
User's Guide

Climsoft Version 3.0

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Introduction to the User's Guide

Purpose of this guide

This guide describes how to use the Climsoft system to enter climatic data into a database and to use these data to produce informative reports and diagrams. This guide is intended for users of the system, and assumes that the system has already been set up correctly by the systems administration section of your organisation.

Layout of this guide

This guide deals specifically with using the Data Entry program and the products supplied as part of the standard Climsoft system. It is divided in the following sections;

- ***The ClimSoft Program:*** Shows how to start the Climsoft program and describes its general features.
- ***The Key-entry facility:*** Describes in detail how to use the Data Entry facility, including a description of all the standard data entry forms.
- ***Checking Data Quality:*** Describes the quality control facilities available for checking the consistency of data that have been entered, and for correcting values when necessary.
- ***Updating the Database:*** Describes how to update the the intermediate and main databases once the data have been checked.
- ***Products:*** Describes the standard products, Which extract information from the database and present it in various forms. The section gives details of how to use the products and examples of the results that they produce.
- ***Administration:*** Describes administration functions, such as defining users of the system, and updating the metadata (information about stations, elements and other entities described in the database).

Note that this guide does no cover any modifications of additional user facilities that may have been implemented for your local organisation. Please refer to your Systems Administrator for documentation of these features.

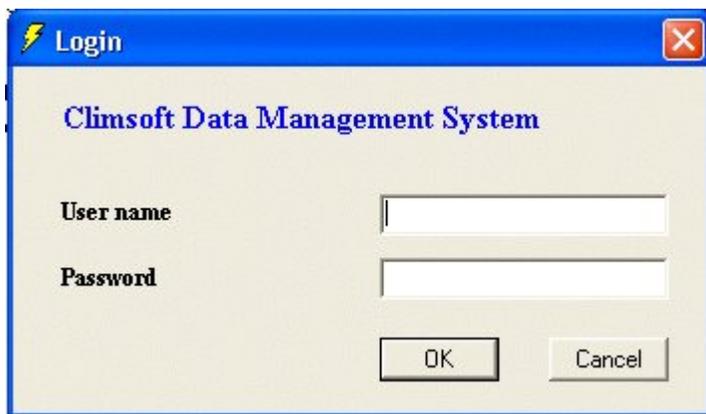
Information about how to set up and administer the Climsoft system is contained in the Climsoft System Administrator's Guide. The Climsoft System Programmer's Guide describes how to modify and extend the functionality of the system.

Starting the ClimSoft Program

After a standard installation, the Climsoft program can be found in the file Climsoft.exe in the folder **Program Files\Climsoft\bin**. However, your System Administrator may have specified a different folder to contain the Climsoft files.

To start the program, click on the Climsoft icon on the desktop, or use one of the other Windows methods for starting a program.

When the program is started the login form appears.



In order to run Climsoft, you must identify yourself so that the software is aware of the functions that you are allowed to perform. Your System Administrator will supply you with a user name and password for using Climsoft. Note that these may be different from the user name and password that you use to log in to your computer.

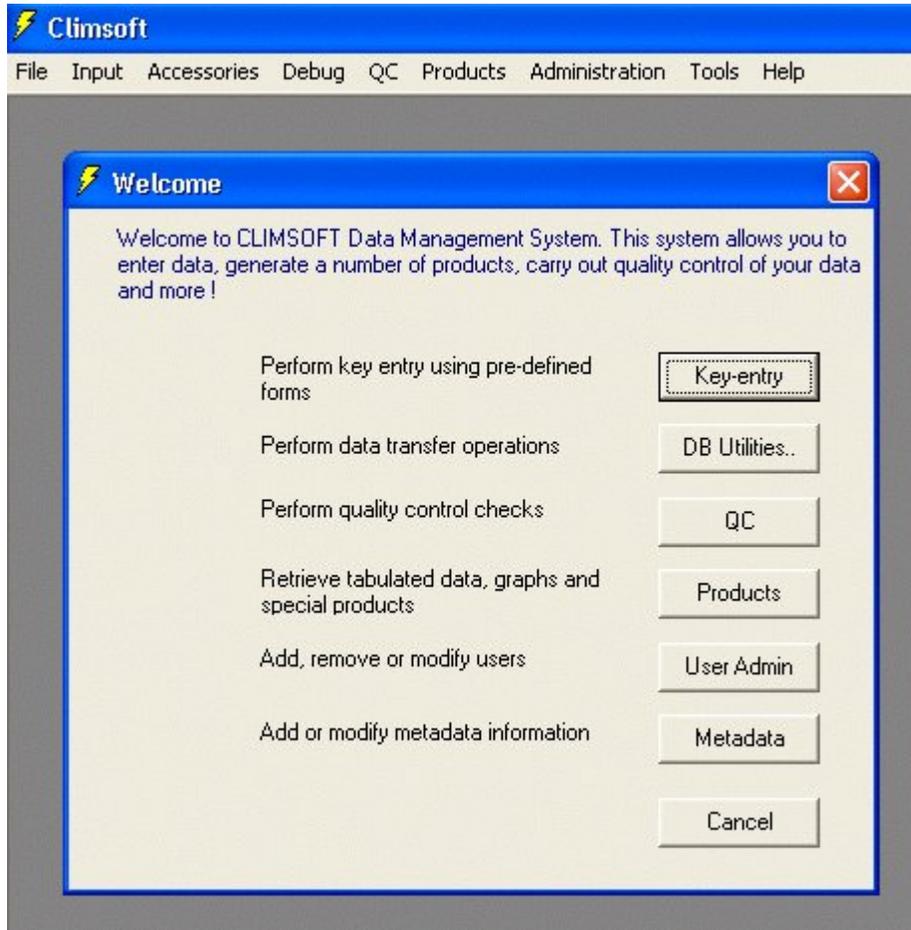
The first time that you run Climsoft after installation, the list of valid users may not yet have been defined. In this case you will get a message to this effect, and then the dialogue shown in the **Defining Users** section will be displayed so that you can define your user name and password as an administrator. Once this has been done, Climsoft will display the Login dialogue, and you can use the user name and password that you have just defined.

If you enter an invalid user name or password, a message will inform you of this and you will be able to try again. Clicking the Cancel button will exit immediately from the Climsoft program.

Once you have entered a valid user name and password, a splash screen appears for a few seconds, and then the Climsoft main window and the Welcome dialogue appear.

ClimSoft Main Window and Welcome Dialogue

The main Climsoft window consists of a menu bar and an area that is used to contain the dialogues and forms that are currently being used. When Climsoft is first started, the Welcome dialogue is displayed.



The *Welcome* dialogue contains several command buttons that you can click to display further dialogues that enable you to perform various tasks in Climsoft. These in turn may invoke further dialogues or forms that help you specify the functions that you want to perform. Exiting from any of these brings you back to the dialogue at the previous level, and eventually back to the *Welcome* dialogue again.

The actions performed by the command buttons can also be performed using the menu if you prefer. In general, the actions available in each dialogue are also available in the menu, which changes appropriately when you display a new dialogue. However, the menu sometimes provides additional features which are not available from the dialogue.

If you prefer to use the menu rather than the *Welcome* dialogue, you can remove the dialogue

by clicking the **Cancel** button. You can display it again by selecting the menu item **File Show Welcome Form**.

If you are logged in as a user with System Administrator privileges, all the command buttons and menu items will be available. However, if you have logged in as another type of user, you will only be allowed to perform the functions relevant to that user, and some of the menu items will be greyed out to show that you cannot use them. This can be seen in the picture above, where the User Admin and Metadata buttons and the Administration menu item are not available.

Getting Help

Information about using the Climsoft system is available on-line through the Help facility. This can be accessed by clicking the **Help** menu item and selecting **Contents...** You can then browse through the help pages, or you can use the **Index** tab to find information about a particular topic.

The About sub-item displays information about this version of Climsoft.

Each Climsoft dialogue contain a Help button. Clicking this button will display information about that particular form. This makes it easy to find out about particular features of the dialogue while you are using it.

Closing the Program

To finish using the Climsoft program, you can then select the menu item **File** **Exit**, or you can click the **Close** button at the top right of the main window.

Climsoft may display messages when closing down to ask whether information that you have changed should be saved. This ensures that changes that you have made are not lost accidentally.

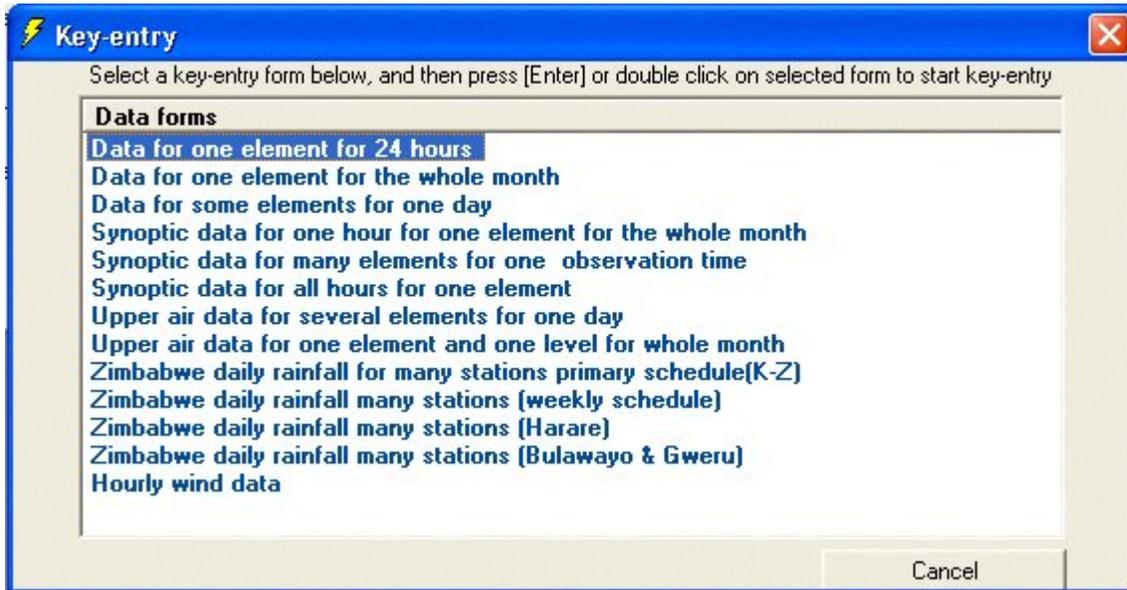
Data Entry

The Key Entry facility of the Climsoft program enables you to take climatic data that has been supplied on paper forms and input the data via the keyboard into the Climsoft system. A number of quality checks will be performed automatically as you enter the data to catch obvious errors. These may be caused, for example, by mis-typing on the keyboard, misreading of the paper records, or misrecording of the original observation. If a problem is detected, the program will display a suitable message, and will give you an opportunity to correct the problem.

The data that you input will be stored in a small database called the **Temporary Work File**. This database is “temporary” in the sense that it is a holding place for data before they are transferred to the main climatic database for permanent storage. However, the contents of the Temporary Work File are preserved when you exit from the Climsoft program. When you run the program again, you can look at (and if necessary change) the records that you entered previously, and of course you can add new records. Thus you can build up the contents of the Temporary Work File over several sessions.

From time to time, the contents of the Temporary Work File can be transferred to another database, so that further consistency checks on the data can be carried out. Generally, this operation will clear the contents of the Temporary Work File.

The Key Entry dialogue can be displayed by clicking the Key entry button on the Welcome dialogue, or by clicking the Input menu item.



Data entry forms are used to add new records into the temporary work file , or to modify existing records. The Data forms box displays a list of the data entry forms that are currently available. Note that the forms available to you may differ from the list shown above.

You can display a particular data entry form by double-clicking its name in the list, or by selecting the name by clicking it once and then using the menu item **Input -> Input Data Using Selected Form**.

Sometimes you may find that the list of data forms is not displayed correctly. In this case you should click the **Cancel** button and try to display the list of data forms again. Details on using the key-entry module are contained in the Key-entry Guide.

Updating the Database

Once a set of data records (for example, all the data recorded for last month) have been input into the Temporary Work File, they need to be transferred into the Climsoft Intermediate Database for further quality control before permanent storage in the Main Database.

The Intermediate Database has a similar structure to the Main Database, but initially does not contain any observational records. These are provided by the data transferred from one or more Temporary Work Files, plus additional data that may be imported from other sources (e.g. CLICOM or GTS data).

Once the data in the Intermediate Database have been checked for consistency and any problems corrected, they can be transferred permanently into the Main Database. Once this has been done, it is good practice to archive the Intermediate Database, and to create a new Intermediate Database with the same structure but without any observational data.

Quality Control

Data that are held in the Intermediate Database may still contain errors or inconsistencies. These may be due to:

Incorrect or dubious values entered into the Temporary Work File during Key Entry.

Generally, errors due to exceeding global or local limits will have been flagged during Key Entry, and will often be corrected at that stage, but sometimes the correct value cannot easily be determined, so the incorrect value may have been accepted for the time being and entered into the Temporary Work File.

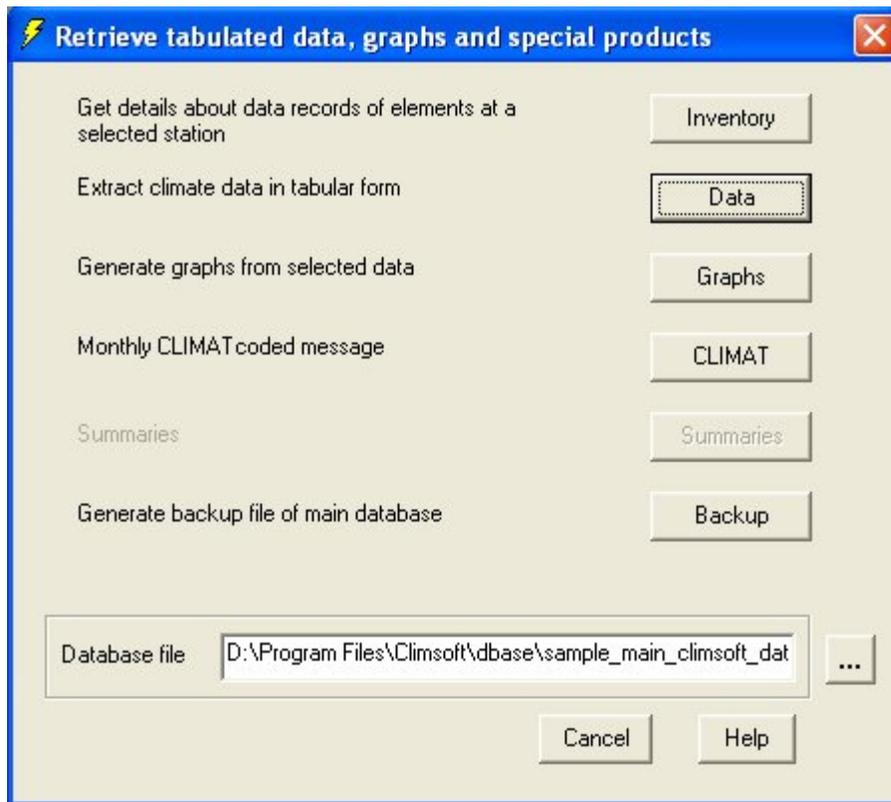
Errors in imported data. Data that have been imported from other sources may contain errors which have not previously been checked.

Inconsistencies between data items. Although individual data items may have values that are within the limits, they may be inconsistent with related values (which may have been entered at a different time by a different person). For example, the minimum temperature should never be greater than the maximum temperature for the same period at the same location.

A number of [Quality Control procedures](#) have been included in Climsoft V3 and are explained in the Administrator's Guide.

Products

ClimSoft provides a number of standard products which produce commonly-required reports or diagrams using data contained in the main database. The Products dialogue can be displayed by clicking the Products button on the Welcome dialogue, or clicking the menu item Products.



There are five types of products available:

- [Inventory](#) – details of the element types recorded at a particular station.
- [Data](#) – various summaries extracted from the data in the climatic database.
- [Graphs](#) – useful graphical summaries of the climatic data.
- [Climat](#) – coded message containing monthly climate summaries.
- Backup - backup of main database to a text file

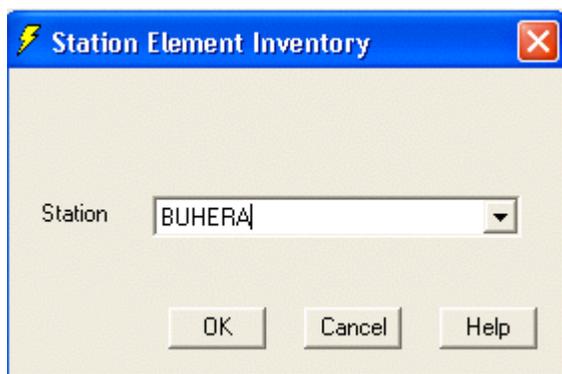
The Database file textbox displays the name of the current intermediate database. This can be changed if necessary by clicking on the browse button to the right of the database name.

The data products allow you to produce Access tables containing various summaries of the data held in the climatic database. You can summarise the values of a specified element type at a specified station between specified dates. Summaries can be made on an hourly, daily, dekadal, monthly or annual basis, and you can also obtain long-term means and extreme

values. These options are given in the initial dialogue for [tabulated data](#). Some Data Products (all except Hourly and Daily) invoke a second dialogue with additional options. For example, there is an [intermediate dialogue](#) for monthly data. A [final dialogue](#) is then displayed, enabling you to input details about the subset of data to be chosen.

Inventory

The inventory product retrieves details of the climatic elements that have been recorded at a particular station. When you click on the menu item **Products → Inventory**, the following dialog is displayed:



Select the required station in the box, and then click OK. The procedure searches the database for the appropriate information and produces an Excel Spreadsheet as shown in the following screen-shot:

	A	B	C	D	E	F	G	H	I	J
1	id	name	code	abbreviation	bdate	edate	actual_obs_days	expected_obs_days	missing_days	% missing
2	67875010	BUHERA	2	TMPMAX	4/1/1990	12/31/2000	3884	3928	44	1
3	67875010	BUHERA	3	TMPMIN	4/1/1990	12/31/2000	3534	3928	394	10
4	67875010	BUHERA	4	TMPMIN	4/2/1990	12/31/2000	3320	3927	607	15
5	67875010	BUHERA	5	PRECIP	4/1/1990	12/31/2000	3889	3928	39	1
6	67875010	BUHERA	18	EVAPPN	1/1/1993	3/31/1993	57	90	33	37
7	67875010	BUHERA	43	SKYSUN	4/2/1990	12/31/2000	3278	3927	649	17
8	67875010	BUHERA	57	WNDMIL	4/1/1990	12/31/2000	3847	3928	81	2
9	67875010	BUHERA	81	MNSOIL	5/1/1990	9/30/1990	153	153	0	0
10	67875010	BUHERA	84	SUNSHN	3/1/1994	8/29/1998	107	1643	1536	93
11	67875010	BUHERA	93	W'	4/1/1990	12/31/2000	3791	3928	137	3
12	67875010	BUHERA	94	MXMNDIFF	4/1/1990	12/31/2000	3499	3928	429	11
13	67875010	BUHERA	99	GRMIN	5/1/1991	5/26/1998	1093	2583	1490	58
14	67875010	BUHERA	101	TEMPDB	1/1/1999	12/31/2000	516	731	215	29
15	67875010	BUHERA	102	TEMPWB	1/1/1999	12/31/2000	515	731	216	30
16	67875010	BUHERA	103	TEMPDP	1/1/1999	3/31/2000	270	456	186	41
17	67875010	BUHERA	105	RELHUM	1/1/1999	3/31/2000	270	456	186	41
18	67875010	BUHERA	109	CEIL	1/1/1999	12/31/2000	515	731	216	30
19	67875010	BUHERA	110	VISBY	1/1/1999	12/31/2000	516	731	215	29
20	67875010	BUHERA	111	WNDSPD	1/1/1999	12/31/2000	516	731	215	29
21	67875010	BUHERA	112	WNDDIR	1/1/1999	12/31/2000	516	731	215	29
22	67875010	BUHERA	114	CLDTOT	1/1/1999	12/31/2000	516	731	215	29
23	67875010	BUHERA	117	CLDTY1	1/1/1999	12/31/2000	516	731	215	29
24	67875010	BUHERA	121	CLDTY2	1/1/1999	12/31/2000	491	731	240	33
25	67875010	BUHERA	125	CLDTY3	1/1/1999	12/31/2000	453	731	278	38
26	67875010	BUHERA	167	PRSWX	1/1/1999	12/31/2000	516	731	215	29
27	67875010	BUHERA	168	CLD-1	1/1/1999	12/31/2000	469	731	262	36
28	67875010	BUHERA	169	CLD-2	1/1/1999	12/30/2000	235	730	495	68
29	67875010	BUHERA	170	CLD-3	1/1/1999	12/19/2000	75	719	644	90
30	67875010	BUHERA	171	CLD-4	1/20/1999	3/15/2000	5	421	416	99
31	67875010	BUHERA	191	LLOUD	1/1/1999	12/31/2000	516	731	215	29
32	67875010	BUHERA	197	PstWx	1/1/1999	12/31/2000	516	731	215	29
33										

The columns contain the following information:

id	Station number.
name	Name of the station.
code	Element code.
abbreviation	Name of the element.
bdate	Date when this element was first recorded at this station.
edate	Date when this element was last recorded at this station.
actual_obs_days	Number of days that observations of this element were made at this station.
expected_obs_days	Number of possible observation days (number of days between bdate and edate).
missing_days	Number of days when no observations were made (difference between expected_obs_days and actual_obs_days)
% missing	Percentage of days with no observations.

Note: In line with the requirements of WIS, the Climsoft inventory output is now also given in XML format for display on the web. The XML inventory output for a selected station is sent to the Climsoft **data** folder and automatically given the filename of the form "**xxxxxxx.xml**", where [xxxxxxx] is the station ID.

Tabulated Data

The data products allow you to produce Excel spreadsheets containing various summaries of the data held in the climatic database. You can summarise the values of a specified element type at a specified station between specified dates. The following list shows the products currently available in Climsoft.

[Hourly](#)

[Daily](#)

[Dekadal](#)

[Monthly](#)

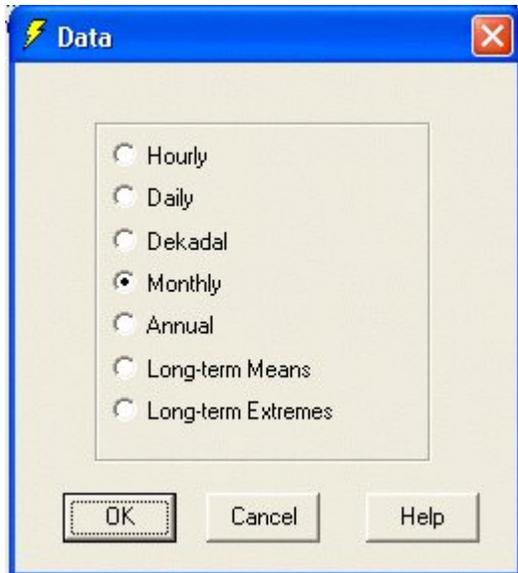
[Annual](#)

[Long-term Means](#)

[Long-term Extremes](#)

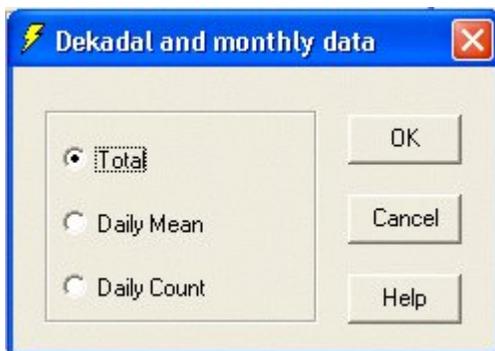
General Dialogue for Tabulated Data

Summaries can be made on an hourly, daily, dekadal, monthly or annual basis, and you can also obtain long-term means and extreme values.



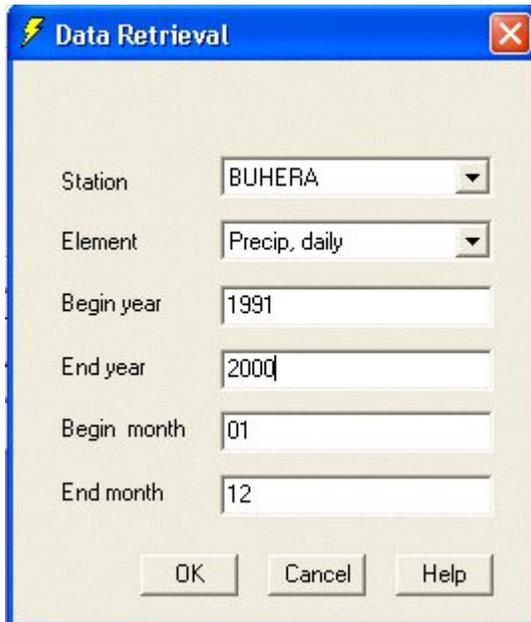
Intermediate Dialogue for Monthly Data

Some Data Products (all except Hourly and Daily) invoke a second dialogue with additional options. For example, for Monthly you get:



Final Dialogue for Data Retrieval

This dialogue has a common format for all the Data Products, though additional fields may be present in some dialogues. The dialogue is typified by the following example for Monthly Totals:



The image shows a 'Data Retrieval' dialog box with the following fields and values:

Field	Value
Station	BUHERA
Element	Precip. daily
Begin year	1991
End year	2000
Begin month	01
End month	12

Buttons: OK, Cancel, Help

In this example, the monthly total precipitation for station Binga is required between January 1999 and December 2000.

The specific actions of the various data products are given in the following sections.

Input Dialogue for Hourly Data

The dialogue for hourly data requires more parameters to be specified than other types of products.

Retrieval of Hourly Data

ID	Sation
67964020	BULAWAYO GOETZ
67893020	CHIBERO
67897040	CHIMANIMANI PORK PIE
67771030	CHINHUYI
67983030	CHIPINGE
67897020	CHISENGU
67985020	CHISUMBANJE
67871020	CHIVHU
67911010	COFFEE RES. STM

Code	Element
139	Radiation,direct
133	Radiation,global
105	Relative Humidity
132	Sunshine
103	Temp, dew point
101	Temp, dry bulb
102	Temp, wet bulb
179	Type of high cloud
177	Type of low cloud

Hour
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00

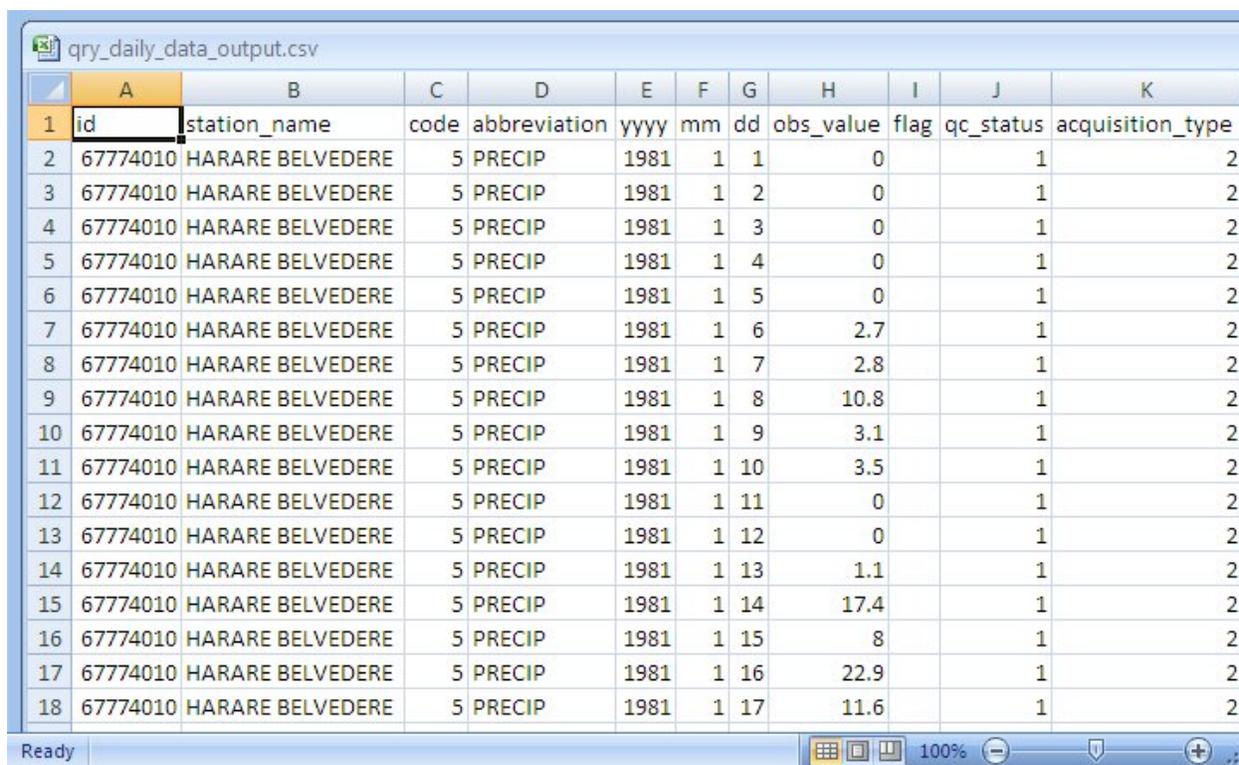
Begin year: 2000 Begin month: 01
End year: 2010 End month: 12

OK
Cancel
Help

Daily Data

Produces the observed values of an element for each day in the period.

For example, the following table shows (some of) the daily records of sky cover at Buhera in the month of April 1990.



	A	B	C	D	E	F	G	H	I	J	K
1	id	station_name	code	abbreviation	yyyy	mm	dd	obs_value	flag	qc_status	acquisition_type
2	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	1	0		1	2
3	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	2	0		1	2
4	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	3	0		1	2
5	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	4	0		1	2
6	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	5	0		1	2
7	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	6	2.7		1	2
8	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	7	2.8		1	2
9	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	8	10.8		1	2
10	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	9	3.1		1	2
11	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	10	3.5		1	2
12	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	11	0		1	2
13	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	12	0		1	2
14	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	13	1.1		1	2
15	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	14	17.4		1	2
16	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	15	8		1	2
17	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	16	22.9		1	2
18	67774010	HARARE BELVEDERE	5	PRECIP	1981	1	17	11.6		1	2

Hourly Data

Produces the observed values of an element for a specified hour over a specified period. The Hourly Data dialog includes an extra field to specify the hour of the day from which the data will be extracted.

For example, the hourly data screen-shot below, shows (some of) the records of daily mean temperature at Binga at 06:00 in the month of January 1992.

	A	B	C	D	E	F	G	H	I	J
1	station_id	station_name	elem_abbrev	yyyy	mm	dd	hh	obs_value	flag	acquisition_type
2	67897020	CHISENGU	TEMPDB	2000	10	22	0	20.1		1
3	67897020	CHISENGU	TEMPDB	2000	10	22	2	21.9		1
4	67897020	CHISENGU	TEMPDB	2000	10	22	4	31.2		1
5	67897020	CHISENGU	TEMPDB	2000	10	22	6	21.2		1
6	67897020	CHISENGU	TEMPDB	2000	11	23	0	19.7		1
7	67897020	CHISENGU	TEMPDB	2000	11	23	2	4.3		1
8	67897020	CHISENGU	TEMPDB	2000	11	23	4	20.1		1
9	67897020	CHISENGU	TEMPDB	2000	11	23	6	10.1		1
10										

Dekadal Data

Produces the total value, daily mean value or the number of observations of an element (e.g. precipitation) for each group of 10 days in the specified period (i.e. 3 times per month).

[DAILY COUNT NOT YET IMPLEMENTED.]

For example, the following table shows the dekadal means of sky cover at Buhera in April and May 1990.

	A	B	C	D	E	F
1	station	element	yy	mm	dekad	daily_mean
2	BUHERA	SKYSUN	1990	5	1	1.1
3	BUHERA	SKYSUN	1990	5	2	4.8
4	BUHERA	SKYSUN	1990	5	3	2.1
5	BUHERA	SKYSUN	1990	6	1	4.0
6	BUHERA	SKYSUN	1990	6	2	4.5
7	BUHERA	SKYSUN	1990	6	3	0.8

Monthly Data

Produces the total value, daily mean value or the number of observations of an element for each month in the specified period.

For example, the following table shows a sample of the monthly total precipitation at Binga.

id	station_name	code	abbreviation	yyyy	mm	monthly_total	monthly_count	qc_status	acquisition_type
2	HARARE BELVEDERE	5	PRECIP	1991	1	153.0	31	1	2
3	HARARE BELVEDERE	5	PRECIP	1991	2	156.4	28	1	2
4	HARARE BELVEDERE	5	PRECIP	1991	3	94.3	31	1	2
5	HARARE BELVEDERE	5	PRECIP	1991	4	0.6	30	1	2
6	HARARE BELVEDERE	5	PRECIP	1991	5	0.8	31	1	2
7	HARARE BELVEDERE	5	PRECIP	1991	6	0.0	30	1	2
8	HARARE BELVEDERE	5	PRECIP	1991	7	0.0	31	1	2
9	HARARE BELVEDERE	5	PRECIP	1991	8	0.0	31	1	2
10	HARARE BELVEDERE	5	PRECIP	1991	9	3.0	30	1	2
11	HARARE BELVEDERE	5	PRECIP	1991	10	38.5	31	1	2
12	HARARE BELVEDERE	5	PRECIP	1991	11	73.4	30	1	2
13	HARARE BELVEDERE	5	PRECIP	1991	12	180.2	31	1	2
14	HARARE BELVEDERE	5	PRECIP	1992	1	62.2	31	1	2
15	HARARE BELVEDERE	5	PRECIP	1992	2	25.3	29	1	2

Annual Data

Produces the total value of an element for each year in the specified period. The output also includes 12 columns containing the monthly totals. One can specify any start month.

station	element	season	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	annual_total
BINGA	PRECIP	1990/1991							176.3	98.9	171.7	0.0	0.0	0.0	446.9
BINGA	PRECIP	1991/1992	0.0	0.0	0.0	1.8	52.7	70.3	34.1	13.9	108.3	4.4	0.1	0.0	285.6
BINGA	PRECIP	1992/1993	0.0	0.0	0.0	5.0	20.9	283.5	99.4	303.8	23.7	4.0	0.0	0.0	740.3
BINGA	PRECIP	1993/1994	2.4	0.0	0.0	0.0	91.4	124.0	214.3	60.7	9.5	0.0		0.0	502.3
BINGA	PRECIP	1994/1995	0.0		0.0	16.1	17.8	30.9	43.2	32.8	11.2	6.2	0.0	0.0	158.2
BINGA	PRECIP	1995/1996	0.0	0.0	0.0	6.1	199.2		210.4	217.4	32.3	0.0	35.6	0.0	701.0
BINGA	PRECIP	1996/1997	0.0	0.0	0.0	0.0	126.4	114.9	387.6	264.8	166.8	129.7	0.0		1190.2
BINGA	PRECIP	1997/1998	0.0	0.0	22.8	0.0	36.1	190.8	273.5	41.1	38.0	0.0	0.0	0.0	602.3
BINGA	PRECIP	1998/1999	0.0	0.0	0.0	0.0	35.7	131.5	181.1	61.2		0.0	0.0	0.0	409.5
BINGA	PRECIP	1999/2000	0.1	0.0	4.6	0.0	107.9	57.2	189.9	348.2	173.2	9.9	22.6	45.9	959.5
BINGA	PRECIP	2000/2001	0.0	0.0	0.3	2.8									3.1

metos AWS data

The metos AWS system is made up of a network of automatic stations which send sensed data to a central web server in Austria. Data transmission to the web server is based on GPRS mobile technology. Observation data from the web server can be downloaded to a PC over the internet using a VB.NET module installed on the PC. The data on the PC are stored in a MS Access database which is synchronized with the data on the web server by running the VB.NET module on the PC.

A special module has been developed in Climsoft to extract the metos AWS data from the Access database and format the output into a csv file suitable for ingestion into Climsoft using the standard module for importing AWS data. Fig 1. shows the dialogue for the data extraction. Climsoft automatically generates the output file name made up of a concatenation of the "metos_aws_data" and date-time stamp at the time the data is extracted. The module is accessed from the Climsoft user interface via **Products--> Data --> metos AWS**.

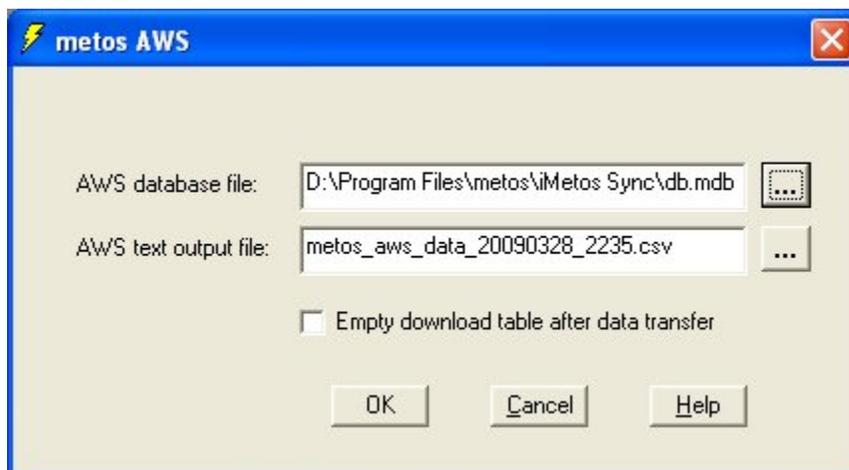


Fig 1. Dialogue for data extraction from metos Access database

Long-term Means

Produces summaries of element values for each day, decade, month or year over the whole of the specified period. [ONLY MONTHLY IS CURRENTLY IMPLEMENTED.]

For dekad, month and year you can specify whether you require the total values, means of daily values, or numbers of observations.

For example, Monthly Means lists the mean of the daily maximum temperatures for each of the specified months over the period 1990 to 1995. This gives one record per month.

	A	B	C	D	E	F	G	H
1	Station_ID	station	Element_Code	element	Month	Longterm_Avg	Beginning_Year	End_Year
2	67875010	BUHERA	2	TMPMAX	1	28.8	1991	1995
3	67875010	BUHERA	2	TMPMAX	2	28.9	1991	1995
4	67875010	BUHERA	2	TMPMAX	3	28.4	1991	1995
5	67875010	BUHERA	2	TMPMAX	4	26.9	1990	1995
6	67875010	BUHERA	2	TMPMAX	5	24.8	1990	1995
7	67875010	BUHERA	2	TMPMAX	6	22.5	1990	1995
8	67875010	BUHERA	2	TMPMAX	7	21.9	1990	1995
9	67875010	BUHERA	2	TMPMAX	8	23.9	1990	1995
10	67875010	BUHERA	2	TMPMAX	9	28.2	1990	1995
11	67875010	BUHERA	2	TMPMAX	10	30.0	1990	1995
12	67875010	BUHERA	2	TMPMAX	11	29.5	1990	1995
13	67875010	BUHERA	2	TMPMAX	12	28.4	1990	1995

Long-term Extremes

Provides the extreme value (maximum or minimum) of an element over the whole of the specified period, and the date at which the extreme value occurred.

You can specify whether the values to be used are daily, dekadal, monthly or annual values. [MONTHLY AND ANNUAL ARE NOT YET IMPLEMENTED]. For all except daily, you can specify whether you require the maximum/minimum of the total values, means of daily values, or numbers of observations. [NUMBERS OF OBSERVATIONS ARE NOT YET IMPLEMENTED].

The following example gives the extreme maximum daily temperature at Binga over the period from January 1990 to December 1999. Normally only one record will be returned, but in this case there are two records with the extreme value of 42.0°C, on 23 November 1994 and 17 November 1995.

	A	B	C	D	E	F	G	H
1	Station_ID	Station_Name	Element_Code	Element_Name	Daily_Extreme	yy	mm	dd
2	67755030	BINGA	2	TMPMAX	42.0	1994	11	23
3	67755030	BINGA	2	TMPMAX	42.0	1995	11	17

CLIMAT

Before a CLIMAT message can be generated for a selected station in Climsoft, there is need to have long-term statistics for the station. This includes climatological means for specific elements and also rainfall quintiles over a thirty year period. The thirty year period is a strict requirement for the calculation of rainfall quintiles. It is therefore necessary to fill any data gaps for precipitation in the climatological base period for the selected station. If it is not possible to get actual daily rainfall values, monthly rainfall totals would suffice. The form for monthly data (**form_monthly**) can be used to capture the data. Monthly rainfall can be entered and flagged as a cumulative total on the last day of the month. If monthly rainfall data are not available, a suitable method should be used to estimate the missing values. In this case, an appropriate flag should be defined to indicate that a value is estimated and cumulative.

It is also essential to update metadata before attempting to generate the CLIMAT message. In particular, instrument and station element details should be updated in order to get instrument height which is one of the required parameters in the encoding of the CLIMAT in TDCF.

The option for the CLIMAT message is accessed from the Climsoft **Welcome** screen by clicking on **Products**. After clicking on CLIMAT the dialogue shown in Fig 1 appears. The right frame on the dialogue is for the generation of CLIMAT long-term statistics, an operation which should be done only once for a given station and climate base period, unless if there is need to update the statistics.

The dialog box is titled "Monthly CLIMAT coded message". It features a "Station" dropdown menu currently set to "HARARE BELVEDERE". The interface is divided into two main sections: "Generate Input Data for BUFR Encoder" and "Generate Long-term Statistics for CLIMAT Message".

In the "Generate Input Data for BUFR Encoder" section, the "New bulletin data" radio button is selected. There is a "Msg Count" field with the value "0". Below this are input fields for "Year" (1996) and "Month" (11). An "OK" button is located at the bottom of this section.

In the "Generate Long-term Statistics for CLIMAT Message" section, there is a "Specify climate base period" section with "Begin Year" (1961) and "End Year" (1990) input fields. An "Enable Stats Calculation" button and an "OK" button are at the bottom of this section.

At the bottom of the dialog box, there are three buttons: "Encode CLIMAT", "Cancel", and "Help".

Fig 1. Dialogue for CLIMAT message

If there are data gaps in the rainfall record for a selected station, an appropriate message is displayed indicating the number of missing months or years. See Fig 2. Details of the data gaps will be automatically displayed in Excel as shown in Fig 3.

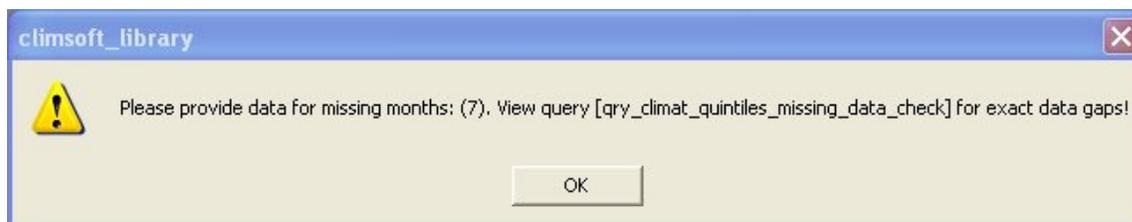


Fig 2. Message on missing data for CLIMAT

Station_ID	station	Element_Code	element	Month	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
67897020	CHISENGU	5 PRECIP	PRECIP	1		182.5	39.9	114.5	379.9	696.7	279.3	230.9	332	337.9
67897020	CHISENGU	5 PRECIP	PRECIP	2		562.5	279.4	237.2	340.8	179.8	65.6	253.9	285.8	133.1
67897020	CHISENGU	5 PRECIP	PRECIP	3		56.1	273.3	511.2	248.8	197.6	32.8	363.3	142.7	
67897020	CHISENGU	5 PRECIP	PRECIP	4		33.9	22.1	60.7	55	225.1	52.6	138.8	130.8	91.9
67897020	CHISENGU	5 PRECIP	PRECIP	5		44.6	59.1	94.6	38.4	29.1	15	88.5	13.2	50.1
67897020	CHISENGU	5 PRECIP	PRECIP	6		29.7	7.5	45.8	46.2	7.9	25.5	13	37	56.2
67897020	CHISENGU	5 PRECIP	PRECIP	7	33.6	37.2	165.1	53	24	28.6	0.7	4	15.7	2.1
67897020	CHISENGU	5 PRECIP	PRECIP	8	30.1	6.2	38.4	17.4	50.3	1.3	10.5	20.3	76.2	41
67897020	CHISENGU	5 PRECIP	PRECIP	9	41.9	40.9	0.2	23.9	59.3	19.7	95.3	16.2	20.4	23.9
67897020	CHISENGU	5 PRECIP	PRECIP	10	89	92	73.5	66.7	70	71.2	66.8	225.3	118.7	15.2
67897020	CHISENGU	5 PRECIP	PRECIP	11	255.5	73.6	80.2	185.1	171	74.9	59.7	160.7	99.9	125.6
67897020	CHISENGU	5 PRECIP	PRECIP	12	232.1	164.6	228.9	193.1	248.8	296.8	445.2	170.8	293.3	254.6

Fig 3. Query output showing rainfall data gaps

The left frame on Fig 1. is for the generation of the CLIMAT message on a monthly basis. On clicking OK, the output will be sent to a text file **bufrtool_climat_input.txt** suitable for input into BUFRTool, a utility used to encode the CLIMAT message in BUFR. Fig 4. shows sample output of the data file used for encoding the CLIMAT message. The data are laid out in a structure suitable for input into BUFRTool. The string “MSG” first line indicates that this is data for BUFR message. The following “0” indicates the message belongs to the field of meteorology and “1” indicates that this is data for one message. If the data are for more than one message the indicator “1” will be replaced by the number of messages.

Before BUFRTool can be used to encode messages in BUFR, the file **bufrtool-4.1.0.zip**, located in the **Climsoft** folder, should be unzipped in the same location to unpack the files required for the encoding process. The next requirement is to configure the program environment by editing the file **siteconf.htm**, located in the folder **bufrtool-4.1.0\tables**. What is essential to encode is the Centre Code indicating the centre origination the BUFR message. This is the same center code used for GRIB message. [..\..\Program Files\Climsoft\Bin\Originating_Centre_IDs_BUFR_GRIB.pdf](#)

Note: BUFRTool is a special utility for encoding messages in BUFR. It is developed by Northern Lighthouse Ltd. BUFRTool is packaged with CLIMSOFT setup under a special agreement with Northern Lighthouse. Detailed conditions of use are contained in the file

CONDITIONS_OF_USE-bufrtool.txt contained in the folder [**bufrtool-4.1.0**] which is created on unzipping the file **bufrtool-4.1.0.zip**.

Cipher BUFRtool is provided on an "as is" basis, without warranty of any kind, either express or implied. While every reasonable effort has been made to ensure that the material in the distribution is correct and up-to-date, Northern Lighthouse Ltd assumes no responsibility for errors or omissions, or for damages resulting from using it.

Reference:Cipher BUFRtool 4.1.0, October 2007, by Northern Lighthouse Ltd.

URL: <http://www.northern-lighthouse.com/>

As Fig.1 shows, there are two options for generating input data for the BUFR encoder. The default option is for generating new data,that is replacing any previously generated data. The second option is for appending data to the existing data file. This is required when the intention is to generate a bulletin containing more than one message, typically multiple stations. As one appends new data, the number of messages, which is incremented automatically, is indicated in the textbox labeled "**Msg Count**".

```
1 MSG 0 1
2 307073
3 67
4 774
5 HARARE BELVEDERE
6 1
7 1996
8 3
9 1
10 0
11 0
12 -17.83
13 31.02
14 1471
15 1472
16 2
17 31
18 4
19 //
20 //
21 850
22 //
23 1.5
24 293.15
25 1
26 6
27 299.4
```

Fig 4. Sample CLIMAT message

To encode the CLIMAT message, one should click the button **Encode CLIMAT**. The encoded message is named **newbfr.bfr** and is located in the path **...\\climsoft\\Bufrrtool-4.1.0**. After the message has been encoded, a dialogue for sending the encoded message automatically appears as shown in Fig.5.

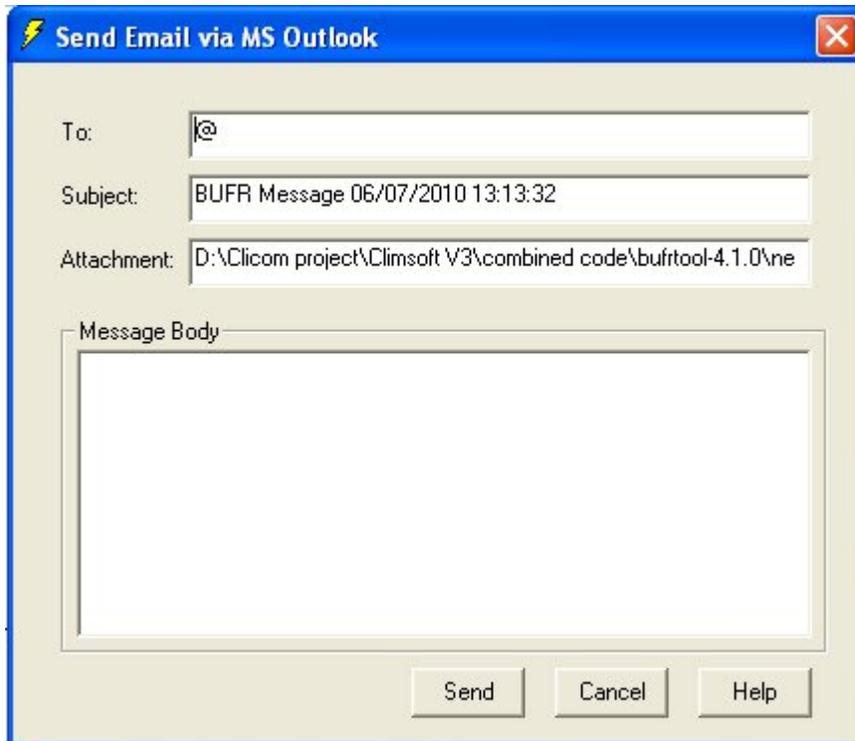


Fig 5. Dialogue for sending BUFR message by email

A correct email address should be entered in the first textbox. Data for the email **subject** and **attachment** fields are automatically generated. When the **Send** button is clicked, MS Outlook will be started with a new message automatically created to send the message.

Backup and Restore of Main Database

Climsoft version 3 includes tools for the [backup and restore of the MS Access main climsoft database](#) to a CSV file. This allows a very compact form of backup as compared to saving a copy of the entire database in MS Access format. [MySQL back-end database backup and restore](#) is carried out through the utility DB Tools, outside the Climsoft application. For [PostgreSQL back-end database backup and restore](#), one needs to use command line statements with the correct syntax.

Backup and Restore: MS Access Main Database

The backup dialogue shown on Fig 2. is accessed via the main dialogue for **Products**. See Fig 1. The backup file is in CSV format to conserve space. The file size can be reduced further, by about ten times, using a compression tool like Winzip.

The facility for backup allows single or multiple selection of stations and elements to backup. In addition to specifying the period covered by the dataset to backup, one is also free to specify the name of the backup file and its location. This means that the backup can be either on the hard disk or external storage media like USB flash disk or hard disk.

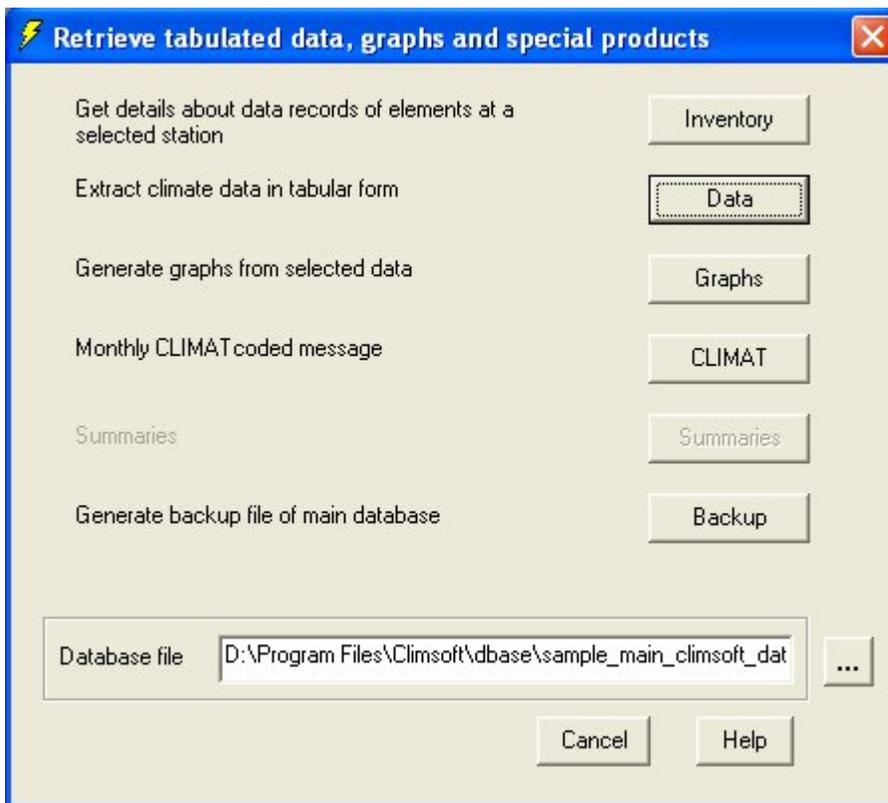


Fig 1. Dialogue for selecting backup option and database to backup

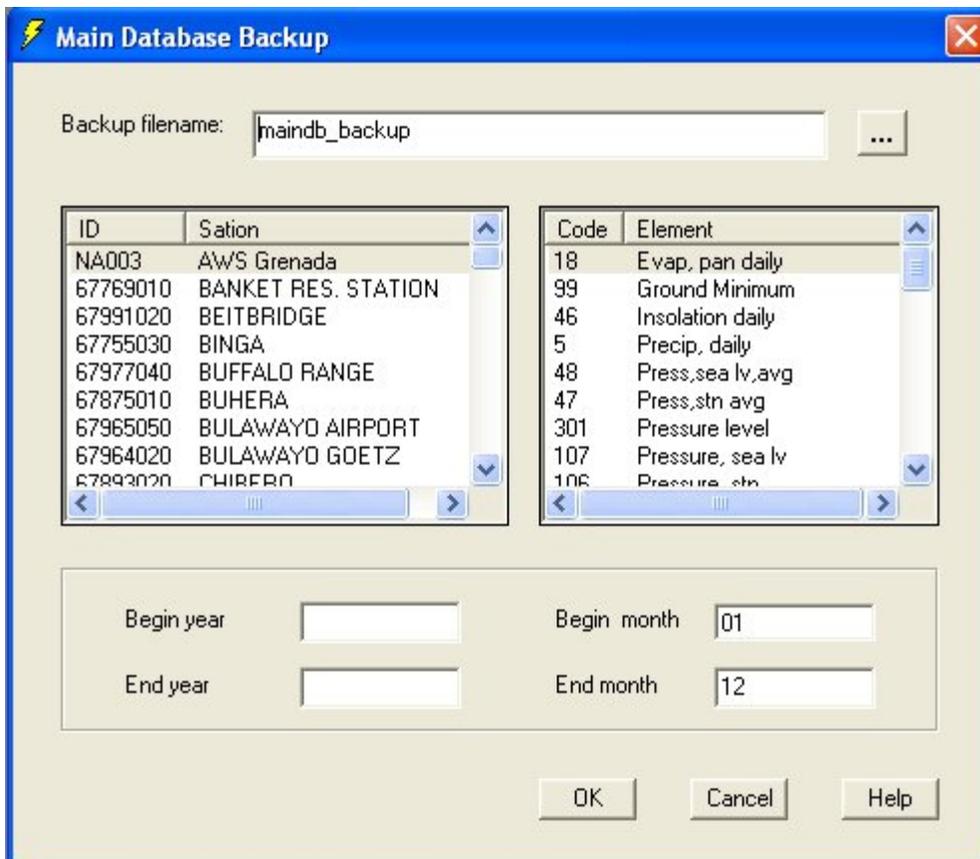


Fig 2. Backup dialogue

The dialogue for updating the main database now includes an additional option for database restore from a backup file as shown on Fig 7.

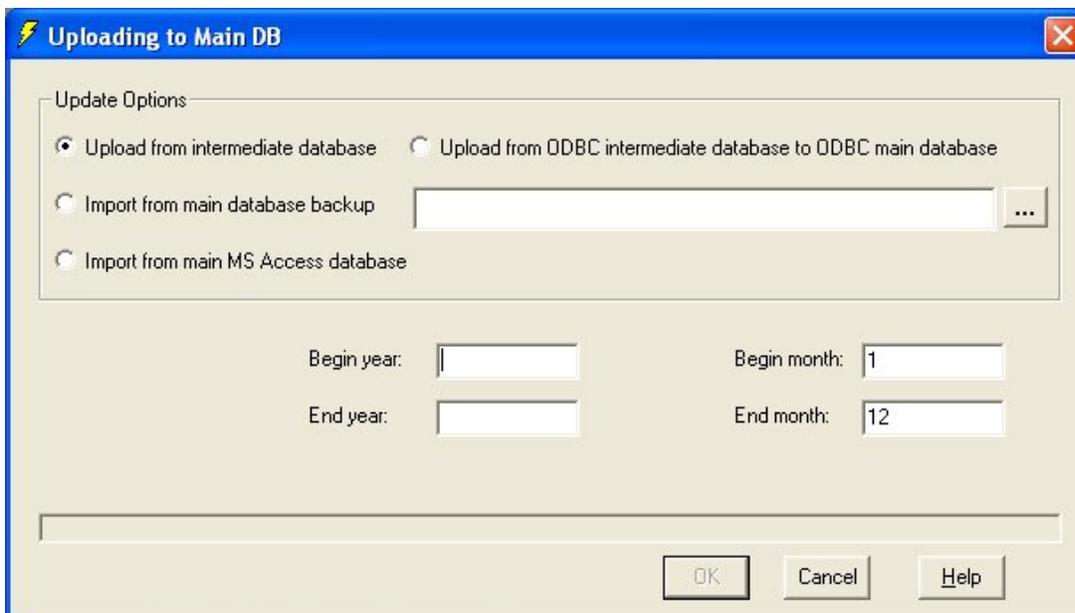


Fig 7. Option for database restore from backup

MySQL Backup and Restore

The easiest way to backup or restore Climsoft backend database in MySQL is probably through the use of DBTools, a freeware utility distributed with the Climsoft setup. To backup a database after starting DBTools, all one needs to do is to right click on the database name on the left panel of the DBTools start page and then select Dump to export the selected database as shown in Fig 1. below.

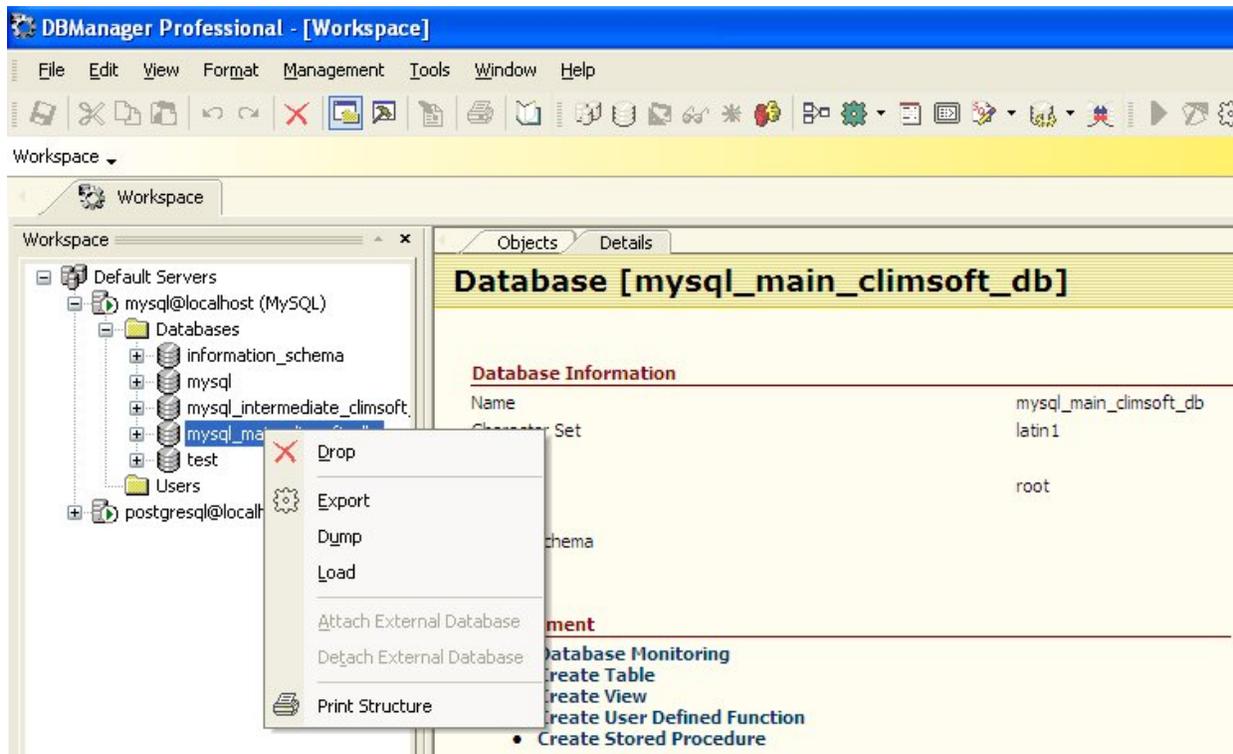
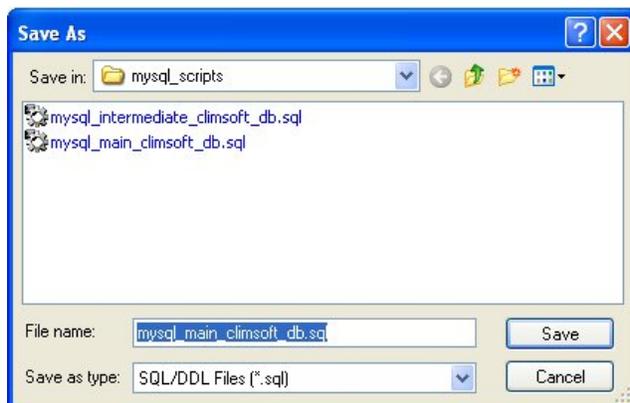


Fig 1. Backup of MySQL database in DBTools

After clicking on Dump, one will be taken to a dialogue to specify the name of the script to be saved and the location to store the file. See Fig 2. The default script name will be the name of the database plus extension (.sql).



To restore a database, after right clicking on the database name on the DBTools start page, one selects Load. This will give a dialogue for browsing for the script file name to restore or re-create the database. In fact this is the same option for creating a new MySQL database from a script.

PostgreSQL backup and Restore

For you to be able to backup or restore PostgreSQL databases, you must be logged into the computer as user "postgres" and password defined during PostgreSQL setup. So if you are logged in as a different user, you must log off and then log in with the above credentials.

Backup Procedure

From Windows Start, choose, All Programs → Accessories → Command Prompt and click. See Fig 1.

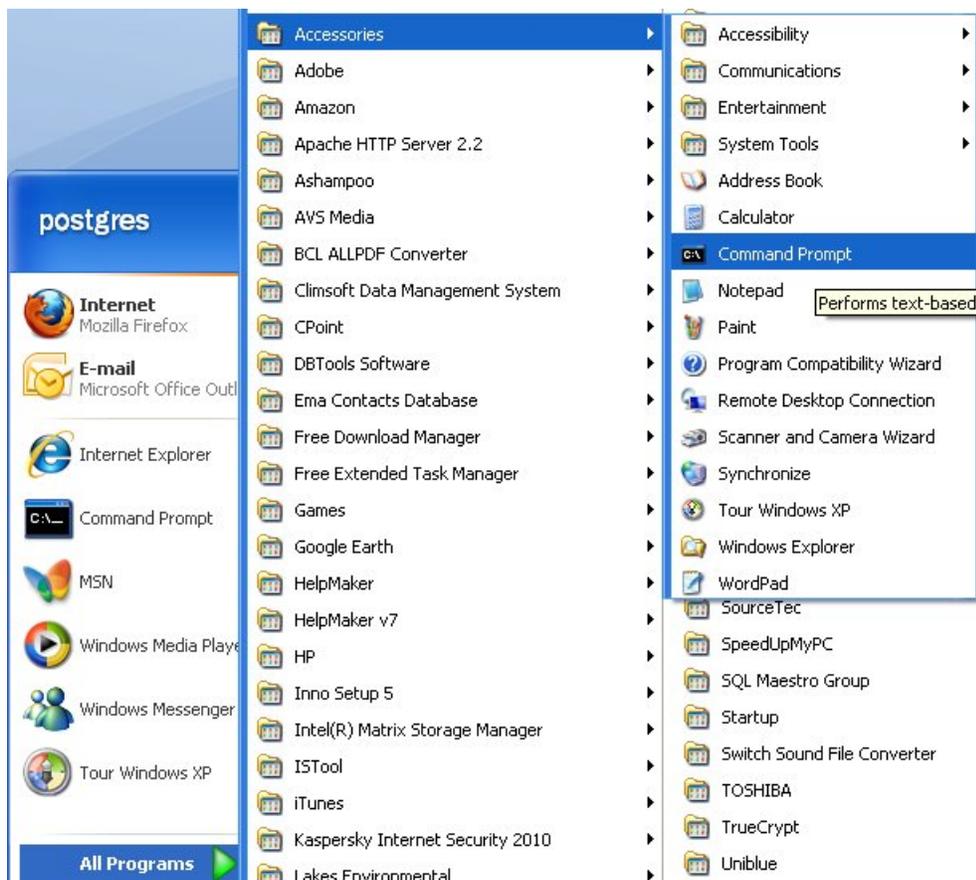


Fig 1. Accessing Command Prompt from Windows Start menu.

This should open the Command Prompt window as shown in Fig 2.

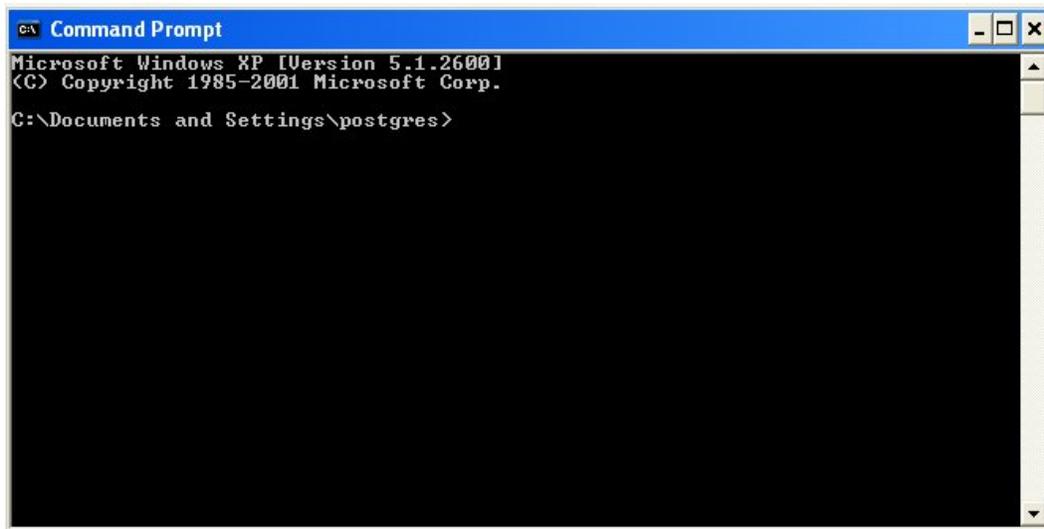


Fig 2. Command Prompt window.

If PostgreSQL is installed on the same drive as the Operating System e.g. C Drive, on the command prompt, type `cd\` and press the [Enter] key. If PostgreSQL is installed on a different drive, type the drive letter containing the path where you installed PostgreSQL followed by colon e.g. `d:` and press the [Enter] key. The Command Prompt should then look like the screenshot shown in Fig 3.

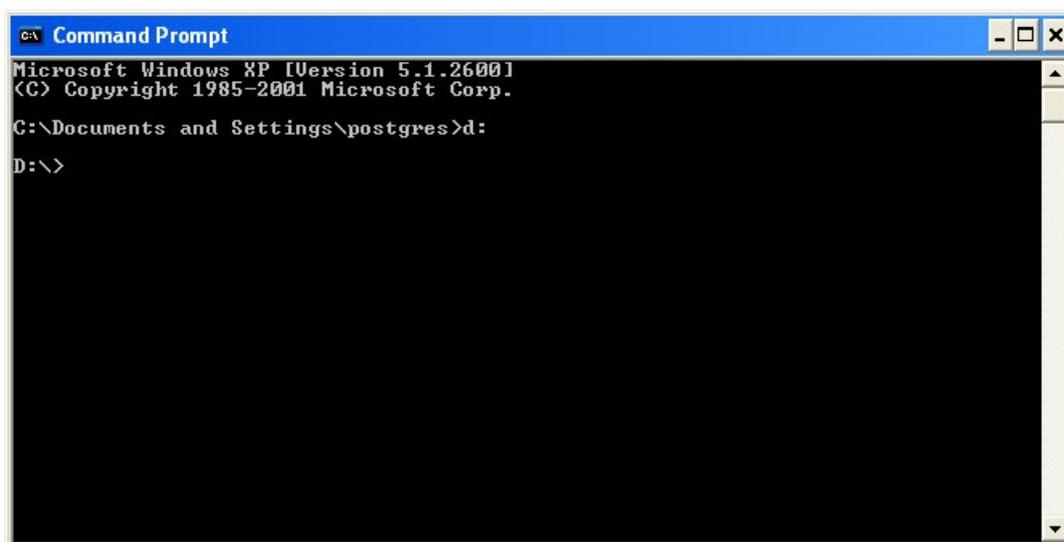


Fig 3. Command Prompt with Drive letter.

Next type `cd` followed by a space and the full path to the `bin` folder for PostgreSQL e.g. `cd "Program Files\PostgreSQL\8.4\bin"` and then press the [Enter] key. Please note that the quotes should be typed as well. The Command Prompt window should then look like the screenshot in Fig 4.

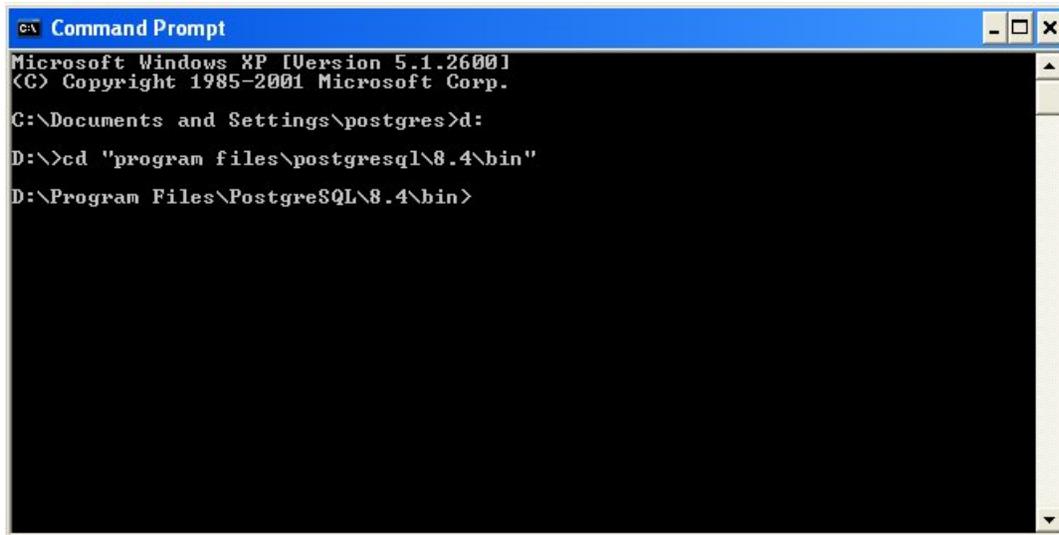


Fig 4. Command Prompt with path to PostgreSQL binary folder

On the Command Prompt, type

```
pg_dump postgres -o postgresql_intermediate_climsoft_db > postgresql_intermediate_climsoft_db.sql
```

and press the [Enter] key. You will then be prompted to enter the password for PostgreSQL. After entering the correct password the database will be backed up and the prompt will return to the path

...Program Files\postgresql\bin. See Fig 5.

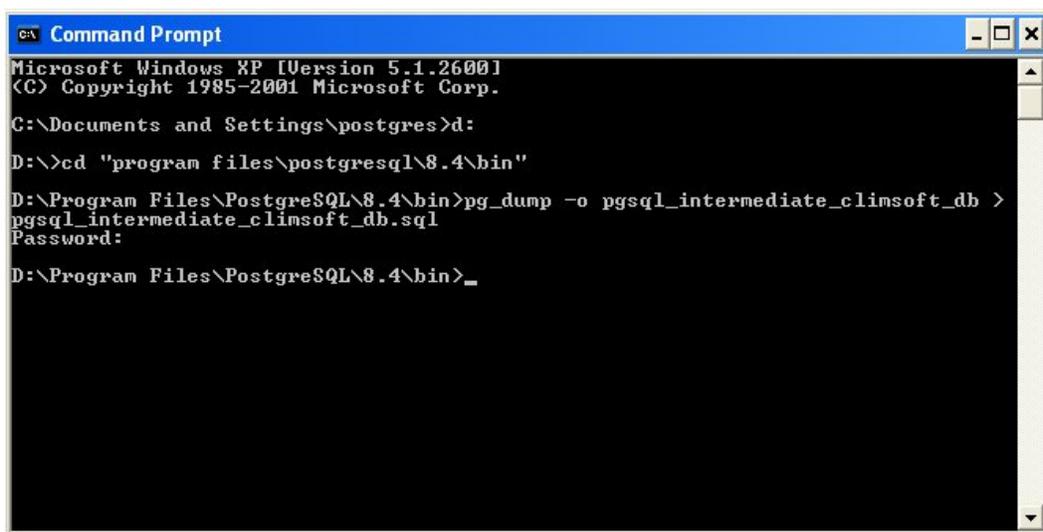


Fig 5. Final Window after typing backup command and password

Restore Procedure

To restore the database or to create a new database from the backup, on the Command Prompt shown in Fig 4, type `createdb -T template0 pgsql_intermediate_climsoft_db` and press the [Enter] key. Next, type `psql_intermediate_climsoft_db < pgsql_intermediate_climsoft_db.sql` and again press the [Enter] key. This will create and restore the database to the state when the database was backed up.

NOTE: *To backup or restore a different database from the climsoft intermediate database, just replace the database name with that of the database you want to backp or restore e.g. for the main database you will use `pgsql_main_clmsoft_db`.*

The above steps can be simplified by creating and executing batch files with commands similar to those given below. These sample batch files are include in Climsoft setup and are located in the folder "`....\Climsoft\dbase`"

1. `Postgresql_db_backup.bat`

D:

`CD "Program Files\PostgreSQL\8.4\bin"`

`Pg_dump pgsql_intermediate_climsoft_db > pgsql_intermediate_climsoft_db`

2. `Postgresql_db_restore.bat`

D:

`CD "Program Files\PostgreSQL\8.4\bin"`

`createdb -T template0 pgsql_intermediate_climsoft_db`

`psql_intermediate_climsoft_db < pgsql_intermediate_climsoft_db.sql`

Graphs

Graphics functionality in ClimSoft is currently limited to the Windrose plot. Although Excel is generally regarded as a good package for the plotting of most types of graphs, there are specialized graphics packages which seem more suitable for certain types of graphics e.g. Surfer is good at contouring. On the basis of this consideration, a freeware utility called WRPLOT has been seen to produce very good windrose plotting. This utility has been linked to the Climsoft user interface so that the windrose plot can be produced on the fly. Input parameters are entered in the [windrose dialogue](#) box which requires a station to be specified, together with a time range for the input data. Clicking the 'OK' button results in the extraction of data for input into WRPLOT followed by a plot of the [windrose](#).

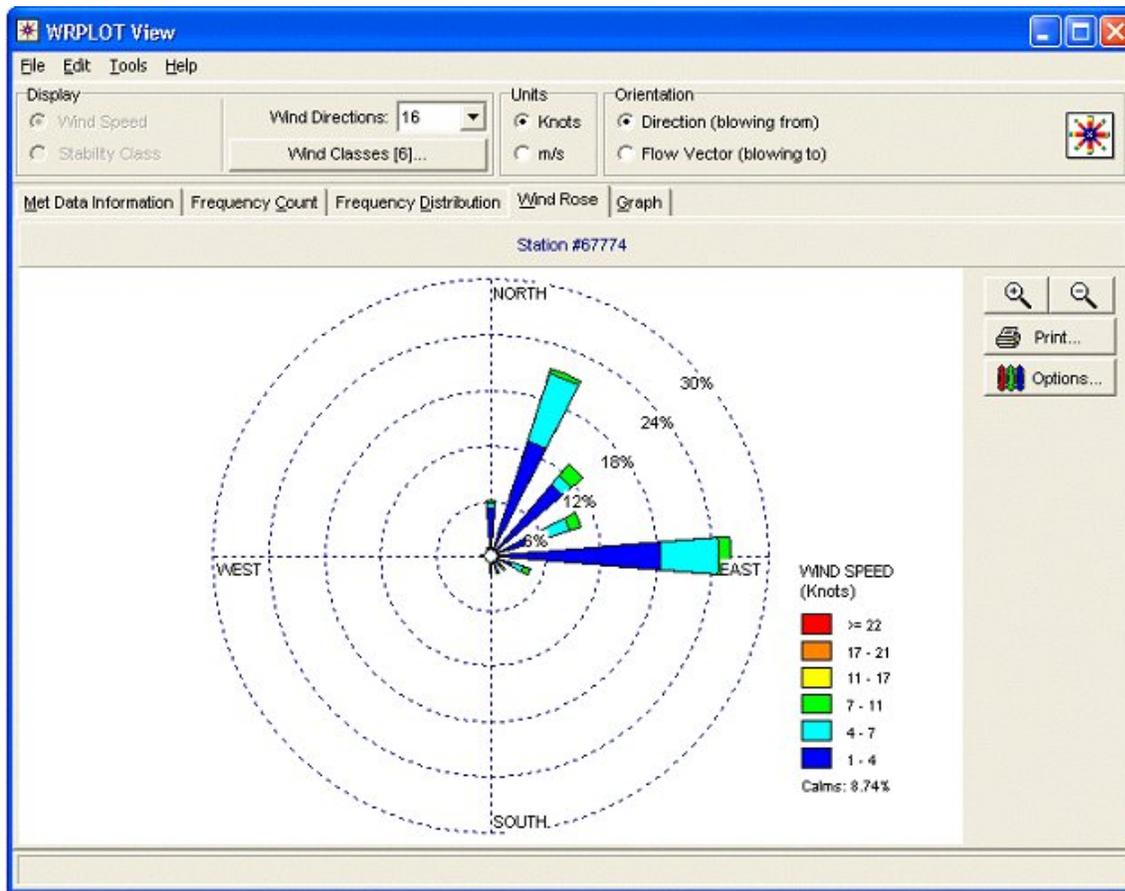
Windrose Input Dialogue



The screenshot shows a dialog box titled "Windrose" with a blue header bar containing a lightning bolt icon and a close button. The dialog contains the following fields and controls:

- Station: A dropdown menu with "HARARE BELVEDERE" selected.
- Begin year: A text input field containing "2000".
- End year: A text input field containing "2000".
- Begin month: A text input field containing "1".
- End month: A text input field containing "12".
- Buttons: "OK", "Cancel", and "Help" are located at the bottom of the dialog.

Windrose Plot



The user can customize the graph if necessary. For example one may want to change the wind speed classes or colour settings.

XML Output

XML Output

In line with the requirements of the WMO Information System (WIS), a module has been added for data output in XML format. Fig 1. shows the dialogue for XML output. This feature is accessed from the **Accessories** menu item on the Climsoft main menu.

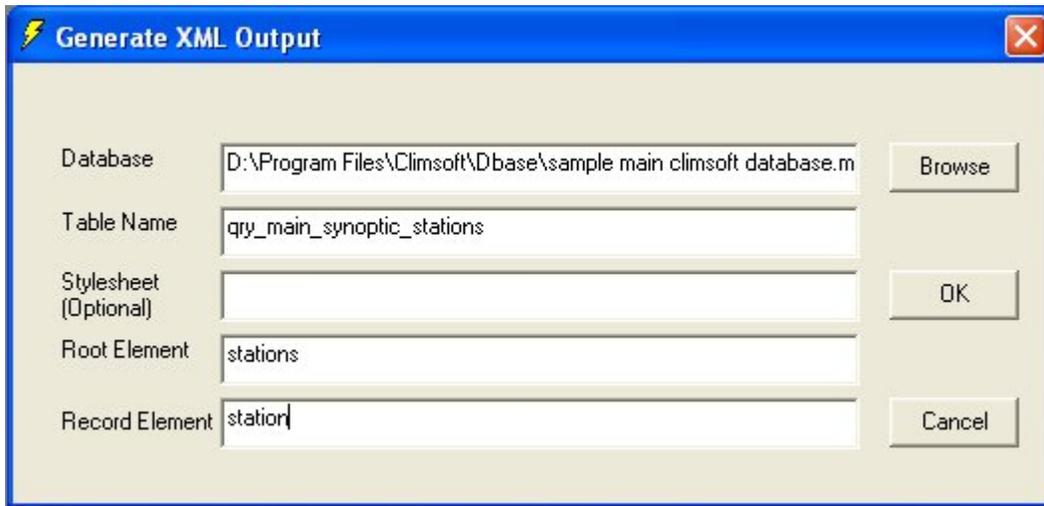


Fig 1. Dialogue for XML output.

Fig 2 below, shows sample output data in XML format from Climsoft.

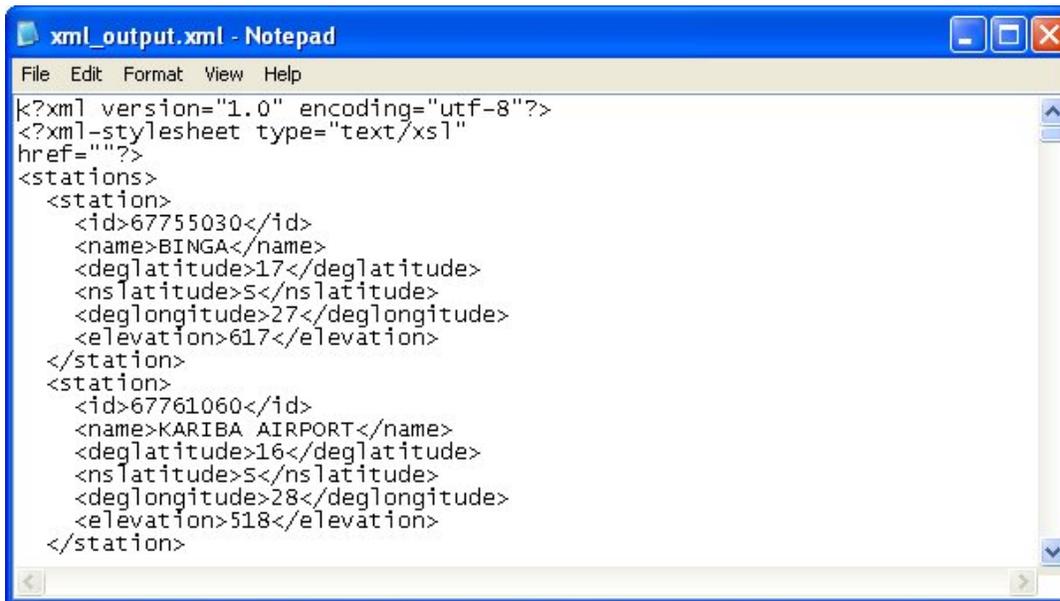


Fig 2. Sample xml output

TDCF

Climsoft version 3 has the capability to produce some standard meteorological messages in compliance with Table Driven Code Forms (TDCF). The SYNOP message is encoded in either CREX or BUFR while the [CLIMAT message](#) is encoded in BUFR. There is also a facility for sending the encoded messages by email.

WMO Information System (WIS)

A web based module is being developed for interfacing the Climsoft climatological data management system (CDMS) with WIS. Currently this module is at the demonstration stage. This gives a catalogue of data inventories for stations in a few selected countries. The list of stations and their countries plus the available data inventories are produced in XML. There is a stylesheet for displaying the available data inventories in a web browser.

Administration

ClimSoft provides facilities for various administrative tasks e.g. system configuration, [user management](#), [metadata management](#) and general database maintenance. Most of the database functions can be accessed via the [database utilities](#) control panel, followed by clicking the appropriate command button at the bottom of the form showing a list of available key-entry forms. Details on these and other administrative tasks are contained in the Administrator's Guide.