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1. Welcome to WeatherMan

WeatherMan is an object-oriented tool for importing, analyzing, and exporting climate data for use in crop simulation modeling and other activities. The Windows version has elements similar to the original DOS version, although a key difference exists in that the new version uses Paradox databases to store climate data. The DOS version used a flat-file ASCII system for storing and manipulating data. This help file contains information on most of the key elements of the program, and context sensitive help is also available for most functions of the program.

Some of the topics covered in the help file are listed below, including a complete users guide with sections

- Introduction
- Getting Started
- Managing Weather Data
- Climate File Structure
- References

There are also help topics dealing with the functionality of WeatherMan. You can browse or search the help file for more information on related topics. The primary reference topics on the functionality of WeatherMan include

- Accessing WeatherMan Functions
- Setting Program Preferences
- Importing Existing Climate Stations
- Importing Raw Data and Creating New Stations
- Editing Station Information
- Editing Monthly Means
- Editing Weather Data
- Plotting Daily Weather
- Plotting Summary Statistics
- Save and Export Options
- Generating Weather Data
- Locating Weather Stations
- Accessing Web Resources
- About WeatherMan

2. User Guide

2.1. 1. Introduction

2.1.1. Intoduction to Weatherman

Daily weather data are commonly used as input to mathematical models used in water related projects and agriculture. While the models expect the data to be complete and reliable, raw data from a weather station, or even a reliable secondary supplier of weather data, are often flawed. Common data problems include format errors, missing data, unreasonable values, data recorded in different units than needed, and data in an inconvenient format. Often there are no data available for a specific site, or a particular variable is not in the available weather record.

ICASA has focused on the development of crop models and software tools such as the DSSAT to aid research and development in agriculture. Available and reliable weather data are essential for good predictions using these crop models.

ICASA has specified a minimum daily weather data set and format for use with the crop models. In DSSAT v2.1, (IBSNAT 1986), the required daily variables were solar radiation ($\text{MJ/m}^2/\text{d}$), maximum temperature ($^{\circ}\text{C}$) minimum temperature ($^{\circ}\text{C}$), and rainfall (mm). An extended DSSAT v2.1 data set included photosynthetically active radiation (PAR, $\text{mol/m}^2/\text{d}$). DSSAT v35 uses the same minimum weather data set and allows optional variables, such as PAR, dew point ($^{\circ}\text{C}$) and wind speed (m/s).

The WeatherMan program is designed to simplify or automate many of the tasks associated with handling, analyzing, and preparing weather data for use with crop models or other simulation software. WeatherMan has the ability to translate both the format and units of daily weather data files, check for errors on import, and fill-in missing or suspicious values on export. WeatherMan can also generate complete sets of weather data comprising solar radiation, maximum and minimum temperature, rainfall, and photosynthetically active radiation. Summary statistics can be computed and reported in tables. The summary statistics or daily data can be viewed graphically.

WeatherMan checks for and flags format or range errors on import. On export, data flagged as missing or suspect can be replaced with estimates using several methods. The GENERATE menu permits generation of synthetic sequences of solar radiation, maximum and minimum temperature, rainfall, and photosynthetically active radiation for any duration. The ANALYZE menu includes the ability to display the results using tables or graphs.

2.2. 2. Getting Started

2.2.1. Getting Started

WeatherMan is installed via a CD. If your computer is configured to Auto-Start a compact disc, the installation should proceed automatically. If not, you will need to run the Setup.exe program in the WeatherMan directory of the CD. You can do this by clicking on Start|RUN and browsing the CD until you find the correct program (not sample dialog below). Your drive letter may vary.



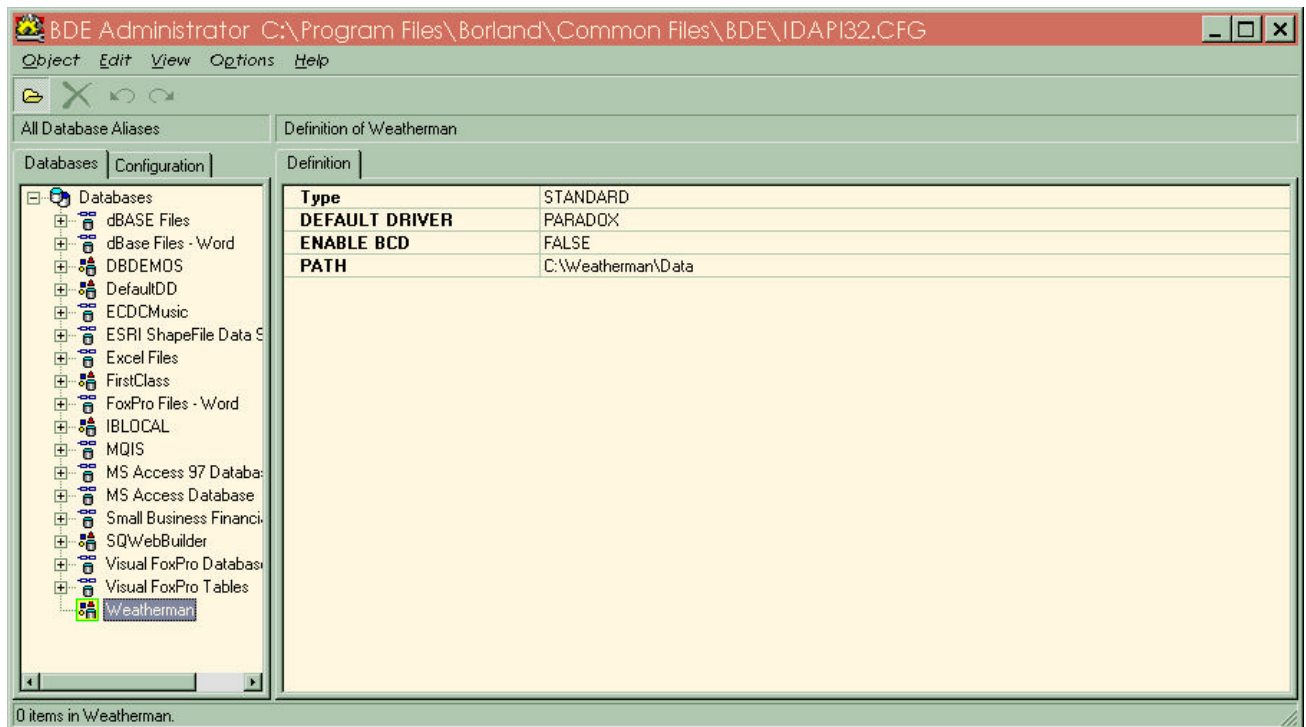
After starting the Setup program, WeatherMan will install itself. The default directory is C:\WeatherMan. It is advised that you choose the default directory. You can install WeatherMan in an alternative directory, however you may then need to run the Borland Database Engine (BDE) configuration utility, supplied by the WeatherMan Installation.

The Installation CD also contains other programs that may be needed to complete installation. An upgrade to the Microsoft® Common Control is supplied, along with a copy of the Adobe Acrobat Reader for reading the documentation file. Both reside in a separate directory on the CD and need only be installed if you experience operational difficulties.

2.2.2. Borland Database Engine

The Borland Database Engine (BDE) is the default database driver installed with WeatherMan. The Borland Database Engine (BDE) offers a rich and robust set of features used in client-server applications. The BDE database-driver architecture includes numerous shared services utilized by database drivers and other functions. The included set of database drivers enables consistent access to standard data sources: Paradox, dBASE, FoxPro, Access, and text databases. BDE is object-oriented in design. Runtime objects are created and then used to manipulate database entities, such as tables and queries. The core database engine files consist of a set of DLLs that are fully re-entrant and thread-safe. You configure the BDE system using the BDE Administrator (BDEADMIN.EXE). BDE provides flexible and powerful configuration management capabilities.

WeatherMan is installed as a Paradox database. You should not need to modify any settings after installation by WeatherMan. If you should, you can access the BDE administrator via the control panel.



Shown is the default settings for WeatherMan. If you need to change the Path (change **NOTHING** else) you can edit this entry.

2.3. 3. Managing Weather Data

2.3.1. Managing Data

WeatherMan is designed to work with the user to import weather data (in ICASA, DSSAT, or undefined weather format) into a WeatherMan database for export and use in applications that require daily climatic data, such as crop simulation models. The weather data, stored in Paradox databases, are associated with climate stations with a PRM extension. The default directories for searching for climate data and saving the data are defined in the Preferences dialog; the data is stored in the system registry.

2.4. 4. Climate file structure

2.4.1. File Structures

There are several climate file structures associated with WeatherMan.

- Summary data are stored in PRM files
- Data can be imported from and exported to DSSAT v35 files
- Data can be imported from and exported to ICASA 1.x files
- Weather can be generated from Monthly Target Files

2.4.2. PRM file

PRM climate files

\$CLIMATE: ARPE

*GENERAL

@Latitude Longitud Elev Zone TAV TAMP REFHT WNDHT SITE
 -33.930 -60.549 65 16.5 6.7 1.5 3.0 Pergamino, Argentina
 @WYR WFIRST WLAST
 68 1931001 1998120
 @PEOPLE
 Guillermo Podesta

@ADDRESS

@METHODS

@INSTRUMENTS

@PROBLEMS

@PUBLICATIONS

@DISTRIBUTION

@NOTES

Created on day 2/20/01 at 12:13:03 PM

*AVERAGES

@ Mean	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
SRad	25.49	21.25	17.10	13.75	10.64	8.36	8.46	12.10	16.17	20.16	26.11	25.59
TMax	30.39	29.32	26.77	22.77	19.62	15.73	15.51	17.54	19.80	22.47	25.87	29.01
TMin	16.22	15.52	13.85	10.06	7.44	4.89	4.28	4.88	6.59	9.68	12.37	14.94
Rain	112.17	97.23	128.14	89.14	52.47	44.93	36.62	39.70	55.53	108.70	95.19	101.74
RNum	7.72	6.83	7.97	6.83	5.69	5.75	4.62	4.62	5.67	8.59	8.31	8.05
SunH	68.01	68.52	63.01	60.64	54.37	48.13	52.06	57.06	57.93	57.45	64.58	63.68

*HIGH-FREQUENCY PARAMETERS

@Param	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TxMND	30.51	29.44	27.00	22.88	19.68	15.81	15.55	17.79	19.93	22.52	25.99	29.12
TxSDD	3.312	3.360	3.730	3.720	4.004	3.693	4.110	4.271	4.297	4.092	3.701	3.559
TxMNW	30.01	28.94	26.10	22.40	19.35	15.41	15.29	16.04	19.21	22.33	25.56	28.70
TxSDW	4.161	3.990	4.225	4.069	4.067	3.543	4.129	4.656	5.145	4.428	4.491	4.017
TnMND	15.70	14.87	13.17	9.17	6.65	4.06	3.66	4.29	5.85	8.74	11.75	14.46
TnSDD	3.278	3.317	3.808	4.084	4.500	4.512	4.620	4.350	4.079	3.828	3.550	3.500
TnMNW	17.79	17.50	15.80	13.04	10.96	8.37	7.81	8.23	9.80	12.11	13.99	16.31
TnSDW	2.719	2.583	3.154	3.416	3.943	3.969	4.016	3.664	3.692	3.329	3.064	2.587
Ku	0.811	0.729	0.748	0.743	0.803	0.872	0.811	0.777	0.819	0.889	0.910	0.814
XMND	1.419	1.566	1.310	1.535	1.114	0.638	0.602	1.178	1.131	0.977	1.275	1.288
XSDD	0.995	1.070	1.016	1.110	1.026	1.210	1.320	1.071	1.070	1.230	1.080	0.976
XMNW	0.181	0.172	-0.132	0.014	-0.209	-0.942	-1.102	-0.314	-0.385	-0.586	-0.051	0.207
XSDW	1.217	1.195	1.167	0.961	0.753	0.891	1.047	0.762	1.016	1.208	1.283	1.148
Alpha	0.2525	0.2036	0.2337	0.2962	0.3032	0.5498	0.3226	0.2948	0.3596	0.3586	0.2172	0.2891
Beta1	1.401	0.814	0.904	1.242	0.473	1.055	0.402	0.710	1.481	1.489	0.723	1.733
Beta2	18.82	17.54	20.58	17.87	12.89	15.85	11.37	11.76	14.31	18.74	14.31	16.94
PDDW	0.2243	0.2163	0.2040	0.1698	0.1350	0.1347	0.1049	0.1035	0.1377	0.2282	0.2479	0.2292
PWDW	0.2048	0.1967	0.1954	0.1801	0.1469	0.1806	0.1354	0.1294	0.1507	0.2310	0.2346	0.2331
PWW	0.3387	0.3390	0.4180	0.4137	0.3966	0.4005	0.3770	0.4048	0.4000	0.4033	0.3611	0.3414
PW	0.2489	0.2440	0.2571	0.2278	0.1835	0.1917	0.1490	0.1489	0.1890	0.2769	0.2769	0.2593

*LOW-FREQUENCY PARAMETERS

@Param	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TxSDC	0.380	1.575	0.233	0.738	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.650
TnSDC	0.836	0.509	0.492	1.137	1.499	1.147	1.564	0.443	0.000	1.103	0.642	1.030
XSDC	0.160	0.113	0.070	0.284	0.237	0.316	0.208	0.170	0.245	0.271	0.270	0.242
PWSDC	0.0702	0.1277	0.0000	0.0423	0.0391	0.0879	0.0535	0.0342	0.0907	0.0967	0.0556	0.1395
TxPHI	0.342	0.474	0.393	0.170	0.146	-0.046	0.225	-0.098	-0.017	0.041	0.108	0.344

TnPHI	0.527	0.451	0.321	0.241	0.260	0.209	0.197	0.000	0.143	0.226	0.348	0.536
XPhi	0.396	0.296	0.162	0.271	0.163	0.262	0.396	0.337	0.449	0.397	0.390	0.458
RaPhi	0.007	0.016	-0.014	0.037	0.263	-0.111	0.098	-0.048	-0.037	0.020	0.027	0.099
RTxTn	0.276	0.316	0.490	0.587	0.591	0.595	0.708	0.583	0.376	0.484	0.443	0.474
RTx_X	0.058	0.320	-0.032	0.330	-0.080	0.213	-0.104	0.226	0.203	0.229	0.124	0.215
RTxRa	-0.478	-0.282	-0.108	-0.105	0.124	-0.130	0.223	-0.044	-0.044	-0.035	-0.270	-0.452
RTn_X	-0.033	-0.038	-0.190	-0.086	-0.476	-0.214	-0.437	-0.098	-0.115	-0.321	-0.126	-0.038
RTnRa	0.143	0.102	0.257	0.119	0.312	0.244	0.450	0.173	0.357	0.569	0.234	0.090
R_XRa	-0.030	-0.187	0.013	-0.118	-0.233	-0.224	-0.169	0.091	-0.068	-0.205	-0.137	-0.083

2.4.3. DSSATv35 Files

DSSAT v35 file structure

*WEATHER DATA : Plains,Georgia,USA

@ INSI		LAT	LONG	ELEV	TAV	AMP	REFHT	WNDHT
GAPL	32.040	-84.370	172	17.7	9.2	2.0	3.0	
@DATE	BRAD	MAX	MIN	RAIN				
93001	9.2	22.4	7.9	0.0				
93002	5.7	16.7	9.4	0.0				
93003	10.7	18.0	8.5	0.0				
93004	2.5	19.8	9.4	2.0				
93005	4.9	20.5	14.3	1.0				
93006	3.7	17.7	13.1	4.8				
93007	1.6	16.9	11.8	53.3				
93008	2.4	20.1	12.7	37.6				
93009	2.8	13.8	8.6	0.0				
93010	1.6	9.7	6.2	0.0				
93011	2.0	10.6	6.1	0.5				
93012	1.5	11.7	7.6	15.0				
93013	9.6	17.8	6.9	0.3				
93014	6.3	11.6	3.4	0.0				
93015	2.9	9.7	2.8	0.0				
93016	11.5	14.3	4.6	0.8				
93017	12.8	16.0	1.4	0.0				
93018	10.8	18.4	4.6	0.0				
93019	2.3	12.9	9.3	0.5				
93020	2.2	10.1	3.8	3.0				
93021	5.5	19.8	4.4	4.8				
93022	14.2	20.5	7.6	0.3				
93023	14.6	19.7	0.9	0.0				
93024	2.5	17.7	4.0	8.6				
93025	11.4	10.5	-0.9	0.0				
93026	6.1	8.6	0.9	0.0				
93027	15.0	17.7	-0.5	0.0				
93028	12.5	17.6	0.2	0.0				
93029	8.1	17.2	6.3	0.0				
93030	12.2	16.2	2.5	0.0				
93031	15.7	17.3	-0.5	0.0				
93032	15.1	18.8	5.7	0.0				
93033	16.0	13.5	2.2	0.0				
93034	16.0	14.4	-2.7	0.0				
93035	10.8	16.6	-0.3	0.0				

2.4.4. ICASA 1.1 Files

ICASA 1.x weather files

\$WEATHER: GAPL1994

*GENERAL

@Latitude	Longitud	Elev	Zone	TAV	TAMP	REFHT	WNDHT	SITE
32.040	-84.370	172		-99.0	-99.0	2.0	3.0	Plains,Georgia,USA

@WYR WFIRST WLAST
6 1992010 1997364

@PEOPLE

@ADDRESS

@METHODS

@INSTRUMENTS

@PROBLEMS

@PUBLICATIONS

@DISTRIBUTION

@NOTES

Created on day 3/5/01 at 10:02:59 AM

*DAILY DATA

@ DATE	RAIN	TMAX	TMIN	SRAD
1994001	1.5	10.1	0.4	2.3
1994002	0.0	15.1	1.1	6.6
1994003	5.8	16.2	5.4	3.7
1994004	0.0	6.2	1.7	2.8
1994005	0.0	11.0	-2.2	13.1
1994006	0.0	15.4	-2.8	6.3
1994007	0.3	21.3	8.8	7.8
1994008	0.3	9.7	-2.3	11.3
1994009	0.0	8.8	-5.1	13.3
1994010	0.0	9.9	-2.5	11.0
1994011	7.6	11.0	4.4	4.5
1994012	0.8	12.5	8.4	3.5
1994013	1.5	9.7	4.0	2.8
1994014	0.0	11.8	1.3	11.0
1994015	0.0	4.7	-3.8	13.7
1994016	0.0	3.0	-7.6	10.3
1994017	15.0	14.9	0.5	1.8
1994018	0.3	5.9	-6.9	14.1
1994019	0.0	1.7	-11.7	14.3
1994020	0.0	8.8	-5.4	13.4
1994021	0.0	10.1	-3.8	14.6
1994022	0.0	15.2	-7.4	15.3
1994023	0.0	13.2	-3.2	7.3
1994024	0.0	19.7	0.3	13.8
1994025	0.0	21.6	2.1	12.4

```

1994026  0.0  22.2   7.6  10.1
1994027  0.3  15.9  10.6   1.6
1994028 37.1  19.6  13.1   3.7
1994029 11.2  14.5   5.5   2.9
1994030  3.6   9.8   3.5   4.6
1994031  0.0  11.1  -2.0  15.3
1994032  0.0   6.1  -3.7  13.5
1994033  0.0   7.4  -3.9  16.2

```

2.4.5. Monthly Target Files

Sample Monthly Target file used in climate file generation.

```

@ StYr  StMn  SpYr  SpMn
   1931     1  1998     4
@ yr mo  srmn  srsd  txmn  txsd  tnmn  tnsd  ramn  rasd
1931  1 25.44 -99.0 30.47 -99.0 16.82 -99.0  4.10 -99.0
1931  2 23.43 -99.0 29.51 -99.0 15.96 -99.0  1.92 -99.0
1931  3 17.35 -99.0 27.45 -99.0 16.16 -99.0  2.79 -99.0
1931  4 15.04 -99.0 24.62 -99.0 11.58 -99.0  7.52 -99.0
1931  5 10.63 -99.0 20.59 -99.0  8.46 -99.0  7.07 -99.0
1931  6  7.65 -99.0 16.99 -99.0  7.42 -99.0  1.72 -99.0
1931  7  8.51 -99.0 15.88 -99.0  1.45 -99.0  0.22 -99.0
1931  8 10.91 -99.0 16.05 -99.0  4.24 -99.0  3.51 -99.0
1931  9 15.28 -99.0 18.43 -99.0  4.19 -99.0  0.77 -99.0
1931 10 21.43 -99.0 23.48 -99.0 10.21 -99.0  2.77 -99.0
1931 11 26.66 -99.0 24.16 -99.0 10.55 -99.0  5.71 -99.0
1932 12 27.92 -99.0 29.42 -99.0 14.22 -99.0  2.58 -99.0
1932  1 28.15 -99.0 33.33 -99.0 16.21 -99.0  3.42 -99.0
1932  2 19.63 -99.0 30.18 -99.0 15.26 -99.0  3.74 -99.0
1932  3 16.81 -99.0 27.79 -99.0 13.86 -99.0  4.64 -99.0
1932  4 11.89 -99.0 23.65 -99.0 11.77 -99.0  2.32 -99.0
1932  5  9.53 -99.0 17.93 -99.0  4.17 -99.0  0.83 -99.0
1932  6  7.15 -99.0 15.63 -99.0  3.26 -99.0  4.44 -99.0
1932  7  6.16 -99.0 17.81 -99.0  7.76 -99.0  3.54 -99.0
1932  8 11.53 -99.0 15.19 -99.0  4.07 -99.0  1.91 -99.0
1932  9 15.90 -99.0 21.18 -99.0  6.30 -99.0  0.76 -99.0
1932 10 16.83 -99.0 22.49 -99.0 11.03 -99.0  2.69 -99.0
1932 11 25.57 -99.0 28.11 -99.0 12.89 -99.0  2.69 -99.0
1933 12 23.81 -99.0 28.36 -99.0 14.65 -99.0  3.70 -99.0
1933  1 22.42 -99.0 30.28 -99.0 15.00 -99.0  3.51 -99.0

```

2.5. 5. References

2.5.1. Literature Cited

Conway, H.M. Jr, S.L. May Jr., and E. Armstrong, Jr. 1963. The Weather Handbook. Conway Publications, Atlanta, GA.

Geng, S., J.S. Auburn, E. Brandsetter and B. Li. 1988. A program to simulate meteorological variables:

Documentation for SIMMETEO. Agronomy Progress report No.204. Dept. of Agronomy and Range Sci., Univ. of California, Davis, CA.

Geng, S. and J.S. Auburn. 1986. Weather simulation models based on summaries of long-term data. In Intl. Symp. on Impact of Weather Parameters on the Growth and Yield of Rice, April 7-10. International Rice Research Institute, Los Banos, Philippines.

Hunt, L.A., J.W. Jones, P.K. Thornton, G. Hoogenboom, D.T. Imamura, G.Y. Tsuji and U. Singh. 1994. Accessing data, models and application programs. *In*: Tsuji, G.Y., G. Uehara and S. Balas (eds.). DSSAT v3. Vol. 1-3. University of Hawaii, Honolulu, HI.

Jones, J.W., L.A. Hunt, G. Hoogenboom, D.C. Godwin, U. Singh, G.Y. Tsuji, N. Pickering, P.K. Thornton, W.T. Bowen, K.J. Boote and J.T. Ritchie. 1994. Input and output files. *In*: Tsuji, G.Y., G. Uehara and S. Balas (eds.). DSSAT v3. Vol. 2-1. University of Hawaii, Honolulu, HI.

NOAA. 1974. Climate of the States. Water Information Center, National Oceanographic and Atmospheric Administration, United States Department of Commerce, Asheville, NC.

Pickering, N.B., J.W. Hansen, J.W. Jones, H. Chan, and D. Godwin. 1994. WeatherMan: A utility for managing and generating daily weather data. *Agron. J.* 86(2):332-337.

Pickering, N.B., J.R. Stedinger, and D.A. Haith. 1988. Weather input for nonpoint-source pollution models. *J. Irrig. Drain. Eng.* 114(4):674-690.

Prescott, J.A. 1940. Evaporation from a water surface in relation to solar radiation. *Trans. R. Soc. S. Austr.* 64: 114-118.

Richardson, C.W. and D.A. Wright. 1984. WGEN: a model for generating daily weather variables. United States Department of Agriculture, Agricultural Research Service, ARS-8, Washington, DC.

Rietveld, M.R. 1978. A new method for estimating the regression coefficients in the formula relating solar radiation to sunshine. *Agricul. Meteorol.* 19:243-252.

Rudloff, W. 1981. World-Climate. Wissenschaftliche Verlagsgesellschaft, mbH Stuttgart, Germany.

2.5.2. Variables

Abbreviations Used In WeatherMan

DAILY WEATHER VARIABLES

SRAD Total daily solar radiation.
 TMAX Maximum daily air temperature.
 TMIN Minimum daily air temperature.
 RAIN Total daily precipitation.
 DEWP Dew point temperature or vapor pressure.
 WIND Total daily wind run.
 SUNH Total daily sunshine hours.
 PAR Total daily photosynthetic radiation.
 TWET Wet bulb air temperature at 9 a.m.
 EVAP Total daily pan evaporation.

Summary Files

TIME VARIABLES

DOC Number of days since January 1, 1801.
MTH Month (1 - January, 2 - February, etc.).
MNO Month number, counting from the first month in the data set.
YR Year of century (eg., 94 can represent 1994).
YRNO Year number, counting from the first year in the data set.

MOMENTS

The first character in moment variables represents the weather variable type.
The second represents wet state. The final two represent the type of statistic.

S__ Total daily solar radiation.
X__ Maximum daily air temperature.
N__ Minimum daily air temperature.
R__ Total daily precipitation.
P__ Total daily photosynthetic radiation.
D Dry days (i.e., without precipitation).
W Wet days (i.e., with precipitation).
A All days
__MN Mean.
__SD Standard deviation.
__SK Skewness coefficient.
__KT Kurtosis coefficient.

PERCENTILES

P0 Minimum.
P25 25th percentile.
P50 Median.
P75 75th percentile.
P100 Maximum.

DISTRIBUTION

BINi The relative frequency of observations falling within the ith interval.
SDEV Standard deviation.
LAGi Lag i (i=0..5) autocorrelation coefficients.
PW Probability of a wet day.
PWW Probability of a wet day following a wet day.
PDW Probability of a wet day following a dry day.
PWWW Probability of a wet-wet-wet sequence.
PDWW Probability of a dry-wet-wet sequence.
PWDW Probability of a wet-dry-wet sequence.
PDDW Probability of a dry-dry-wet sequence.

2.5.3. Climate File Format

CLIMATE FILE FORMAT

The climate file contains summary information on a site in five sections. The *CLIMATE section contains characteristics of the location. The *MONTHLY AVERAGES section contains monthly means and Angstrom coefficients used by the SIMMETEO weather generator. The *WGEN PARAMETERS section contains the monthly distribution parameters used by the WGEN weather generator. The *RANGE CHECK VALUES section contains the values used to check for outliers and suspect data during the Import process. The *FLAGGED DATA COUNT section contains counts of total, erroneous, and suspect data in the archive file.

*CLIMATE

LAT Latitude, degrees north.
LONG Longitude, degrees east.
ELEV Elevation, m.
TAV Mean annual temperature, °C.
AMP Half of the mean temperature difference between the warmest and coolest month.
SRAY Mean annual daily solar radiation, MJ/m²/day.
TMXY Mean annual daily maximum temperature, °C.
TMNY Mean annual daily minimum temperature, °C.
RAIY Mean annual daily rainfall, mm.
START Mean day of year of the first frost-free day.
DURN Mean number of days between the last and the first frost.
ANGA Intercept A in the Angstrom equation (Prescott, 1940).
ANGB Multiplier B in the Angstrom equation (Prescott, 1940).
REFHT Height of weather instruments above ground, m.
WNDHT Height of anemometer above ground, m.
GSST First year of observed weather data.
GSDU Number of years of observed weather data.

*MONTHLY AVERAGES

MONTH Month (1 - January, 2 - February, etc.).
SAMN Mean daily solar radiation for month, MJ/m²/day.
XAMN Mean daily maximum temperature for month, °C.
NAMN Mean daily minimum temperature for month, °C.
RTOT Mean total rainfall for month, mm.
RNUM Mean number of days with rainfall for month.
SHMN Mean daily hours of bright sunshine for month, percent of daylength.
AMTH Intercept A in the Angstrom equation for month.
BMTH Multiplier B in the Angstrom equation for month.

*WGEN PARAMETERS

MTH Month (1 - January, 2 - February, etc.).
SDMN Mean daily solar radiation on dry days, MJ/m²/day.
SDSD Standard deviation of solar radiation on dry days.
SWMN Mean daily solar radiation on wet days, MJ/m²/day.
SWSD Standard deviation of solar radiation on wet days.
XDMN Mean daily maximum temperature on dry days, °C.
XDSD Standard deviation of maximum temperature on dry days.
XWMN Mean daily maximum temperature on wet days, °C.
XWSD Standard deviation of maximum temperature on wet days.
NAMN Mean daily minimum temperature, °C.
NASD Standard deviation of minimum temperature.
ALPHA Alpha coefficient of gamma distribution for rainfall.
RTOT Total rainfall, mm.

PDW Probability of a wet day following a dry day.
RNUM Mean number of days with rainfall.

*RANGE CHECK VALUES

MIN Minimum value for range check.
MAX Maximum value for range check.
RATE Maximum change between days for range check.

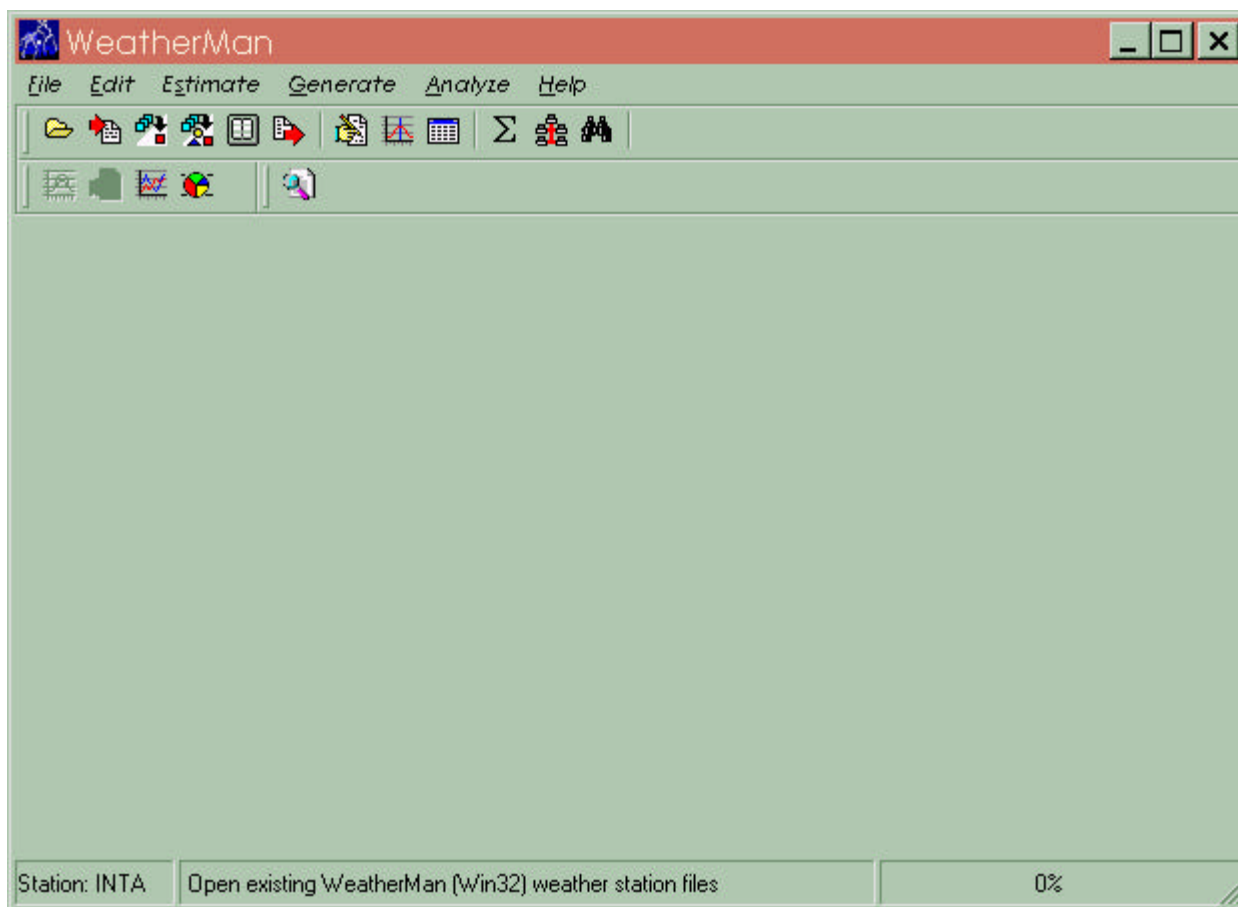
*FLAGGED DATA COUNT

BEGYR Year of first daily weather record.
BEGDY Day of year of first daily weather record.
ENDYR Year of last daily weather record.
ENDDY Day of year of last daily weather record.
TOTAL Total number of observations.
VALID Number of observations without error flags.
MISSING Number of missing values.
ERROR Number of values with non-numeric strings encountered.
ABOVE Number of values above the maximum.
BELOW Number of values below the minimum.
RATE Number of values with greater than maximum change from previous day.

3. WeatherMan

3.1. Accessing Weatherman Functions

This is the main form displayed on the initialization of WeatherMan. All functionality of the program can be accessed via the menu system or buttons. The buttons reside on tool bars, that themselves reside on resizable bars (rebars). These can be moved, expanded, or contracted to suit the users wishes. Hints are displayed whenever a mouse is held over a control; a longer hint is displayed in the status bar on the bottom of the screen.

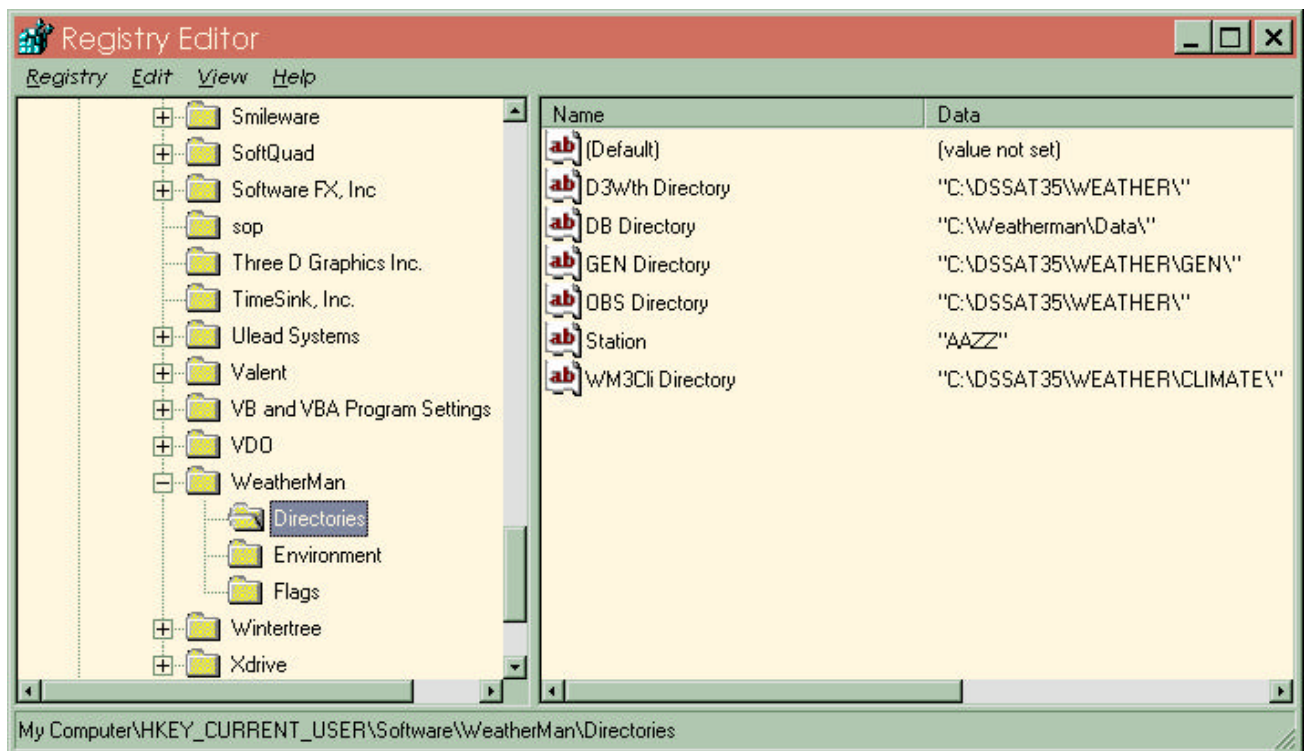


4. Preferences

4.1. Preferences

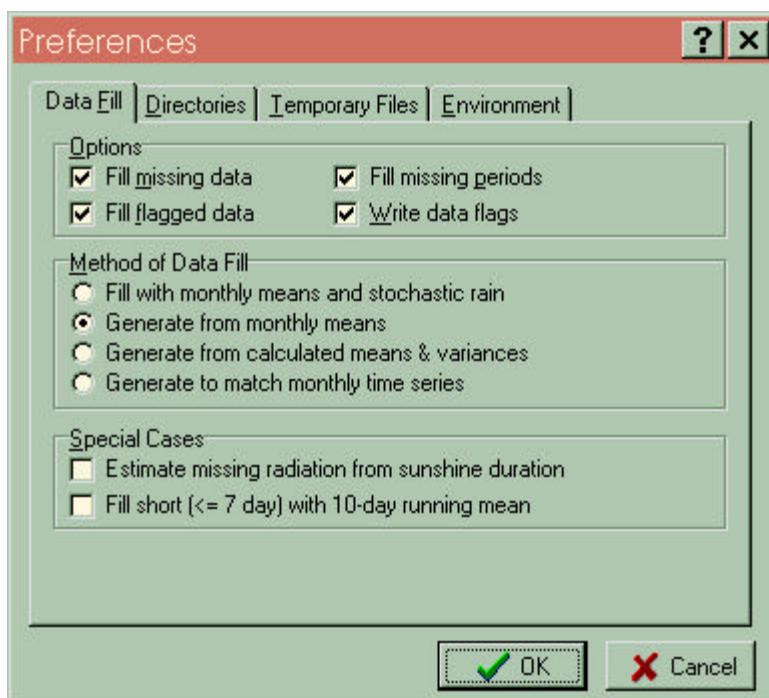
The WeatherMan preferences and default settings are accessed by the Preferences dialog. All settings are stored in the system registry. The data is stored in the Primary key of HKEY_CURRENT_USER in the \Software\WeatherMan directory. WeatherMan automatically reads and writes data to the Registry at startup and shutdown. Four pages are available in the preferences dialog;

- Data Fill Options
- Directories
- Temporary Files
- Environment



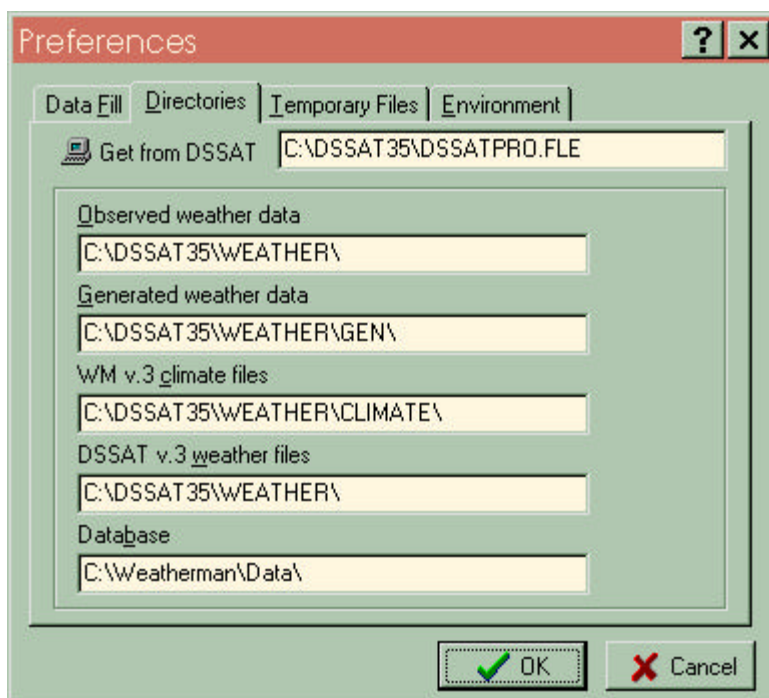
4.2. Data Fill Options

The data fill options for WeatherMan dictate how missing weather data is handled in WeatherMan. Using checkboxes, you can decide on default policies for filling missing data and flagging the data in the database files, the method to use for filling missing data, and how to calculate data in special cases, i.e. short periods of missing data or converting sunshine hours into solar radiation.



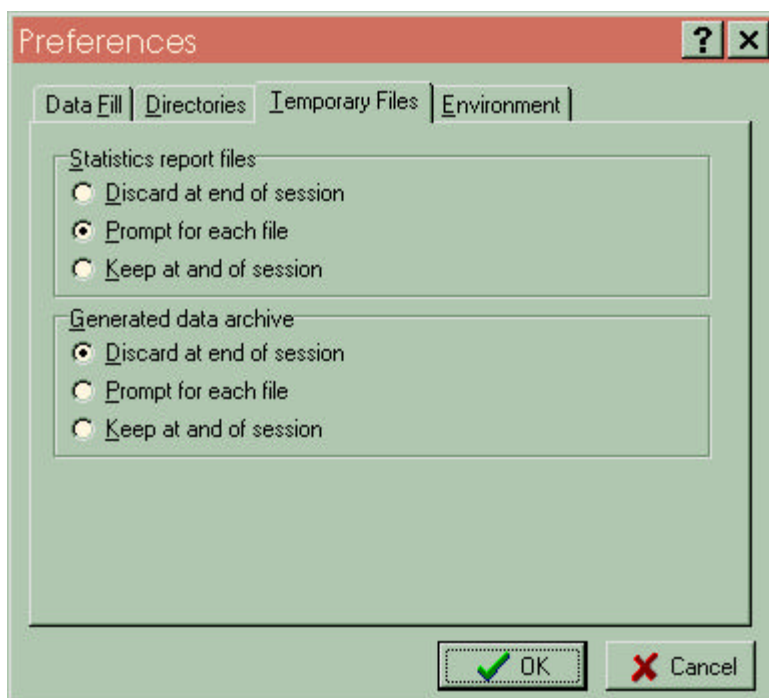
4.3. Directories

This sheet defines the default directories for WeatherMan. Click on the Get From DSSAT button to get path setting stored in DSSAT in the file DSSATPRO.FLE. Double-click on the displayed path for DSSAT to search for other DSSATPRO.FLE files on your computer to use, assuming you do not have DSSAT installed in the C:\DSSAT directory. Double-click on any of the directories listed (observed data, generated weather, DSSAT v35 weather, and the WeatherMan database directory) to change the current setting. The SelectDirectory dialog will be displayed in that case.



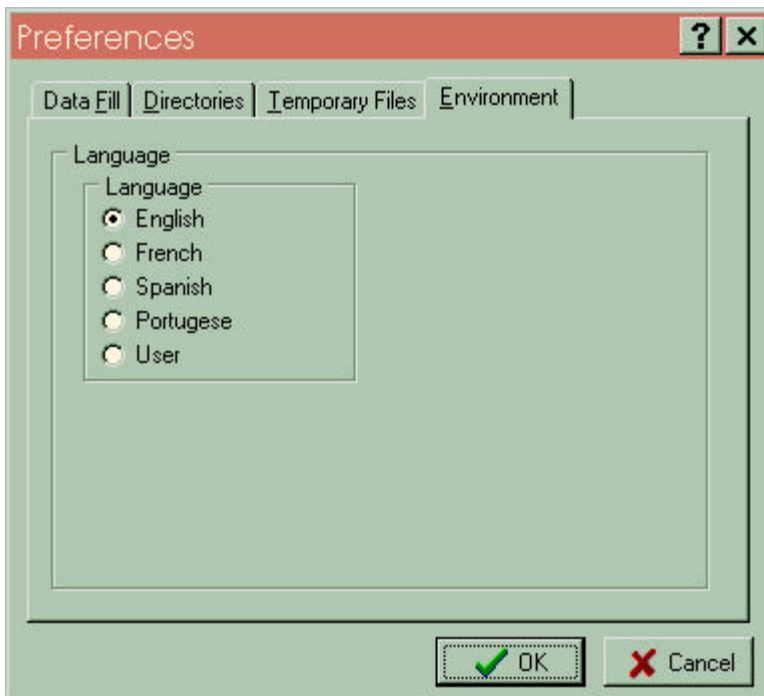
4.4. Temporary Files

The Temporary Files tab sheet displays the options for handling temporary files that may be created during normal functioning of WeatherMan.



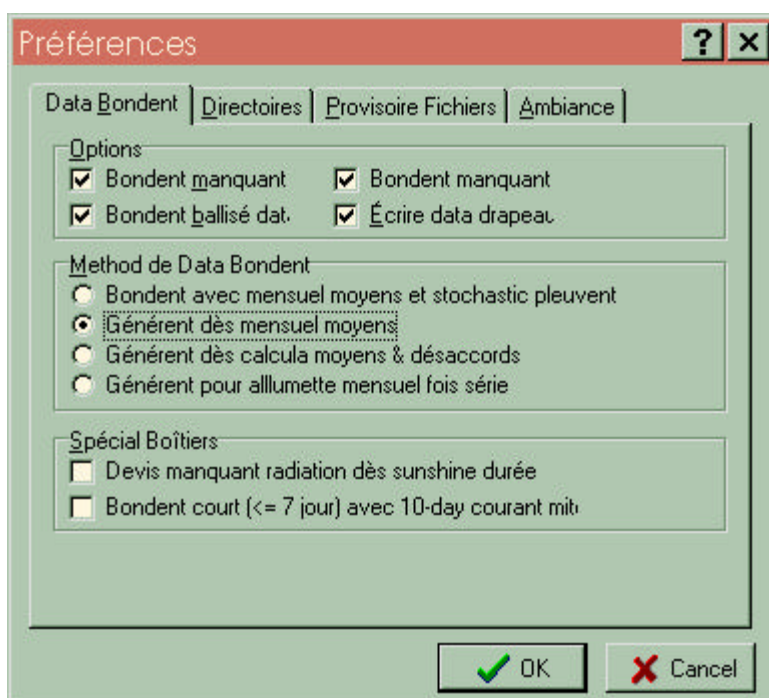
4.5. Environment

The environment options are displayed on this tabsheet. You can select any of 5 languages (4 defined) for use in WeatherMan.



The language file that holds the literal string translations is in a file called WeatherMan.sil. This file can be edited with an included utility program, SilEditor.exe. The last language included has been left blank; the user may in fact translate the program string to any language, save the SIL file, and use it in WeatherMan. It may be advisable to backup the SIL file before editing.

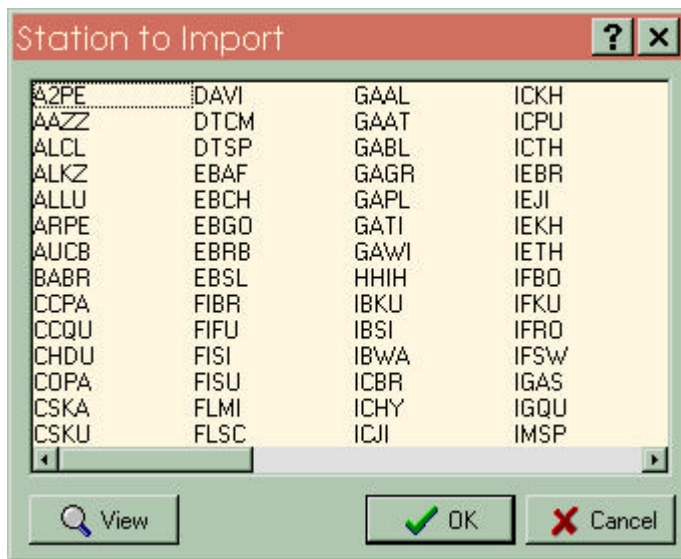
After selecting a new language, all strings in the program are immediately translated. An example of is displayed below. The English version of this same dialog is displayed here.



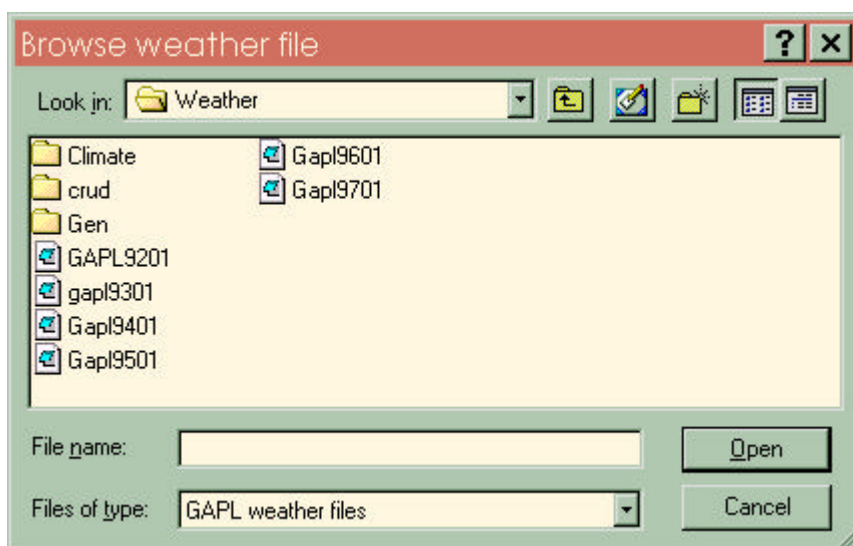
5. Importing Existing Stations

5.1. Importing Climate Data

WeatherMan allows the user to import DSSAT v35 and ICASA 1.x data files, along with DOS WeatherMan climate files into a WeatherMan database. From the File|Import Station menu or by clicking on the appropriate tool bar button, choose to import DSSAT or ICASA weather data or DOS WeatherMan climate stations. A list of candidate files will be shown. Select the station to import by clicking on your choice. After importing, WeatherMan will calculate statistics and display the Edit Station dialog.



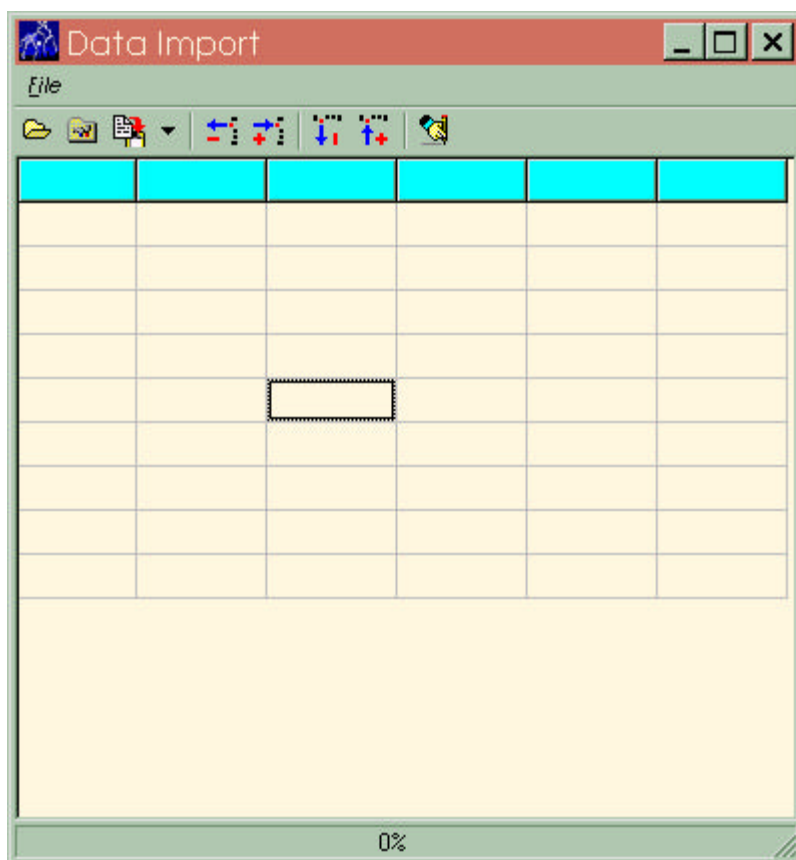
Selecting the View option after choosing a climate file(s) for input brings up a dialog box to view and/or edit any of the prospective files that will be imported as a WeatherMan data set.



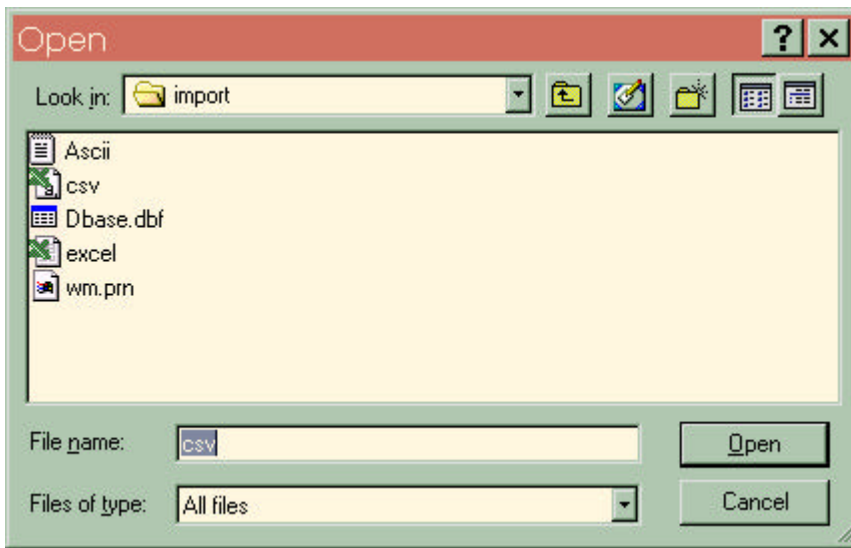
6. Importing and Creating Datasets

6.1. Import Raw Data

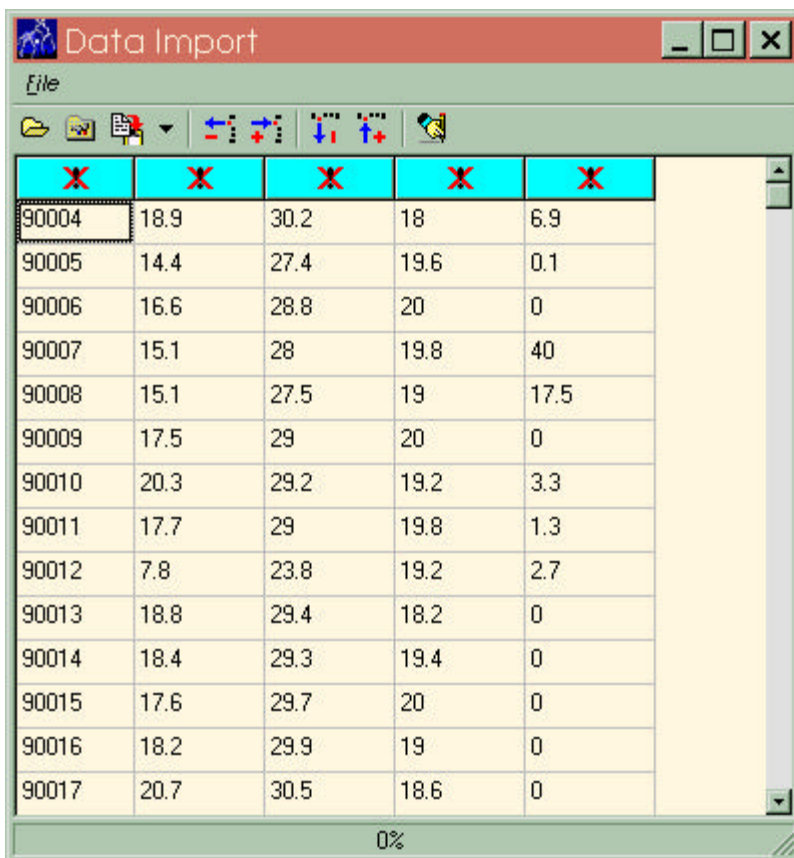
The Data Import dialog is used to import data from non-ICASA based weather file formats into WeatherMan, where they can be edited and exported as ICASA weather data. The default grid is displayed when the dialog box is created; you may enter data manually or import the data. To construct the data manually, use the Grid Wizard button (button 2 on the tool bar).



To selecting a file to import, click on the Open folder icon. A list of files is displayed; sample data for ASCII format, CSV format, and Excel XLS format is installed with WeatherMan. Select a file for import from the Import directory or browse the disk for data in other locations. Currently, WeatherMan supports space-delimited text (TXT) files, comma-delimited (CSV) files, and Excel work sheets (XLS files).

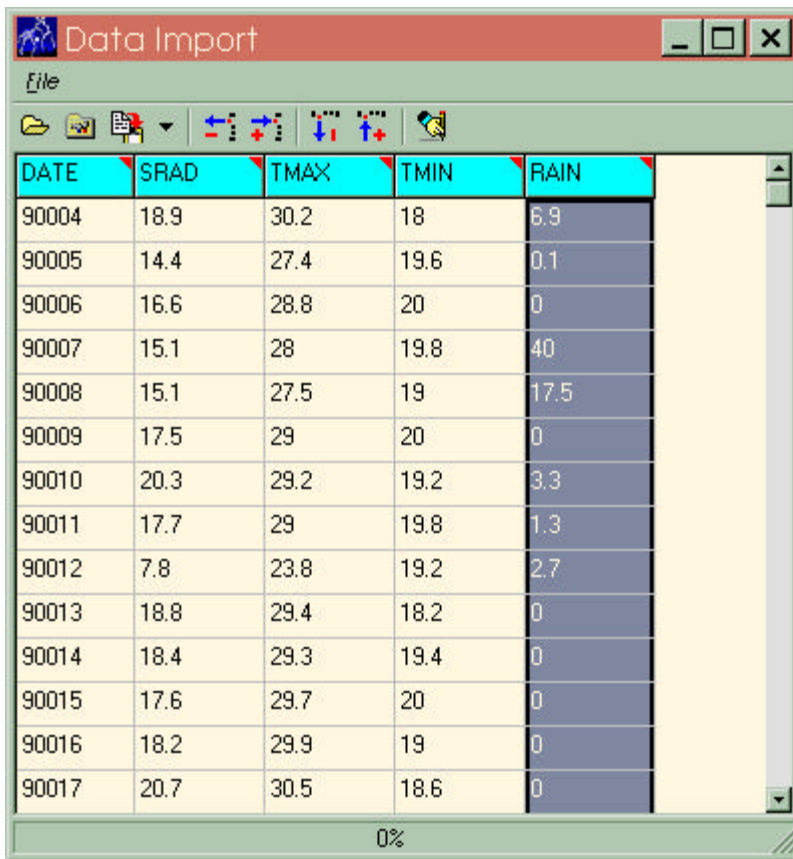


After importing a raw data file, the data is displayed in the grid. No columns are defined as yet as to content. This is noted by the X in the column header. Numerous functions are defined for editing the grid data. Both rows and columns may be inserted or deleted using the buttons on the tool bar. You can manually edit any of the cells using the in place editor. You can navigate from cell to cell by clicking on a cell or to advance to the next cell, just hitting return. Hitting return on a cell without making any changes returns the cell contents to the original value. Before you can save/export/import the data into a WeatherMan database, the columns need to be defined as to variable and units. Right-click on a column header and the Column Property Editor is invoked.



90004	18.9	30.2	18	6.9
90005	14.4	27.4	19.6	0.1
90006	16.6	28.8	20	0
90007	15.1	28	19.8	40
90008	15.1	27.5	19	17.5
90009	17.5	29	20	0
90010	20.3	29.2	19.2	3.3
90011	17.7	29	19.8	1.3
90012	7.8	23.8	19.2	2.7
90013	18.8	29.4	18.2	0
90014	18.4	29.3	19.4	0
90015	17.6	29.7	20	0
90016	18.2	29.9	19	0
90017	20.7	30.5	18.6	0

After you have defined all the columns and edited the data, you need to save the data by choosing the Write Data icon. Note that data columns that you have NOT defined will be ignored and not included when the data is imported into the WeatherMan database. You may simply wish to delete any unneeded columns to simplify the editing and assignment process.

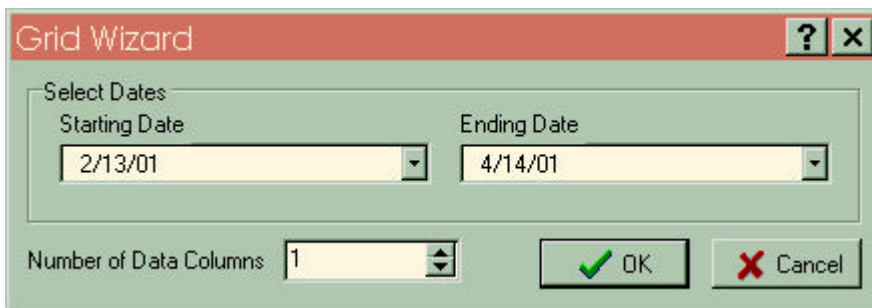


The Data Import window displays a table with 5 columns: DATE, SRAD, TMAX, TMIN, and RAIN. The table contains 14 rows of data, with the first row highlighted in blue. The status bar at the bottom indicates 0% completion.

DATE	SRAD	TMAX	TMIN	RAIN
90004	18.9	30.2	18	6.9
90005	14.4	27.4	19.6	0.1
90006	16.6	28.8	20	0
90007	15.1	28	19.8	40
90008	15.1	27.5	19	17.5
90009	17.5	29	20	0
90010	20.3	29.2	19.2	3.3
90011	17.7	29	19.8	1.3
90012	7.8	23.8	19.2	2.7
90013	18.8	29.4	18.2	0
90014	18.4	29.3	19.4	0
90015	17.6	29.7	20	0
90016	18.2	29.9	19	0
90017	20.7	30.5	18.6	0

6.2. Using the Grid Wizard

The Grid wizard allows a user to set up a grid for entering raw data by hand by defining the start and end dates for the climate record and the number of data columns. A blank grid is created with the data column populated and defined; you need only fill in the met data for the station.



The Grid Wizard dialog box is used to configure a new data grid. It includes fields for selecting start and end dates and a spinner for the number of data columns.

Select Dates

Starting Date: 2/13/01

Ending Date: 4/14/01

Number of Data Columns: 1

OK Cancel

Selecting a combobox for either the Starting or Ending date will allow the user to select the exact starting and ending dates for his new file. Note that you can always add or delete columns and/or rows once you have begun editing the data grid.

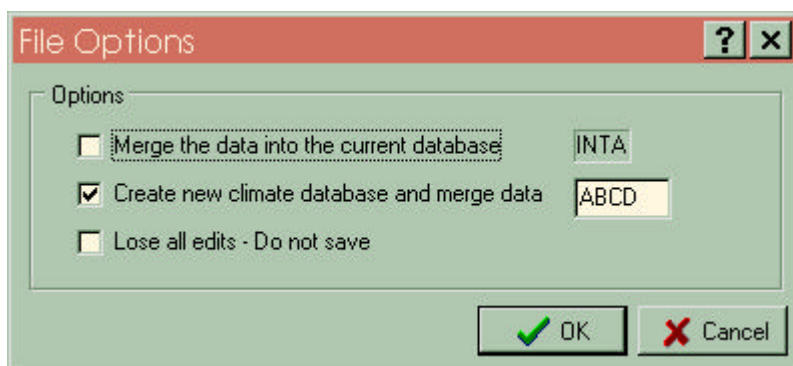


6.3. Save Raw Data Dialog

This dialog allows the user to save the data defined in the Import Data grid. You can either

- Merge the data the currently selected database
- Change the current database by double clicking on the station name (INTA in this case), or
- Create a new climate station from scratch

If you create a new station from scratch, the station will use the 4-character name you have chosen (ABCD in this case). The imported data will be analyzed, put in the ABDC.db database, and the Edit Station dialog will be displayed. You will need to fill in all the correct parameters for the station at this time (latitude, longitude, etc.).



6.4. Column Property Editor

The column property editor is invoked by right-clicking on a column header in the Import Raw data grid. You must choose the variable that that column represents and then select the units for that variable. Note that a unit called undefined is available for each variable; this allows a unit of measure not included in the translation table to be used by setting the multiplier and offset properties for converting the raw data into ICASA default units. The climate file variables and constants are defined in the file weather.var in the WeatherMan directory. Do **NOT** delete this file.

Column Property Editor ? X

Column ☒ Include this column?

Variable Min Max Delta

Units Multiplier Offset

6.5. Climate Units

Climate units

*DATE Date/Time Variables	1.0	1.0	1.0
Year	Year of weather (yyyy)	1.0	0.0
Month	Month of the year	1.0	0.0
Day of Year	Julian day of year	1.0	0.0
Day of Mon	Day of associated month	1.0	0.0
YRDOY	DSSAT Year Day-of-Year Format (yyddd)	1.0	0.0
LDate	ICASA Long Date Format (yyyddd)	1.0	0.0
Encoded	Windows encoded date-time	1.0	0.0
*SRAD Total	daily solar radiation	5.0	85.0 70.0
MJ/m²	MegaJoules per square meter per day (Default)	1.0	0.0
kJ/m²	KiloJoules per square meter per day	0.001	0.0
cal/cm²	Calories per square centimeter per day	0.04184	0.0
W h/m²	Watt-hour per square meter per day	0.0036	0.0
BTU/ft²	British Thermal Units per square foot per day	0.011357	0.0
New	Undefined radiation unit	1.0	0.0
*TMAX Maximum	daily air temperature	5.0	40.0 20.0
°C	Degrees Celsius (Centrigrade) (Default)	1.0	0.0
10th °C	Tenths of a degree Celsius	0.1	0.0
°F	Degrees Fahrenheit	0.555556	-32.0
10th °F	Tenths of a degree Fahrenheit	0.055556	-320.0
°K	Degrees Kelvin (Absolute)	1.0	-273.15
New	Undefined temperature unit	1.0	0.0
*TMIN Minimum	daily air temperature	-20.0	30.0 20.0
°C	Degrees Celsius (Centrigrade) (Default)	1.0	0.0
10th °C	Tenths of a degree Celsius	0.1	0.0
°F	Degrees Fahrenheit	0.555556	-32.0
10th °F	Tenths of a degree Fahrenheit	0.055556	-320.0
°K	Degrees Kelvin (Absolute)	1.0	-273.15
New	Undefined temperature unit	1.0	0.0
*RAIN Total	daily precipitation	0.0	600.0 500.0
mm	Millimeters per day (Default)	1.0	0.0
10th mm	Tenths of a millimeter per day	0.1	0.0
cm	Centimeters per day	10.0	0.0
inch	Inches per day	25.4	0.0
10th in	Tenths of an inch per day	2.54	0.0
100th in	Hundredths of an inch per day	0.254	0.0
New	Undefined rainfall unit	1.0	0.0
*DEWP Dew point	temperature or vapor pressure	0.0	25.0 5.0
°C	Degrees Celsius (Centrigrade) (Default)	1.0	0.0
°F	Degrees Fahrenheit	0.555556	-32.0
°K	Degrees Kelvin (Absolute)	1.0	-273.15
Pa	Water vapor pressure (Pa)	0.001	0.0

kPa	Water vapor pressure (kPa)	1.0	0.0
MPa	Water vapor pressure (MPa)	1000.0	0.0
mbar	Water vapor pressure (mbar)	0.1	0.0
bar	Water vapor pressure (bar)	100.0	0.0
New	Undefined dewpoint unit	1.0	0.0
*WIND Total	daily wind run	0.0	500.0 300.0
km	Kilometers per day (Default)	1.0	0.0
Miles	Miles per day	1.609344	0.0
m/s	Meters per second (average daily speed)	86.4	0.0
Knots	Nautical miles per hour (average daily speed)	44.448	0.0
Miles/hr	Miles per hour (average daily speed)	38.624	0.0
New	Undefined wind unit	1.0	0.0
*SUNH Total	daily sunshine hours	0.0	100.0 90.0
%Hrs	Percent of day with bright sunshine (Default)	1.0	0.0
n/N	Fraction of daylength with bright sunshine	0.01	0.0
Hrs	Hours of bright sunshine	1.0	0.0
10th Hrs	Tenths of an hour of bright sunshine	0.1	0.0
New	Undefined sunshine hours unit	1.0	0.0
* PAR Total	daily photosynthetic radiation	5.0	85.0 70.0
Mol/m ²	Moles PAR per square meter per day (Default)	1.0	0.0
New	Undefined PAR unit	1.0	0.0
*TDRY Dry bulb	air temperature at 9 am	0.0	35.0 20.0
°C	Degrees Celsius (Centigrade) (Default)	1.0	0.0
10th °C	Tenths of a degree Celsius	0.1	0.0
°F	Degrees Fahrenheit	0.555556	-32.0
10th °F	Tenths of a degree Fahrenheit	0.055556	-320.0
°K	Degrees Kelvin (Absolute)	1.0	-273.15
New	Undefined dry bulb unit	1.0	0.0
*TWET Wet bulb	air temperature at 9 am	0.0	25.0 20.0
°C	Degrees Celsius (Centigrade) (Default)	1.0	0.0
10th °C	Tenths of a degree Celsius	0.1	0.0
°F	Degrees Fahrenheit	0.555556	-32.0
10th °F	Tenths of a degree Fahrenheit	0.055556	-320.0
New	Undefined wet bulb unit	1.0	0.0
°K	Degrees Kelvin (Absolute)	1.0	-273.15
*EVAP Total	daily pan evaporation	0.0	15.0 15.0
mm	Millimeters per day (Default)	1.0	0.0
10th mm	Tenths of a millimeter per day	0.1	0.0
cm	Centimeters per day	10.0	0.0
inch	Inches per day	25.4	0.0
10th in	Tenths of an inch per day	2.54	0.0
100th in	Hundredths of an inch per day	0.254	0.0
New	Undefined evaporation unit	1.0	0.0
*			

7. Edit Station Information

7.1. Editing Station Information

The Edit Station Information dialog allows the user to modify the existing information stored in the selected PRM file. The first page of data displays the location of the data set, latitude, longitude, elevation, instrument height, and anemometer height. This data is normally imported from DSSAT or ICASA weather files; when creating a station from scratch, you will need to edit this information manually.

Edit Station Information [?] [X]

Description | Documentation

Location: Tarauaca_Acre_82807_INMET

Climate classification: []

Latitude: Degrees: 8, Minutes: 10, Seconds: 11, South

Longitude: Degrees: 70, Minutes: 46, Seconds: 11, West

Elevation (m above sea level): 190.0

Instrument height (m above ground): -99.0

Anemometer height (m above ground): -99.0

[OK] [Cancel]

The second tab sheet in the dialog deals with documenting all facets of the climate data, from the people who collected it to where the data is published. WeatherMan by default always inserts the date and time that the file was created in the Notes section as a reference; Each section can contain as many lines that are needed to fully document the data set and all the data are stored in the PRM file.

Edit Station Information ? x

Description Documentation

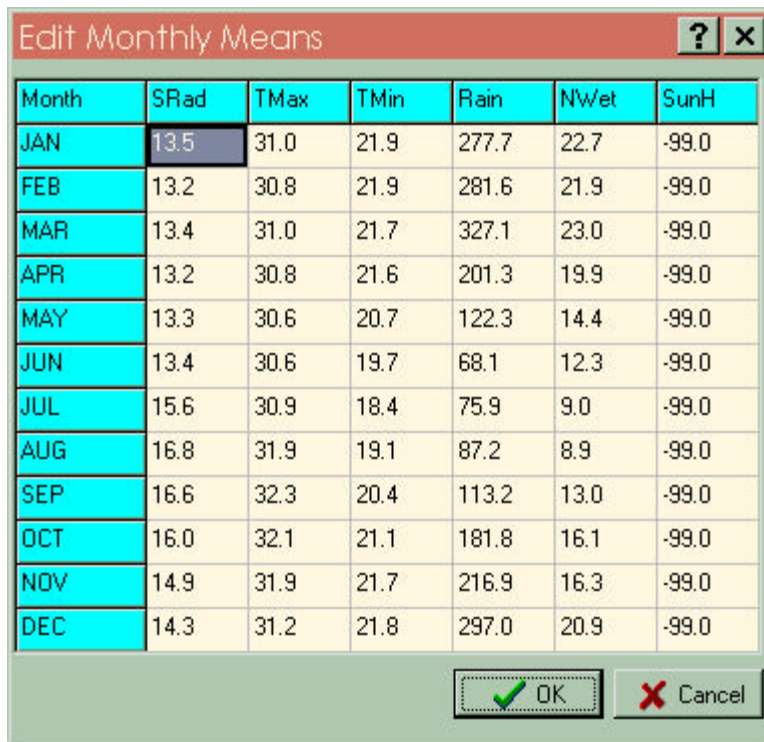
<u>P</u> eople		▼
<u>A</u> ddresses		▼
<u>M</u> ethods		▼
<u>I</u> nstruments		▼
<u>P</u> roblems		▼
<u>P</u> ublications		▼
<u>D</u> istribution		▼
<u>N</u> otes	Created on day 3/12/01 at 9:05:25 AM	▼

OK Cancel

8. Edit Monthly Means

8.1. Edit Calculated Monthly Means

The calculated monthly means may be viewed and/or edited by choosing the Edit|Monthly Means menu option. The grid displays the calculated monthly means based on all data that has been imported for that station. you can edit and change these values, if you wish, by editing any cell. You may right-click on the grid to bring up a menu for printing, saving, or exporting the grid data.



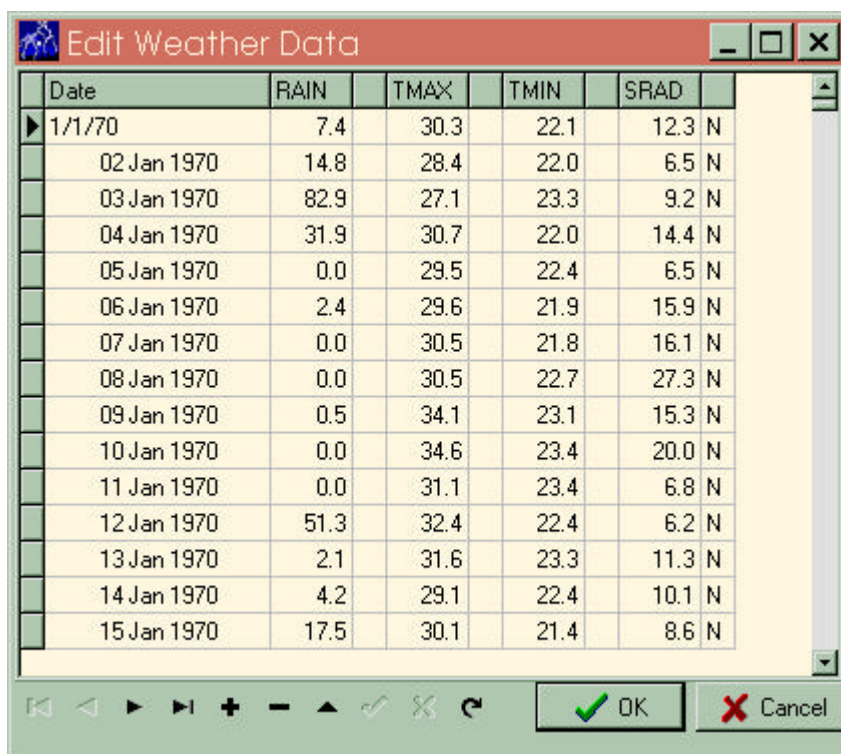
Month	SRad	TMax	TMin	Rain	NWet	SunH
JAN	13.5	31.0	21.9	277.7	22.7	-99.0
FEB	13.2	30.8	21.9	281.6	21.9	-99.0
MAR	13.4	31.0	21.7	327.1	23.0	-99.0
APR	13.2	30.8	21.6	201.3	19.9	-99.0
MAY	13.3	30.6	20.7	122.3	14.4	-99.0
JUN	13.4	30.6	19.7	68.1	12.3	-99.0
JUL	15.6	30.9	18.4	75.9	9.0	-99.0
AUG	16.8	31.9	19.1	87.2	8.9	-99.0
SEP	16.6	32.3	20.4	113.2	13.0	-99.0
OCT	16.0	32.1	21.1	181.8	16.1	-99.0
NOV	14.9	31.9	21.7	216.9	16.3	-99.0
DEC	14.3	31.2	21.8	297.0	20.9	-99.0

OK Cancel

9. Editing Weather Data

9.1. Editing a climate database

The daily weather data may be edited by selecting the Edit|Daily Weather menu option. A database grid is displayed that is linked to the Paradox database containing all of the climate data for the station. You can edit any of the climate data at this time and changes are written to the database. If you make changes, you should recalculate the station PRM file.



Date	RAIN	TMAX	TMIN	SRAD	
1/1/70	7.4	30.3	22.1	12.3	N
02 Jan 1970	14.8	28.4	22.0	6.5	N
03 Jan 1970	82.9	27.1	23.3	9.2	N
04 Jan 1970	31.9	30.7	22.0	14.4	N
05 Jan 1970	0.0	29.5	22.4	6.5	N
06 Jan 1970	2.4	29.6	21.9	15.9	N
07 Jan 1970	0.0	30.5	21.8	16.1	N
08 Jan 1970	0.0	30.5	22.7	27.3	N
09 Jan 1970	0.5	34.1	23.1	15.3	N
10 Jan 1970	0.0	34.6	23.4	20.0	N
11 Jan 1970	0.0	31.1	23.4	6.8	N
12 Jan 1970	51.3	32.4	22.4	6.2	N
13 Jan 1970	2.1	31.6	23.3	11.3	N
14 Jan 1970	4.2	29.1	22.4	10.1	N
15 Jan 1970	17.5	30.1	21.4	8.6	N

For ease in navigating the database, a series of navigator buttons are placed on the dialog. The DBNavigator provides users a simple control for navigating through records in a dataset, and for manipulating records. The navigator consists of a series of buttons that enable a user to scroll forward or backward through records one at a time, go to the first record, go to the last record, insert a new record, update an existing record, post data changes, cancel data changes, delete a record, and refresh record display. The following table describes the buttons on the navigator.

Button Purpose

First	Calls the dataset's First method to set the current record to the first record.
Prior	Calls the dataset's Prior method to set the current record to the previous record.
Next	Calls the dataset's Next method to set the current record to the next record.
Last	Calls the dataset's Last method to set the current record to the last record.
Insert	Calls the dataset's Insert method to insert a new record before the current record, and set the dataset in Insert state.
Delete	Deletes the current record. If the ConfirmDelete property is True it prompts for confirmation before deleting.

Edit Puts the dataset in Edit state so that the current record can be modified.
Post Writes changes in the current record to the database.
Cancel Cancels edits to the current record, and returns the dataset to Browse state.
Refresh Clears data control display buffers, then refreshes its buffers from the physical table or query.

10. Plot Daily Data

10.1. Graph Data

Daily data can be graphed for the selected climate database by clicking on the Graph icon or choosing the Analyze|Graph menu item. The primary graph is then displayed.

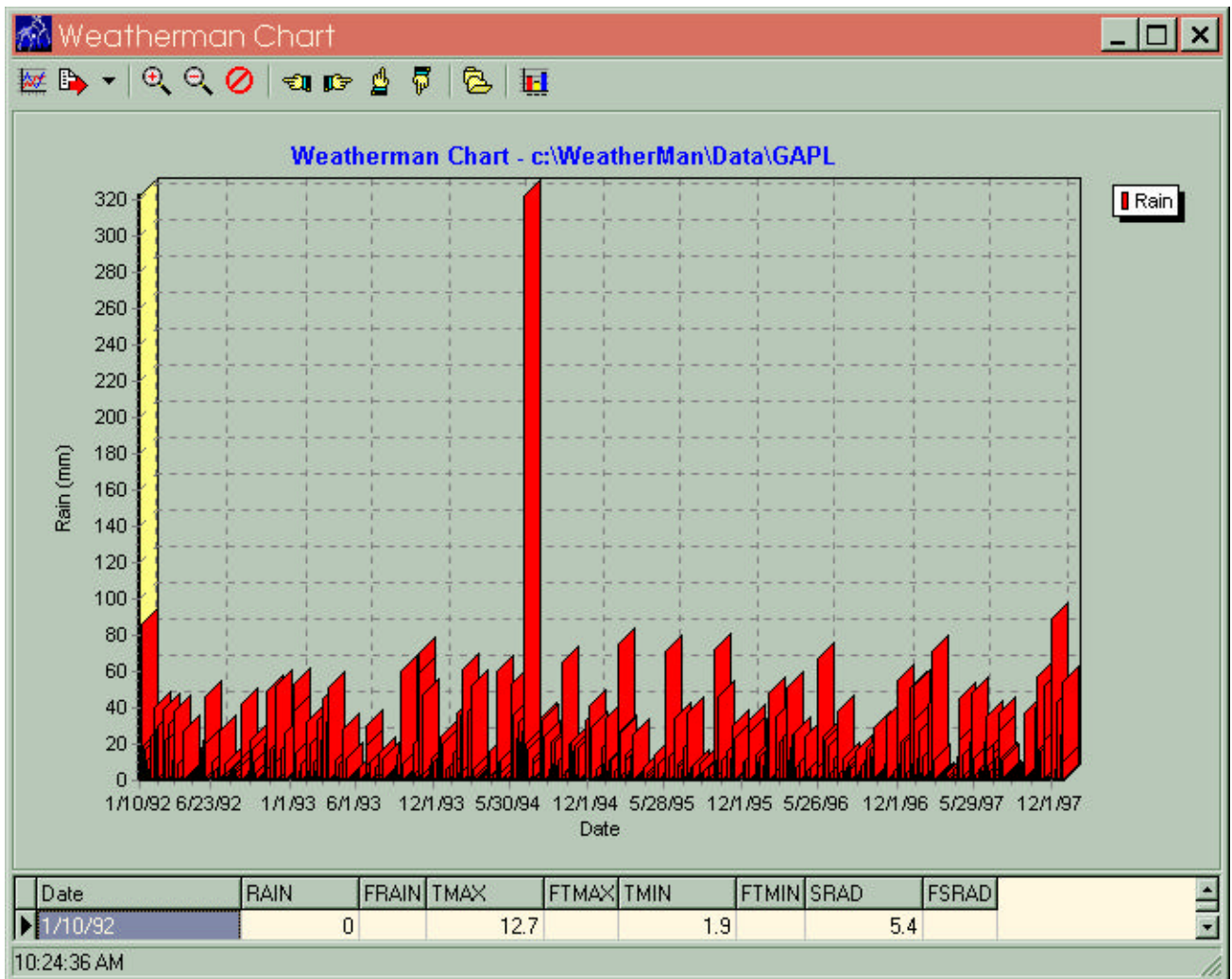
10.2. Weatherman Chart

10.2.1. Graph Data

This is the main screen for displaying daily data. The data table at the bottom is the data being displayed; this data is live. You can interactively edit and of the data points and the chart changes accordingly. The changes you make are written to the database so edit with caution. The tool bar at the top encapsulates much of the graph functionality. The buttons (from the left) ..

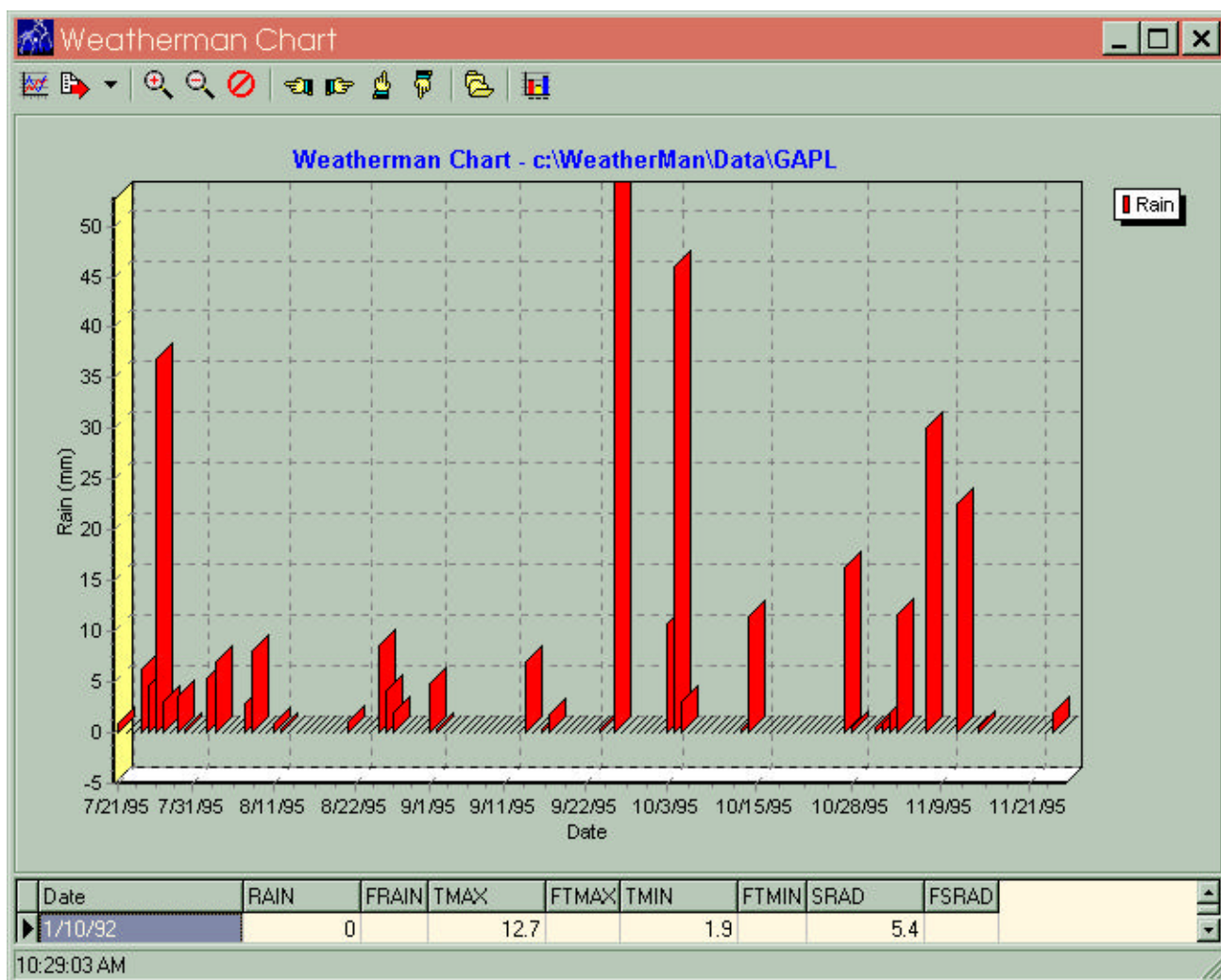
- Display the plot options dialog
- Access the print/export menu options
- Zoom In
- Zoom Out
- Reset Zoom
- Scroll Left
- Scroll Right
- Scroll Up
- Scroll Down
- Open an additional or new database
- Plot Summary data for this station (if it exists)

In addition, drawing a rectangle with the left mouse button zooms in on a particular subsection of the plot, and clicking on the Graph key show the statistics for that plotted series. Holding the right mouse button down allows you to drag the graph in all directions.



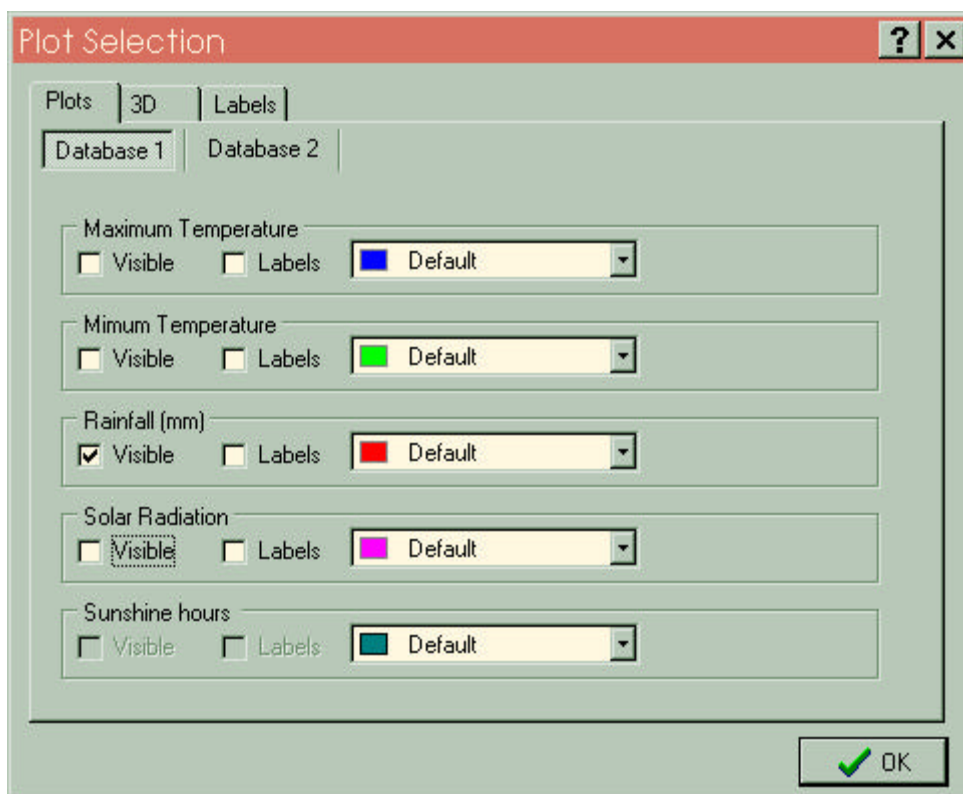
10.2.2. Select Data

Selecting a subset of data to view with the mouse allows you too zoom in an a particulat X-axis range. This particularly useful if you are plotting labels on the graph and have many data points to view.



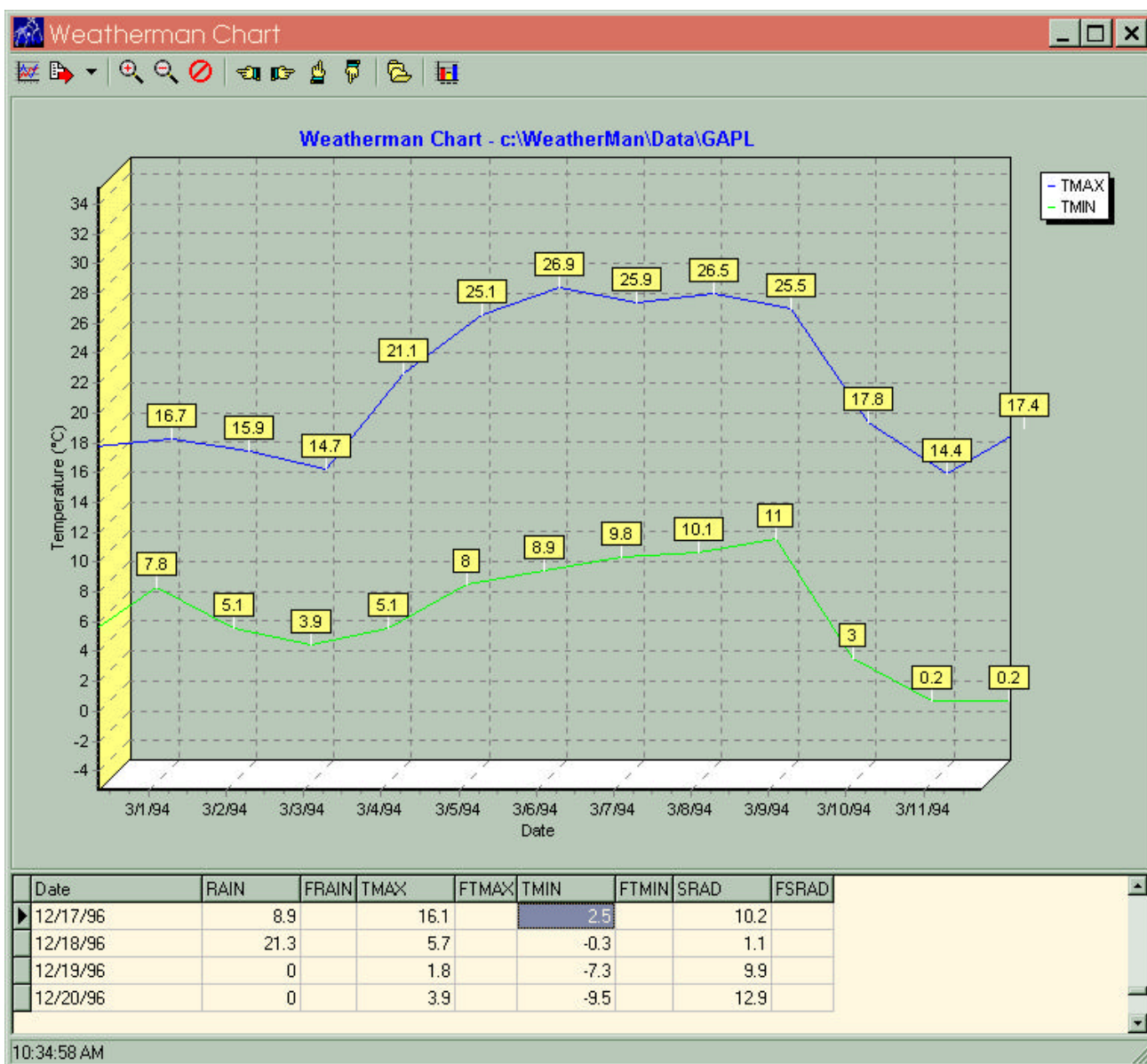
10.2.3. Plot Chart Options

Chart options are displayed on a three tier dialog. This page allows the user to choose which series to plot (none or any combination of variables), whether the labels are plotted, and the color for that series. The same dialog is used if a second dataset is being plotted simultaneously.



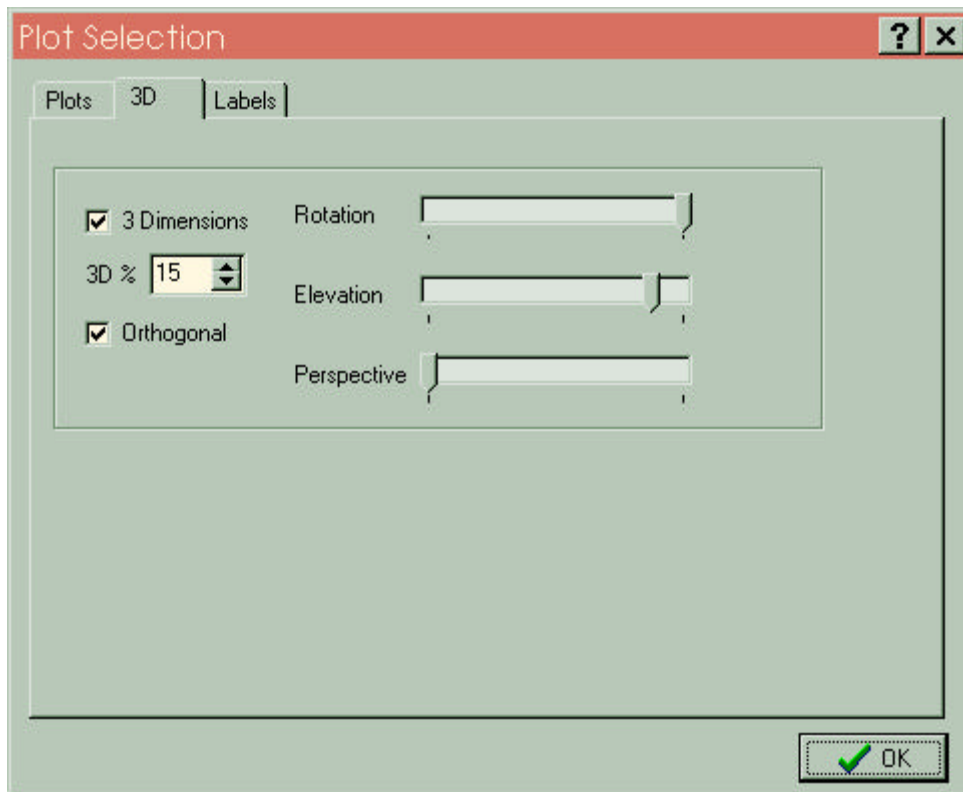
10.2.4. Labels

With the labels option checked, the data values for each point are displayed on the chart. This is useful when verifying the veracity of data imported into the database.



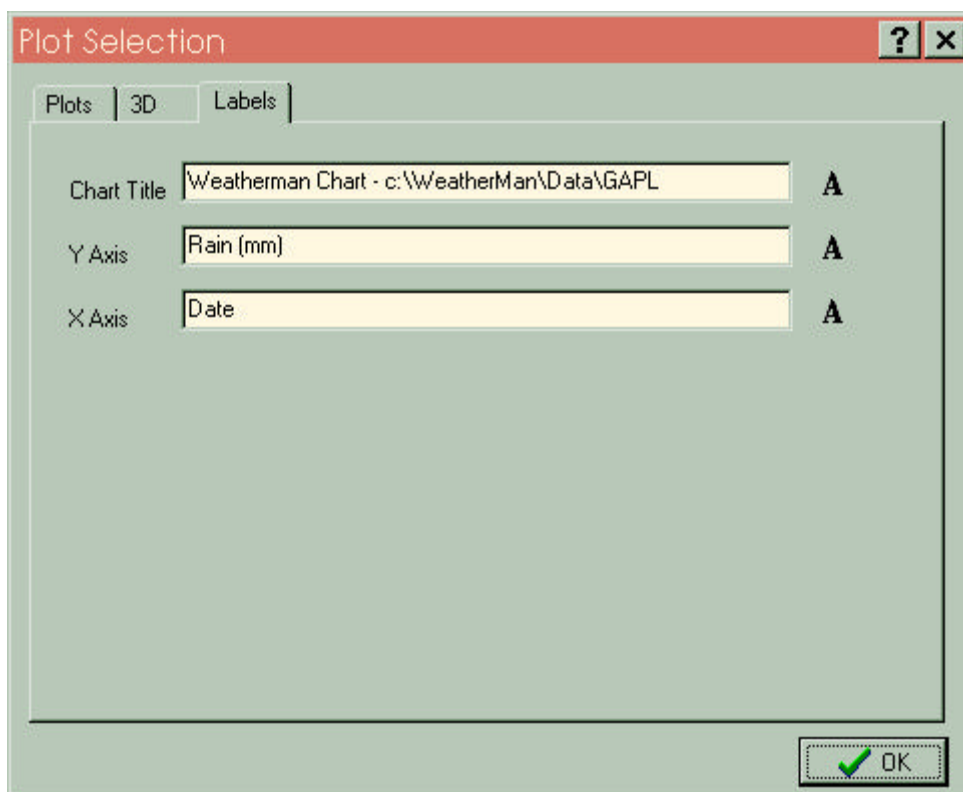
10.2.5. 3D Chart Options

This page displays options for displaying the chart in 3D.



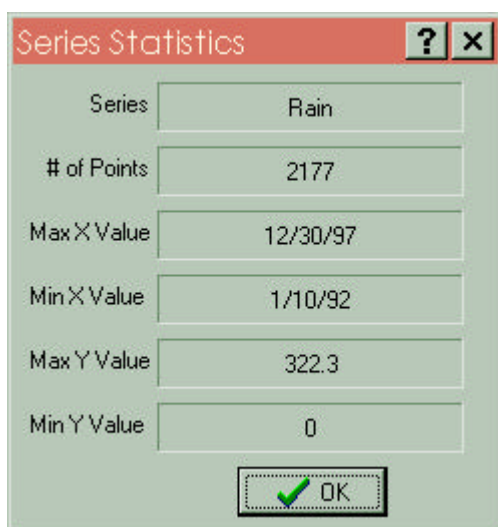
10.2.6. Plot Labels

This page defines the title and axis-labels for the chart, including the font. Clicking on the Font icon will bring up a FontDialog, where you can choose the font, color, and size of the text on the chart.



10.2.7. Series Statistics

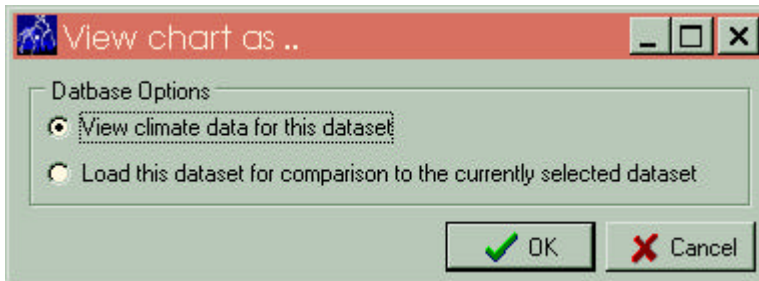
Series Statistics are generated by clicking on a series name in the chart key.



10.2.8. Selecting an additional dataset

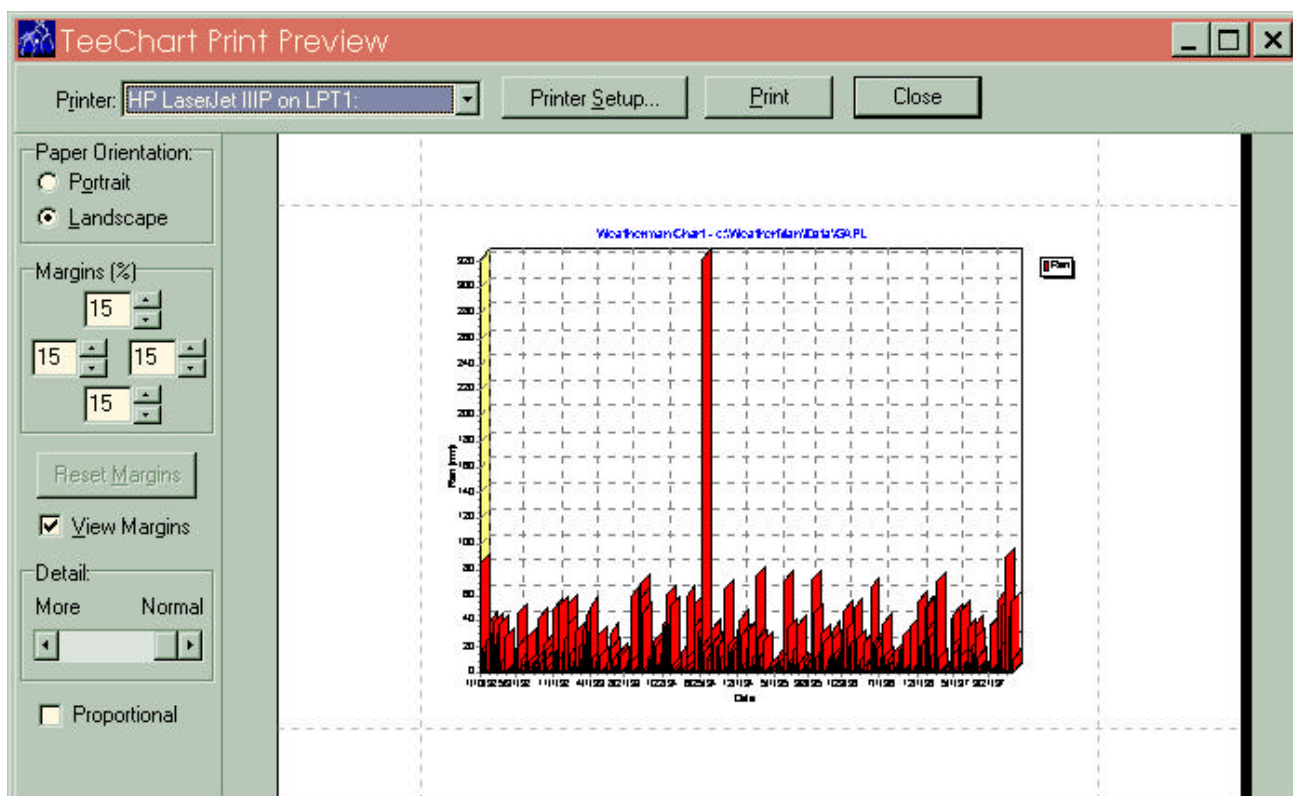
A new data set can be loaded, or a second data set can be loaded for comparison to the original data set. Choose the Open Folder icon and select a second database (do **NOT** select the current database). When you choose a new database, the View Chart as dialog is displayed. You can either

- Load this climate dataset and plot it out, or
- Load this dataset in conjunction with the currently selected database to plot both simultaneously for comparison.



10.2.9. Capturing Graph Output

Selecting the Graph Output option in the toolbar allows you to copy or save the current chart in a variety of formats; choosing to print the chart displays the Print Preview dialog box. Here, you can set the orientation of the chart, select the printer, and other print options.



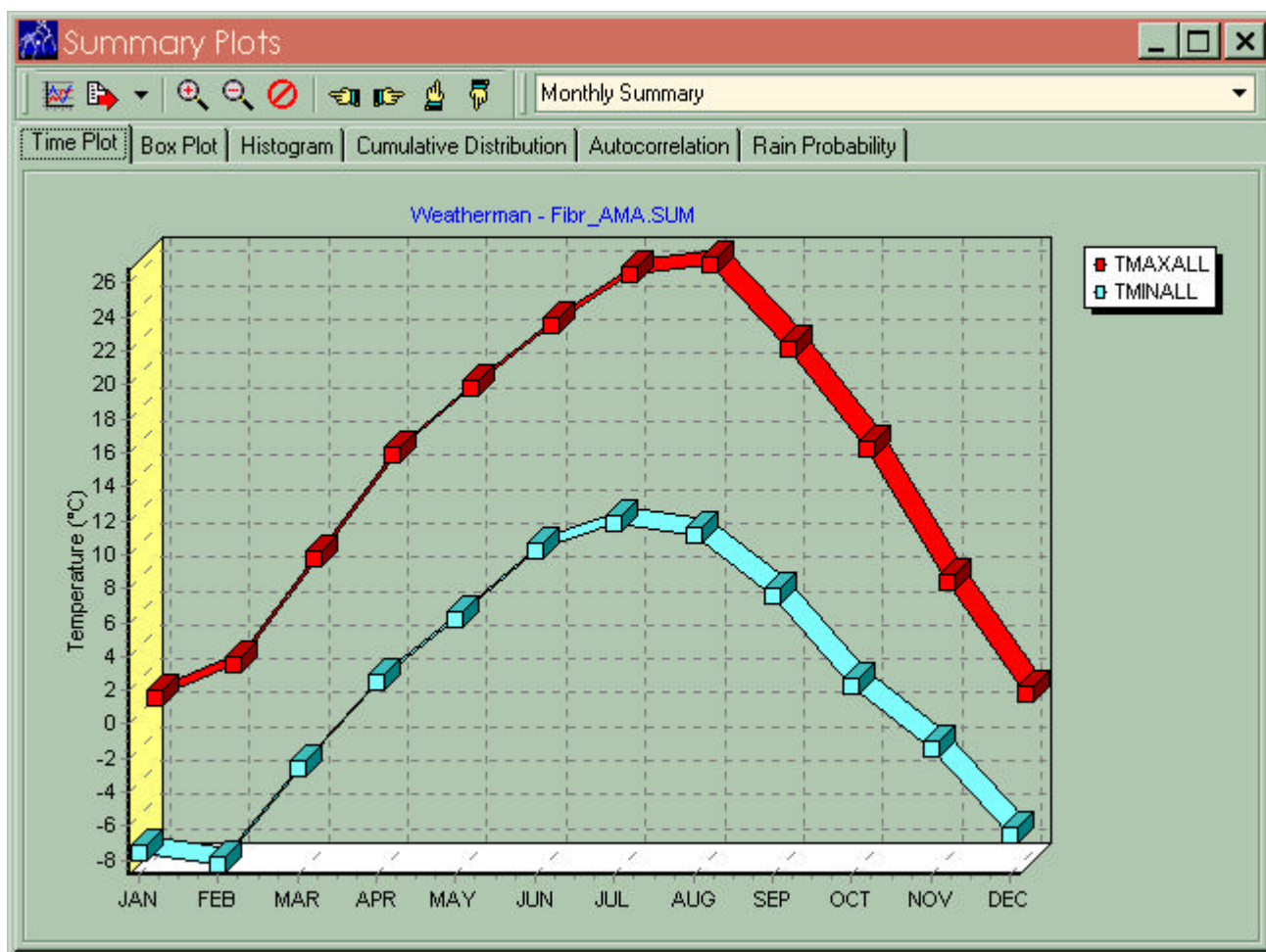
11. Plot Summary Data

11.1. Summary Data Plots

This is the main screen for displaying summary statistical data. The tool bar at the top encapsulates much of the graph functionality. The buttons (from the left) ..

- Display the plot options dialog
- Access the print/export menu options
- Zoom In
- Zoom Out
- Reset Zoom
- Scroll Left
- Scroll Right
- Scroll Up
- Scroll Down
- Select the aggregation of data; Monthly summary, monthly time series, or yearly time series.

In addition, drawing a rectangle with the left mouse button zooms in on a particular subsection of the plot.

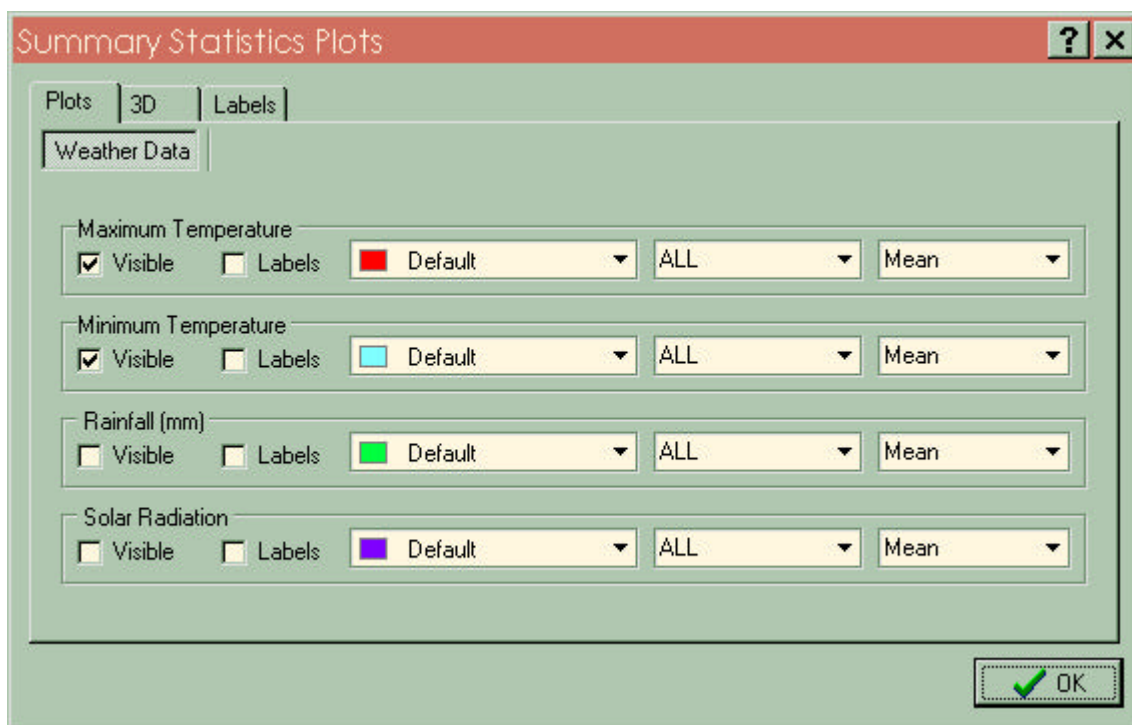


There are several plot types available to graphs the summary data; Time plots, Box Plots, Histograms, Cumulative distribution, Autocorrelation, and Rain probability. Simply click on the selected Tab to view that plot.

There are several plot groupings to choose from: a monthly summary of data, a monthly time series, and a yearly time series. These are selected by clicking on the combobox in the toolbar. In some cases, a up-down control will appear on the screen. Use this control to rapidly scroll thorough months and years on the screen when looking at monthly or yearly summary data.

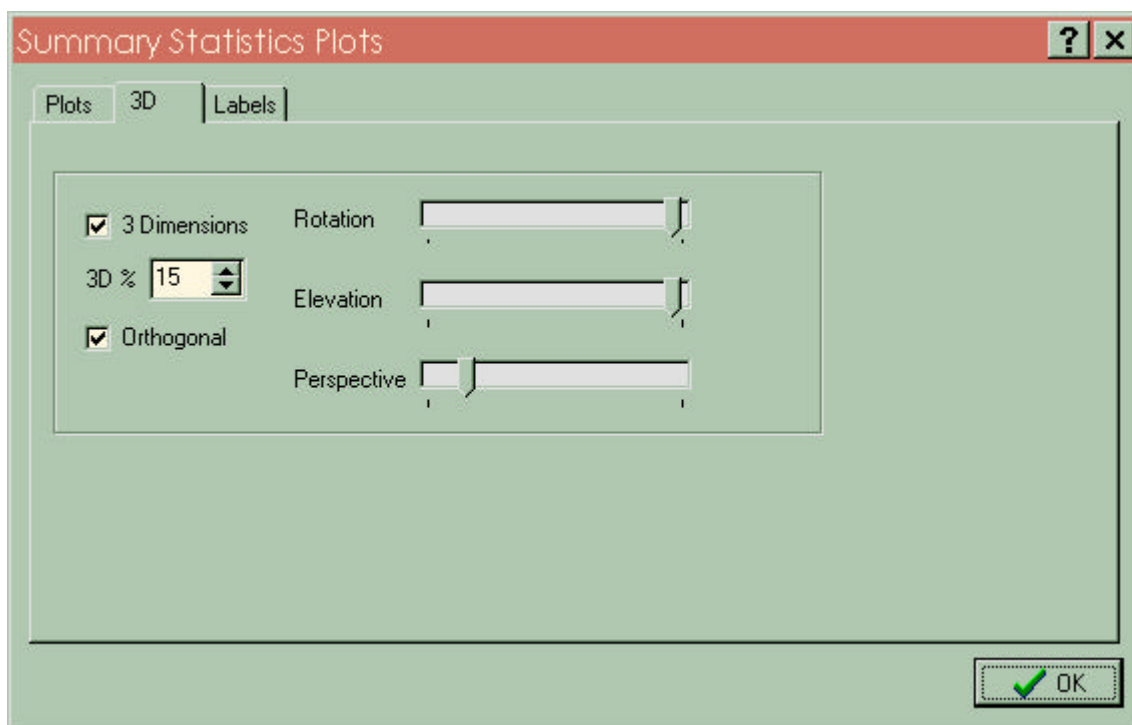
11.2. Plot Chart Options

Chart options are displayed on a three tier dialog. This page allows the user to choose which series to plot, whether the labels are plotted, the color for that series, the subset of data used (All days, Wet days, Dry days), and the statistical parameter to plot (mean, standard deviation, skew, or kurtosis)..



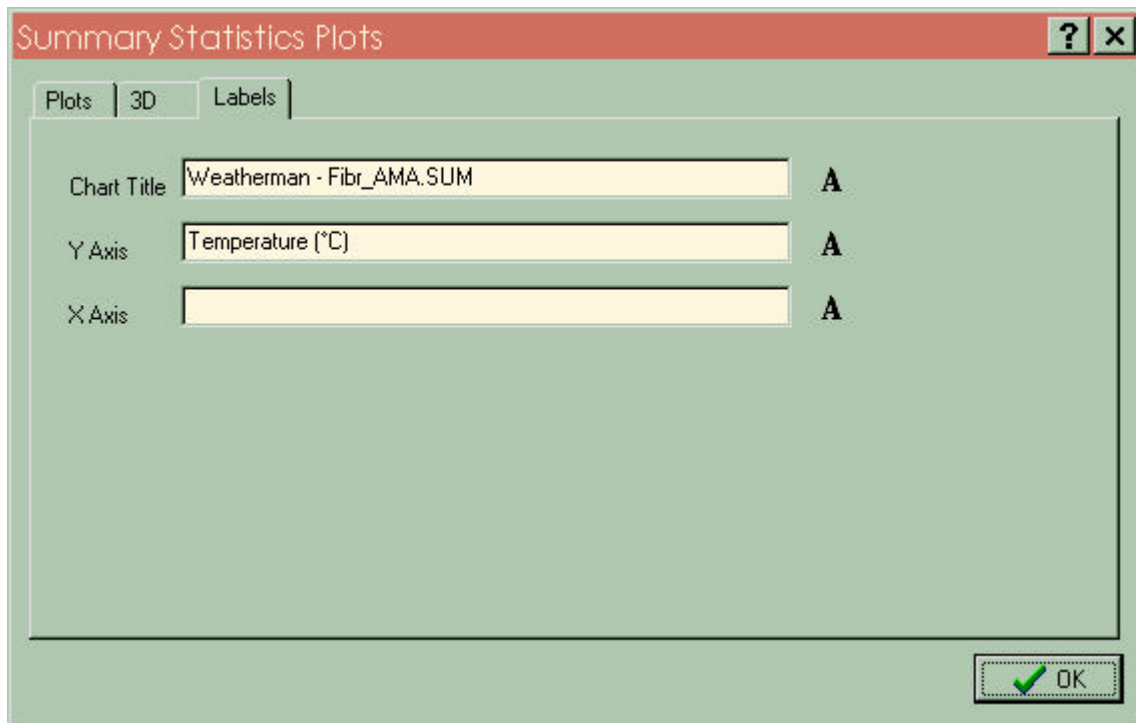
11.3. 3D Chart Options

This page displays options for displaying the chart in 3D.



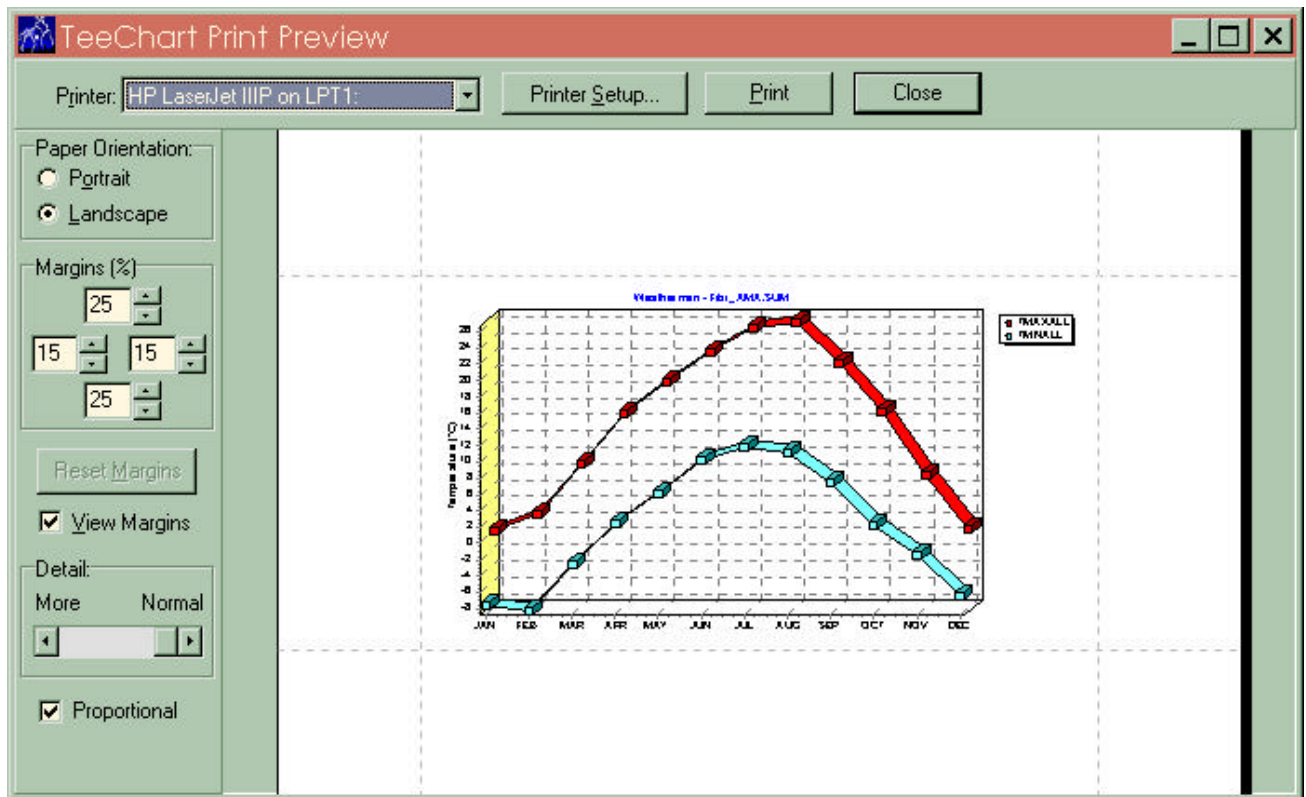
11.4. Plot Labels

This page defines the title and axis-labels for the chart, including the font. Clicking on the Font icon will bring up a FontDialog, where you can choose the font, color, and size of the text on the chart.



11.5. Print Plots

Selecting the Graph Output option in the toolbar allows you to copy or save the current chart in a variety of formats; choosing to print the chart displays displays the Print Preview dialog box. Here, you can set the orientation of the chart, select the printer, and other print options.

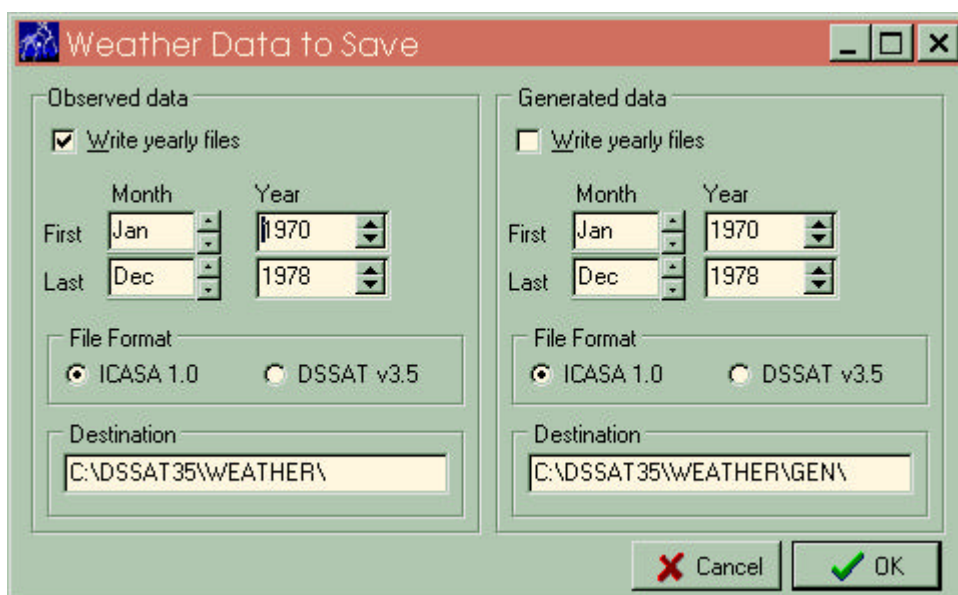


12. Save and Export Options

12.1. Saving and Exporting Weather Data

The Weather Data to Save Dialog is used when you choose to save your data from the main menu (File|Save Station). You can choose to write out either observed weather data and/or generated data, depending on which databases exist for the currently selected climate station. You also have an option of generating ICASA 1.x weather structures or for back-compatibility, DSSAT v35 weather data. You may only export data up to and including the limits of the data in the database. By double-clicking on the destination edit boxes, you can choose an alternate destination for the weather data that is written out.

To generate more synthetic weather data, choose the Generate option.



The dialog box is titled "Weather Data to Save" and contains two main sections: "Observed data" and "Generated data".

Observed data section:

- ☒ Write yearly files
- Month: Jan (dropdown), Year: 1970 (spin box)
- First: Dec (dropdown), Last: 1978 (spin box)
- File Format: ☒ ICASA 1.0, ☐ DSSAT v3.5
- Destination: C:\DSSAT35\WEATHER\

Generated data section:

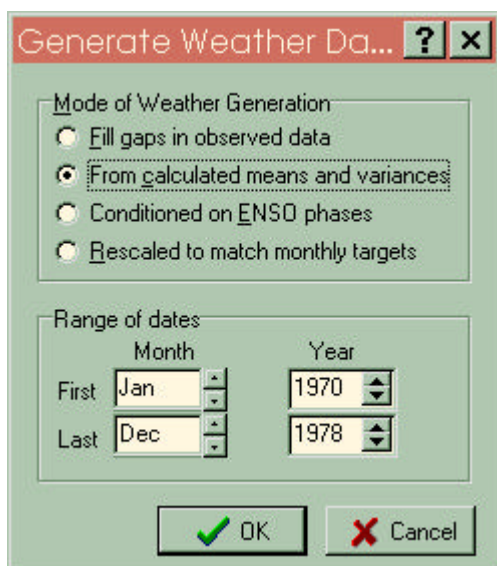
- ☐ Write yearly files
- Month: Jan (dropdown), Year: 1970 (spin box)
- First: Dec (dropdown), Last: 1978 (spin box)
- File Format: ☒ ICASA 1.0, ☐ DSSAT v3.5
- Destination: C:\DSSAT35\WEATHER\GEN\

At the bottom right are "Cancel" and "OK" buttons.

13. Generate Weather Data

13.1. Generate Synthetic Climate Data

This dialog is shown when you choose the option to generate weather data (Generate|Stochastic Weather). Weather data can be generated from the calculated means and variances of the currently selected weather station, by filling in gaps in the observed weather, scaled to match monthly targets, or conditioned on ENSO phases. New and/or improved weather generators may be implemented for generating stochastic weather.



14. Locate Proximate Weather Data

14.1. Locating Proximate Climate Stations

The Locate Proximate Weather Data dialog displays a dialog that searches all WeatherMan data files, DSSAT v35 files, and ICASA1.1 files for stations or climate files and sorts them by latitude and longitude. You can sort the results by site, latitude, or longitude by clicking in the header bar for each variable. Clicking on the Filter button allows you to refine your search. The purpose of this functionality is to hasten the search for weather data that you have may have that is closest to a particular lat/lon location that weather data may not exist.

Locate Proximate Weather Data

Target Coordinates

Latitude: 29, 37, 47
 Longitude: -82, 22, 12

Search Criteria

☒ Weatherman Data Files
☐ DSSAT V3.5 files
☐ ICASA 1.0 Data Files

Site	Latitude	Longitude
C:\WEATHERMAN\DATA\AAZZ.PRM	10.000	10.000
C:\WEATHERMAN\DATA\INCS.PRM	-7.630	-72.670
C:\WEATHERMAN\DATA\OSBO.PRM	45.830	119.280
C:\WEATHERMAN\DATA\ALFR.PRM	40.736	19.521
C:\WEATHERMAN\DATA\TEST.PRM	-35.000	149.000
C:\WEATHERMAN\DATA\IFRO.PRM	52.500	0.000
C:\WEATHERMAN\DATA\INTA.PRM	-8.170	-70.770
C:\WEATHERMAN\DATA\AREP.PRM	-33.930	-60.549
C:\WEATHERMAN\DATA\EBCH.PRM	-15.590	-47.700
C:\WEATHERMAN\DATA\FIBR.PRM	45.700	25.530
C:\WEATHERMAN\DATA\HHIH.PRM	48.000	0.000

Buttons: Search, Filter, Clear, Cancel

14.2. Search Filter Criteria

This dialog is displayed after you search for all climate data and then choose to filter the results to narrow the results.

Search Filter Criteria ? x

Target Greater Than and Less Than

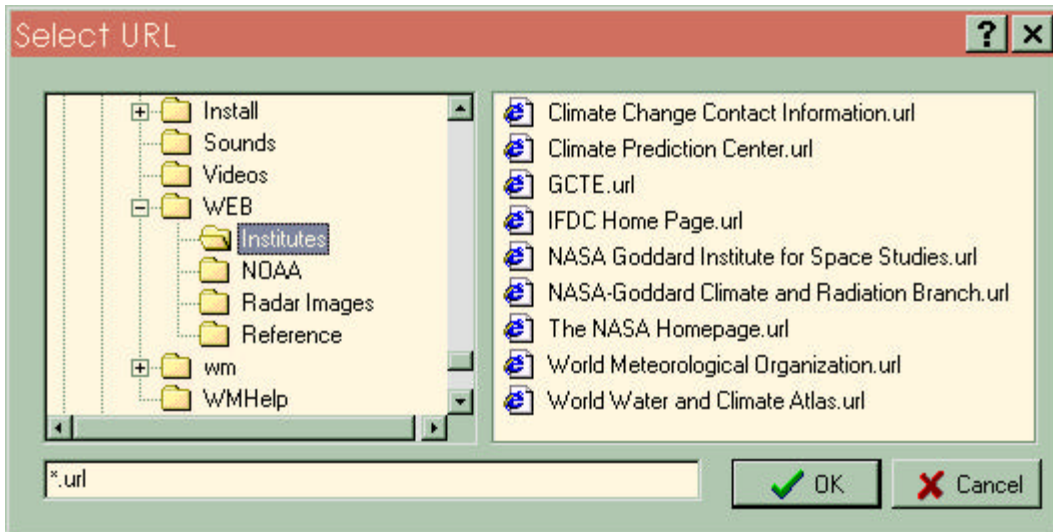
Latitude

Longitude

15. Web resources

15.1. Web Climate Data

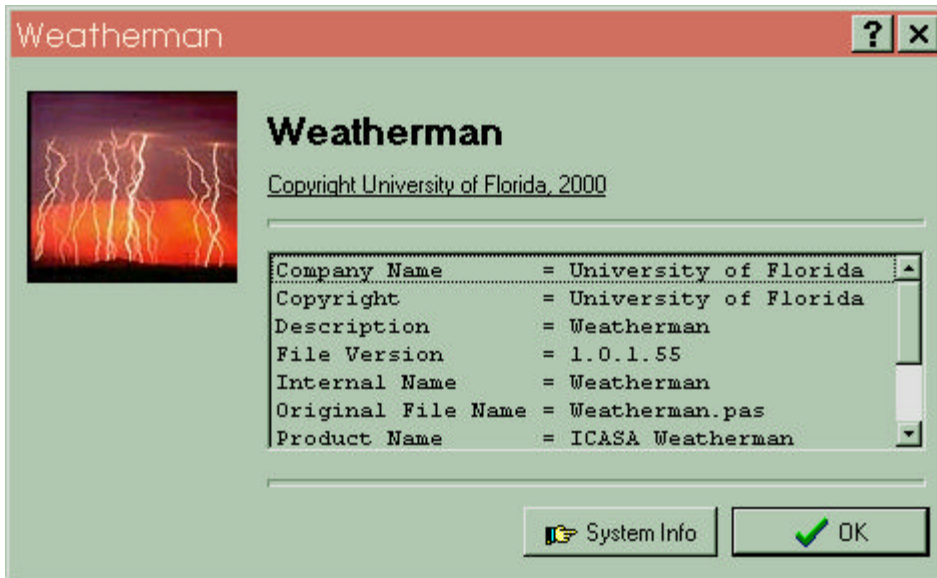
A selected list of some helpful web resources for finding, creating, and modifying climate data is installed with WeatherMan. Simply click on the web site you wish to visit and your default browser will be loaded. You can add more shortcuts to web sites you visit by saving them in any of the WEB folders.



16. About

16.1. About Weatherman

The About screen displays information on the WeatherMan executable, including the file version (build number) of the EXE file. The System Info button will attempt to load the installed system information utilities that gives detailed information on your system which may be useful in debugging problems.



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