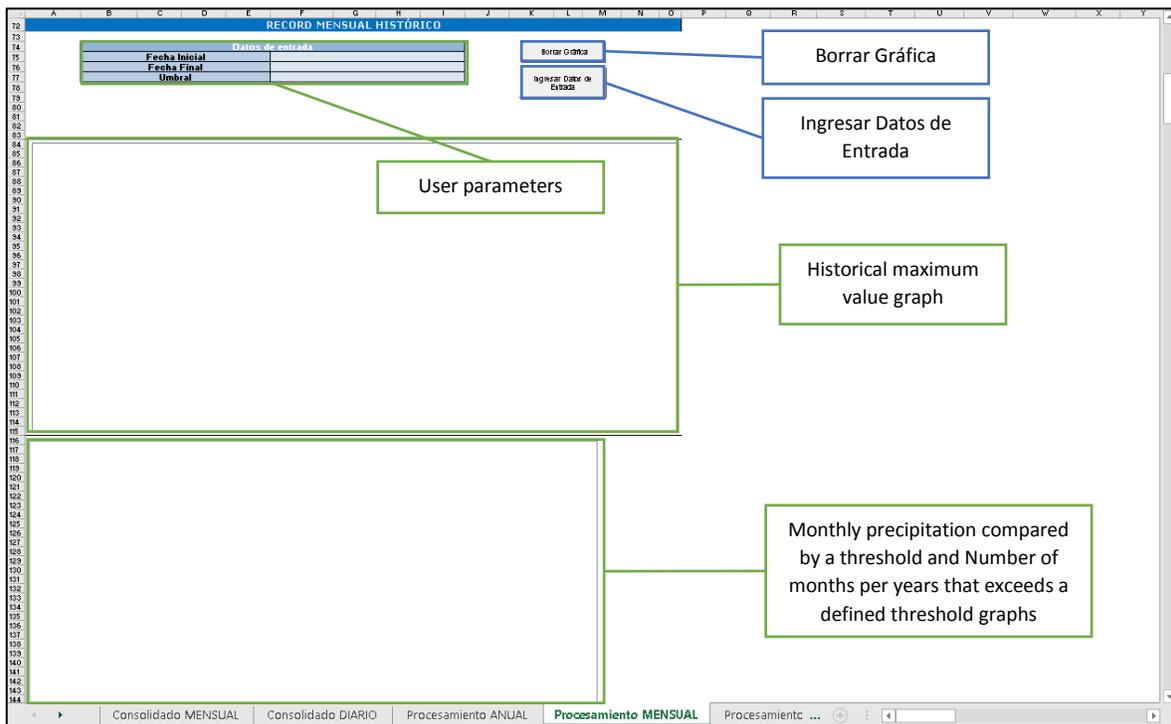


Figure 9. Historical monthly record values panel in Procesamiento MENSUAL spreadsheet

- **Station Name:** Name of the station or point. It is the same of **consolidado MENSUAL**.
- **Borrar Gráfica:** Erase the corresponding graph.

- Ingresar Datos de Entrada: Activate the windows to enter the data for creating the desire graph.
- User Parameters: Table where user parameters about the graph are shown.
- Graphs: The graphs created according to user parameters. Each one is explained in the Step-by-Step tutorial section.

Procesamiento DIARIO

This spreadsheet contains the daily precipitation graphics, which are generated from the information in **consolidado DIARIO** spreadsheet. In Figure 10 Figure 4 each component is shown and later explained

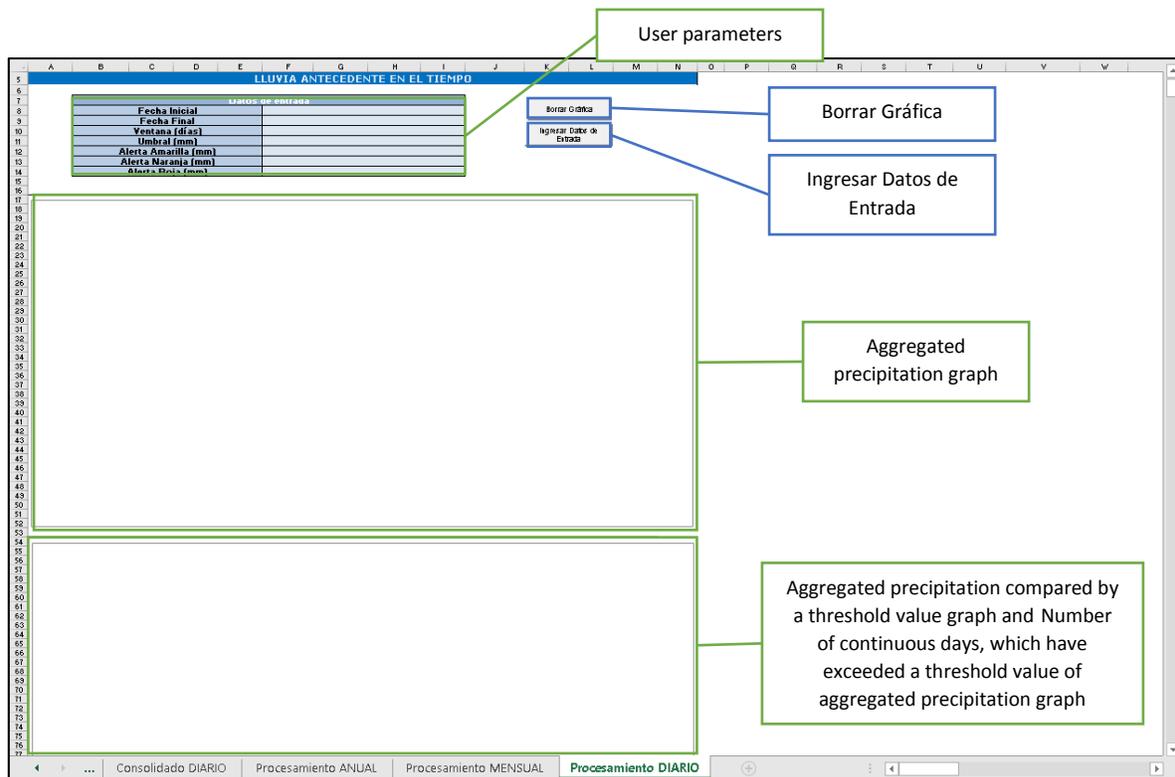


Figure 10. Antecedent rain in time panel in *Procesamiento DIARIO* spreadsheet

- Borrar Gráfica: Erase the corresponding graph.
- Ingresar Datos de Entrada: Activate the windows to enter the data for creating the desire graph.
- User Parameters: Table where user parameters about the graph are shown.
- Graphs: The graphs created according to user parameters. Each one is explained in the Step-by-Step tutorial section

Chapter 4

Setting input data and files

4.1. Input parameters setting

The Microsoft Excel workbook does not require any special input parameters setting. The required precipitation data is paste directly by the user from another workbook, database or text file. For the generation of each graph the associated parameters specifications is explained in each corresponding window.

Chapter 5

Visualization output files

5.1. Output files and file format

The output files are:

- For versatility after creating the graphs in Microsoft Excel, it is possible to edit them according to the user requirements. The tables can be copied but the format cannot be edited directly.
- Microsoft Word document (*.doc) which contains all the graphics generated by the software.

Chapter 6

Step by step tutorial

6.1. Step-by-step tutorial

This chapter provides an example application of how to perform the software, for the tutorial it is used the precipitation information of an Example station which contains data from January 1975 to December 2012. The Step by step process is explained in the next pages.

Contents

- Starting a New Project
- Entering required Data
- Performing the simulation
- Viewing Results
- Exiting the Program

6.1.1. Starting a new Project

To begin this example, open the *.XLSM file (Microsoft Excel Workbook) and the main window should appear as shown in Figure 11.

Figure 11. Main Windows of the workbook

If you have added information, it should appear in the cells. In this case, go to the **Consolidado MENSUAL** spreadsheet and select the **Borrar Datos** button to erase all the information in the file.

6.1.2. Entering required data

For this example, it will be used daily precipitation information. However, it is possible to use directly monthly data by pasting the information in the **Consolidado MENSUAL** spreadsheet table. By using monthly data, it is not possible to generate daily graphics.

Start by assigning the name of the station at the top of the **Consolidado MENSUAL** spreadsheet as shown in the next figure.

	A	B	C	D	E	F	G	
1	ESTACIÓN:	EJEMPLO						
2								

Figure 12. Station name assignment

Next, open the Example station information that is contained in the file Precipitation Data (1975-2012).txt and copy the last column information to the Precipitación (mm/día) column in the **Consolidado DIARIO** spreadsheet as shown in Figure 13.

Date	Year	Month	Precipitation (mm)
1/1/1975	1975	1	39.2
1/2/1975	1975	1	5.3
1/3/1975	1975	1	0
1/4/1975	1975	1	0
1/5/1975	1975	1	0
1/6/1975	1975	1	0
1/7/1975	1975	1	65.2
1/8/1975	1975	1	29.2
1/9/1975	1975	1	35
1/10/1975	1975	1	0
1/11/1975	1975	1	0
1/12/1975	1975	1	28.3
1/13/1975	1975	1	39.8
1/14/1975	1975	1	8.1
1/15/1975	1975	1	83
1/16/1975	1975	1	1
1/17/1975	1975	1	0
1/18/1975	1975	1	0
1/19/1975	1975	1	0
1/20/1975	1975	1	24.8
1/21/1975	1975	1	0
1/22/1975	1975	1	3
1/23/1975	1975	1	0
1/24/1975	1975	1	4
1/25/1975	1975	1	14
1/26/1975	1975	1	21
1/27/1975	1975	1	43.2
1/28/1975	1975	1	6

	A	B	C	D	E
5484	1974	12	30		
5485	1974	12	31		
5486	1975	1	1	39.2	
5487	1975	1	2	5.3	
5488	1975	1	3	0	
5489	1975	1	4	0	
5490	1975	1	5	0	
5491	1975	1	6	0	
5492	1975	1	7	65.2	
5493	1975	1	8	29.2	
5494	1975	1	9	35	
5495	1975	1	10	0	
5496	1975	1	11	0	
5497	1975	1	12	28.3	
5498	1975	1	13	39.8	
5499	1975	1	14	8.1	
5500	1975	1	15	83	
5501	1975	1	16	1	
5502	1975	1	17	0	
5503	1975	1	18	0	
5504	1975	1	19	0	
5505	1975	1	20	24.8	
5506	1975	1	21	0	
5507	1975	1	22	3	
5508	1975	1	23	0	
5509	1975	1	24	4	
5510	1975	1	25	14	
5511	1975	1	26	21	
5512	1975	1	27	43.2	
5513	1975	1	28	6	
5514	1975	1	29	0	
5515	1975	1	30	37.3	
5516	1975	1	31	4.1	
5517	1976	2	1	0.8	
5518	1976	2	2	10	
5519	1976	2	3	0	
5520	1976	2	4	0	
5521	1976	2	5	0	
5522	1976	2	6	0	
5523	1976	2	7	0	
5524	1976	2	8	0	
5525	1976	2	9	0	
5526	1976	2	10	8.2	
5527	1976	2	11	0	
5528	1976	2	12	0	
5529	1976	2	13	0	

Figure 13. Entering of daily precipitation data

6.1.3. Performing the simulation

After the daily or monthly information is introduced. It is possible to analyse the data in the **Consolidado MENSUAL spreadsheet**. If it is, used monthly data only select the **Identificar Incompletos** button. In contrary case, select the **Calcular Mensual** button. The following window is shown:

Figure 14. Calculate monthly data window

In the first box, write the maximum number of missing days in a month to be consider valid. In the second box the maximum number of missing months in a year to be consider valid. Press ok and the result corresponds to the monthly table complete and the fill of missing or not valid months in green color as shown in the next figure:

AÑO	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OT	NOV	DIC	TOTAL	MAX	MEDIO	MIN	MEDIANA	DESV EST
1960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	491.5	219	288.2	85.7	80.7	138.8	78.9	42.7	85.7	163.1	352	427.6	2881.8	491.5	222	43	891	140
1976	732.1	591.6	395.4	170.7	241.2	89	0	119	48.5	159.7	392.9	393.6	3380.8	732.1	282	0	256	224
1977	423.9	567.6	285.5	323.9	282.2	82.2	68.9	243.7	181.1	85.8	241.1	248.7	3223.6	567.6	259	18	266	126
1978	213.4	681.5	378.8	89.5	598.1	142	43.9	35.3	30	45.4	237	411	2558.9	681.5	209	39	95	388
1979	378	260	388	101	82.1	139	55	80	84.5	126	236	1893.9	388	84	1	128	125	
1980	625	495	366	276	186	108	25	221	84	235	122	349	2913	625	243	25	228	173
1981	209	377	397	187	133	171	89	187	101	18	282	331	2859	397	284	89	179	111
1982	227	430	509	222	138	243	98	15	25.7	98	374	287	2634.7	509	220	15	225	858
1983	189	408	168	243	404	388	249	24	79	236	166	824.6	2537.6	408	211	24	139	112
1984	347.4	488	294.8	236	418	170	46	117	29	124	276	655	2834.02261	488	224	28	182	858
1985	331	268	106	175.13	104	42.2	294	112	37	143	180.8	212	2095.828713	331	188	37	859	95
1986	270	484	281	88.3	225.8	84	55.4	91	73	60	178.8	119.9	1891.2	484	186	55	142	111
1987	287	199.6	189	181	187	235	42	79	122.8	114.4	299	356	2288.8	287	189	42	189	101
1988	182.2	328.8	95	188.4	62.1	7.2	53	18	27.6	175	189	893	2624.1	182.2	200	7	144	235
1989	225	271	53.7	38.5	184	186	20	47	168.4	200	84.8	444.2	1638.6	271	141	20	161	88
1990	454	368	217.4	115.1	284.5	833.5	163	85	108	375	281	358.2	3088.7	454	282	108	238	119
1991	235	228.8	288.1	62.2	62	207.8	78.2	60	82	185	252	18	189.2	235	180	68	142	96
1992	207.6	389.3	2412	356.3	227.9	280.3	58.9	242	148.1	118.863218	294.87210	252.71	2840.742584	389.3	237	59	248	95
1993	286	323.7	330.7	63.4	60.5	32.5	139.3	38	89	158.8	55.3	370.3	1893.5	330.7	163	33	145	120
1994	365.6	215.5	526.8	144.6	78	85.1	23.7	63	201	210	85	280	1817.7	365.6	182	17	156	106
1995	266	370	283	322.1	66.9	145.8	163.5	107	10	90.7	189.85	159.7	1860.85	370	188	18	138	107
1996	301.4	180.8	138.1	860.8	78.4	63.2	48.7	16.8	84.4	131.3	466.2	288.4	1868.5	466.2	84	17	135	130
1997	332	459.3	139.8	807.8	32.2	290.5	100.2	214	300	89.5	117.6	201.7	2008	459.3	167	21	113	131
1998	288.4	289.3	328.8	18	63.9	79.2	27.6	85.6	203.1	123.5	117.5	215.5	218.5	288.4	176	28	187	125
1999	212	195.9	383.9	402	171.8	224.8	82.2	6.5	84.4	85.7	312.9	258.6	2185.9	383.9	180	7	184	109
2000	248.8	217.1	245.5	76	55.7	241.8	63.5	18	415	77.8	212.4	231.7	1729.8	248.8	144	18	145	84
2001	280.11	236.5	89.9	819	189.8	87.2	134.9	38	25.7	43	180.7	114.5	1784	280.11	149	38	118	138
2002	389.8	311	141.8	142.4	189.5	83.8	32.8	70	63.8	221.6	40.9	834.6	1742	311	145	13	142	80
2003	232.5	298.5	314	69.4	88.3	82.1	3.6	87.1	112	114.4	82.6	384.3	1878.2	298.5	85	4	113	116
2004	179.3	104.5	251	188.4	289.8	53.2	19.1	16.8	88.4	128.4	131.4	388.8	1839.8	179.3	108	15	138	118
2005	431.4	281.9	179.6	191.9	272.3	186.2	0	8	216	141.5	127.3	203.1	184	431.4	85	6	153	113

Figure 15. Monthly table complete with identification of missing values

6.1.4. Generating graphics

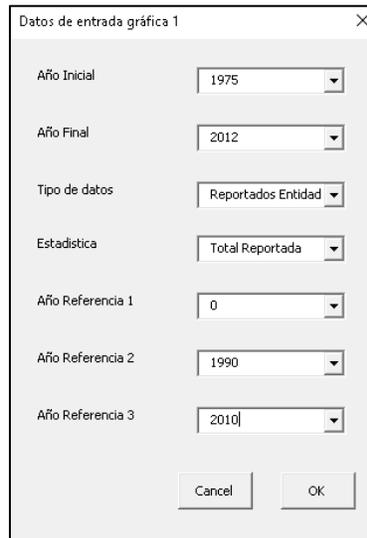
It is possible to generate graphics of annual, monthly and daily analysis. In the next steps, it is shown the creation of each one.

Annual Graphics

For the annual graphics, select the **PROCESAMIENTO ANNUAL spreadsheet**. The following graphics are the possible outcomes:

1. Annual statistical data: Graphic of precipitation annual statistics such as total, mean, maximum, minimum, median, standard deviation, etc.
2. Climate normal: Graphic of the three-decade average of precipitation per year. The user can change the number of years.
3. Exceedance with reference of a climate normal: Graphic of exceedance of each year climate normal with reference of a value defined by user.

For the first graphic, select the **Ingresar Datos de Entrada** button in the **Datos Estadísticos Anuales** section. The next window pop ups:



Field	Value
Año Inicial	1975
Año Final	2012
Tipo de datos	Reportados Entidad
Estadística	Total Reportada
Año Referencia 1	0
Año Referencia 2	1990
Año Referencia 3	2010

Figure 16. Calculate annual statistical data window

Define the initial and last year, the type of data, the type of statistic to be calculated, and three years of reference. It is possible to select only two years by putting zero in the **Año Referencia 1**. Press ok and the result is a plot like the one in Figure 17.

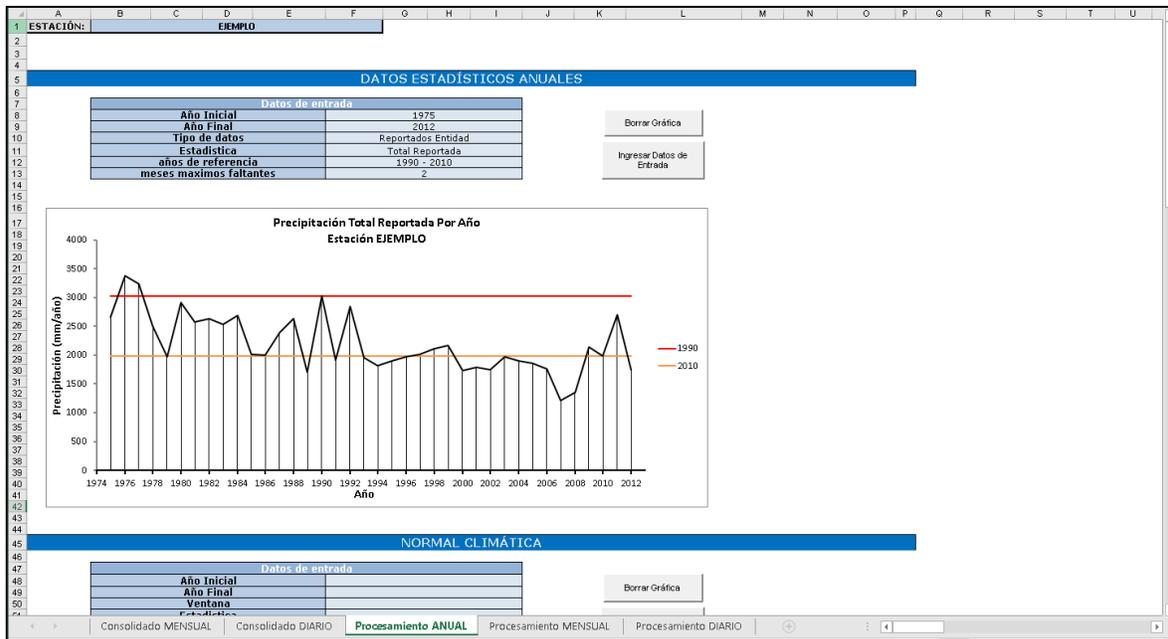


Figure 17. Annual statistical graphic

For the next graphic, select the **Ingresar Datos de Entrada** button in the **Normal Climática** section. The next window appears:

✕

Datos de entrada gráfica 2

Año Inicial

Año Final

Ancho de ventana (años)

Estadística

Año Referencia 1

Año Referencia 2

Año Referencia 3

* La celda con el valor de meses máximo vacíos debe estar llena

Figure 18. Calculate climate normal data window

Define the initial year, final year, the window of analysis that corresponds to the number of year to calculate the climate normal, the type of statistic, and three years of reference. It is possible to select only two years by putting zero in the **Año Referencia 1**. Press ok, if there is no enough past years to calculate the climate normal in a year between the initial and final year a warning pop ups. Continue by pressing ok and a graph like the one in Figure 19 is created.

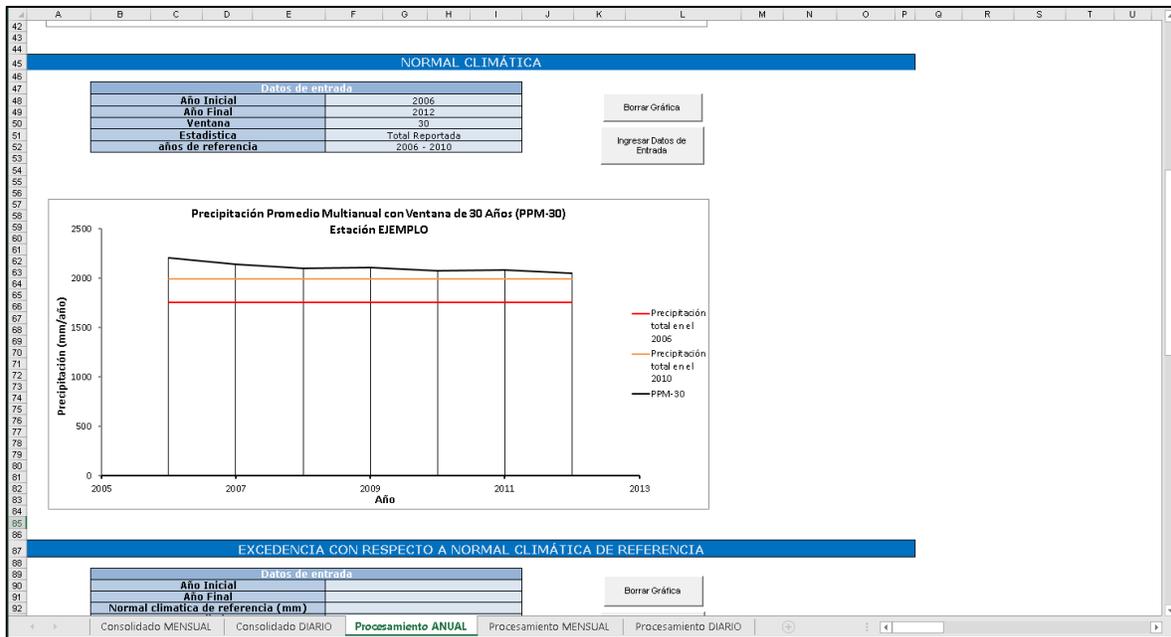


Figure 19. Climate normal graphic

Finally, for the last graph select the **Ingresar Datos de Entrada** button in the **Excedencia Con Respecto A Normal Climática De Referencia** section. The next window appears:

The 'Datos entrada gráfica 3' dialog box contains the following fields and values:

- Año Inicial: 2006
- Año Final: 2012
- Normal Climática (mm): 2077
- Estadística: Total Reportada
- Año Referencia 1: 0
- Año Referencia 2: 2006
- Año Referencia 3: 2011

Below the fields are two red asterisked notes:

- *Realice la gráfica 2 para obtener la normal del 2010 por defecto.
- * La celda con el valor de meses máximo vacíos debe estar llena

At the bottom are 'Cancel' and 'OK' buttons.

Figure 20. Calculate exceedance with reference of a climate normal data window

Define the initial year, final year, the climate normal which is used as reference, the type of statistic (the climate normal defined by the user should be congruent with the type of statistic select), and three years of reference. It is possible to select only two years by putting zero in the **Año Referencia 1**. Press ok and a graph like the one in Figure 21 is created.

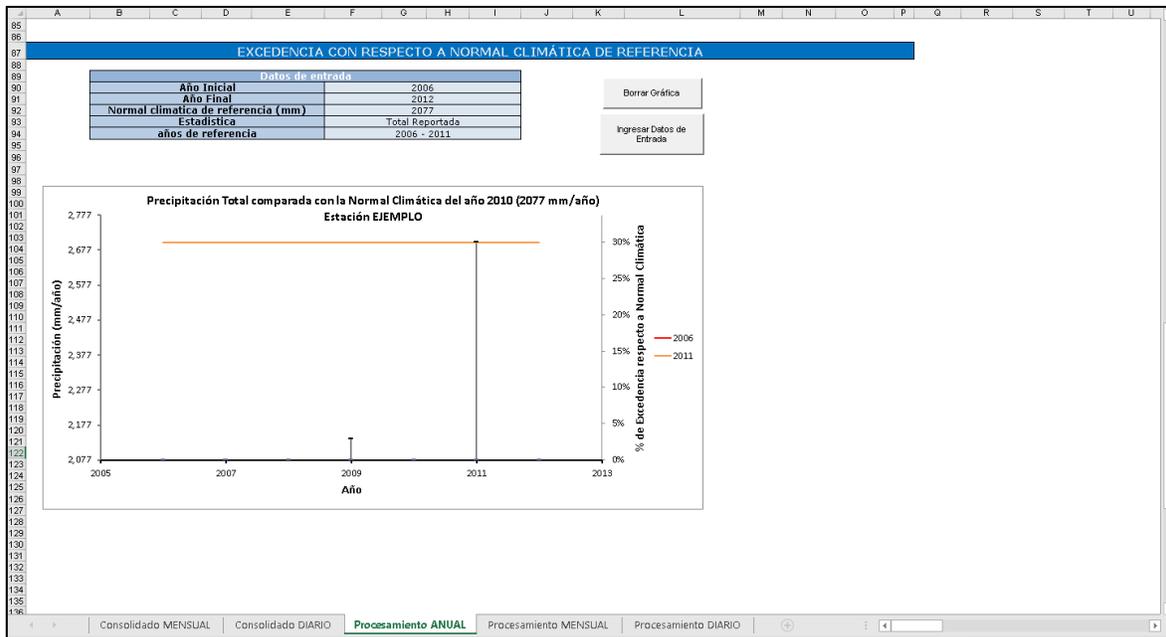


Figure 21. Exceedance with climate normal as reference graphic

Monthly Graphics

For the monthly graphics, select the **PROCESAMIENTO MENSUAL** spreadsheet. The following graphics are the possible outcomes:

1. Monthly mean multiannual statistical data: Graphic of mean multiannual precipitation statistics such as total, mean, maximum, minimum, median, standard deviation, etc.
2. Box-Whiskers of monthly statistical data: Box-Whiskers plot of the monthly statistical data.
3. Historical maximum value: It shows the maximum value of monthly precipitation.
4. Monthly precipitation compared by a threshold: Shows the precipitation values of months with overpassed a defined threshold.
5. Number of months per years that exceeds a defined threshold.

For the first two graphs, select the **Ingresar Datos de Entrada** button in the **Datos Estadísticos Mensuales** section. The next window pop ups:

Datos de entrada graficas 4 y 5

Año Inicial: 1975 Mes: 1

Año Final: 2012 Mes: 12

Tipo de datos: Reportados Entidad

Estadística: Media

Año Referencia 1: 0

Año Referencia 2: 2000

Año Referencia 3: 2010

Figure 22. Calculate monthly mean multiannual statistical data

Define the initial year and month, the final year and month, the type of data, the type of statistic to be calculated, and three years of reference. It is possible to select only two years by putting zero in the **Año Referencia 1**. Press ok and the results are two plots as shown in Figure 23.

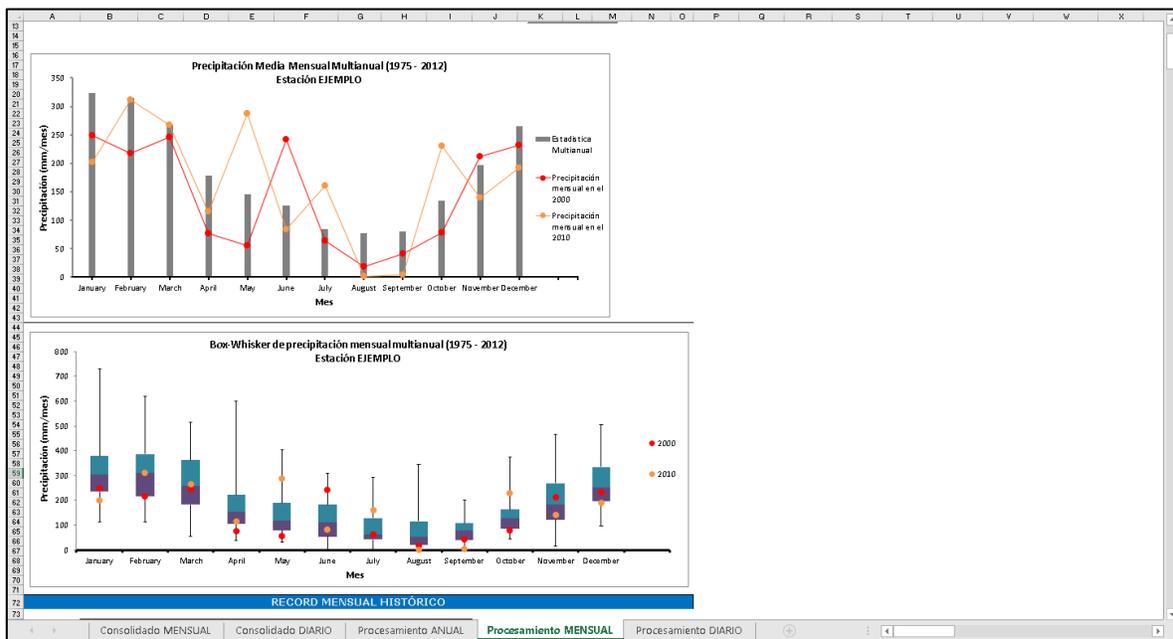


Figure 23. Monthly mean multiannual statistical and Box-Whiskers graphic

For the next three graphs, select the **Ingresar Datos de Entrada** button in the **Record Mensual Histórico** section. The next window shows:

Figure 24. Calculate maximum data and values overpassing certain threshold

Define the initial year and month, the final year and month and the threshold for selecting months. Press ok and the results are three plots as shown in Figure 25.

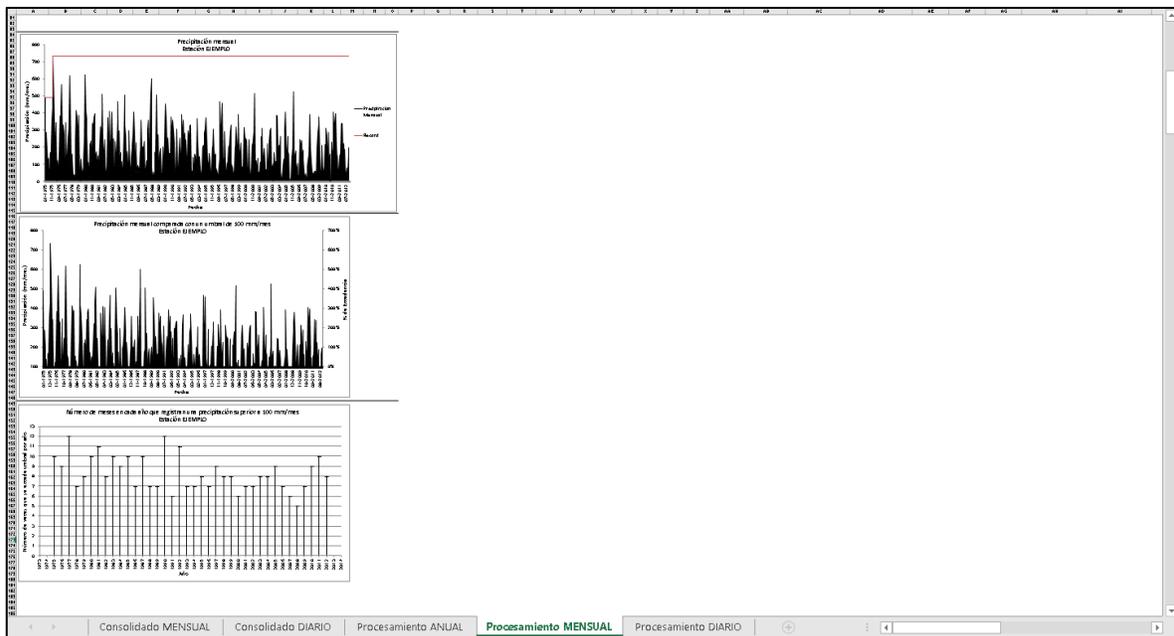


Figure 25. Monthly maximum value and overpassing threshold graphics

Daily Graphics

For the daily graphics, select the **PROCESAMIENTO DIARIO spreadsheet**. The following graphics are the possible outcomes:

1. Aggregated precipitation: Graphic of aggregated precipitation of a number of past days defined by the user per day.
2. Aggregated precipitation compared by a threshold value.
3. Number of continuous days, which have exceeded a threshold value of aggregated precipitation.

For all the graphs, select the **Ingresar Datos de Entrada** button in the **Lluvia Antecedente En El Tiempo** section. The next window is shown:

The dialog box 'UserForm1' contains the following fields and controls:

- Año Inicial:** Dropdown menu with value '2000'.
- Mes:** Dropdown menu with value '1'.
- Día:** Dropdown menu with value '1'.
- Año Final:** Dropdown menu with value '2012'.
- Mes:** Dropdown menu with value '12'.
- Día:** Dropdown menu with value '31'.
- Ancho de ventana (días):** Text input field with value '25'.
- Umbral (mm):** Text input field with value '200'.
- Alerta Amarilla:** Text input field with value '50'.
- Alerta Naranja:** Text input field with value '100'.
- Alerta Roja:** Text input field with value '200'.
- Buttons:** 'Cancel' and 'OK' buttons.

Figure 26. Daily analysis window

Define the initial and final year, month and day, the window of analysis that corresponds to the number of previous days for aggregate the data, the threshold for selecting days, and the “Alertas” that correspond to reference lines. Press ok and the results are three plots as shown in Figure 27.

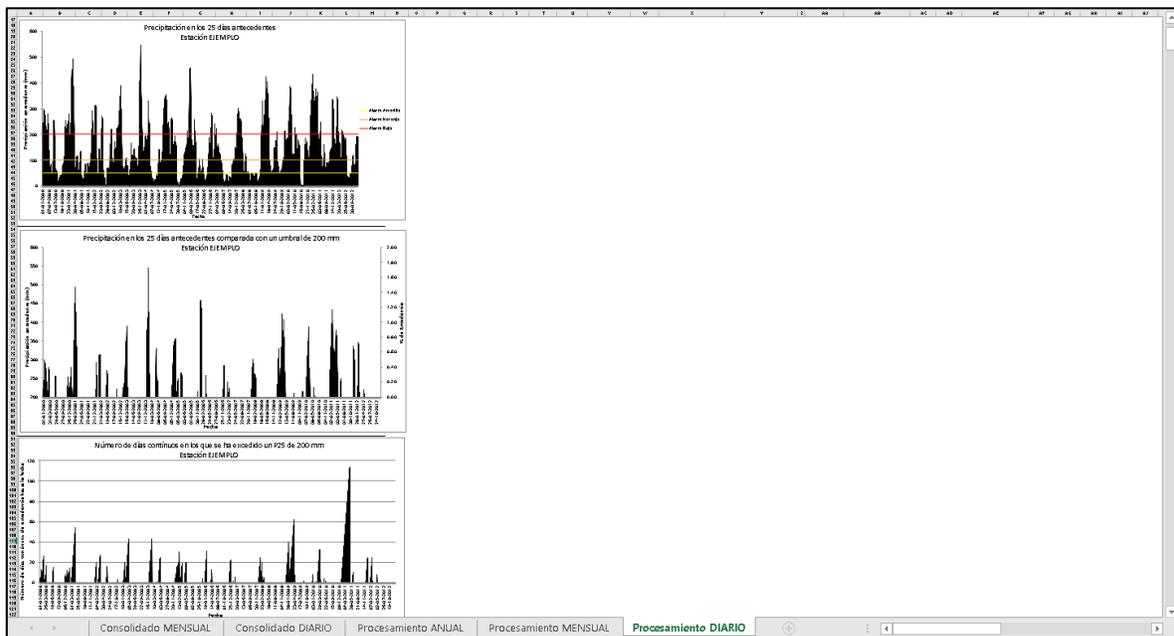


Figure 27. Daily graphics

6.1.5. Generating the word document

After creating all the annual, monthly and daily graphics select the button **Crear Word** in the **Consolidado MENSUAL spreadsheet**. The word document is saved in \User\Documents.

Chapter 7

Software limitations

7.1. Software limitations

The most important limitations of the software are listed below:

- The software only admits precipitation data in the period between **1960 and 2025**.
- The software **does not** complete missing data. However, it makes a completeness analysis to verify if the data is valid and congruent according to a threshold of missing values, which is defined by the user.
- The software is only available in Spanish.

Chapter 8

Problems and errors

8.1. Problems and errors

Not identified at the time of creation of this manual.

Chapter 9

References

9.1. References

Chow, V.-T., D. R. Maidment, et al. (1994). Applied hydrology, McGraw-Hill Science Engineering.