GRANADA UNIVERSITY (UGR)

Geophysics Andalusian Institute

THEORETICAL PHYSICS AND THE COSMOS DEPARTMENT

ANDALUSIAN INSTITUTE OF GEOPHYSICS AND PREVENTION OF SEISMIC DISASTERS

"Download Seismic Records from the FDSN network"

(Sistema para Descargar Registros sísmicos de la red mundial FDSN)

USER MANUAL: VERSION 1.0

Author:

Ligdamis A. Gutiérrez E. PhD.

Masaya Volcano, Nicaragua
Photo by: Ligdamis A. Gutiérrez E.

Granada, Spain 2021- 2023

General Index

Back to Index

1.- Introduction.

The "*Download Seismic Records from the FDSN network (Sistema para descargar registros sísmicos de la red mundial FDSN)*" It provides a user-friendly interface that allows for easy and efficient management of seismic data downloads from the global FDSN (Federation of Digital Seismograph Networks). These processes offer a reliable automated tool that assists operators in downloading tectonic or volcanic seismic data. Once downloaded, specific spectral analyses can be performed on the seismic signals using the software or modules that complement this system.

The application, through its built-in libraries, allows the download of seismic records and stations using two available domain methods: the circular domain method and the rectangular domain method. In the circular domain method, a central point (given by latitude and longitude) is defined, and a minimum and maximum radius from that point is established in degrees. For the rectangular domain method, a rectangle is defined by the latitude and longitude limits specified by the user.

The first version of this system consists of a single interface, which also includes a small global database of **431** volcanoes (***Worldwide Volcanoes List***). This list is useful for selecting the volcano from which data needs to be downloaded (the complete list is available in Appendix C of this document and can be printed if required). The main interface is available in English. However, documentation, such as this document, is available in Spanish. Information on the folder structure and contents can be found in the appendices. The system also allows for the storage of records in MSEED format, as well as station data in XML format, in folders or directories designated by the user.

The module and the entire system have been developed in Python, version 3.8.6. (The set of libraries is compatible with version 3.10.10). Additionally, a series of open-access libraries are included, which, in conjunction with Python, enable the use of graphical and analytical tools, providing ease of use and enhancing computational power for the user. Some of the main elements and libraries used are listed below:

- **Matplotlib**: Used for creating static, animated, and interactive visualizations in Python. (https://matplotlib.org/stable/users/index.html).
- **NumPy**: A library for numerical operations in Python. (https://numpy.org/doc/stable/user/quickstart.html).
- **PyQt5**: A tool that links with the graphical library Qt5 in C++ (https://pypi.org/project/PyQt5/).
- **Obspy**: A Python toolbox for seismology. (https://docs.obspy.org/).
- **Tkinter**: Graphical User Interface (GUI) (https://docs.python.org/3/library/tkinter.html)

Another key feature of the system is its definition as a cross-platform application, meaning it can operate on various platforms or operating systems, such as Windows (7, 8, 10, 11) in both 32-bit and 64-bit versions. It also supports Linux systems, such as Ubuntu and other similar systems (Debian, Red Hat, Fedora, SUSE, etc.), macOS, and Android for tablets and mobile devices (with Python appropriately adapted for these devices).

NOTE: In the appendices of this document (*as well as in the Readme.txt and Initial_requirements.txt files*), you can find general information on installation for Windows and Linux systems, as well as guidelines for installing the main programs and additional libraries required by Python to properly execute the developed programs in its environment.

Back to Index

2.- Initial Screen of the System

In the appendices of this document and in the "**README.txt**" file included in the "***Documents***" folder, you will find instructions for installing the system on Windows (*the process on Linux systems is similar*). Essentially, you need to perform two actions:

a) Copy the "Set_tools_System_1_1" folder to "My Documents" on Windows.
b) Copy the "Set_tools_System_1_1.bat" file to the Windows desktop.

Additionally, there are instructions for installing the necessary Python libraries on the system. Once "Set_tools_System_1_1.bat" has been copied to the desktop, you need to right-click on it and select "Run as administrator."

Fig. 1 Popup Window when Right-Clicking on the "Set_tools_System_1_1.bat" File

In the window that opens, click the "Yes" button when prompted with "*Do you want to allow this app to make changes to your computer*?" This is a warning message. However, the application does not make any changes, so you should trust its execution.

Upon clicking "*Yes*," the following command window opens, welcoming you to the system.

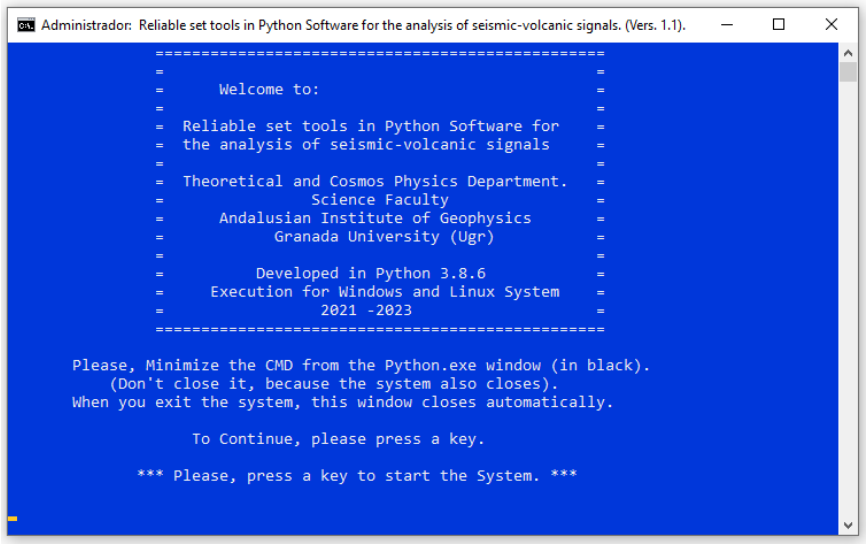


Fig. 2 Welcome Screen and Instructions for Loading the System.

After reading the information in the window, you simply need to press any key to access the system's initial screen. The folder should already be copied to "***My Documents***," and the "**Set_tools_System_1_1.bat**" file contains all the loading instructions.

The system's initial screen is "**Menu.py**". It appears when any key is pressed on the Welcome screen. Additionally, the Python command window or console is displayed, similar to the following

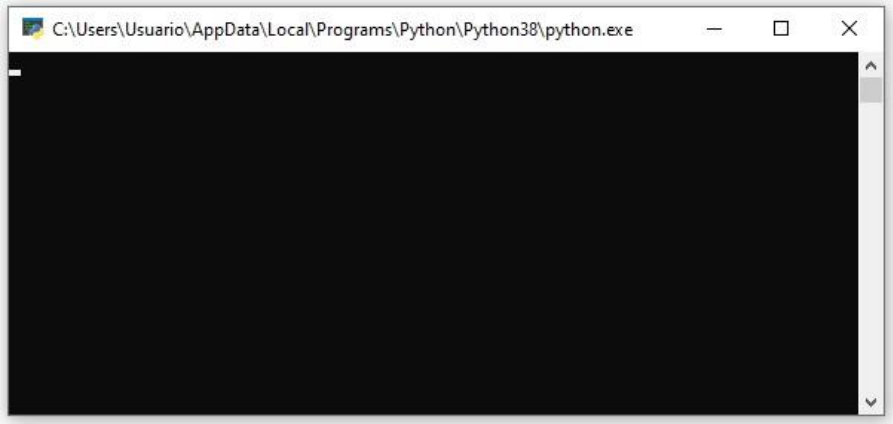


Fig. 3 Python Console (CMD) Window (*Should be minimized*)

To avoid obstructing the view, you can and should "minimize" this screen. Do **not** close it, as this would also close the system's startup window. Once you have finished working with the system, this window will close automatically. The initial presentation screen of the system (the module menu) "**Menu.py**" is as follows:

NOTE: When pressing or clicking on a module button, the startup window will close and the module window will open (*this may take a little time depending on the PC's memory. It is recommended to have at least 8 GB of memory in the system, with 16 GB being ideal*)

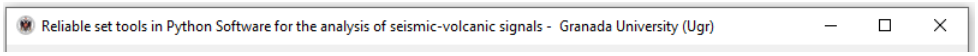
Fig. 4 **Main Menu Screen.** The module to be worked on is highlighted. Module 9 (*Download record from the FDSN*).

2.1.- Elements of the Initial Screen.

As observed in the previous figure, the initial or presentation screen is a simple window composed of:

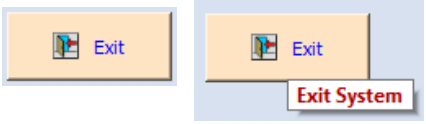
a) A top toolbar with basic information about the module.
b) On the left side, there are 10 execution buttons or command buttons for each module of the system.
c) At the bottom, there is a command button that allows for exiting the system.
d) Additionally, it features a background image representing a volcano (Masaya in Nicaragua), and three images with the logos of the University of Granada, the Andalusian Institute of Geophysics, and the Department of Theoretical and Cosmic Physics.

a) At the top, the icon of the University is visible, along with the module title and a reference to the University of Granada (UGR).



b) On the left side, there are 10 execution buttons or command buttons for each module of the system. When the mouse pointer is placed over each button, it is highlighted in white to indicate that it is being selected. Clicking on a button closes the startup menu window and opens the window for the indicated module (this may take a little time depending on the PC's memory).

c) At the bottom, there is a command button: **Exit**. When the mouse pointer is placed over each button, a text appears indicating the action of that button (Exit System, Start System).



If you click the "Exit" button, a window will appear asking the user if they are sure they want to leave the system.

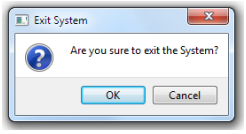


Fig. 5 Text Box Indicating Whether You Want to Exit the System.

If you click "**OK**," the screen will close and the system will exit. If you click "Cancel," you will remain on the initial screen.

3.- Main Interface of the Record and Station Download System.

The "***main screen of the download system***" is the module's primary interface, where the activities comprising the download tools (***circular or rectangular domain***) are performed, as well as the input parameters for the records and the global list of volcanoes. This global list can be used to select a specific volcano, or it can be omitted. In that case, the coordinates of a seismic event that occurred at a specific time (tectonic or volcanic earthquake) can be selected, and the download can proceed without using the list. Additionally, the size of the records to be downloaded can be set; these are defined as records of one or twenty-four hours in duration. In the case of the circular domain, the desired start time is set, and data will be obtained from 10 minutes before the event to one hour after the event, thus defining the time limits of the waveform. As for the rectangular domain, the limits are defined by the start and end times specified by the user. The interface is composed of the following parts (*See Fig. 6*):

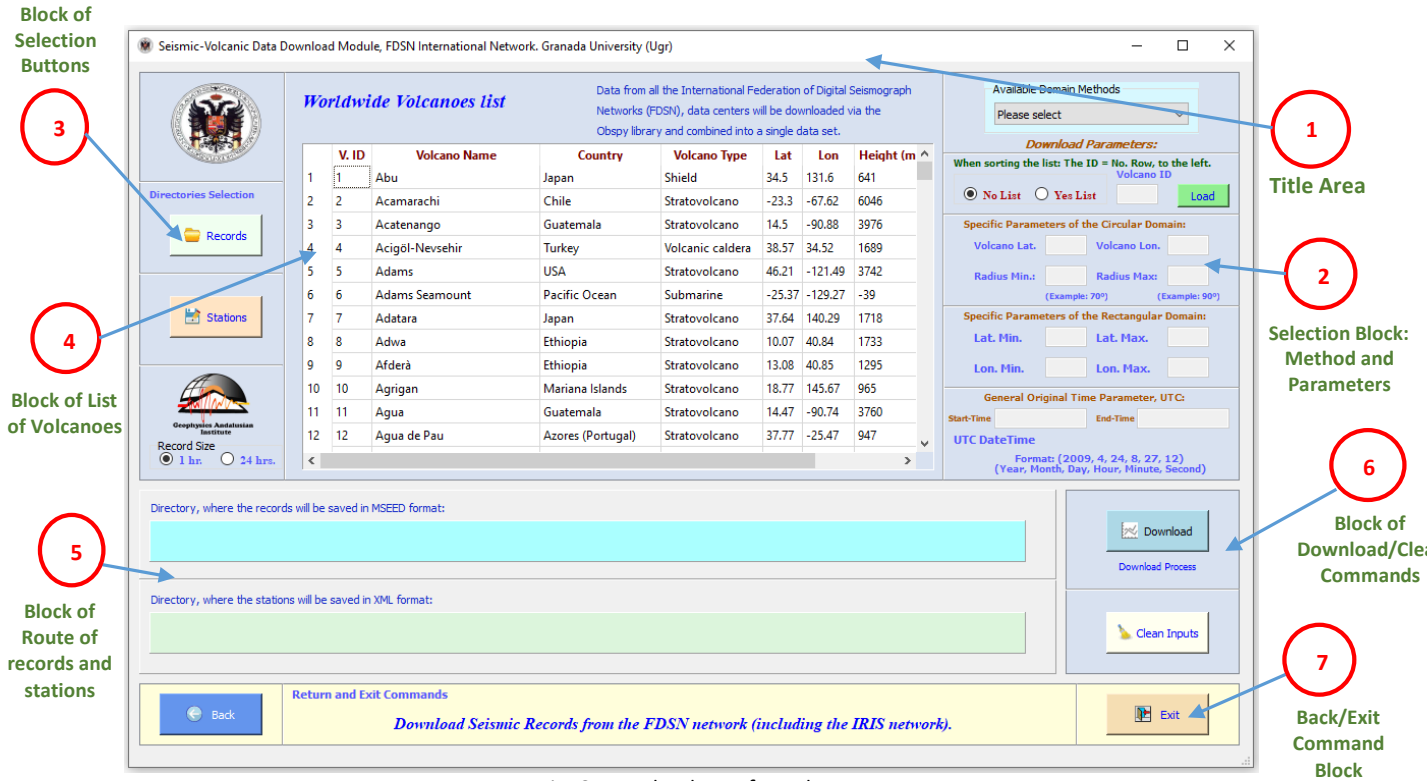
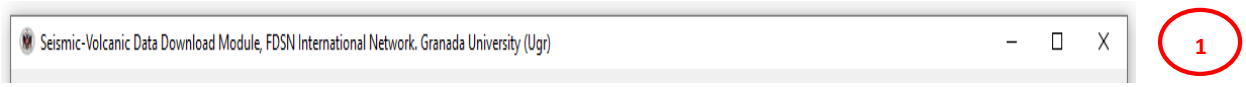


Fig. 6 Download Interface Elements.

1) Title Area: Name of the Program and the University.
2) Selection Block: Method and Parameters:
    a) Available methods: 1) Circular Domain, 2) Rectangular Domain,
    b) Download parameters: Selecting and loading a volcano using its ID from the list.
    c) Parameters for specifying the circular domain.
    d) Parameters for specifying the rectangular domain.
    e) Parameters for specifying the original time (Start/End).
3) Selection Button Block:
    a) Command button for selecting the path where the downloaded data will be stored.
    b) Command button for selecting the path where the stations will be stored.
4) Volcano List Block (Worldwide Volcanoes List): Database composed of 431 volcanoes.
5) Records and Stations Path Block: Path of the directories where the data and stations to be downloaded will be stored.
6) Download/Clear Command Block: Command buttons (*Download / Clear Inputs*).
7) Go Back/Exit Command Block: Command buttons (*Go Back, Exit*).

3.1.- Elements of the Download screen.

The previous screen consists of several elements for its use. At the top, you will see: the program name, the icon and name of the University, and the author as the title. (1).



The elements that make up the main screen are detailed below.

In conjunction with number (1), the 6 elements of the initial download interface screen have been distributed, highlighted in six main blocks that are listed from (2-7) in the red circles (Cf. Fig. 6). Now, let's distinguish each of them.

3.1.1.- Selection Block: Method and Parameters. (2)

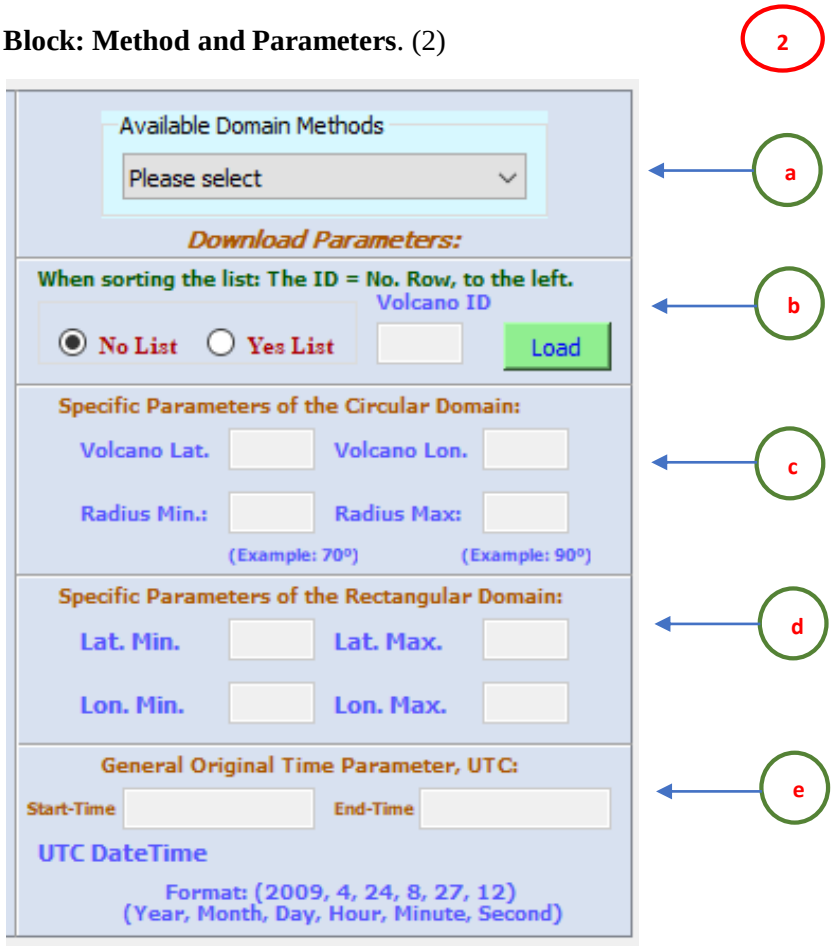


Fig. 7 Selection block: Method and Parameters. In the green circles: a) Available download methods (Circular and Rectangular), b) Download parameters: Selection and loading of a volcano using the list ID, c) Parameters to specify the circular domain, d) Parameters to specify the rectangular domain, e) Parameters to specify the original time (Start/end).

This block is configured (green circles in the previous figure) by the input parameters for the download. The elements are as follows:

a) **Available Download Methods** (***Circular and Rectangular***): This option allows you to select the method you wish to use to download the seismic records. Circular or Rectangular.

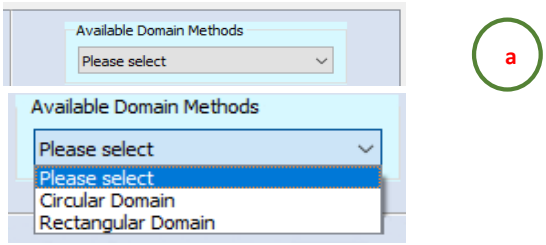
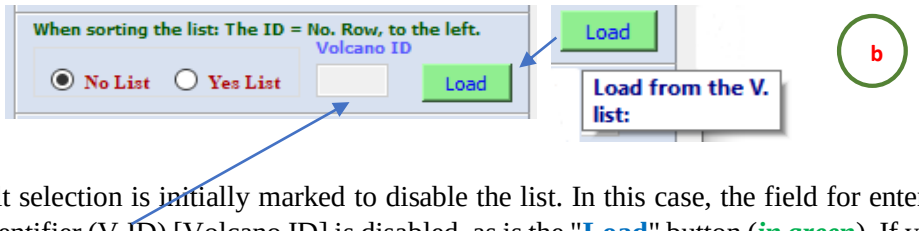


Fig. 8 Selection of download domain method.

In the circular domain, a central point (given in latitude and longitude) is defined, and a minimum and maximum radius from that point is established in degrees. For the rectangular domain, a rectangle is defined by the latitude and longitude limits specified by the user. The download parameters are:

b) **Selecting and loading a volcano using its ID from the list.** This option only works for the circular domain (***if the rectangular domain is selected, the values are irrelevant***) and allows you to specify whether to use data from the available global list of 431 volcanoes. Furthermore, you must first select the domain and then click to use the list (in that order).



The default selection is initially marked to disable the list. In this case, the field for entering the volcano identifier (V.ID) [Volcano ID] is disabled, as is the "**Load**" button (***in green***). If you wish to use the list, select "Yes List" by clicking the circle. This will activate the field for entering the list and the "**Load**" button. For example, if you want to use the "**Hunga Tonga with ID = 152**" volcano setting, click "Yes List", type the value 152 in the text box and click the "Load" button.

. The result is as follows:

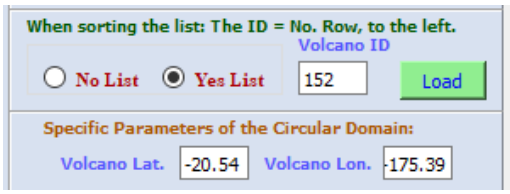
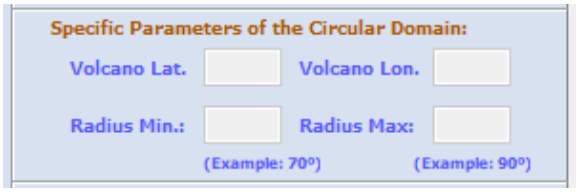


Fig. 9 Elements of the download by means of a list in the circular domain.

The geographical coordinates "**latitude and longitude**" of the "Hunga Tonga" volcano, number 152 in the list, are automatically placed in the parameters of the circular domain.

IMPORTANT NOTE: The database listing can be sorted according to the header parameters (see Section 3.1.3). For example, by volcano ID, country, volcano name (***default***), latitude, longitude, or altitude. However, when sorting by one of these parameters, the leftmost parameter must always be used as the identifier, as shown in Figure 9.

c) **Parameters for specifying the circular domain:** When selecting the circular domain download method, the parameters established in the designated area must be set, which is as follows:



In this area, the data entry fields are initially disabled by default. They will only be activated when you select option (a) to work with this domain. As previously mentioned, a circular domain involves defining a central point (given by latitude and longitude) and establishing a minimum and maximum radius from that point in degrees. This central point can be defined or not using the list shown earlier. If you wish to work with an independent tectonic earthquake, the list is not needed, or if the volcano or area to be studied is not included in it. Simply enter the desired latitude and longitude, as well as the minimum and maximum radius in degrees from that point. An example of the parameter inputs in this domain is shown below.

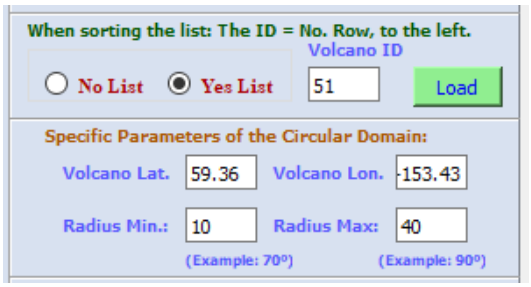


Fig. 10 Example of download parameters using a list in the circular domain.

The figure above shows that the volcano with ID number 51 on the list, corresponding to "**Augustine**," has been selected. In this example, the minimum and maximum radii have been arbitrarily set at 10 and 40 degrees, respectively.

d) **Parameters for specifying the rectangular domain:** When the rectangular domain method is selected in step (a), the text boxes in this area are activated.

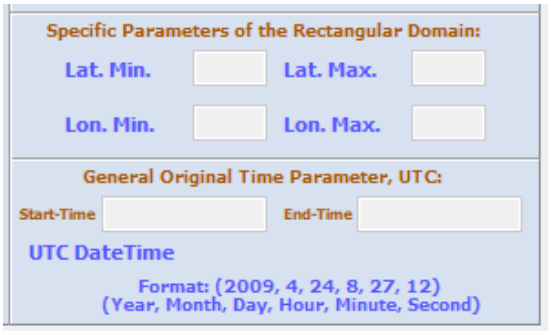


Fig. 11 Elements of the download by means of a list in the rectangular domain.

As mentioned, the rectangular domain establishes a rectangle defined by latitude and longitude limits, as well as the user-defined start and end times. This method does not require a list of volcanoes, but such a list can be useful as a reference for geographic parameters, showing the location of the volcanoes.

By activating the minimum and maximum latitude and longitude fields, the user determines which areas will be included in the data download, selecting the start and end times when the events occurred. An arbitrary example of this is shown in the following image.

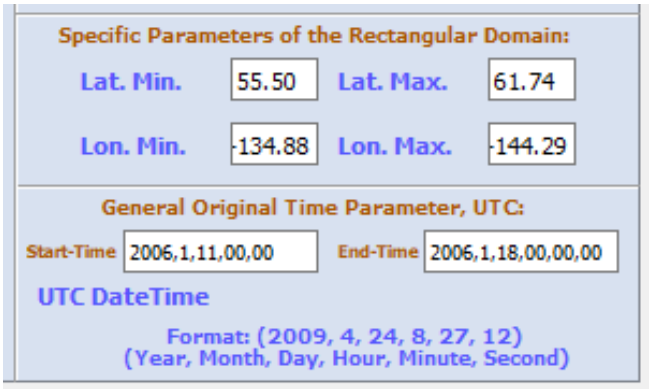


Fig. 11 Example of download parameters using a list in the rectangular domain.

3.1.2. Selection button block (3)

This block consists of the following elements:

a) **Records command button:** To set the path where the "***Records***" data will be stored**.**
b) **Stations command button:** To set the path where the "***Stations***" stations will be stored.
c) **Record size radio buttons:** To set the size of the records to download (***1 and 24 hours***).

Fig. 12 Button selection block.

IMPORTANT NOTE: It is recommended that these be the first two steps in the download process. First, determine where you want to store the records. Clicking either the "Records" or "Stations" button will select the folder or directory where the downloaded data and stations will be stored, respectively. This will appear in the Records and Stations Path area (block 5, shown below). The next step is to select, by clicking, whether you want to download one-hour or twenty-four-hour records for later analysis.

a) **Records Command Button**: This is the button for selecting the directory where the downloaded data will be stored in "**MSEED**" format. Hovering over the button displays text indicating its purpose.

Clicking on this button opens a window to select the folder or directory where the path to save the data will be set, which will be displayed in the log path (See Block 5).

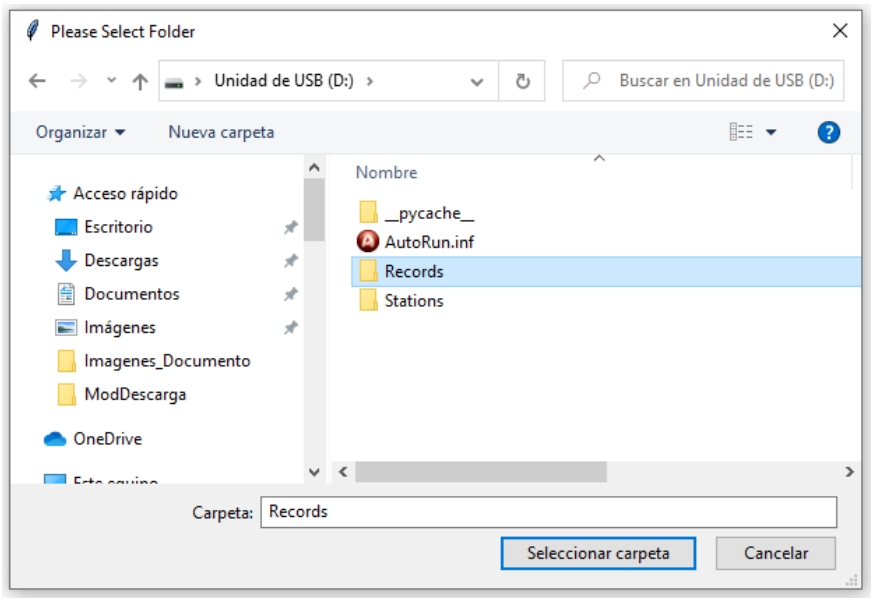
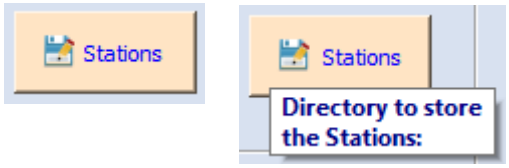


Fig. 13 Select the "Records" folder, where the records will be stored in "**MSEED**" format

In the image above, as an example, a folder called "Records" has been selected and created on an external USB drive, where the records will be stored. The user can assign any drive and create folders to store or save the downloaded records.

b) **Stations Command Button:** This command button is used to select the directory or folder where the stations will be stored in XML format, corresponding to the download data. Hovering the cursor over the button displays text indicating its purpose.



Clicking this button opens a window to select the folder or directory where the data for the stations will be saved. This path will be displayed in the log file (see Block 5). It is advisable to place both the data and station folders in the same location for a single download. The window that opens for selecting stations is shown in the following image as an example.

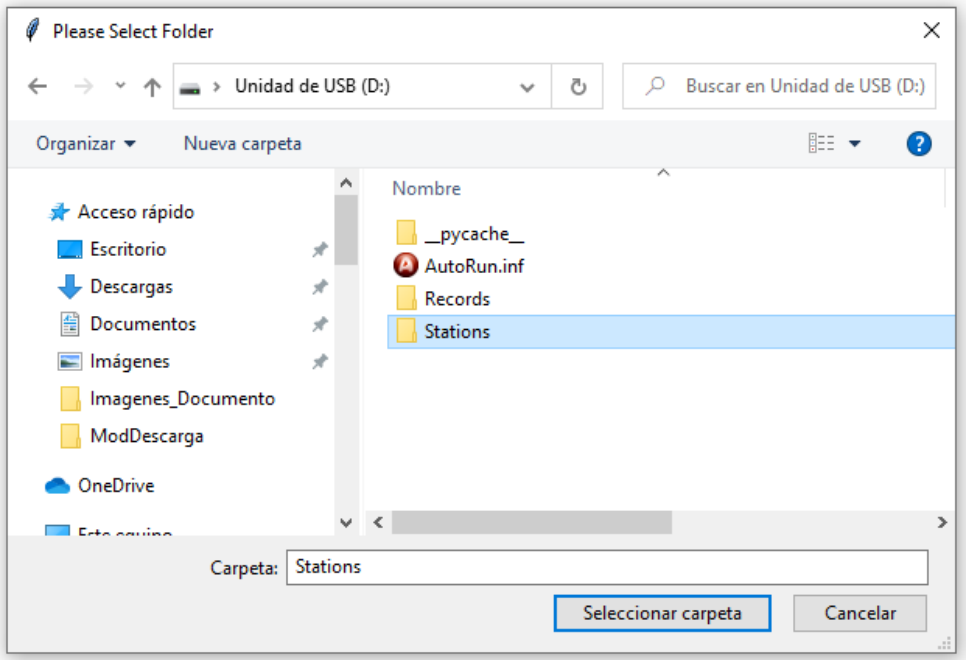


Fig. 14 Selection of the "Stations" folder, where the stations will be stored in "XML" format corresponding to the records.

In the image above, as an example, a folder called "Stations" has been selected and created on an external USB drive where the stations, in "XML" format, corresponding to the logs, will be stored. The user can thus assign any drive and create folders where they wish to store or save the downloaded logs.

c) **Record size radio buttons**: This option allows you to choose the size of the records you wish to download. They are available in one-hour and twenty-four-hour durations.

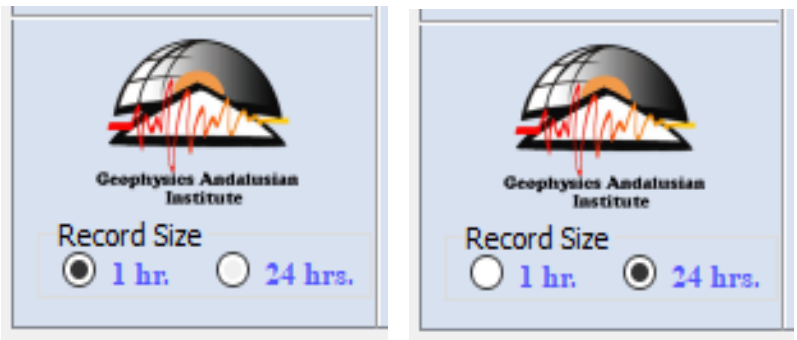


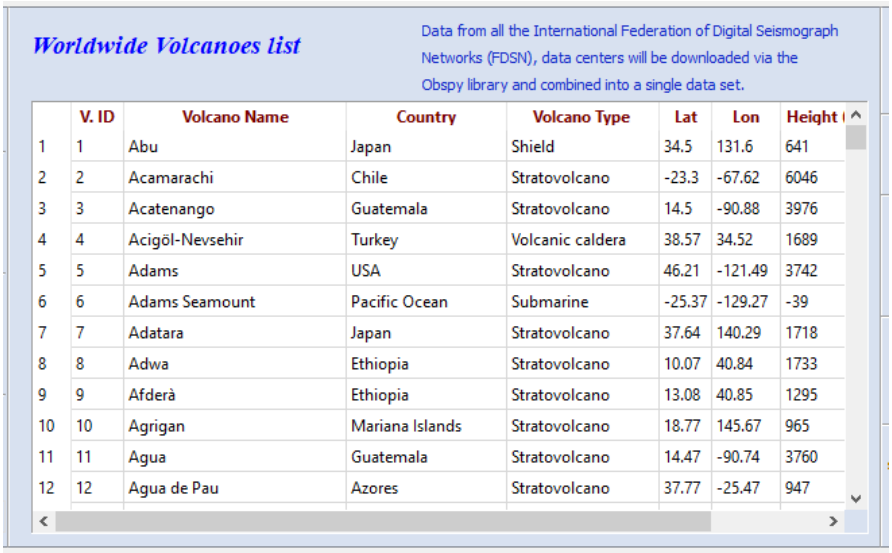
Fig. 15 Select the size of the records to download; ***1 and 24 hours***.

By clicking the radio buttons that indicate the time, you can choose between downloading one-hour or twenty-four-hour logs. This option must be selected after designating the data download directories and stations, the step described previously. By default, the shorter, one-hour log size is selected initially; the user decides the size of the logs they need to download.

3.1.3. Volcano list block (4)

4

This section comprises a predefined list that forms a small global database of 431 volcanoes. This list is shown in the following image.



Worldwide Volcanoes list

Data from all the International Federation of Digital Seismograph Networks (FDSN), data centers will be downloaded via the Obspy library and combined into a single data set.

	V. ID	Volcano Name	Country	Volcano Type	Lat	Lon	Height
1	1	Abu	Japan	Shield	34.5	131.6	641
2	2	Acamarachi	Chile	Stratovolcano	-23.3	-67.62	6046
3	3	Acatenango	Guatemala	Stratovolcano	14.5	-90.88	3976
4	4	Acigöl-Nevsehir	Turkey	Volcanic caldera	38.57	34.52	1689
5	5	Adams	USA	Stratovolcano	46.21	-121.49	3742
6	6	Adams Seamount	Pacific Ocean	Submarine	-25.37	-129.27	-39
7	7	Adatara	Japan	Stratovolcano	37.64	140.29	1718
8	8	Adwa	Ethiopia	Stratovolcano	10.07	40.84	1733
9	9	Afderà	Ethiopia	Stratovolcano	13.08	40.85	1295
10	10	Agrigan	Mariana Islands	Stratovolcano	18.77	145.67	965
11	11	Agua	Guatemala	Stratovolcano	14.47	-90.74	3760
12	12	Agua de Pau	Azores	Stratovolcano	37.77	-25.47	947

Fig. 16 Volcano list block.

The complete list is also available at the end of this document, in "***Appendix C***", for printing if needed. As shown in the previous figure, the header labels, which indicate the column names or titles, are located at the top and are shown in the following figure:

	V. ID	Volcano Name	Country	Volcano Type	Lat	Lon	Height
1	2	3	4	5	6	7	8

Where the headings indicate the following:

1) Primary Identifier Number Field (Empty): Determines the table's Identifier column. Initially, it matches the V.ID field. It is used when the list is sorted to select the volcano in the circular domain.
2) V.ID (Volcano ID): Determines the volcano's identifier; it can be used in the initial listing of circular domain parameters (if the list is sorted by any other parameter, this identifier changes. Use the ID from the table, the leftmost number in the listing).
3) Volcano Name: Indicates the name of the volcano.
4) Country: Indicate the country where the volcano is located in the list.
5) Volcano Type: Indicates the type of volcano.
6) Lat (Latitude): Determines the geographical latitude where the volcano is located.
7) Lon (longitude): Determines the geographical longitude where the volcano is located.
8) Height (m) (Height in meters): Indicates the height in meters of the volcano in the list.

For easier navigation, the list can be sorted by headers (by default, it is sorted by Name). Clicking on a specific area of the header will highlight the corresponding cell or area, allowing you to sort the entire list in ascending or descending order. This way, you can sort the list by: ID, Name, Country, Type, Latitude, Longitude, or Altitude. An example of this is shown in the following images.

As an example, the list will be sorted based on the "Country" field

Clicking in that area sorts the entire list in descending order "^" by the selected field. This is shown in the following image.

	V. ID	Volcano Name	Country	Volcano Type	Lat	Lon	Height
1	114	Erebus	Antarctica	Stratovolcano	-77.5	167.2	3794
2	93	Copahue	Argentina	Stratovolcano	-37.85	-71.17	2965
3	147	Heard	Australia	Stratovolcano	-53.1	73.5	2745
4	243	McDonald Islands	Australia	Volcanic complex	-53.03	72.6	230
5	270	Newer Volcanics Province	Australia	Shield	-37.77	142.5	1011
6	402	Undara	Australia	Shield	-18.25	144.75	1020
7	12	Agua de Pau	Azores	Stratovolcano	37.77	-25.47	947
8	126	Furnas	Azores (Portugal)	Stratovolcano	37.76	-25.33	805
9	138	Graciosa	Azores(Portugal)	Stratovolcano	39.02	-27.97	402
10	75	Cameroon Mount	Cameroon	Stratovolcano	4.2	9.17	4095
11	282	Oku Volcanic Field	Cameroon	Stratovolcano	6.25	10.5	3011
12	120	Fogo	Cape Verde Islands	Stratovolcano	14.95	-24.35	2829

Fig. 17 Sort the list in ascending order based on the "Country" field.

IMPORTANT NOTE: *In the figure above, when the list is sorted, the first column now displays the table identifier and does not match the volcano ID. This is indicated in the interface (when sorting the list, the first value in the leftmost column is taken as the primary identifier), which is the one that must be entered to load the list into the download using the circular domain.*

Therefore, in Figure 16 at the beginning, the identifier "**12**" in the table (***which matches the V.ID***) indicates that it is the "**Agua de Pau**" volcano in the Azores. Taking the latitude and longitude parameters in the circular domain, the values obtained will be 37.77 and -25.47. However, when sorting the list in ascending order "^", the identifier 12, as seen in Figure 17, now corresponds to the "**Fogo**" volcano in the Cape Verde Islands (***which does not match the volcano's V.ID, which is 120***). Therefore, the latitude and longitude parameters to take will now be 14.95 and -24.35, respectively. The same will happen if the list is sorted in descending order "V", as can be seen in the following image.

	V. ID	Volcano Name	Country	Volcano Type	Lat	Lon	Height
1	32	Ambrym	Vanuatu	Shield	-16.25	168.12	1334
2	34	Aneityum	Vanuatu	Stratovolcano	-20.2	169.78	852
3	37	Aoba	Vanuatu	Shield	-15.4	167.83	1496
4	109	East Epi	Vanuatu	Volcanic caldera	-16.7	168.4	-34
5	134	Gaua	Vanuatu	Stratovolcano	-14.27	167.5	797
6	209	Kuwae	Vanuatu	Volcanic caldera	-16.83	168.54	-2
7	228	Lopevi	Vanuatu	Stratovolcano	-16.51	168.35	1413
8	390	Traitor's Head	Vanuatu	Stratovolcano	-18.75	169.23	1881
9	426	Yasur	Vanuatu	Stratovolcano	-19.53	169.44	361
10	5	Adams	USA	Stratovolcano	46.21	-121.49	3742
11	23	Akutan	USA	Stratovolcano	54.13	-165.99	1303
12	35	Aniakchak	USA	Volcanic caldera	56.88	-158.17	1341

Fig. 18 Sort the list in descending order based on the "Country" field.

In the figure above, when sorted in descending order, identifier field 12 corresponds to the "Aniakchak" volcano in the USA (where its volcano identifier, V.ID, is 35). Therefore, the latitude and longitude coordinates to be used in the circular domain are 56.88 and -158.17, respectively. These are the coordinates that will be entered in the parameter fields when selecting the circular domain, not the volcano's coordinates. Therefore, care must be taken when making the selection while sorting the table, because otherwise, the wrong coordinates will be set if the V.ID field is selected instead of using the table ID, which is the primary ID (first column on the left).

3.1.4.- Record and station routing block (5)

5

This block indicates the areas where both the records and the stations will be stored.

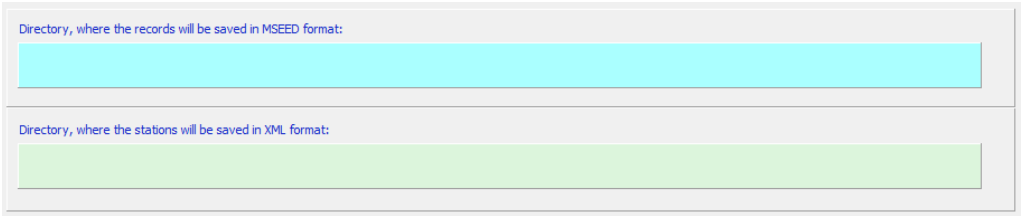


Fig. 19 Record and Station Path Block: This block consists of: a) The directory path where records will be saved in MSEED format. b) The directory path where the stations associated with the records will be stored in XML format. The areas where the path to follow for each action will be displayed are shown.

As an example, following the steps indicated in section 3.1.2 of block (3) when selecting the "Records" and "Stations" folders to store the data (Cfr. Page 11) the output showing the path where the data and stations will be stored will be as shown in the following image.

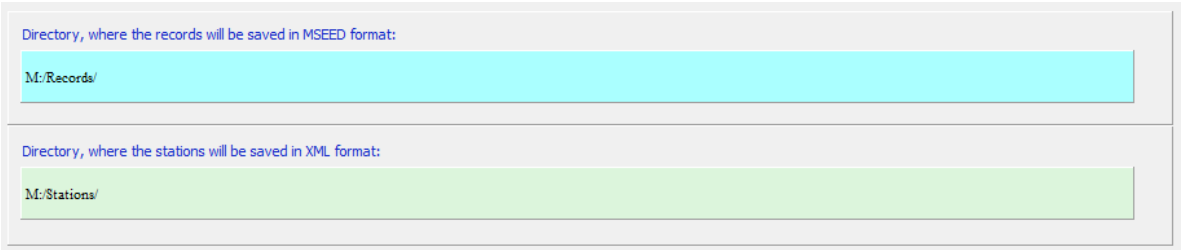


Fig. 20 View of the path of the directories or folders where both the seismic records and the stations to be downloaded will be stored.

3.1.5.- Command block Download/Clean (6)

6

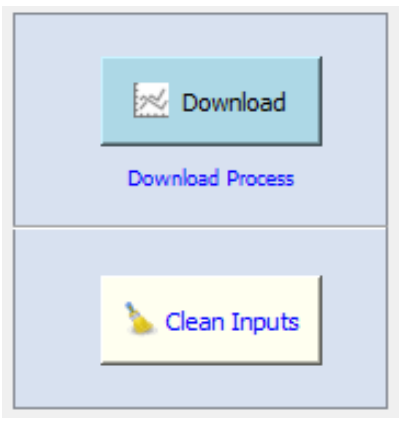
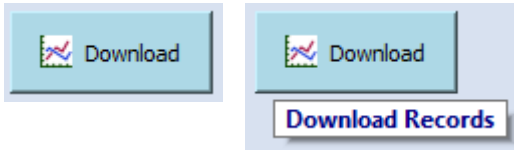


Fig. 21 View of the Download and Clean Inputs command buttons.

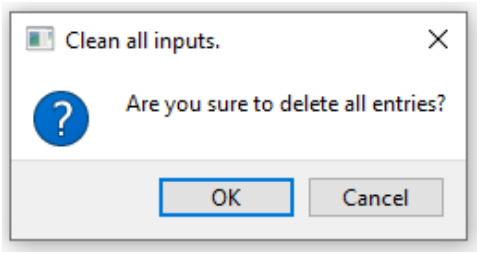
As shown in the figure above, this block consists of the command buttons a) Download and b) Clean Inputs.

a) **Download Command Button**: This command button initiates the download process for data in MSEED format and stations in MLF format, once all necessary parameters have been entered, according to the chosen circular or rectangular method. Hovering the cursor over the button displays text indicating its purpose.



The process of downloading the logs and stations is described in detail in the following section.

b) **Clean Inputs Command Button**: This command button clears or deletes the input elements, closes all existing processes, and returns the download screen to its initial state, ready for a new search and download of records from the FDSN global network. Hovering the mouse pointer over it displays a message indicating its function.



Clicking the button opens a window asking the user if they are sure they want to delete the data entries. If yes, all entries are deleted, and the interface returns to its initial state. Otherwise, the current entries remain in the interface.

If you wish to continue the search with the established parameters, modifying only some of them, such as method, coordinates, or time, you must keep the parameters already entered, modifying only those required, and then click the "***Download***" button again. Therefore, be careful not to use the clear button, as it will delete all entries, including the location of the download directories, the size of the records, and disable the option to use the listing.

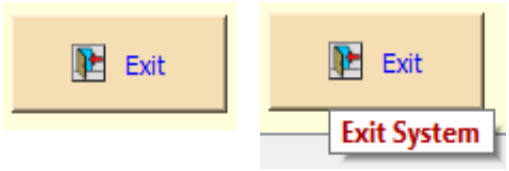
3.1.6.- Return/Exit command block (7)

Fig. 22 View of the Back and Exit command buttons.

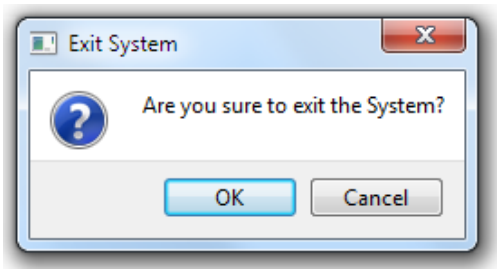
The image above shows the "***Back***" button, which returns to the home screen (Menu), and the "***Exit***" button, which exits the system.

a) ***Back Command Button***: Allows you to return to the system's initial splash screen (Menu). When you hover the mouse pointer over it, a message will appear indicating its function.

b) **Exit Command Button**: Allows complete system exit (after displaying a screen asking if you wish to exit). Hovering the mouse pointer over it displays a message indicating its function.



Similarly, to the home screen, if you press or click the "***Exit***" button, a window appears asking the user if they are sure they want to leave the system.



Clicking "***OK***" closes the screen and completes the system exit. The "***Cancel***" option remains on the log download screen.

4.- Process required for downloading the Records and Stations.

The process for downloading records and stations from the **FDSN** (*Federation of Digital Seismograph Networks*) global network involves several steps that must be followed in order to avoid problems, and is as follows:

a) Select the directory where the downloaded MSEED logs will be stored. To do this, you must first create a folder or directory in your preferred location. Click the "Records" command button, which will open a window where you can locate the folder. Click the "Select Folder" button to copy the path to the log directory area.
b) Select the directory where the downloaded XML stations will be stored. To do this, you must first create a folder or directory in your preferred location. Click the "Stations" command button, which will open a window where you can locate the folder. Click the "Select Folder" button to copy the path to the directory area for the stations.
c) Select the desired record size for download, either one hour or twenty-four hours. To do this, click the corresponding circular button.
d) Select the type of domino you wish to use (circular or rectangular) and enter the necessary parameters.

4.1.- Download via circular domain.

If the domain is circular, in addition to the volcano identifier field ("***V. ID***") if the list is selected, five more fields will be activated, corresponding to the following values: 1) latitude (***Volcano lat***, 2) longitude (***Volcano lon***, 3) minimum radius (***Radius min***. in degrees, 4) maximum radius (***Radius max***. in degrees, 5) start time (***Star time***) in the format (***Year, month, day, hour, minute, second***). The following steps must then be taken:

a. Select whether you want to use the volcano list (YES/NO). If yes (the text area for entering the identifier will be activated), consider whether you want to sort the list (in which case the ID will change) or use it as is. This is to ensure that the ID used matches the volcano's ID in the table. Once you have selected the identifier, enter it in the text area and click the "Load" button for the volcano's parameters (longitude and latitude). If you click the "Load" button without entering a value in that area, a warning window will appear indicating that you must enter a value in that field. Once this process is complete, the geographic location values that define the volcano's central point will appear in the corresponding "latitude" and "longitude" parameter fields. If the table is not desired, the user can enter the values they deem appropriate that correspond to the desired geographical location.
b. Assign the minimum and maximum radius parameter values in degrees that are suitable for the download. Keep in mind that the larger the search radius, the greater the number of stations involved in the download process, and therefore the longer the download time.
c. Specify the download start time in the format: Year, month, day, hour, minute, second. The system will automatically convert these values to UTC.
d. Once the necessary parameters have been assigned, finally click the "Download" button, which will start the download process. The following window will then open:

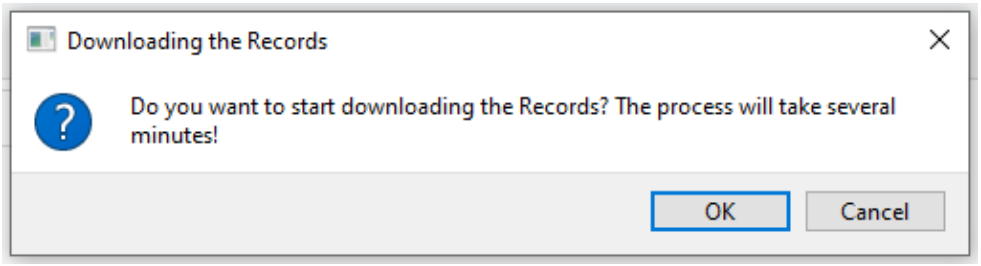


Fig. 23 View of the window that will start the download process. If you are sure of the entered parameter values, click the "OK" button and the process will begin. Otherwise, click the "CANCEL" button to modify the parameters.

As shown in the image above, the download process can take several minutes, depending on the designated radius area and, consequently, the number of stations involved. However, involving more stations also means that more records can be downloaded and stored.

If the parameters are invalid or incompatible with the search results, a window will appear indicating this error, similar to the following.

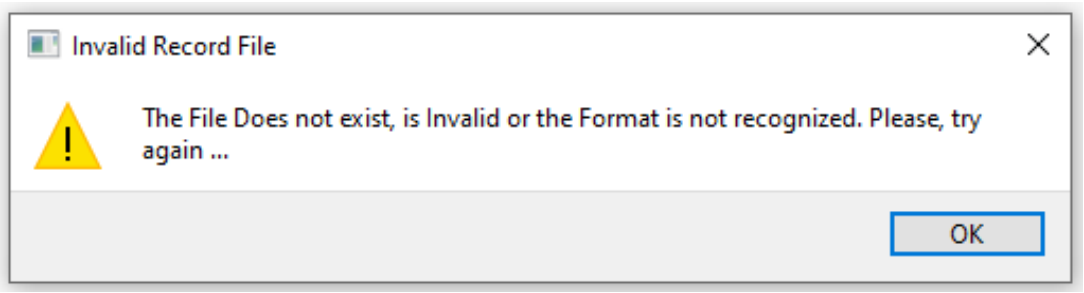


Fig. 24 The window will display an error message indicating that there is an error in the records or that one of the parameters is invalid, requiring the entries to be reviewed and modified.

It is emphasized that the download process from the global network may take several minutes, depending on the size of the designated radius and the stations involved in the download.

As an example, the following image presents an interface with the parameter values entered for a download of seismic records from the "***Agustine***" volcano from an eruption on January 11, 2006, (min radius = 10, max radius = 40), using the circular domain method.

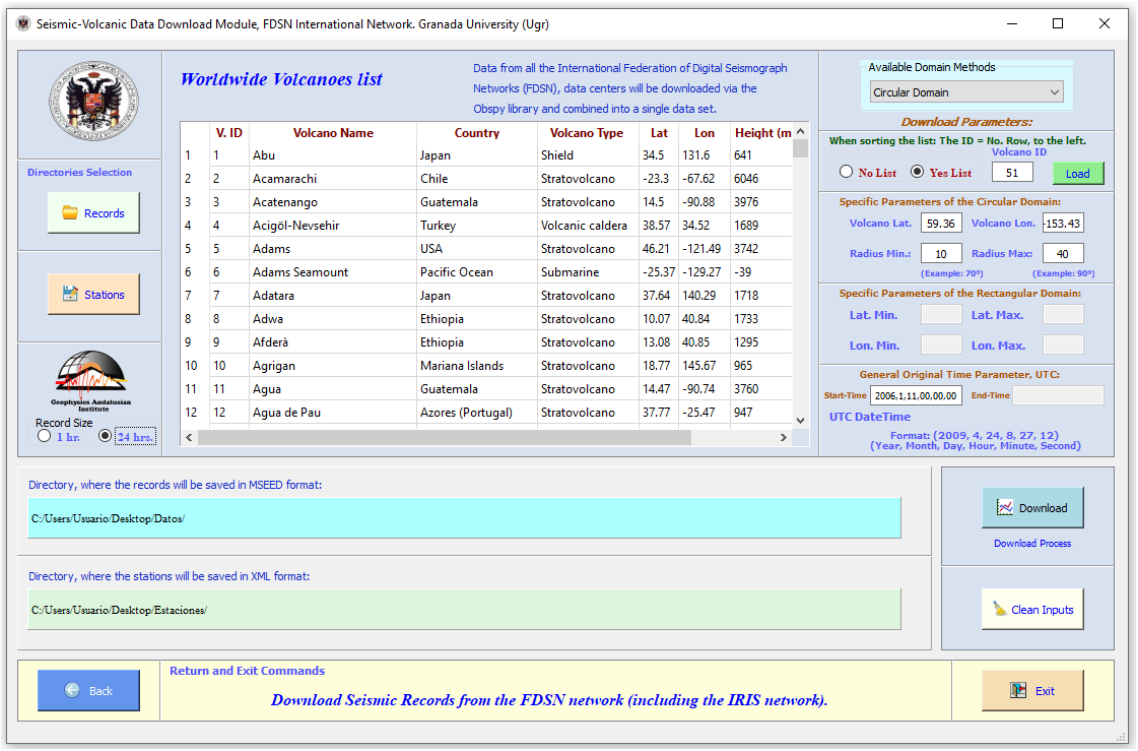
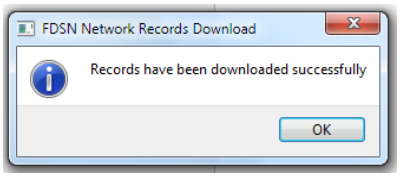


Fig. 25 View of the interface with parameters for downloading data and stations, using the circular domain method.

Once the process is complete (depending on the search time according to the specified radius), a window similar to the following will appear, indicating that the download of the records has been successful.



If you wish to observe the download process, you must first open or run the program or interface, not with the "bat" command from the desktop, but with a command prompt window. You can open a command prompt window as administrator, navigate to the "My Documents" directory using the "CD" command, and then locate the folder where the program is located using the "CD" command again. For example:

> cd: C:\Dirección\Documents\Download_FDSN_1

From there, call the main program using the following command:

> python Download_FDSN_1.py

This will run the program directly. Then, you must complete all the previous steps for the download. Once the download has started, you can view the process in that window until it is finished. The command window for downloading the logs of the "Agustine" volcano, mentioned earlier, will look similar to the following:

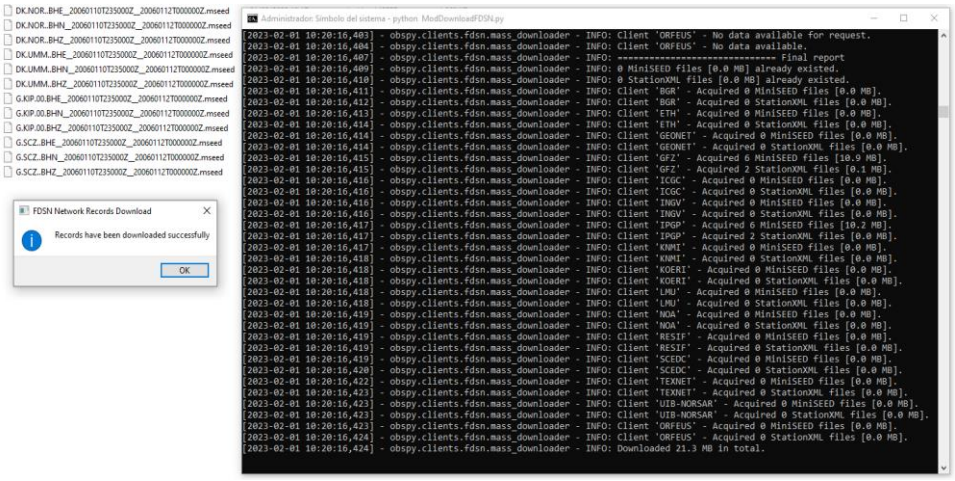


Fig. 26 View of the command window showing the process of downloading the records using the circular domain.

The figure above shows the command window where the "**Obspy**" library connects the various clients and associated download stations. In the upper left of the image, the downloaded records are displayed in the "Records" folder. Once the process is complete, a window appears indicating that the download has finished successfully. Finally, the total size of the downloaded records is displayed in the command window.

4.2.- Download using the rectangular domain.

When selecting the rectangular domain, six fields will be activated for entering parameters: 1) Minimum Latitude, 2) Maximum Latitude, 3) Minimum Longitude, and 4) Maximum Longitude. These four parameters define the boundaries of the geographic rectangle to be downloaded. The next two parameters are: 5) Start Time and 6) End Time, which establish the time limits for the download. Remember that the download process, as in the previous method, begins by selecting the directories where both the records and the stations will be stored, and then selecting whether to download one-hour or twenty-four-hour records. After indicating that the method is rectangular and activating the corresponding fields, the following steps will be taken:

a) Enter the minimum geographic latitude.
b) Enter the maximum geographic latitude.
c) Enter the minimum geographic longitude.
d) Enter the maximum geographic longitude.
e) Enter the start time in the format (Year, Month, Day, Hour, Minute, Second).
f) Enter the end time in the format (Year, Month, Day, Hour, Minute, Second).
g) Click the "Download" command button.

Once the process has started, as with the previous process, a user confirmation window will appear, indicating that the process is about to begin and that it may take several minutes depending on the area to be covered for the download and the stations involved.

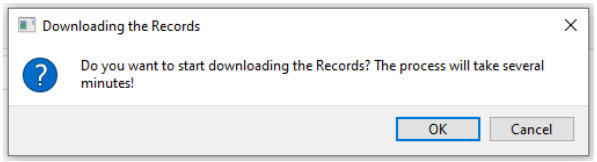


Fig. 27 View of the window that will start the download process. If you are sure of the entered parameter values, click the "**OK**" button and the process will begin. Otherwise, click the "**CANCEL**" button to modify the parameters.

As an example, the following image presents an interface with arbitrary parameter values entered for a download of seismic records from January 11 to 18, 2006, with geographic values of "Lat min = 55.50", "Lat max = 61.74", "Long min = -134.88", "Long max = -144.29", using the rectangular domain method.

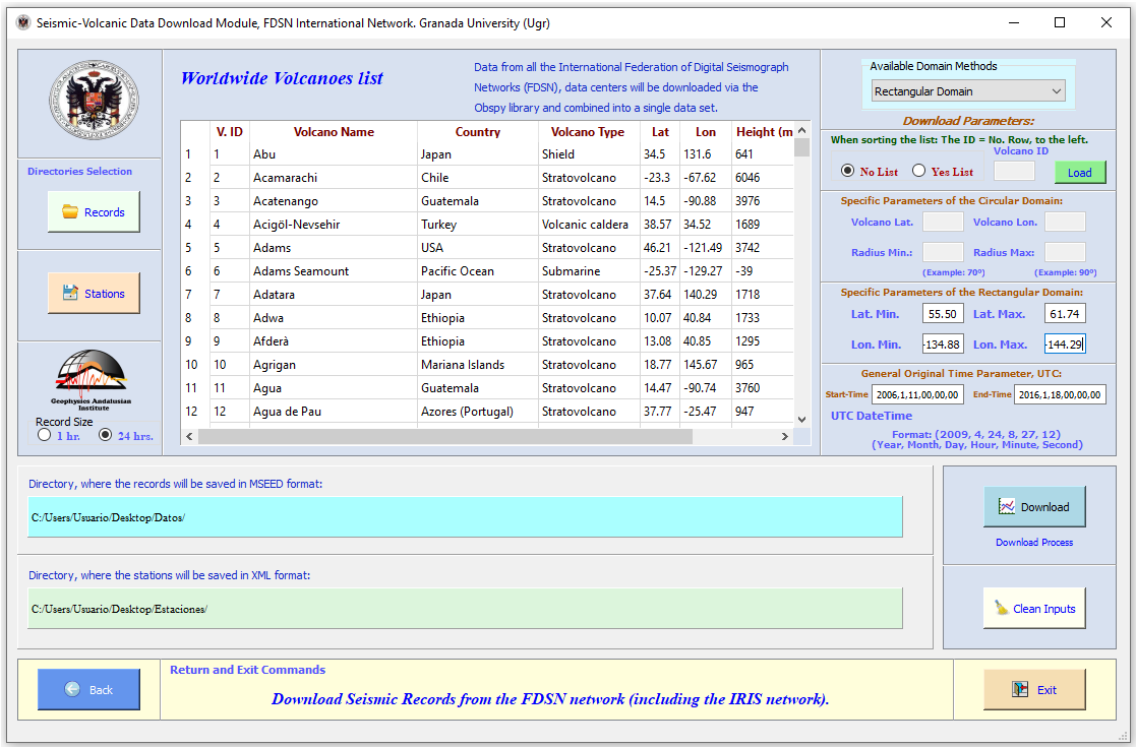


Fig. 28 View of the interface with the parameters for downloading data and stations, using the rectangular domain method.

It is important to clearly define the area to be covered so that the data obtained, whether actual or recorded, falls within the designated perimeter for that date. The data presented here is for illustrative purposes only and may not represent significant events for your analysis. The user determines the actual parameter values for the download based on the events themselves. The observed result of the previous download is shown in the following image.

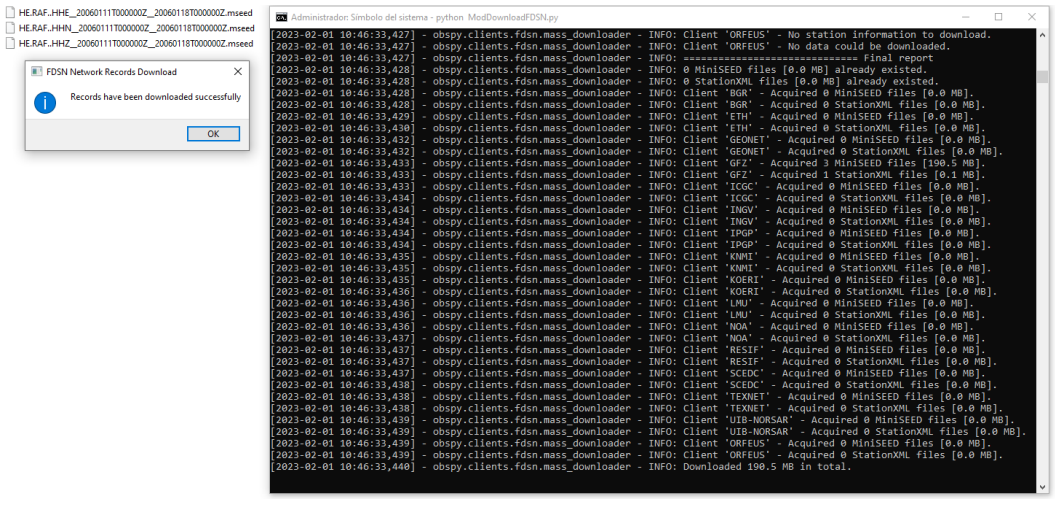


Fig. 29 View of the command window showing the process of downloading records using the rectangular domain.

5.- Validation of errors in registration or entries.

When you click the "Download" button, if an error occurs (invalid input, missing record, or out-of-range format), a validation will be displayed via dialog boxes, showing an alert message. This allows the user to modify the inputs or select a valid event or volcano without the system crashing or stopping. The screens displayed are as follows:

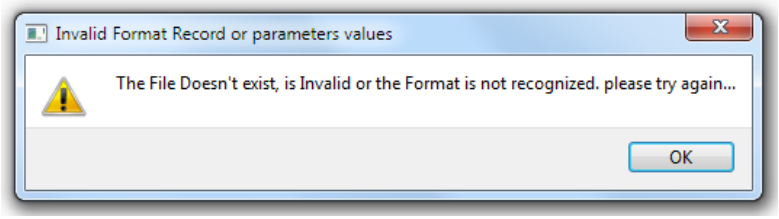


Fig. 30 Validation of invalid entries, incorrect formats or records.

According to the message in the previous figure, an error has occurred because the format is not recognized, the record does not exist, or the merge cannot be performed because the records do not match. Additionally, the parameters or inputs may be outside the allowed range for the signal being analyzed. Pressing the "***OK***" command button returns you to the system, allowing you to select a valid file or correct the erroneous inputs. This way, the program can continue running without further issues.

5.1- Input validations for data directory paths and stations: These are as follows

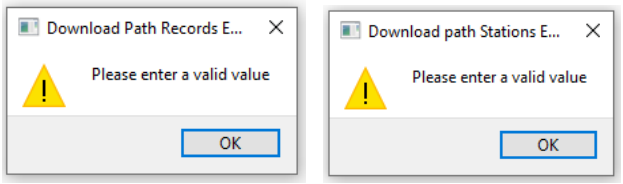


Fig. 31 Validation of empty entries in: a) log directories and b) station directory.

5.2- Input validations for circular domain parameters: These are as follows:

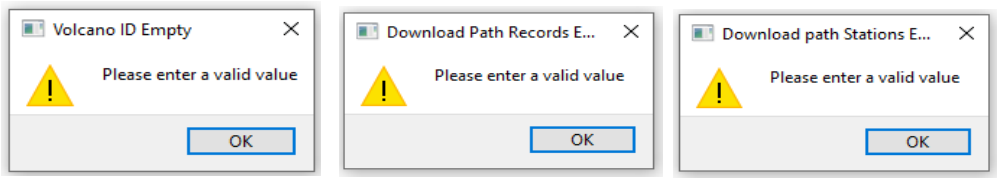


Fig. 32 Validation of empty entries in: a) Volcano identifier “V.ID”, b) Log directory path, and c) Station directory path. A valid entry must be entered in each of these fields.

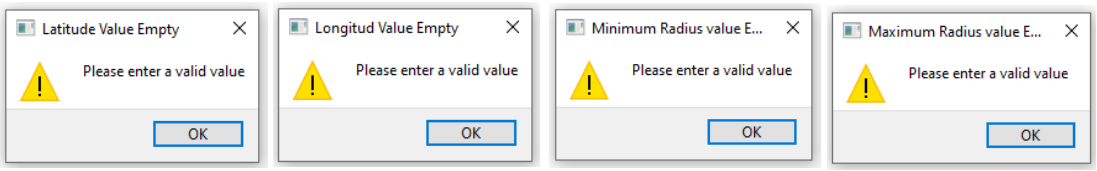


Fig. 33 From left to right, the following fields show empty input validation: a) latitude, b) longitude, c) minimum radius, and d) maximum radius. A valid entry must be entered in each of these fields.

5.3- Input validations for rectangular domain parameters: These are as follows:

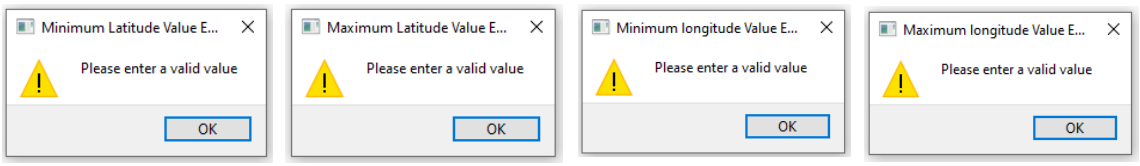


Fig. 34 From left to right, the following fields show empty input validation: a) Minimum Latitude, b) Maximum Latitude, c) Minimum Longitude, d) Maximum Longitude. A valid record must be entered in each of these fields.

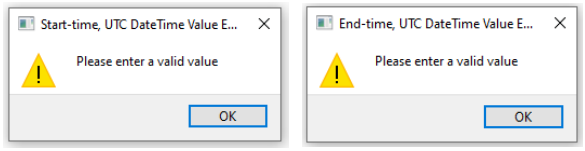


Fig. 35 From left to right, the empty input validation is shown in: a) Start time, b) End time. A valid record must be entered in each of these fields.

CONCLUSION: The system is designed to be an easy-to-use, accessible, and understandable tool. Its user-friendly interface provides reliable technological assistance to the human operator in downloading seismic records, both tectonic and volcanic. This allows observatories or institutes that lack sufficient equipment for data collection or require records for analysis, research, or educational purposes to access records from the FDSN global network. The simplicity of this first version lies in its single module, which includes the necessary development for downloading records and provides access to a list of available volcanoes. This is particularly important in areas that require such resources or that need support in training and developing personnel in seismology. Subsequent versions will include additional modules containing various data download methods, all of which will benefit the entire scientific community in advancing research and study.

Acknowledgments:

This software and its documentation are the result of research from Spanish projects:

a) PID2022-143083NB-I00, "LEARNING", funded by MCIN/AEI /10.13039/501100011033

b) JMI and LG were partially funded by the Spanish project PROOF-FOREVER (EUR2022.134044)

c) PRD was funded by the Ministerio de Ciencia e Innovación del Gobierno de España (MCIN), Agencia Estatal de Investigación (AEI), Fondo Social Europeo (FSE), and Programa Estatal de Promoción del Talento y su Empleabilidad en I+D+I Ayudas para contratos predoctorales para la formación de doctores 2020 (PRE2020-092719).

d) Spanish Project PID2022-143083NB-100 founded by MCIN/AEI/10.13039/501100011033 and by FEDER (EU) "Una manera de hacer Europa". PLEC2022-009271""DigiVolCa"", funded by MCIN/AEI, funded by MCIN/AEI/10.13039/501100011033 and by EU «NextGenerationEU/PRTR», 10.13039/501100011033.

END of the document.

Ligdamis A. Gutiérrez E. PhD.
Theoretical and Cosmos Physics Department, Faculty of Sciences.
Geophysics Andalusian Institute.
Granada University (Ugr)
Granada, Spain – 2021 - 2023

Geophysics Andalusian Institute

APPENDIX A

A1.- Installation of Python and Additional Libraries.

A1.1. Package Content.

The main folder "***Analysis_System_1***", It contains two folders with the programs (codes and interfaces in English and documentation in Spanish and English), organized as follows:

a) Folder **"*Reliable_set_tools_system_1*"**: (*seismic analysis system assembly*). This folder must be copied to "*My Documents*". Contains the following elements:

   a. Subfolder: "***Images***" Images necessary for program interfaces.
   b. Program: ***Menu.py***. Startup program, presentation and calling of individual modules.
   c. Program: "***Download_FDSN_1.py***". The current module. Main program and interface for downloading seismic records and stations from the FDSN network and converting them into MSEED and SAC formats. The remaining programs corresponding to each module (1-10) will also be included.

b) Folders (*Document_ES and Document_EN, depending on the language; English or Spanish*). For *English* "***Document_EN***": It consists of the following items:

   a. User Manual for the module: "***9_Manual_Download_Records_FDSN_EN.pdf***" in PDF, written in English, with the necessary documentation for the use of the system interfaces. In addition, the rest of the manuals for the other modules (1-10) that make up the system are found.

   b. "***Initials Requirements.txt***" file. File containing the libraries needed to be installed on Windows through "Pip", once Python is installed.

   c. File "***README.txt***": File with general instructions for system installation.

   d. File "***Set_tools_System_1_1.bat***", batch processing executable file. It must be copied to the desktop, from there by right clicking "run as administrator", it will start the system by calling the main menu. The file will automatically search for the startup program (Menu.py) that is located in the "Set_tools_System_1_1" folder that has been previously copied to "My Documents" and will start Python, executing said program.

The system has all the elements (*programs and interfaces*) in English, except for the user manual, which is written in both Spanish and English. To install on Windows, two main actions should be taken after downloading and extracting the ". Rar" files. The first is to copy the entire folder (a) to the "*My Documents*" folder on the PC.

a) From the main folder (**Analysis_System_1**), copy the subfolder "**Document_EN**" to "**My Documents**" in Windows.

b) Copy the file "**Set_tools_System_1_1.bat**", from the "(Document/Document_ES or Document_EN)", depending on the version (Spanish or English), to the Windows desktop.

This ensures the proper use of the program. Now, we will proceed with the installation of the Python language and additional Python libraries on Windows.

A1.2.- Installing Python on Windows.

Python is an interpreted, multi-platform, and multiparadigm programming language (*it works on various operating systems, including Windows, Linux, and Mac*), utilizing two or more programming paradigms within a program-object-oriented, reflective, imperative, and functional.

In addition, Python can be enriched by a large number of programming modules, libraries, packages, or libraries installed through its package manager, "**Pip**." On Linux, the Python program and its manager "**Pip**" are installed together with the operating system. In Windows systems, however, where Python is not a native language, it is necessary to install this language beforehand by downloading the appropriate version from the Python distribution website at the following address: https://www.python.org/downloads/

On the website, the correct version should be selected based on the type of operating system on the computer, including whether it is 32 or 64 bits.

To be installed on both 32 and 64-bit systems, it is essential to note that this document and the software were created with the version available at that time, which was "Python 3.8.6", and many more versions have emerged since then. A more modern and adaptable version to the software (recommended) is "Python 10.10".

Users need to check if more advanced versions do not interfere with some of the installed libraries, such as "*Obspy*," for example. This is because everything related to Linux systems is constantly changing with updates that Python and Linux-based systems make. It is advisable to visit the website and download the most stable or tested updated version of Python that works well with this software.

Once downloaded, run it as an administrator (*right-click and "**run as administrator**"*), and the software installation wizard will guide you through the necessary steps (*just follow the instructions*).

The process takes only a few minutes. It is "recommended" to indicate during the process, when asked, to include an access path in the system's "**Path**" so that Python can be accessed from any location in Windows. If this is not done during the installation process, it must be done manually by modifying the environment variables (*more complicated*) to include the path from where Python is installed. This will not be necessary (*if indicated at the beginning*) through the installation wizard.

A1.3.- Installation of Additional Libraries.

The next step is to ensure that Python and its file manager or package manager (**Pip**) have been installed correctly. "**Pip**" (*file and library manager*) is crucial because it allows the installation of additional libraries that Python needs to run the created programs. To do this, open the Windows console window, or "*CMD*." The CMD, or command prompt, is a command-line interpreter.

Accessing the CMD is possible by typing, searching for the Windows logo key (a window), located between the "Ctrl" and "Alt" keys at the bottom left of the keyboard. Pressing this key, plus (+) the letter "**R**" key, will open a "Run" program window, similar to the following.

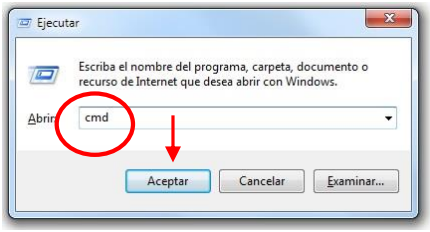


Fig. A1 Screen run in Windows. In the red circle, type "cmd" and click "OK."

As seen in the figure above, type "cmd," click "OK," which will open the Windows command prompt window.

Another way to do this is at the bottom of the desktop, in (W7) or next to (W10) the Windows "Start" button. There is the search section, indicated by the magnifying glass icon. This indicates a search for programs, similar to the following.

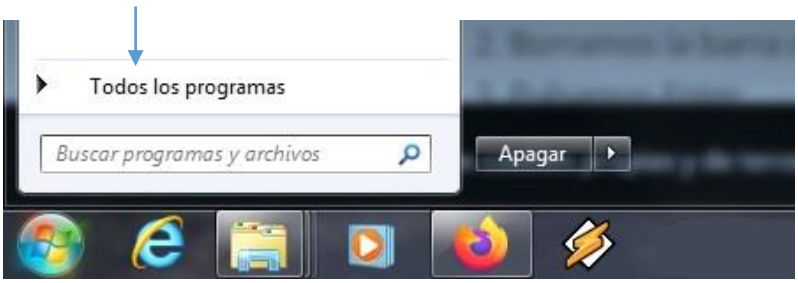


Fig. A2 Windows Program Search Screen.

In the box that says "Search programs and files" (Windows 7) or "*Type here to search*" (Windows 10), type "cmd" as well. This action or the previous one will bring up the Windows command prompt (CMD), similar to the following (W7).

Fig. A3 Windows 7 Command Prompt (CMD) Screen.

The same applies to versions: Windows 10 (W10) or Windows 11 (W11).

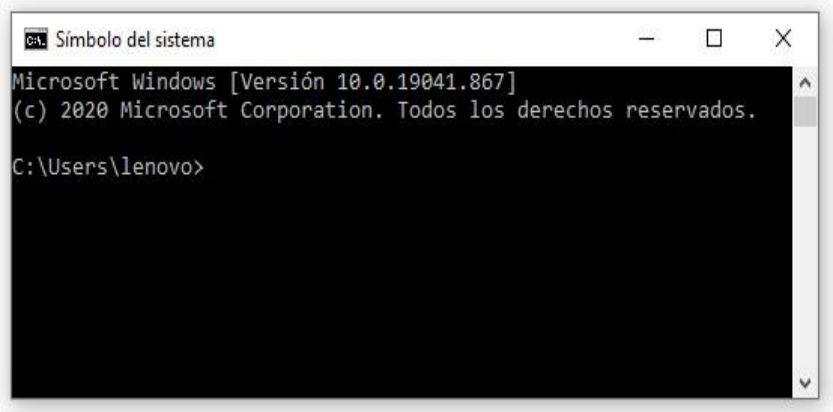


Fig. A4 Command Prompt (CMD) Screen in Windows 10.

Once on this screen, to verify that both Python and its package manager "pip" have been installed correctly, type the following commands: Python -V, and to check "pip," type: pip -V. This is shown in the following figure.

Fig. A5 CMD Screen, indicating Python and pip versions in Windows.

The output of typing "-V" in Python indicates invoking the installed version. In this case, it can be seen that it is "3.8.6" (*The library set is compatible with 3.10.10 version*). This has been possible from any location in the system because the Python script has been installed, remember, in the "**path**" or route found in the system's environment variables. Also, after typing "pip -V", it can be seen that the Pip version is "*20.2.1*." At this point, it is recommended to update this version since, by default, "Pip" is installed along with "Python", but it does not install the latest or most up-to-date version. To do this, in the CMD window or console, type the following command (*Windows/Linux*): On Windows, type "python," and on Linux, type "python3".

Windows: > python –m pip install –upgrade pip | Linux: $ sudo python3 –m pip install –upgrade pip

This indicates that "Pip" will be updated to its most recent version (*On Linux, as a "superuser," i.e., with "sudo" at the beginning*). It is shown in the following screen.

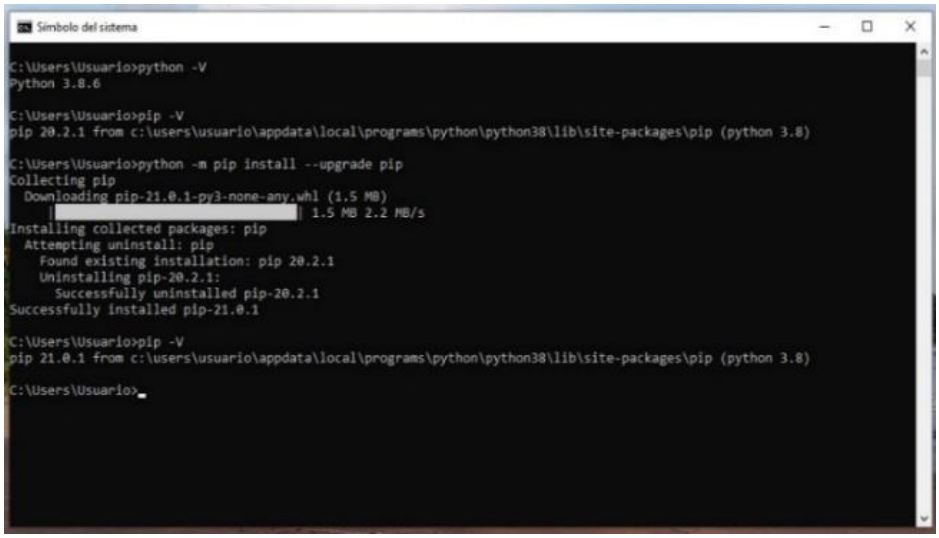


Fig. A6 Screen showing the update and verification of the new version of pip in Windows.

As can be seen, when typing again (**pip -V**), once Pip is updated, the version is 21.0.1. With this, Python and Pip are already installed and updated. Pip, as mentioned, is very important because with this manager, all the necessary libraries and packages are installed so that Python applications can be executed correctly and without errors. To use the system, you must proceed to install the necessary packages or libraries through Pip.

Next, we will proceed to explain how, in a simple and completely automatic way, the most commonly used and general libraries that Python needs will be installed on the system. Libraries such as, for example, "*obspy*," which is the open-source library or software based on Python for processing seismological data. Also, "***matplotlib***," which is a library for generating graphics from data contained in lists or arrays in Python and its mathematical extension "***NumPy***," among others, which the system needs for its execution (*See Annex B*).

A1.4 Automatic Installation of Libraries on Windows and Linux from PIP.

The advantage of having already installed and updated Pip in Windows is that you can install all the libraries that Python needs to run the system.

Additionally, in the "***Document***" folder, the "***Readme.txt***" file contains instructions for this installation. So the user only needs to follow the instructions, and the necessary packages will be installed on the computer (PC) automatically by Pip, both on Windows and Linux. The required libraries are in the file called "***Initial_requirements.txt***", included in the "***Document***" folder of the downloaded installation files and in **Annex B**.

In a Windows Command Prompt (**Cmd**) window, actions are taken for each of the commands indicated in the file, following the instructions. The installation should not present problems on Windows and Linux systems. If any library encounters an error during installation (*shown in red in CMD*), you should consult the documentation for that library or check if the correct or recommended version of Python is being installed (*version 3.8.6 and/or 3.10.10*). The installation on Linux systems (*See README.txt*) is similar and simpler. Copy the main folder to the desktop, the personal folder, etc. From that location, open a command prompt, and simply type:

"***$ python3 Menu.py***" to start the system.

APPENDIX B:

INSTALL PYTHON LIBRARIES FOR THE PROPER FUNCTIONING OF THE SYSTEM.

1.- **PIP**: The **Pip** (*Preferred Installer Program*) is the package or package management manager used to install and manage software packages written in Python. When installing Python, Pip is installed by default. To check the version of Python or PIP, type the following in a console or CMD:

python - V / pip – And to see the list of installed pip packages: -> pip list

Usually, you need to update the version of pip with which Python is installed. For this, type the following command in the command prompt (CMD). In Linux and Mac systems, "**sudo**" is placed at the beginning to indicate super-user permissions.

Python –m pip install - - upgrade pip / (LINUX) -> sudo python –m pip install - - upgrade pip

Once downloaded and installed, you can check the version again with the first command, and you will see that the version has changed and been updated. Now that pip is updated, we will proceed to install the necessary packages for Python to work correctly with the applications.

2.- .- **PyQt Installation**: This is a Python binding for the Qt library written in the C++ language. It is used for creating and using graphical user interfaces (GUI) in Python. Type the following in the command prompt (CMD).

pip install PyQt5 / (LINUX & Mac) -> sudo python install PyQt5

3.- **Matplotlib library Installation**. Matplotlib is the library that allows the creation and visualization of graphics. Type the following:

pip install matplotlib / (LINUX & Mac) -> sudo python install matplotlib

4.- Install the **Obspy** library. This library is for handling seismic signals. Type the following:

pip install obspy / (LINUX & Mac) -> sudo python install obspy

5.- Install **Thinter**: Thinter is a graphical user interface (GUI). Type the following:

pip install tk / (LINUX & Mac) -> sudo python install tk

6.- Install **quantecon**: This library is used for spectrum estimation, Periodogram, Fourier transform. Type the following:

pip install - - upgrade quantecon / (LINUX & Mac) -> sudo python install - - upgrade quantecon

7.- Update a library for **matplotlib**. To avoid problems with graphics, install the following:

pip install msvc-runtime / (LINUX & Mac) -> sudo python install msvc-runtime

8.- Install **easygui** for the graphical interface:

pip install easygui / (LINUX & Mac) -> sudo python install easygui

9 Install **PyWavelets** for CWT handling.

pip install PyWavelets / (LINUX & Mac) -> sudo python install PyWavelets

10.- Install **plotly** for handling and assisting with graphics along with Matplotlib.

pip install plotly / (LINUX & Mac) -> sudo python install plotly

11.- Install "**pyaudio**", for audio management. Python bindings for PortAudio v19, the cross-platform audio I/O library

python -m pip install pyaudio / (LINUX & Mac) -> sudo apt-get install python3-pyaudio

Finally, type "pip list" to see the installed libraries. Optionally, you can create a file called "***requirements.txt***" that will contain all the libraries that the PC will use. The "***requirements.txt***" file must be in the current directory. The instruction to do this is as follows:

pip freeze > requirements.txt

Back to Index

APPENDIX C

C1.- World Volcano Database (*Worldwide Volcano list*)

Worldwide Volcano list - (*Base de datos mundial de Volcanes*).

V. ID	Volcano name	Country	Volcano type	lat	lon	Height (m)
1	Abu	Japan	Shield	34.5	131.6	641
2	Acamarachi	Chile	Estratovolcano	-23.3	-67.62	6046
3	Acatenango	Guatemala	Estratovolcano	14.5	-90.88	3976
4	Acigöl-Nevsehir	Turkey	Caldera	38.57	34.52	1689
5	Adams	USA	Estratovolcano	46.21	-121.49	3742
6	Adams Seamount	Pacific Ocean	Submarine	-25.37	-129.27	-39
7	Adatara	Japan	Estratovolcano	37.64	140.29	1718
8	Adwa	Etiopia	Estratovolcano	10.07	40.84	1733
9	Afderà	Etiopia	Estratovolcano	13.08	40.85	1295
10	Agrigan	Mariana Islands	Estratovolcano	18.77	145.67	965
11	Agua	Guatemala	Estratovolcano	14.47	-90.74	3760
12	Agua de Pau	Azores	Estratovolcano	37.77	-25.47	947
13	Aguilera	Chile	Estratovolcano	-50.33	-73.75	2546
14	Agung	Islas Lesser Sunda	Estratovolcano	-8.34	115.51	3142
15	Ahyi	Mariana Islands	Submarine	20.42	145.03	-137
16	Akademia Nauk	Russia	Caldera	53.98	159.45	1180
17	Akagi	Japan	Estratovolcano	36.56	139.2	1828
18	Akan	Japan	Caldera	43.38	144.01	1499
19	Akhtang	Russia	Shield	55.43	158.65	1956
20	Akita Komagatake	Japan	Estratovolcano	39.76	140.8	1637
21	Akita Yakeyama	Japan	Estratovolcano	39.96	140.76	1366
22	Akuseki-jima	Japan	Estratovolcano	29.46	129.6	584
23	Akutan	USA	Estratovolcano	54.13	-165.99	1303
24	Alaid	Russia	Estratovolcano	50.86	155.55	2339
25	Alamagan	Mariana Islands	Estratovolcano	17.6	145.83	744
26	Alayta	Etiopia	Shield	12.88	40.57	1501
27	Alban Hills	Italy	Caldera	41.73	12.7	949
28	Alcedo	Galapagos Islands	Shield	-0.43	-91.12	1130
29	Ale Bagu	Etiopia	Estratovolcano	13.52	40.63	1031
30	Alid	Eritrea	Estratovolcano	14.88	39.92	904
31	Altiplano-Puna	Varios pasises	Volcanic complex	-22.44	-67.96	4600
32	Ambrym	Vanuatu	Shield	-16.25	168.12	1334
33	Anatahan	Mariana Islands	Estratovolcano	16.35	145.67	790
34	Aneityum	Vanuatu	Estratovolcano	-20.2	169.78	852
35	Aniakchak	USA	Caldera	56.88	-158.17	1341
36	Antisana	Ecuador	Estratovolcano	-0.48	-78.14	5753
37	Aoba	Vanuatu	Shield	-15.4	167.83	1496
38	Apoyeque	Nicaragua	Stratovolcano	12,24	-86,34	420
39	Apoyo	Nicaragua	Volcanic caldera	11,92	-86,03	468
40	Ararat	Turkia	Estratovolcano	39.7	44.3	5165
41	Arenal	Costa Rica	Estratovolcano	10.46	-84.7	1670
42	Arintica	Chile	Volcanic complex	-18.73	-69.05	5597
43	Asacha	Russia	Estratovolcano	52.36	157.83	1910
44	Asama	Japan	Volcanic complex	36.4	138.53	2568
45	Ascensión	South Atlantic Ocean	Estratovolcano	-7.95	-14.37	858
46	Askja	Iceland	Estratovolcano	65.03	-16.75	1516
47	Aso	Japan	Caldera	32.88	131.11	1592
48	Atitlán	Guatemala	Volcanic complex	14.58	-91.19	3535
49	Atka	USA	Caldera	52.38	-174.15	1533
50	Atsonupuri	Russia	Estratovolcano	44.81	147.14	1206
51	Augustine	USA	Domo	59.36	-153.43	1252
52	Avachinsky	Russia	Estratovolcano	53.26	158.83	2741
53	Awu	Indonesia	Estratovolcano	3.67	125.5	1320
54	Axial Seamount	Pacific Ocean	Submarine	45.95	-130	-1410
55	Ayelu	Etiopia	Estratovolcano	10.08	40.7	2145
56	Azufre	Chile	Volcanic complex	-21.79	-68.24	5846
57	Azuma	Japan	Estratovolcano	37.73	140.25	2035
58	Babuyon Claro	Philippines	Estratovolcano	19.5	121.9	1180
59	Bachelor	USA	Estratovolcano	43.8	-121.6	2763
60	Bagana	Papua New Guinea	Cylindrical cone	-6.1	155.2	1750
61	Baker	USA	Estratovolcano	48.79	-121.82	3285
62	Bam	Papua New Guinea	Estratovolcano	-3.6	144.85	685
63	Bamus	Papua New Guinea	Estratovolcano	-5.2	151.2	2248
64	Bandai	Japan	Estratovolcano	37.6	140.1	1819
65	Barren Island	India	Pyroclastic cone	12.29	93.88	305
66	Barrier	Kenia	Volcanic complex	2.32	36.57	1032

Download Seismic Records from the FDSN network Module, Vers. 1.0"
Author: Ligdamis A. Gutiérrez E. PhD.

Worldwide Volcano list - (*Base de datos mundial de Volcanes*).

V. ID	Volcano name	Country	Volcano type	lat	lon	Height (m)
67	Bazman	Iran	Estratovolcano	28,00	60	3490
68	Beerenberg	Noruega	Estratovolcano	71.1	-8.2	2277
69	Belknap	USA	Shield	44.28	-121.83	2096
70	Bezymianny	Russia	Estratovolcano	55.98	160.58	2882
71	Biliran	Philippines	Volcanic complex	11.5	124.5	1187
72	Bolshoi Semiachik	Russia	Estratovolcano	54.32	160.02	1720
73	Bulusan	Philippines	Estratovolcano	12.8	124.1	1565
74	Butajira	Etiopia	Maar	8.05	38.35	2281
75	Monte Cameroon	Cameroon	Estratovolcano	4.2	9.17	4095
76	Camiguin de Babuyanes	Philippines	Estratovolcano	18.83	121.85	712
77	Canlaon	Philippines	Estratovolcano	10.41	123.13	2435
78	Capulin	USA	Cylindrical cone	36.45	-104.09	2494
79	Carrizozo	USA	Volcanic Shield	33.7	-106	1730
80	Cayambe	Ecuador	Estratovolcano	0.03	-77.99	5790
81	Cereme	Indonesia	Estratovolcano	-6.9	108.41	3078
82	Cerro Negro	Nicaragua	Slag cone	12,30	-86,42	728
83	Chaine des Puys	France	Domo	45.78	2.97	1464
84	Chiginagak	USA	Estratovolcano	57.13	-156.99	2067
85	Chikurachki	Russia	Estratovolcano	50.33	155.46	5958
86	Chimborazo	Ecuador	Estratovolcano	-1.46	-78.82	6310
87	Chinchon o chichonal	México	Tuff cone	17,36	-93,23	1160
88	Chiles-Cerro Negro	Colombia-Ecuador	Estratovolcano	0,82	77,97	4748
89	Cleveland	USA	Estratovolcano	52.83	-169.95	1730
90	Coatepeque	El Salvador	Caldera	13.86	-89.54	746
91	Colima	Mexico	Estratovolcano	19.51	-103.62	4100
92	Concepción	Nicaragua	Estratovolcano	11.5	-85.6	1610
93	Copahue	Argentina	Estratovolcano	-37.85	-71.17	2965
94	Cosigüina	Nicaragua	Shield	12.98	-87.56	847
95	Cotopaxi	Ecuador	Estratovolcano	-0.68	-78.44	5911
96	Crater Lake	USA	Caldera	42.94	-122.11	2471
97	Craters of the Moon	USA	Volcanic Shield	43.42	-113.5	2005
98	Daisetsu	Japan	Estratovolcano	43.7	142.9	2290
99	Dakataua	Papua New Guinea	Caldera	-5,00	150.1	400
100	Damavand	Iran	Estratovolcano	35.95	52.11	5670
101	Dempo	Indonesia	Estratovolcano	-4,00	103.1	3173
102	Devils Garden	USA	Volcanic Shield	43.5	-120.9	1525
103	Devils Tower	USA	Volcanic Plug	44.6	-104.7	1558
104	Diamond Craters	USA	Volcanic Shield	43.1	-118.7	1450
105	Dieng	Indonesia	Volcanic complex	-7.2	109.9	2565
106	Diky Greben	Russia	Domo	51.46	156.98	1331
107	Dubbi	Eritrea	Estratovolcano	13.6	41.8	1625
108	Dukono	Indonesia	Volcanic complex	1.7	127.87	1185
109	East Epi	Vanuatu	Caldera	-16.7	168.4	-34
110	Ebeko	Russia	Somma Volcano	50.68	156.02	1156
111	Egmont (Taranaki)	New Zealand	Estratovolcano	-39.3	174.1	2518
112	Egon	Indonesia	Estratovolcano	-8.7	122.45	788
113	Elbrus	Russia	Estratovolcano	43.33	42.45	5633
114	Erebus	Antarctica	Estratovolcano	-77.5	167.2	3794
115	Erta Ale	Etiopia	Shield	13.6	40.7	613
116	Etna	Italy	Estratovolcano	37.73	15	3350
117	Fantale	Etiopia	Estratovolcano	8.98	39.93	2007
118	Fernandina	Ecuador	Caldera	-0.37	-91.55	1476
119	Fisher	USA	Estratovolcano	54.63	-164.42	1095
120	Fogo	Cape Verde Islands	Estratovolcano	14.95	-24.35	2829
121	Fort Rock	USA	Maar	43.37	-121.07	1716
122	Frosty Peak	USA	Estratovolcano	55.08	-162.81	1920
123	Fuego	Guatemala	Estratovolcano	14.47	-90.88	3763
124	Fuerteventura	Spain	Fissure vents	28.36	-14.02	529
125	Fuji	Japan	Stratovolcano	35.36	138.73	3776
126	Furnas	Azores (Portugal)	Estratovolcano	37.76	-25.33	805
127	Fuss Peak	Russia	Estratovolcano	50.27	155.25	1772
128	Galeras	Colombia	Estratovolcano	1.22	-77.37	4276
129	Galunggung	Indonesia	Estratovolcano	-7.26	108.08	2168
130	Gamalama	Indonesia	Estratovolcano	0.81	127.33	1715
131	Gamchen	Russia	Estratovolcano	54.97	160.68	2576
132	Gamkonora	Indonesia	Estratovolcano	1.38	127.53	1635

Download Seismic Records from the FDSN network Module, Vers. 1.0"
Author: Ligdamis A. Gutiérrez E. PhD.

Worldwide Volcano list - (*Base de datos mundial de Volcanes*).

V. ID	Volcano name	Country	Volcano type	lat	lon	Height (m)
133	Gareloi	USA	Estratovolcano	51.8	178.8	1573
134	Gaua	Vanuatu	Estratovolcano	-14.27	167.5	797
135	Gede	Indonesia	Estratovolcano	-6.77	106.94	2958
136	Glacier Peak	USA	Estratovolcano	48.11	-121.11	3213
137	Gorely	Russia	Caldera	52.56	158.03	1829
138	Graciosa	Azores (Portugal)	Estratovolcano	39.02	-27.97	402
139	Gran Canaria	Canary islands Spain	Fissure vents	28,00	-15.58	1950
140	Great Sitkin	USA	Estratovolcano	52.07	-176.13	1740
141	Griggs	USA	Estratovolcano	58.35	-155.09	2317
142	Grímsvötn	Iceland	Caldera	64.42	-17.33	1725
143	Guagua Pichincha	Ecuador	Estratovolcano	-0.17	-78.6	4784
144	Guallatiri	Chile	Estratovolcano	-18.42	-69.09	6071
145	Guguan	USA	Estratovolcano	17.31	145.84	287
146	Hakone	Japan	Estratovolcano	35.23	139.02	1439
147	Heard	Australia	Estratovolcano	-53.1	73.5	2745
148	Hibok-hibok	Philippines	Estratovolcano	9.2	124.7	1332
149	Hierro	Spain	Shield	27.73	-18.03	1500
150	Hood	USA	Estratovolcano	45.4	-121.7	3426
151	Hualalai	USA	Shield	19.69	-155.87	2523
152	Hunga Tonga	Tonga	Submarine	-20.54	-175.39	149
153	Ibu	Indonesia	Estratovolcano	1.49	127.63	1325
154	Ijen	Indonesia	Estratovolcano	-8.06	114.24	2386
155	Ile Lewotolok	Indonesia	Estratovolcano	8.27	123.50	1423
156	Iliamna	USA	Estratovolcano	60.03	-153.09	3053
157	Iliboleng	Indonesia	Estratovolcano	-8.34	123.26	1659
158	Iliniza	Ecuador	Estratovolcano	-0.66	-78.71	5248
159	Ilopango	El Salvador	Caldera	13.67	-89.05	450
160	Ilyinsky	Russia	Estratovolcano	51.49	157.2	1578
161	Ioto (Iwo-jima)	Japan	Caldera	24.75	141.29	161
162	Iraya	Philippines	Estratovolcano	20.47	122.01	1009
163	Irazu	Costa Rica	Estratovolcano	9.98	-83.85	3431
164	Isanotski	USA	Estratovolcano	54.77	-163.72	2446
165	Izalco	El Salvador	Estratovolcano	13.81	-89.63	1950
166	Iztaccihuatl	Mexico	Estratovolcano	19.18	-98.64	5286
167	Izu-Tobu	Japan	Pyroclastic cone	34.9	139.1	581
168	Jailolo	Indonesia	Estratovolcano	1.08	127.42	1130
169	Jefferson	USA	Estratovolcano	44.67	-121.8	3199
170	Jordan Craters	USA	Volcanic Shield	43.1	-117.4	1400
171	Kadovar	Papua New Guinea	Estratovolcano	-3.63	144.63	365
172	Kaguyak	USA	Estratovolcano	58.62	-154.06	901
173	Kahoolawe	USA	Shield	20.55	-156.57	450
174	Kambalny	Russia	Estratovolcano	51.3	156.87	2156
175	Kanaga	USA	Estratovolcano	51.92	-177.17	1307
176	Karangetang [Api Siau]	Indonesia	Estratovolcano	2.78	125.4	1784
177	Karisimbi	Kongo-Ruanda	Estratovolcano	-1.51	29.45	4507
178	Karthala	Comoros	Shield	-11.75	43.38	2361
179	Karymsky	Russia	Estratovolcano	54.05	159.45	1536
180	Katla	Iceland	Fissure vents	63.63	-19.05	1512
181	Katmai	USA	Estratovolcano	58.28	-154.96	2047
182	Katwe-Kikorongo	Uganda	Volcanic Shield	-0.08	29.92	1067
183	Kavachi	Solomon Islands	Submarine	-9.02	157.95	-20
184	Kell	Russia	Estratovolcano	51.65	157.35	900
185	Kelut	Indonesia	Estratovolcano	-7.93	112.31	1731
186	Kerinci	Indonesia	Estratovolcano	1.7	101.26	3800
187	Khodutka	Russia	Estratovolcano	52.06	157.7	2090
188	Kialagvik	USA	Estratovolcano	57.2	-156.75	1677
189	Kick 'em Jenny	Grenada	Submarine	12.3	-61.64	-185
190	Kikai	Japan	Caldera	30.79	130.31	704
191	Kikhpinych	Russia	Estratovolcano	54.49	160.25	1552
192	Kilauea	USA	Shield	19.42	-155.29	1222
193	Kilimanjaro	Tanzania	Estratovolcano	3.07	37.35	5895
194	Kirishima	Japan	Estratovolcano	31.93	130.86	1700
195	Kliuchevskoi	Russia	Estratovolcano	56.06	160.64	4835
196	Komagatake	Japan	Estratovolcano	42.06	140.68	1131
197	Kone	Etiopia	Caldera	8.8	39.69	1619
198	Koryaksky	Russia	Estratovolcano	53.32	158.69	3456

Download Seismic Records from the FDSN network Module, Vers. 1.0"
Author: Ligdamis A. Gutiérrez E. PhD.

Worldwide Volcano list - (*Base de datos mundial de Volcanes*).

V. ID	Volcano name	Country	Volcano type	lat	lon	Height (m)
199	Koshelev	Russia	Estratovolcano	51.36	156.75	1812
200	Krafla	Iceland	Caldera	65.73	-16.78	818
201	Krakatoa	Indonesia	Estratovolcano	-6.1	105.42	813
202	Krasheninnikov	Russia	Estratovolcano	54.59	160.27	1856
203	Kronotsky	Russia	Estratovolcano	54.75	160.53	3528
204	Ksudach	Russia	Estratovolcano	51.8	157.53	1079
205	Kukak	USA	Estratovolcano	58.45	-154.36	2043
206	Kusatsu-Shirane	Japan	Estratovolcano	36.64	138.54	2171
207	Kutcharo	Japan	Caldera	43.61	144.44	999
208	Kuttara	Japan	Estratovolcano	42.49	141.16	581
209	Kuwae	Vanuatu	Caldera	-16.83	168.54	-2
210	La Palma	Spain	Estratovolcano	28.57	-17.83	2426
211	Lamington	Papua New Guinea	Estratovolcano	-8.95	148.15	1680
212	Langila	Papua New Guinea	Estratovolcano	-5.53	148.42	1330
213	Lanzarote	Spain	Fissure vents	29.03	-13.63	670
214	Láscar	Chile	Estratovolcano	-23.37	-67.73	5592
215	Lereboleng	Indonesia	Volcanic complex	-8.36	122.84	1117
216	Lewotobi	Indonesia	Estratovolcano	-8.54	122.78	1703
217	Lewotolo	Indonesia	Estratovolcano	-8.27	123.51	1423
218	Liamuiga	St. Kitts and Nevis	Estratovolcano	17.37	-62.8	1156
219	Lipari	Italy	Estratovolcano	38.48	14.95	602
220	Little Sitkin	USA	Estratovolcano	51.95	178.54	1174
221	Loihi	USA	Submarine	18.92	-155.27	-975
222	Lokon-Empung	Indonesia	Estratovolcano	1.36	124.79	1580
223	Lolo	Papua New Guinea	Estratovolcano	-5.47	150.51	805
224	Lolobau	Papua New Guinea	Caldera	-4.92	151.16	858
225	Loloru	Papua New Guinea	Estratovolcano	-6.52	155.62	1887
226	Long Island	Papua New Guinea	Volcanic complex	-5.36	147.12	1280
227	Longonot	Kenia	Estratovolcano	-0.91	36.45	2776
228	Lopevi	Vanuatu	Estratovolcano	-16.51	168.35	1413
229	Maderas	Nicaragua	Estratovolcano	11.45	-85.52	1394
230	Mageik	USA	Estratovolcano	58.2	-155.25	2165
231	Mahawu	Indonesia	Estratovolcano	1.36	124.86	1324
232	Makian	Indonesia	Estratovolcano	0.32	127.4	1357
233	Maly Semiachik	Russia	Caldera	54.13	159.67	1560
234	Manam	Papua New Guinea	Estratovolcano	-4.08	145.04	1807
235	Mariveles	Philippines	Estratovolcano	14.52	120.47	1388
236	Marsabit	Kenia	Shield	2.32	37.97	1707
237	Masaya	Nicaragua	Caldera	11.98	-86.16	635
238	Mashkovtsev	Russia	Estratovolcano	51.1	156.72	503
239	Mashu	Japan	Caldera	43.57	144.57	855
240	Mauna Kea	USA	Shield	19.82	-155.47	4205
241	Mauna Loa	USA	Shield	19.48	-155.61	4170
242	Mayon	Philippines	Estratovolcano	13.26	123.69	2462
243	McDonald Islands	Australia	Volcanic complex	-53.03	72.6	230
244	McLoughlin	USA	Estratovolcano	42.45	-122.32	2894
245	Menan Buttes	USA	Tuff Ring	43.7	-111.96	1713
246	Menengai	Kenia	Shield	-0.2	36.07	2278
247	Merapi	Indonesia	Estratovolcano	-7.54	110.44	2911
248	Merbabu	Indonesia	Estratovolcano	-7.45	110.43	3145
249	Meru	Tanzania	Estratovolcano	-3.25	36.75	4565
250	Methana	Greece	Domo	37.62	23.34	760
251	Metis Shoal	Tongo	Submarine	-19.18	-174.87	43
252	Michael	USA	Estratovolcano	-57.78	-26.45	990
253	Michoacan-Guanajuato	Mexico	Cylindrical cone	19.85	-101.75	3860
254	MÃlos	Greece	Estratovolcano	36.7	24.44	751
255	Miyake-jima	Japan	Estratovolcano	34.08	139.53	815
256	Moffett	USA	Estratovolcano	51.94	-176.75	1196
257	Mojanda	Ecuador	Estratovolcano	0.13	-78.27	4263
258	Momotombo	Nicaragua	Estratovolcano	12.42	-86.54	1297
259	Monaco Bank	Portugal	Submarine	37.6	-25.88	-197
260	Mono Lake Vol Field	USA	Volcanic Shield	38,00	-119.03	2121
261	Monowai Seamount	New Zealand	Submarine	-25.89	-177.19	-132
262	Moti	Indonesia	Estratovolcano	0.45	127.4	950
263	Muria	Indonesia	Estratovolcano	-6.62	110.88	1625
264	Nantai	Japan	Estratovolcano	36.76	139.48	2486

Download Seismic Records from the FDSN network Module, Vers. 1.0"
Author: Ligdamis A. Gutiérrez E. PhD.

Worldwide Volcano list - (*Base de datos mundial de Volcanes*).

V. ID	Volcano name	Country	Volcano type	lat	lon	Height (m)
265	Nasu	Japan	Estratovolcano	37.12	139.97	1915
266	Navajo Volcanic Field	USA	Volcanic Shield	36.78	-109.18	2740
267	Nemo Peak	Russia	Caldera	49.57	154.81	1018
268	Nevis Peak	St. Kitts and Nevis	Estratovolcano	17.15	-62.58	985
269	Newberry	USA	Shield	43.72	-121.23	2434
270	Newer Volcanics Province	Australia	Shield	-37.77	142.5	1011
271	Ngauruhoe	New Zealand	Estratovolcano	-39.13	175.64	1978
272	Nikko-Shirane	Japan	Shield	36.8	139.38	2578
273	Nipesotsu-Maruyama	Japan	Estratovolcano	43.45	143.04	2013
274	Nisyros	Greece	Estratovolcano	36.59	27.16	698
275	Nyambeni Hills	Kenia	Shield	0.23	37.87	750
276	Nyamuragira	Kongo	Shield	-1.41	29.2	3058
277	Nyiragongo	Kongo	Estratovolcano	-1.52	29.25	3470
278	Oahu	USA	Shield	21.44	-158	1220
279	Ojos del Salado	Chile/Argentina	Estratovolcano	-27.12	-68.55	6887
280	Okataina	New Zealand	Domo	-38.12	176.5	1111
281	Okmok	USA	Shield	53.43	-168.13	1073
282	Oku Volcanic Field	Cameroon	Estratovolcano	6.25	10.5	3011
283	Ol Doinyo Lengai	Tanzania	Estratovolcano	-2.76	39.91	2962
284	Opala	Russia	Caldera	52.54	157.34	1776
285	Oraefajokull	Iceland	Estratovolcano	64,00	-16.65	2119
286	Oshima	Japan	Estratovolcano	34.72	139.4	764
287	Pacaya	Guatemala	Volcanic complex	14.38	-90.6	2552
288	Pagan	USA	Estratovolcano	18.13	145.8	570
289	Pago	Papua New Guinea	Caldera	-5.58	150.52	742
290	Papandayan	Indonesia	Estratovolcano	-7.32	107.73	2665
291	Paricutin	Mexico	Cylindrical cone	19.5	-102.2	3170
292	Parinacota	Chile/Bolivia	Estratovolcano	-18.17	-69.15	6348
293	Pauzhetka	Russia	Domo	51.45	156.97	1070
294	Pavlof	USA	Estratovolcano	55.42	-161.89	2519
295	Pavlof Sister	USA	Estratovolcano	55.45	-161.84	2142
296	Pelee	France	Estratovolcano	14.82	-61.17	1397
297	Peuet Sague	Indonesia	Volcanic complex	4.91	96.33	2801
298	Pico	Portugal	Estratovolcano	38.47	-28.4	2351
299	Pilas, Las	Nicaragua	Estratovolcano	11.54	-85.62	1700
300	Pinacate	Mexico	Cylindrical cone	31.77	-113.5	1200
301	Pinatubo	Philippines	Estratovolcano	15.13	120.35	1486
302	Pisgah Lava Field	USA	Volcanic Shield	34.75	-116.63	1495
303	Piton de la Fournaise	France	Shield	-21.23	55.71	2631
304	Poas	Costa Rica	Estratovolcano	10.2	-84.23	2708
305	Popocatepetl	Mexico	Estratovolcano	19.02	-98.62	5246
306	Prevo Peak	Russia	Estratovolcano	47.02	152.12	1360
307	Purace	Colombia	Estratovolcano	2.32	-76.4	4650
308	Quill, The	Netherlands	Estratovolcano	17.48	-62.96	601
309	Rabaul	Papua New Guinea	Shield	-4.27	152.2	688
310	Ragang	Philippines	Estratovolcano	7.7	124.5	2815
311	Raikoke	Russia	Estratovolcano	48.29	153.25	551
312	Rainier	USA	Estratovolcano	46.85	-121.76	4392
313	Rajabasa	Indonesia	Estratovolcano	-5.78	105.63	1281
314	Raoul	New Zealand	Estratovolcano	-29.27	-177.92	516
315	Rasshua	Russia	Estratovolcano	47.77	153.02	956
316	Raung	Indonesia	Estratovolcano	-8.13	114.04	3332
317	Rausu	Japan	Estratovolcano	44.07	145.13	1660
318	Redoubt	USA	Estratovolcano	60.49	-152.74	3108
319	Reventador	Ecuador	Estratovolcano	-0.08	-77.66	3562
320	Rincon de la Vieja	Costa Rica	Volcanic complex	10.83	-85.32	1916
321	Roundtop	USA	Estratovolcano	54.8	-163.59	1871
322	Ruapehu	New Zealand	Estratovolcano	-39.28	175.57	2797
323	Rudakov	Russia	Estratovolcano	45.88	149.83	542
324	Ruiz, Nevado del	Colombia	Estratovolcano	4.89	-75.32	5321
325	Rumble IV	New Zealand	Submarine	-36.13	178.05	500
326	Saba	Netherlands	Estratovolcano	17.63	-63.23	887
327	Sabancaya	Peru	Estratovolcano	-15.78	-71.85	5967
328	Sakar	Papua New Guinea	Estratovolcano	-5.41	148.09	992
329	Sakura-jima	Japan	Estratovolcano	31.59	130.66	1117
330	Salak	Indonesia	Estratovolcano	-6.72	106.73	2211

Download Seismic Records from the FDSN network Module, Vers. 1.0"
Author: Ligdamis A. Gutiérrez E. PhD.

Worldwide Volcano list - (*Base de datos mundial de Volcanes*).

V. ID	Volcano name	Country	Volcano type	lat	lon	Height (m)
331	San Cristobal	Nicaragua	Estratovolcano	12.7	-87	1745
332	San Salvador	El Salvador	Estratovolcano	13.73	-89.29	1893
333	San Vicente	Cape Verde Islands	Estratovolcano	16.9	-25	697
334	Sanford	USA	Shield	62.22	-144.13	4949
335	Sangay	Ecuador	Estratovolcano	-2,00	-78.34	5230
336	Santa Ana	El Salvador	Estratovolcano	13.85	-89.63	2381
337	Mount st Helens	USA	Estratovolcano	46.20	-122.189	2552
338	Santa Maria	Guatemala	Estratovolcano	14.76	-91.55	3772
339	Santorini	Greece	Shield	36.4	25.4	367
340	Sarychev Peak	Russia	Estratovolcano	48.09	153.2	1496
341	Savo	Solomon Islands	Estratovolcano	-9.13	159.82	485
342	Segula	USA	Estratovolcano	52.02	178.14	1160
343	Semeru	Indonesia	Estratovolcano	-8.11	112.92	3676
344	Semisopochnoi	USA	Estratovolcano	51.93	179.58	1221
345	Sete Cidades	Portugal	Estratovolcano	37.87	-25.78	856
346	Shasta	USA	Estratovolcano	41.41	-122.19	4317
347	Sheveluch	Russia	Estratovolcano	56.65	161.36	3283
348	Shikotsu	Japan	Caldera	42.69	141.38	1320
349	Shiretoko-Iwo-zan	Japan	Estratovolcano	44.13	145.17	1563
350	Shishaldin	USA	Estratovolcano	54.76	-163.97	2857
351	Sinarka	Russia	Estratovolcano	48.88	154.18	934
352	Smirnov	Russia	Estratovolcano	44.42	146.14	1189
353	Sollipulli	Chile	Caldera	-38.97	-71.52	2282
354	Soputan	Indonesia	Estratovolcano	1.11	124.73	1784
355	Soufriere Guadeloupe	France	Estratovolcano	16.05	-61.67	1467
356	Soufrière Hills	United Kingdom	Estratovolcano	16.72	-62.18	915
357	Soufrière St. Vincent	St. Vincent	Estratovolcano	13.33	-61.18	1220
358	South Island	Kenia	Estratovolcano	2.63	36.6	800
359	SP Mountain	USA	Cylindrical cone	35.6	-111.6	2141
360	Spurr	USA	Estratovolcano	61.3	-152.25	3374
361	Srednii	Russia	Submarine	47.6	152.92	36
362	Steller	USA	Estratovolcano	58.4	-154.4	2272
363	Stromboli	Italy	Estratovolcano	38.79	15.21	924
364	Sumaco	Ecuador	Estratovolcano	-0.54	-77.63	3990
365	Sumbing	Indonesia	Estratovolcano	-7.38	110.07	3371
366	Sundoro	Indonesia	Estratovolcano	-7.3	109.99	3136
367	Sunset Craters	USA	Cylindrical cone	35.37	-111.5	2447
368	Suswa	Kenia	Shield	-1.18	36.35	2356
369	Suwanose-jima	Japan	Estratovolcano	29.64	129.72	799
370	Taal	Philippines	Caldera	14,00	120.99	311
371	Talang	Indonesia	Estratovolcano	-0.98	100.68	2597
372	Tambora	Indonesia	Estratovolcano	-8.25	118	2850
373	Tanaga and Takawangha	USA	Estratovolcano	51.89	-178.15	1806
374	Tangkubanparahu	Indonesia	Estratovolcano	-6.77	107.6	2084
375	Tao-Rusyr Volcanic caldera	Russia	Estratovolcano	49.35	154.7	1325
376	Tarso Voon	Chad	Estratovolcano	20.92	17.28	3100
377	Telica Volcano	Nicaragua	Estratovolcano	12.6	-86.85	1010
378	Tenerife (Teide)	Spain	Estratovolcano	28.27	-16.64	3715
379	Tengger Caldera and Bromo	Indonesia	Estratovolcano	-7.94	112.95	2329
380	Three Fingered Jack	USA	Estratovolcano	44.5	-121.8	2390
381	Three Sisters	USA	Estratovolcano	44.1	-121.77	3100
382	Thule Islands	United Kingdom	Estratovolcano	-59.45	-27.37	1075
383	Tiatia	Russia	Estratovolcano	44.35	146.26	1819
384	Toba	Indonesia	Caldera	2.58	98.83	2157
385	Todoko-Ranu	Indonesia	Caldera	1.25	127.47	979
386	Tokachi	Japan	Estratovolcano	43.42	142.69	2077
387	Tolbachik	Russia	Estratovolcano	55.83	160.33	3682
388	Tolimán	Guatemala	Estratovolcano	14.61	-91.19	3158
389	Towada	Japan	Caldera	40.47	140.92	1159
390	Traitor's Head	Vanuatu	Estratovolcano	-18.75	169.23	1881
391	Tri Sestry	Russia	Estratovolcano	45.93	149.92	998
392	Tristan da Cunha	United Kingdom	Shield	-37.09	-12.28	2060
393	Tsurumi	Japan	Domo	33.28	131.43	1584
394	Tungurahua	Ecuador	Estratovolcano	-1.47	-78.44	2011
395	Ubehebe Craters	USA	Maar	37.02	-117.45	752
396	Ubinas	Peru	Estratovolcano	-16.36	-70.9	5672

Download Seismic Records from the FDSN network Module, Vers. 1.0"
Author: Ligdamis A. Gutiérrez E. PhD.

Worldwide Volcano list - (*Base de datos mundial de Volcanes*).

V. ID	Volcano name	Country	Volcano type	lat	lon	Height (m)
397	Udina	Russia	Estratovolcano	55.76	160.53	2923
398	Ugashik and Peulik	USA	Estratovolcano	57.75	-156.37	1474
399	Uinkaret Volcanic Field	USA	Volcanic Shield	36.38	-113.13	1555
400	Ulawun	Papua New Guinea	Estratovolcano	-5.05	151.33	2334
401	Umboi	Papua New Guinea	Volcanic complex	-5.59	147.88	1548
402	Undara	Australia	Shield	-18.25	144.75	1020
403	Ungaran and Telomoyo	Indonesia	Estratovolcano	-7.18	110.33	2050
404	Unzen	Japan	Volcanic complex	32.76	130.29	1500
405	Urataman	Russia	Somma Volcano	47.12	152.25	678
406	Ushishur	Russia	Caldera	47.52	152.8	401
407	Usu	Japan	Estratovolcano	42.54	140.84	737
408	Uzon	Russia	Caldera	54.5	159.97	1617
409	Veniaminof	USA	Estratovolcano	56.17	-159.38	2507
410	Vernadskii Ridge	Russia	Cylindrical cone	50.55	155.97	1183
411	Vesubio	Italy	Somma Volcano	40.82	14.43	1281
412	Villarrica	Chile	Estratovolcano	-39.42	-71.93	2847
413	Vilyuchik	Russia	Estratovolcano	52.7	158.28	2173
414	Visoke	Congo/Rwanda	Estratovolcano	-1.47	29.49	3711
415	Vsevidof and Recheschnoi	USA	Estratovolcano	53.13	-168.69	2149
416	Vulcano	Italy	Volcanic complex	38.4	14.96	500
417	Washington	USA	Shield	44.3	-121.8	2376
418	Wau-en-Namus	Libia	Caldera	25.05	17.55	547
419	Westdahl	USA	Estratovolcano	54.52	-164.65	1654
420	White Island	New Zealand	Estratovolcano	-37.52	177.18	321
421	Wrangell	USA	Shield	62,00	-144.02	4317
422	Wudalianchi	China	Volcanic Shield	48.72	126.12	597
423	Yake-dake	Japan	Estratovolcano	36.22	137.59	2455
424	Yali	Greece	Domo	36.67	27.14	180
425	Yantarni	USA	Estratovolcano	57.02	-157.19	1345
426	Yasur	Vanuatu	Estratovolcano	-19.53	169.44	361
427	Yellowstone	USA	Caldera	44.43	-110.67	2805
428	Zavaritzki Volcanic caldera	Russia	Caldera	46.93	151.95	624
429	Zheltovsky	Russia	Estratovolcano	51.57	157.32	1953
430	Zhupanovsky	Russia	Estratovolcano	53.59	159.15	2958
431	Zimina	Russia	Estratovolcano	55.86	160.6	3081

Download Seismic Records from the FDSN network Module, Vers. 1.0"
Author: Ligdamis A. Gutiérrez E. PhD.