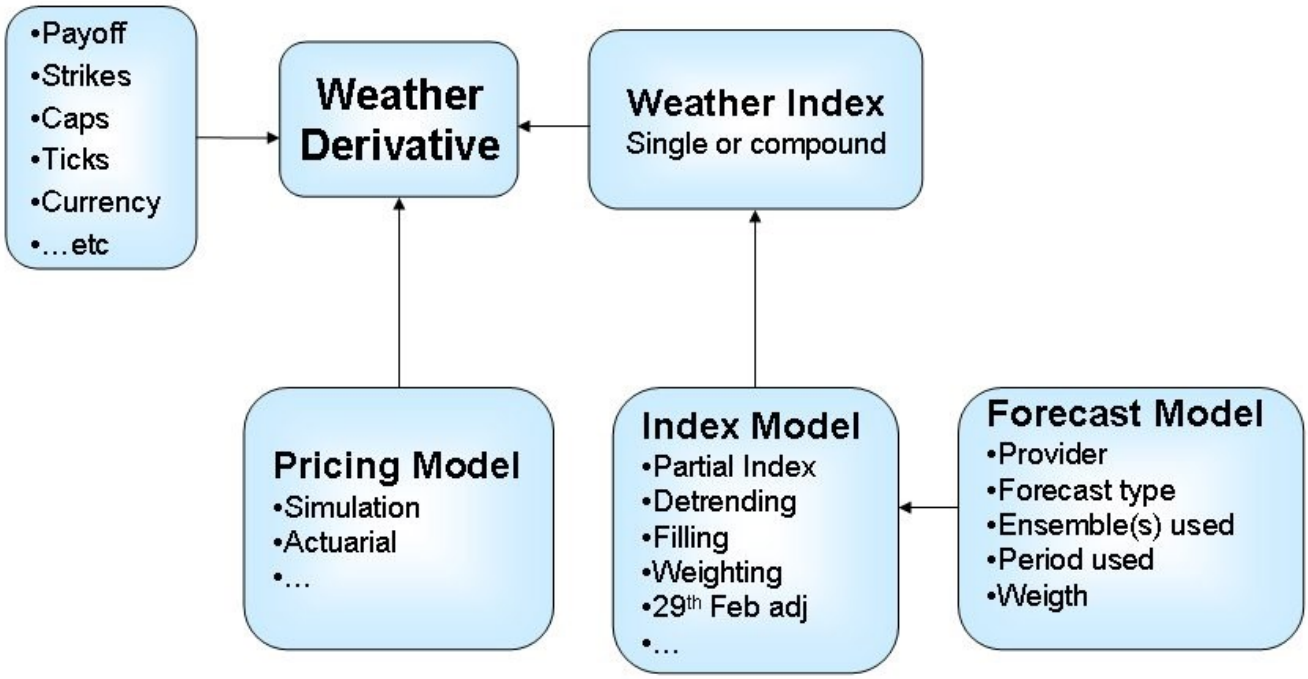
Introduction to the SWS Index Model

The following information has been extracted from the Speedwell Weather SWS Help document.

Background

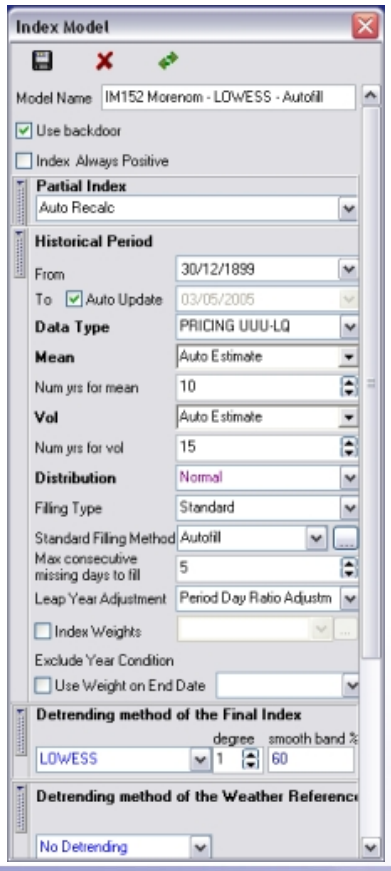
This document discusses the SWS index model. The pricing of a weather derivative involves the specification of both index and pricing models. An unlimited number of index and pricing models can be created and saved for re-use. The schema below describes their interaction



Adding/Editing an Index Model

To access: Choose Middle Office / Index and Pricing Models / Index Models. Click the New button

The following entry form for a new Index Model is generated:



Model Name: A name for the model can be specified here
Use Backdoor: Use the 'backdoor' facility to price any structure where the user defines the index values outside of SWS (**Using the Index Back Door**)

Index Always Positive: Makes sure that the Index is always positive. This may be important when detrending positive index close to zero with a negative trend. SWS tries to: Set the negative detrended value to 0 and adjust the other points so that the Mean and Standard Deviation are not modified. **NB: This algorithm may generate erratic values depending on the trend strength, the index mean and volatility and the number of zero values of the index**

Partial Index: Options for the Partial Index

Continued over

No Partial Index : no actual data will be used to adjust the historical index series even if the period of the index has started. This may be used if it is needed to repopulate the historical index series as they were before the index period started.

Auto Recalc : This is the normal option. Any available historical of the index period will be used to adjust the series. This depends on both the pricing date and on the specified historical period end date.

Users Values : this allows the users to force a value for the partial index in the past or in the future

Historical Period: Allows specification of a historical period for the Index data.

Auto Update to Today: Historical Period "To" parameter is automatically set to today whenever the model is used.

Years for Mean and Vol: Allows specification of the number of years to use for the mean and the volatility. As an example when the index mean number of years is set to 10, SWS calculates the historical Mean of the index based on the last 10 index values (after detrending, leap year adjustment, etc).

Index Mean Calculation Options:

- ***Auto Estimate*:** SWS will automatically estimate the index mean from the index model without any further adjustment (Standard Actuarial Method)
- ***User's Value*:** SWS will adjust the index distribution so that the average matches the specific user's average value.

Use Swap Level: Use the latest market swap level (**Market Swap Levels**) in the pricing irrespective of the historical mean.

Auto Est. - No Detrending: SWS will automatically estimate the index mean from the index model without detrending the index historical values

Index Vol - Calculation Options:

- ***Auto Estimate*:** SWS will automatically estimate the index volatility / standard deviation from the index model without any further adjustment (Standard Actuarial Method)
- ***User's Value*:** SWS will adjust the index distribution so that the standard deviation matches the specific user's value (normally used when marking to market).

Auto Est. - No Detrending: SWS will automatically estimate the index vol from the index model without detrending the index historical values

Leap Year adjustment: Allows specification of the method of Leap Year Adjustment. In SWS, several 29th February adjustment methods are available indeed . These adjustment methods correspond to different needs and may not be appropriate for all the cases.

- ***No Adjustment*:** When selected, SWS will not adjust the calculation. In order for traders to work out the effect of the 29th February this method can be used.
- ***Period Day Ratio Adjustment*:** The final index is multiplied by the ratio (Number of days in pricing period) / (Number of days in the current previous period)

Continued over

Leap Year adjustments continued

- ***Plus/Minus One Day:*** One day is added or removed at the end of the period so that the number of days is always equal to the number of days in the pricing period.
- ***Twice 28th Feb***: If the deal period contains a 29th Feb and the historical period does not the 28th February value is used twice to "simulate" a 29th February. For all other cases this method uses the plus/minus one day algorithm. Thus if the deal period does not contain a 29th Feb but the historical one does, the 29th Feb is retained, and the last date of the data is discarded, ensuring the same number of days for deal and historical periods.
- ***Twice 1st March***: As above, except the 1st March value is used twice to "simulate" a 29th February.
- ***Average 28 Feb - 1 Mar***: As above, except the average value between 28th Feb and 1st March value is used to "simulate" a 29th February.
- **Feb Day Ratio Adjustment:** The cumulative index for the February period only is multiplied by the ratio (Number of days in February in pricing period) / (Number of days in February in the current previous period)

Missing Data Method: Allows specification of the method of filling in any missing data (**Using the Data Auditor**)

Max consec missing data fill: Allows specification of the maximum number of missing data to fill in for. If a period is made of more consecutively missing day then the data will not be filled.
Hourly Filling Method: Allows specification of the method used to fill gaps in hourly data sets (**List of Hourly Filling Models**)

Data Type: Allows specification of the data type used for the Index Model (**Weather Data Types**)

Index Weights: Select which Index Weightings list to use (**List Of Index Weightings**)

Use Weight on End Date: Specify whether the weight is used on the end date (an average is used if this not ticked) (**List Of Index Weightings**)

Exclude Year Condition: Allows setting of the conditions for excluding a year from the index calculations

Detrending method of the Weather Reference: Allows specification of the trending method for the weather reference. The data are detrended on a monthly basis to respect the seasonality of trends. Supported detrending models are:

- None

Polynomial (includes Linear, parabolic, cubic, etc)
Sub option: degree. Polynomial order (1 for linear, 2 for parabolic, etc)

- ***Bilinear***

LOWESS a.k.a. LOESS (Locally Weighted Regression)
Sub option: degree. Polynomial order (1 for linear, 2 for parabolic, etc)
Sub Option: "Smooth band %". This lets the user specifies the smooth band proportion to take into account when running the local regression. As an example, a smooth band of 60% with 50 years worth of data will mean that each local regression will use 60% x 50 = 30 data points.

- ***Exponential***
- ***Power***
- **Log**
- ***Robust Lowess*** (5 pass Lowess)

Sub Option: "Additive Trends?": When ticked (default) the trend correction is applied using an additive shift of the data whereas when unticked the trend correction is applied by using a multiplicative shift of the data. For temperature like data an additive correction is best suited whereas for precipitation data a multiplicative correction (so that 0 values remain 0) may be best suited.

Sub Option: Override Child Index Trend: Specifies whether or not all the child indices use the same weather detrending method

More information can be found on detrending methods in the "Calculation Methods Used" document.

Detrending method of the final Index: Allows specification of the trending method for the final Index values. Supported detrending models are:

- ***None***

Polynomial (includes Linear, parabolic, cubic, etc)

Sub option: degree. Polynomial order (1 for linear, 2 for parabolic, etc)

- ***Bilinear***

LOWESS a.k.a. LOESS (Locally Weighted Regression)

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- ***Exponential***
- ***Power***
- *Log*

Daily Simulation Model: Sets the method by which the daily simulation is calculated. The pricing model of the option must be set to "Weather Daily Simulation".

Forecast Model: Sets the forecast data provider and the method for handling ensemble forecasts (**List of Forecast Models**)

Scenarios: Allows specification for the use of scenario analysis. Scenarios are used to understand the sensitivity of the contract to the weather element itself and allow to answer questions such as:

- What happens if historically the temperature had been 1 degree warmer/colder ("Bump" parameters)?;
- What happens if historically it had rained (in magnitude) say 7% more ("Multiplier" parameter)?.

Daily Simulation Model:

SWS supports two daily simulation processes:

- Bootstrap for Temperature like processes
- Markovian with Magnitude for precipitation type series

List of Forecast Models

Please see separate SWS Forecast Model document.

Using the Index Back Door

How to access : Having opened an option in Pricing/ Price Weather Derivatives then choose Weather Option / Get-Set Histo Values

For “super-exotic” indices that cannot be automatically generated within SWS it is possible to enter an index through "the back door". This index is simply a list of period end dates and index values that have been generated outside of SWS. This series can then be used to value the structure and to manage risk on it.

To use this feature, the '**Use Backdoor**' option must be ticked from the ***Index Model*** tab in the main pricing form.

To do this save an option (the index description is not material in this case) which is to be priced using the exotic index.

Then choose the **Options / Back Door / Set Histo Values** menu option.
Copy in the index. An example is shown below:

Now press the **Save Values** button.

Now choose **Options / Back Door / Get values**. The data are automatically copied into the left of the index grid. The structure can now be priced using this index.

Appendix

Weather Derivatives Pricing

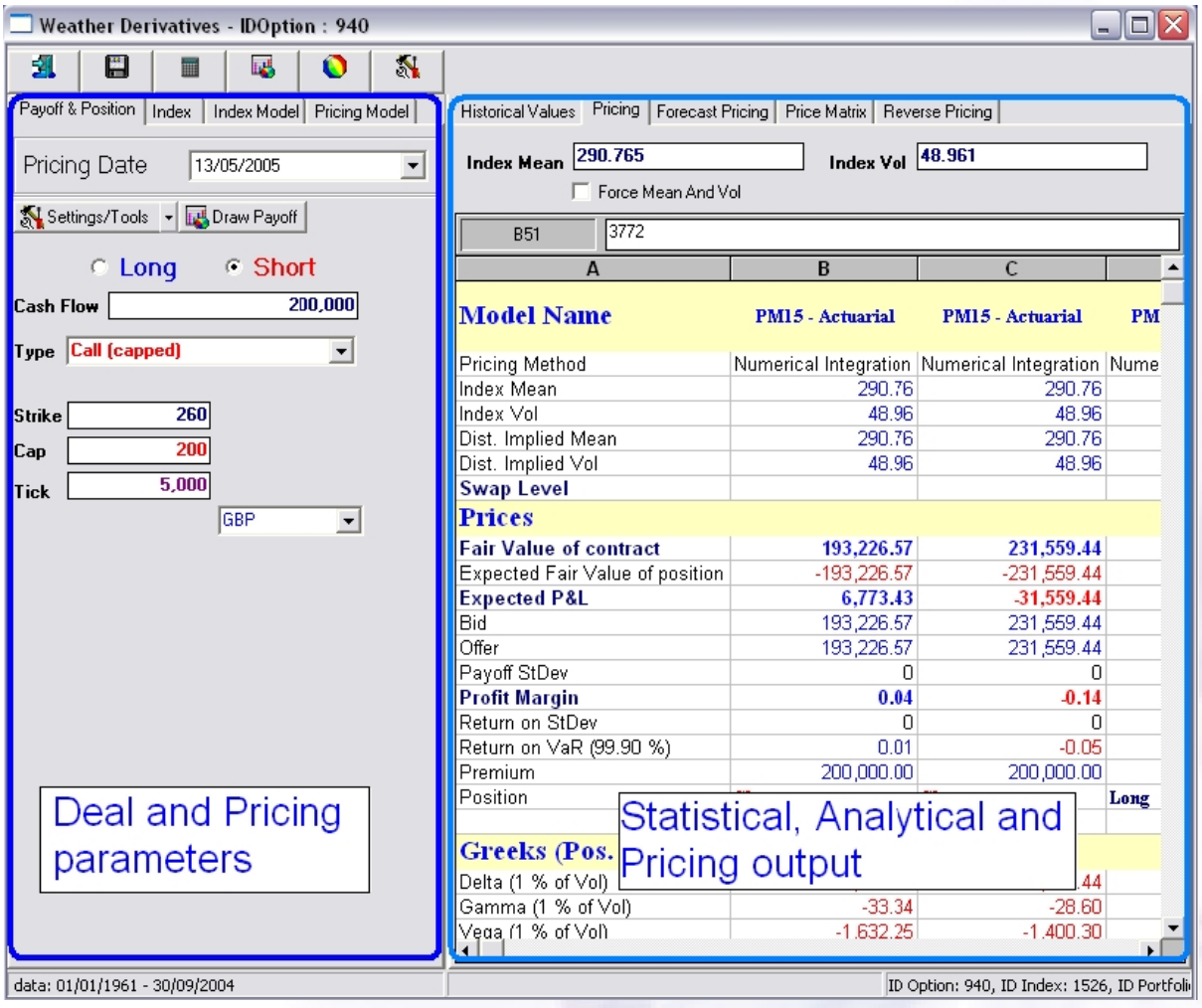
To call this tool choose the Pricing / Price Weather Derivatives menu option

*NB. To price a predefined option access go to the **Pricing / List of Weather Derivatives** menu. To see the Option Pricing outputs go to the Pricing tab (please see Pricing with a distribution for more information). Click on the required row and press the **Edit Option** button (List of Weather Derivatives). The full details of the option are now entered into the pricing form.*

Entering the contract and index and pricing models details

The Weather Derivatives pricing menu option allows contracts to be priced using different models including burn, simulation and actuarial methods. The underlying weather index can be based on either daily, hourly or up to the minute or a mixture of them and can be Simple or Compound. Compound indices cover those which are based on a relationship between two series (e.g. rain and cold) and/or based on multiple sites (basket or spread options) with no limit on the complexity.

The main pricing screen has two parts: on the left hand side the definition of the deal and the parameters to price it can be entered whereas on the right hand side SWS will display statistical and



Below is a description of the function of each tab under Pricing:

Index tab for defining the index of a single site structure.

Payoff and Position tab for defining the option or swap.

Index Model tab for defining the determinants of the historical index values.

Pricing Model tab for defining the pricing method and the risk parameters.

Historical Values tab to see the values of the index and its payoff in the past.

Forecast Pricing to incorporate probabilistic forecasts.

Pricing tab use this to price using different distributions.

Price Matrix tab: use this to show, for example, option prices as a function of swap level and volatilit

Reverse Pricing tab: Use this tool to calculate a parameter (mean, strike or volatility) for a given price

The Pricing Date by default is set to the current day. This is the base from which the time-value of money is taken into account. The date can be changed to allow retrospective pricing (i.e. pricing with historical data that was only available up to that date). **Just below the Pricing Date on the** *Payoff and Position* **tab there is a selection to be made as to the nature of the position. If a weather derivative is being priced, the effect of a short or long position in terms of Premium can be incorporated via this option.**

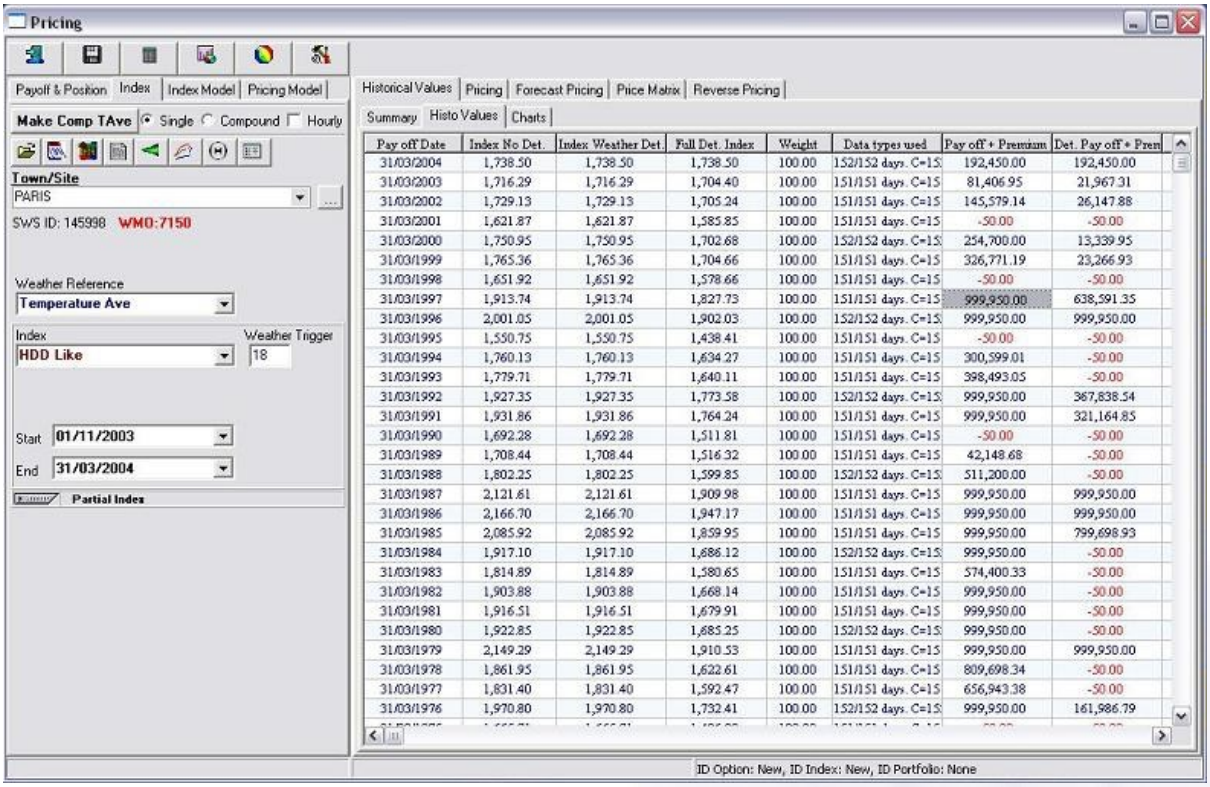
Entering the index and models details should be obvious but if you need additional help please refer to: **Setting up an Index and an Option**. Once the parameters have been defined, press the Price button (or the F5 key). This calculates the historical index values, the detrended values, the payoff and the detrended payoff and a summary of the period values in the grid to the right. It will also Price the option, using the Pricing parameters under the Pricing tab.

Once a new option has been defined, it can be saved to a portfolio without trading it (for seeing the effect on the portfolio) or it actually be traded. To do this press the Save / Save to Portfolio **button. The option can also be traded. Press the Save /** Trade **button. If none of these are required, the terms of the option can be saved by pressing** Save / Save to Options List**. If an option has been already defined in the list then the option can be modified by changing the details in the form and then pressing the** Save / Save Pricing Param **button.**

The next section deals with the explanation of the output tabs.

Historical Values Tab

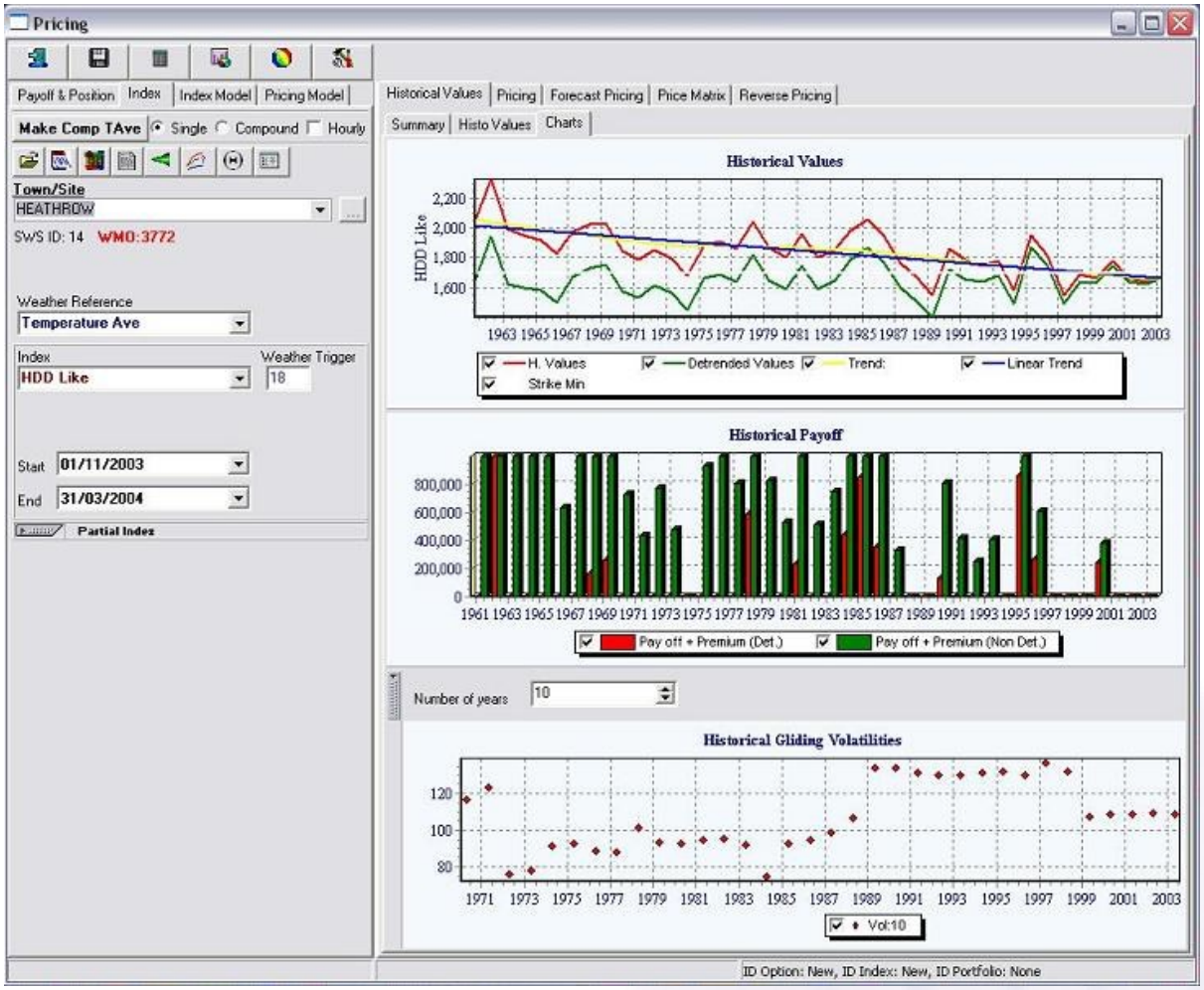
The Historical Values tab displays the historical burn and detrended values of the index and the payoff. A more in depth analysis showing burns with different detrending methods can be performed using the Index Analysis tool Weather Index Analysis. Below is shown an ordinary Paris Winter 2004 HDD structure with a 1700 strike with an incorporated -50 Cash Flow and a Long position:



Pay off Date	Index No Det.	Index Weather Det	Full Det. Index	Weight	Data types used	Pay off + Premium	Det. Pay off + Prem
31/03/2004	1,738.50	1,738.50	1,738.50	100.00	152/152 days. C=15	192,450.00	192,450.00
31/03/2003	1,716.29	1,716.29	1,704.40	100.00	151/151 days. C=15	81,406.95	21,967.31
31/03/2002	1,729.13	1,729.13	1,705.24	100.00	151/151 days. C=15	145,579.14	26,147.88
31/03/2001	1,621.87	1,621.87	1,585.85	100.00	151/151 days. C=15	-50.00	-50.00
31/03/2000	1,750.95	1,750.95	1,702.68	100.00	152/152 days. C=15	254,700.00	13,339.95
31/03/1999	1,765.36	1,765.36	1,704.66	100.00	151/151 days. C=15	326,771.19	23,266.93
31/03/1998	1,651.92	1,651.92	1,578.66	100.00	151/151 days. C=15	-50.00	-50.00
31/03/1997	1,913.74	1,913.74	1,827.73	100.00	151/151 days. C=15	999,950.00	638,591.35
31/03/1996	2,001.05	2,001.05	1,902.03	100.00	152/152 days. C=15	999,950.00	999,950.00
31/03/1995	1,550.75	1,550.75	1,438.41	100.00	151/151 days. C=15	-50.00	-50.00
31/03/1994	1,760.13	1,760.13	1,634.27	100.00	151/151 days. C=15	300,599.01	-50.00
31/03/1993	1,779.71	1,779.71	1,640.11	100.00	151/151 days. C=15	398,493.05	-50.00
31/03/1992	1,927.35	1,927.35	1,773.58	100.00	152/152 days. C=15	999,950.00	367,838.54
31/03/1991	1,931.86	1,931.86	1,764.24	100.00	151/151 days. C=15	999,950.00	321,164.85
31/03/1990	1,692.28	1,692.28	1,511.81	100.00	151/151 days. C=15	-50.00	-50.00
31/03/1989	1,708.44	1,708.44	1,516.32	100.00	151/151 days. C=15	42,148.68	-50.00
31/03/1988	1,802.25	1,802.25	1,599.85	100.00	152/152 days. C=15	511,200.00	-50.00
31/03/1987	2,121.61	2,121.61	1,909.98	100.00	151/151 days. C=15	999,950.00	999,950.00
31/03/1986	2,166.70	2,166.70	1,947.17	100.00	151/151 days. C=15	999,950.00	999,950.00
31/03/1985	2,085.92	2,085.92	1,859.95	100.00	151/151 days. C=15	999,950.00	799,698.93
31/03/1984	1,917.10	1,917.10	1,686.12	100.00	152/152 days. C=15	999,950.00	-50.00
31/03/1983	1,814.89	1,814.89	1,580.65	100.00	151/151 days. C=15	574,400.33	-50.00
31/03/1982	1,903.88	1,903.88	1,668.14	100.00	151/151 days. C=15	999,950.00	-50.00
31/03/1981	1,916.51	1,916.51	1,679.91	100.00	151/151 days. C=15	999,950.00	-50.00
31/03/1980	1,922.85	1,922.85	1,685.25	100.00	152/152 days. C=15	999,950.00	-50.00
31/03/1979	2,149.29	2,149.29	1,910.53	100.00	151/151 days. C=15	999,950.00	999,950.00
31/03/1978	1,861.95	1,861.95	1,622.61	100.00	151/151 days. C=15	809,698.34	-50.00
31/03/1977	1,831.40	1,831.40	1,592.47	100.00	151/151 days. C=15	656,943.38	-50.00
31/03/1976	1,970.80	1,970.80	1,732.41	100.00	152/152 days. C=15	999,950.00	161,986.79

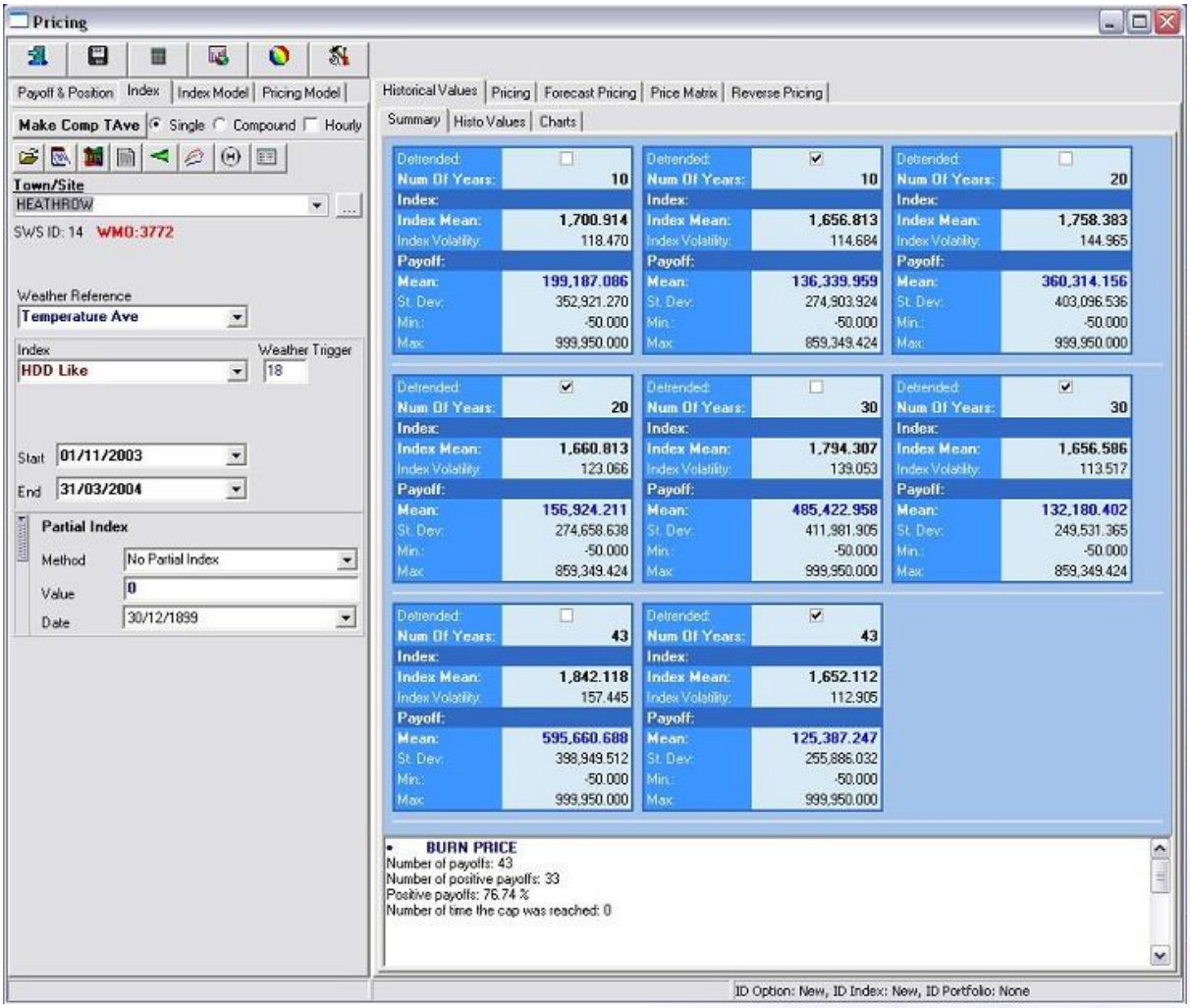
There are a number of outputs on the grid. The Index values are shown with no detrending applied (Index No Det.), with detrending of the weather reference (Index Weather Det.) and with both weather reference and final index detrending applied (Full Det. Index). Next to these columns are the weights (see **List Of Index Weightings**) applied to each Index period. Next to this column is the number of days in the period with the corresponding data types used (Synoptic, Climate, Reconstructed, Settlement and Pricing). Then there is the historical payoff for each period plus the cash flow figure without and with detrending applied in the next two columns. Finally there is a detrended index rank applied for each period.

Charts of the historical values, payoffs and gliding volatilities are shown under the Charts tab. There is also a general summary shown under the Summary tab (this tab is the default once a pricing calculation has been run). Within the Charts tab there are two default graphs available (the Historical Values and the Historical Payoff) as well as the optional selection of the Gliding Volatilities:



As can be seen, the Cash Flow value is incorporated into the Pricing analysis. The Position selection and Cash Flow value will also have an effect on other aspects of the form such as VaR under the Pricing tab.

The Summary tab presents a general summary of all the historical values information generated when a pricing calculation is made. In addition all relevant information pertaining to the calculation is generated into the form at the bottom:



Pricing Tab

The Weather Derivatives pricing tab displays prices, Greeks and VaR figures using the currently selected model. A variety of methods can be used to price a contract in addition to the specification of risk premium parameters. Each pricing iteration will move previous results to the right hand side of the grid for easy comparison.

Forecast Pricing Tab

The Forecast Pricing tab permits the use probabilistic forecasts for weather derivative structures. There is also a subtab, Ensemble Forecast, that gives a detailed breakdown of any ensemble forecast that is used in the pricing of a weather derivative structure. Please see **Pricing incorporating probabilistic/ensemble forecasts** for further information.

Price Matrix Tab

The Price Matrix is a tool that generates that will generate a series of prices based on plotting a series of parameters against each other, commonly Mean and Volatility against Fair Values. Please see **The Price Matrix** for further information.

Pricing using a Covered Capped Call or Put (i.e. swap + option)

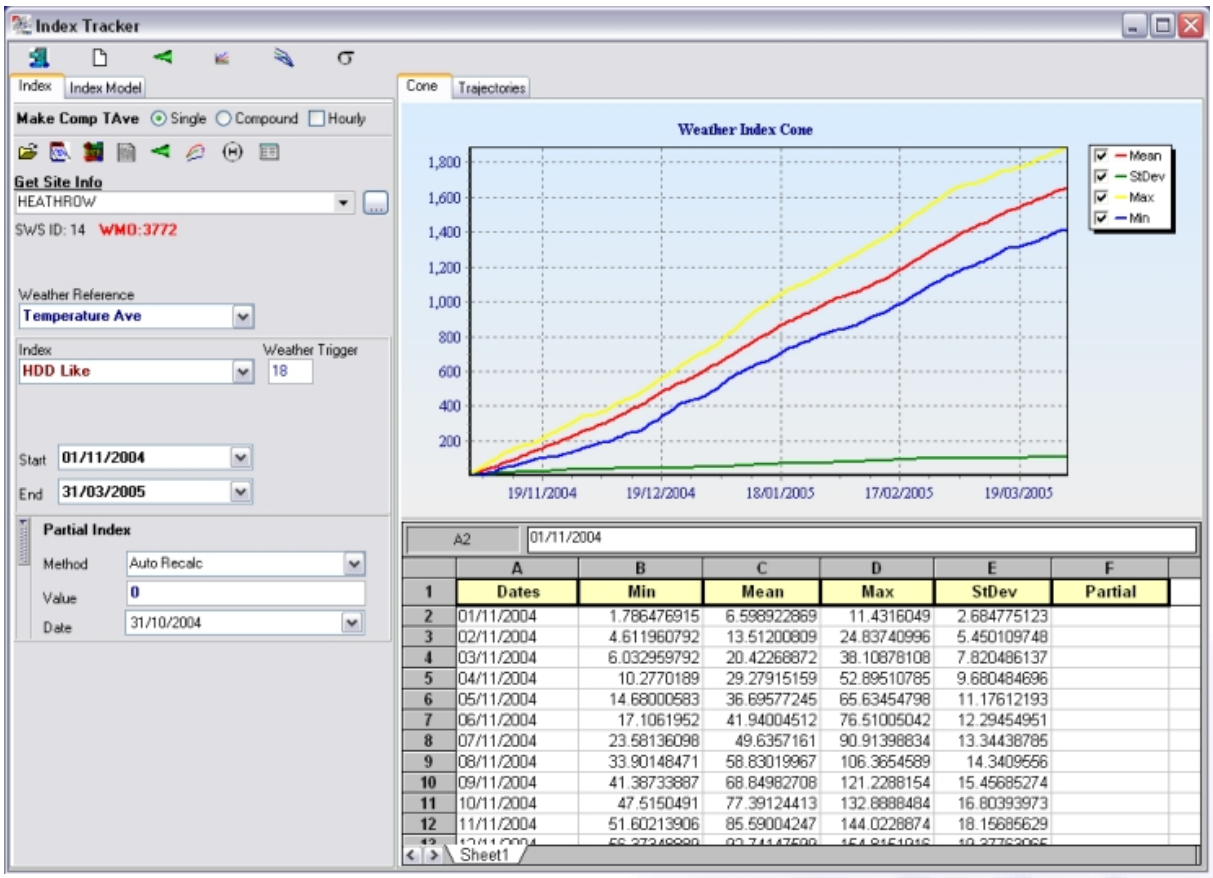
When pricing a covered option structure, the layout of the option tab will look slightly different to normal:

Having selected the appropriate covered structure (i.e. a call or a put) the next entry needs to be made under the Strike, Cap and Tick fields. The figures for the Strike, Cap and Tick are laid out as follows: to the left the swap levels must be entered (circled in red) and to the right the structure (call or put) value (circled in blue) needs to be inputted. After this has been done the prices can be generated in the usual fashion.

Many other outputs can be obtained at a click of a button

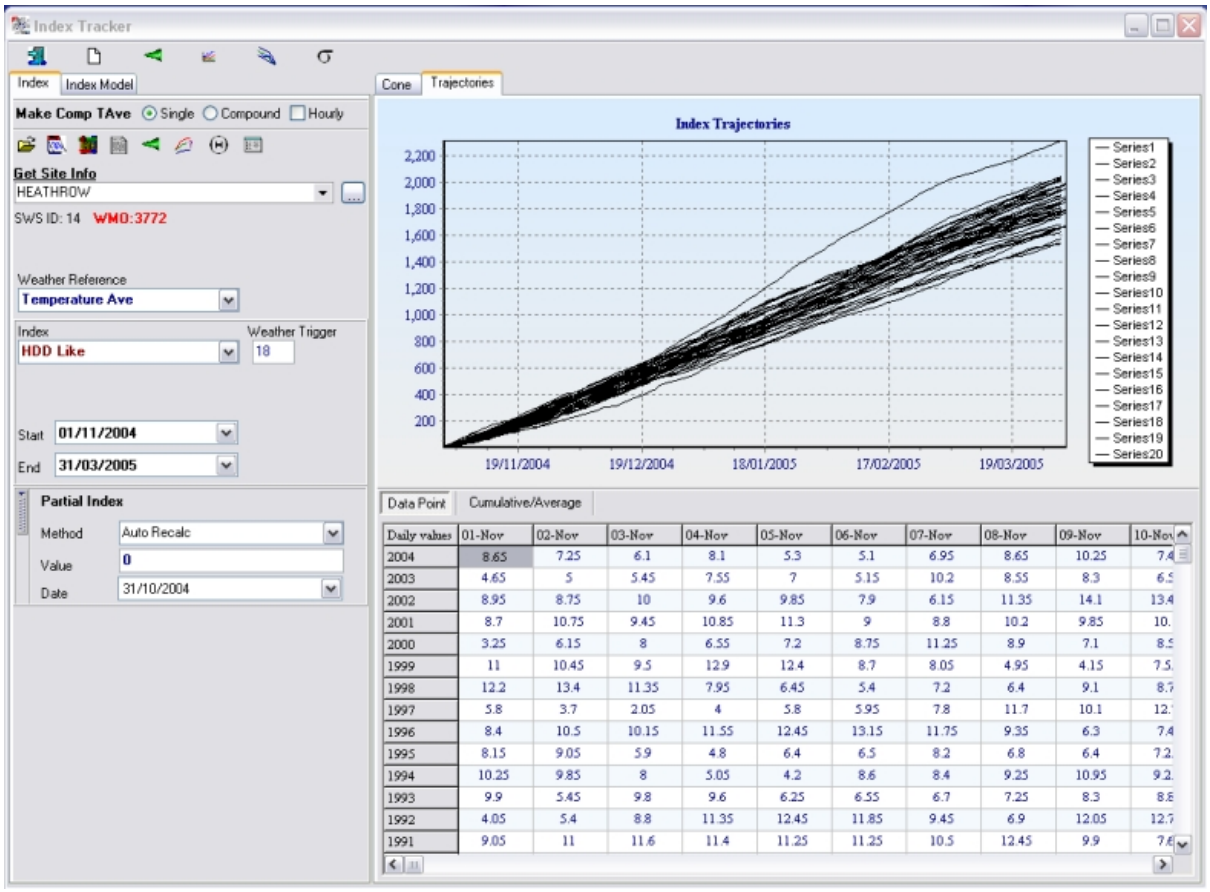
Displaying the Index historical trajectories and Cone

Index Cone: use this to view the history on an index progression. On the form, press the **Cone** button. The following is generated:



	A	B	C	D	E	F
1	Dates	Min	Mean	Max	StDev	Partial
2	01/11/2004	1.786476915	6.598922869	11.4316049	2.684775123	
3	02/11/2004	4.611960792	13.51200809	24.83740996	5.450109748	
4	03/11/2004	6.032959792	20.42268872	38.10878108	7.820486137	
5	04/11/2004	10.2770189	29.27915159	52.89510785	9.680484696	
6	05/11/2004	14.68000583	36.69577245	65.63454798	11.17612193	
7	06/11/2004	17.1061952	41.94004512	76.51005042	12.29454951	
8	07/11/2004	23.58136098	49.6357161	90.91398834	13.34438785	
9	08/11/2004	33.90148471	58.83019967	106.3654589	14.3409556	
10	09/11/2004	41.38733887	68.84982708	121.2288154	15.45685274	
11	10/11/2004	47.5150491	77.39124413	132.8888484	16.80393973	
12	11/11/2004	51.60213906	85.59004247	144.0228874	18.15685629	

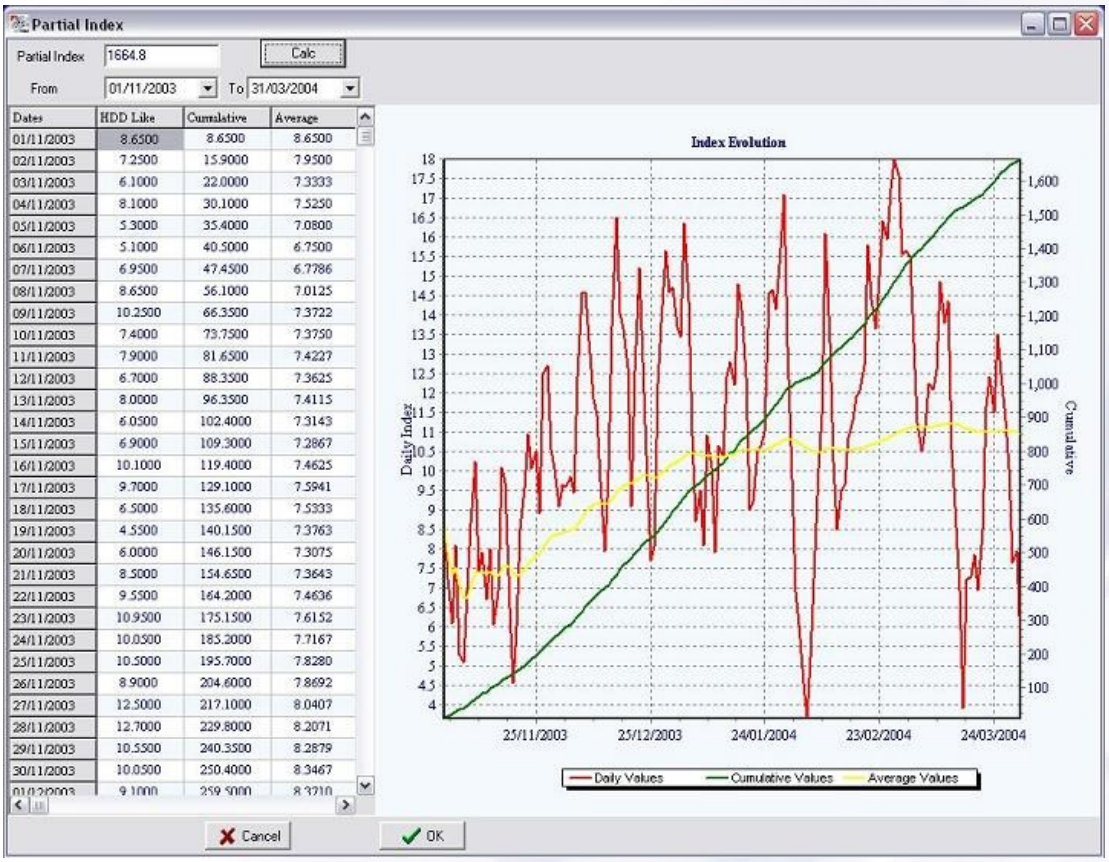
The green line shows the StDev, the yellow the max, the red the mean, and the blue the minimum. It is now easy to put the current season in an historical context. The actual daily values are displayed on the grid below. This shows the minimum, mean, maximum, and standard deviation for each day.
Two grids which are filled with data when the **Index Trajectories** button is pressed. The first is the daily value of the index for every day in the period and for every year of the history selected. The second is the cumulative value for each period.



Daily values	01-Nov	02-Nov	03-Nov	04-Nov	05-Nov	06-Nov	07-Nov	08-Nov	09-Nov	10-Nov
2004	8.65	7.25	6.1	8.1	5.3	5.1	6.95	8.65	10.25	7.4
2003	4.65	5	5.45	7.55	7	5.15	10.2	8.55	8.3	6.5
2002	8.95	8.75	10	9.6	9.85	7.9	6.15	11.35	14.1	13.4
2001	8.7	10.75	9.45	10.85	11.3	9	8.8	10.2	9.85	10.
2000	3.25	6.15	8	6.55	7.2	8.75	11.25	8.9	7.1	8.5
1999	11	10.45	9.5	12.9	12.4	8.7	8.05	4.95	4.15	7.5
1998	12.2	13.4	11.35	7.95	6.45	5.4	7.2	6.4	9.1	8.7
1997	5.8	3.7	2.05	4	5.8	5.95	7.8	11.7	10.1	12.
1996	8.4	10.5	10.15	11.55	12.45	13.15	11.75	9.35	6.3	7.4
1995	8.15	9.05	5.9	4.8	6.4	6.5	8.2	6.8	6.4	7.2
1994	10.25	9.85	8	5.05	4.2	8.6	8.4	9.25	10.95	9.2
1993	9.9	5.45	9.8	9.6	6.25	6.55	6.7	7.25	8.3	8.8
1992	4.05	5.4	8.8	11.35	12.45	11.85	9.45	6.9	12.05	12.7
1991	9.05	11	11.6	11.4	11.25	11.25	10.5	12.45	9.9	7.8

Calculate the Partial Index

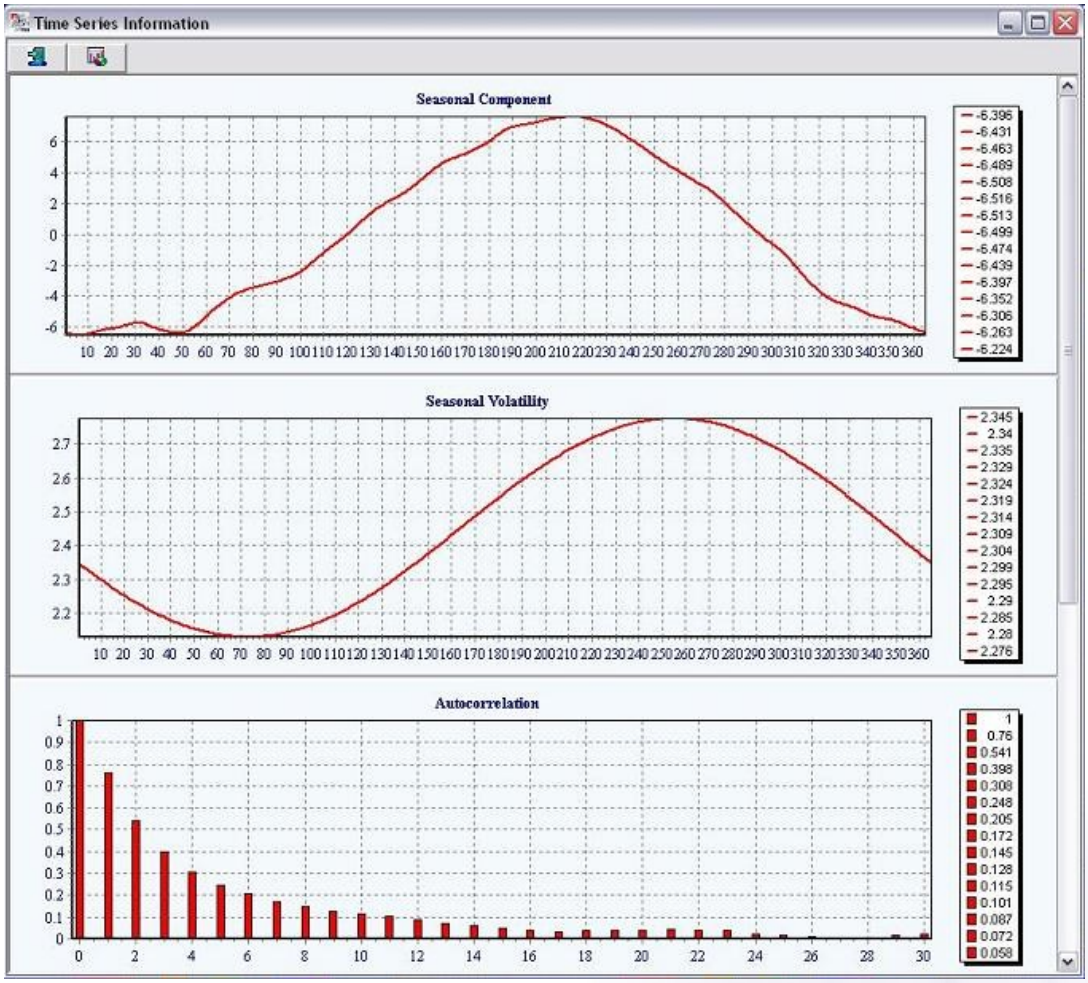
Calculate Partial Index: Press this button to calculate the Partial Index, as illustrated below:



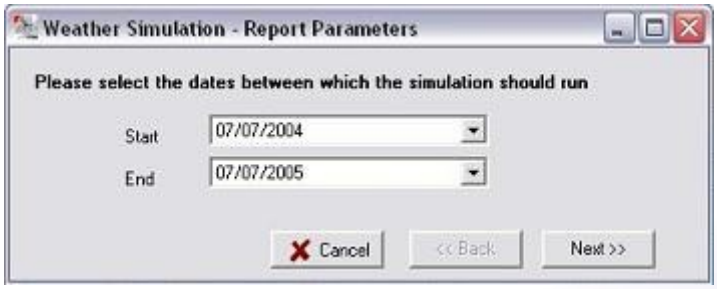
Dates	HDD Like	Cumulative	Average
01/11/2003	8.6500	8.6500	8.6500
02/11/2003	7.2500	15.9000	7.9500
03/11/2003	6.1000	22.0000	7.3333
04/11/2003	8.1000	30.1000	7.5250
05/11/2003	5.3000	35.4000	7.0800
06/11/2003	5.1000	40.5000	6.7500
07/11/2003	6.9500	47.4500	6.7786
08/11/2003	8.6500	56.1000	7.0125
09/11/2003	10.2500	66.3500	7.3722
10/11/2003	7.4000	73.7500	7.3750
11/11/2003	7.9000	81.6500	7.4227
12/11/2003	6.7000	88.3500	7.3625
13/11/2003	8.0000	96.3500	7.4115
14/11/2003	6.0500	102.4000	7.3143
15/11/2003	6.9000	109.3000	7.2867
16/11/2003	10.1000	119.4000	7.4625
17/11/2003	9.7000	129.1000	7.5941
18/11/2003	6.5000	135.6000	7.5333
19/11/2003	4.5500	140.1500	7.3763
20/11/2003	6.0000	146.1500	7.3075
21/11/2003	8.5000	154.6500	7.3643
22/11/2003	9.5500	164.2000	7.4636
23/11/2003	10.9500	175.1500	7.6152
24/11/2003	10.0500	185.2000	7.7167
25/11/2003	10.5000	195.7000	7.8280
26/11/2003	8.9000	204.6000	7.8692
27/11/2003	12.5000	217.1000	8.0407
28/11/2003	12.7000	229.8000	8.2071
29/11/2003	10.5500	240.3500	8.2879
30/11/2003	10.0500	250.4000	8.3467
01/12/2003	9.1000	259.5000	8.3210

Visualising Daily simulations

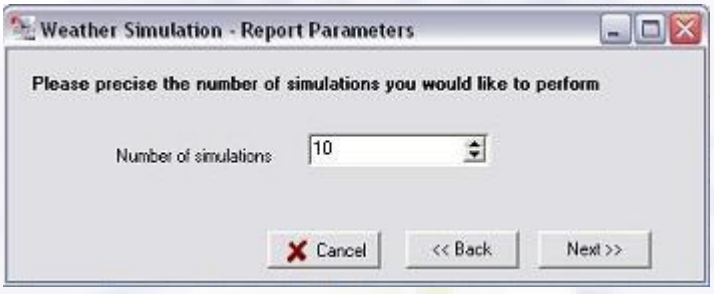
Simulation Process: Press this button to calculate the simulation process and access the tool for running daily simulations:



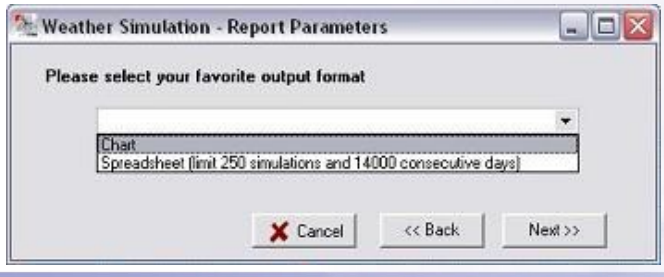
To run daily temperature simulations, click the Run Daily Sim button. The following will appear:



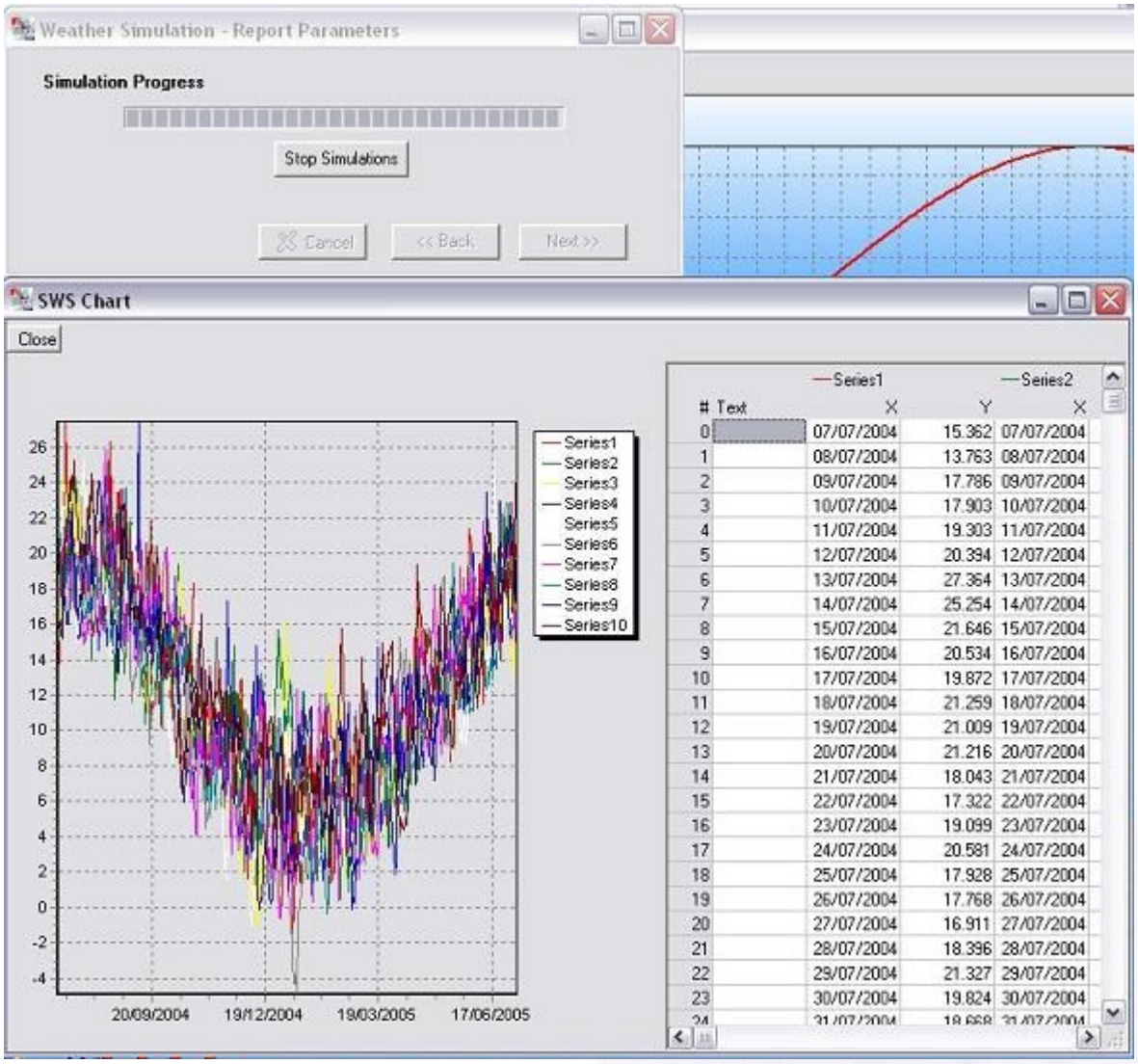
Simply select the dates that are required for the simulation to be run between and press Next:



The next step is to specify the number of simulations that are required to be run. Then press the



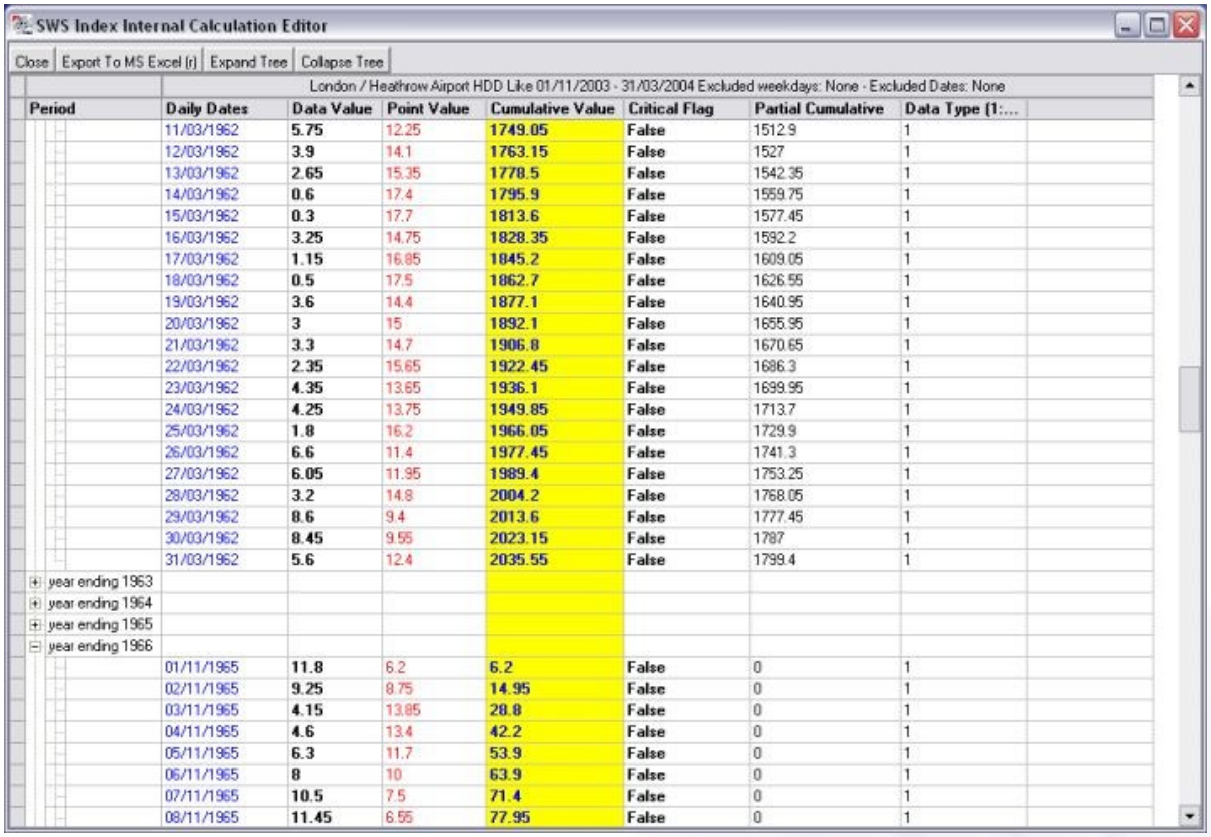
The simulations can either be displayed on a chart or on a spreadsheet - the example shown below uses a chart. Click Next to produce the output of the daily simulations:



Each simulation is displayed as a different series on the graph.

Viewing the Daily Index Values

Viewing the Daily Index Values: Press this button to display a tree view of all the daily index values. The view is shown below:



Period	Daily Dates	Data Value	Point Value	Cumulative Value	Critical Flag	Partial Cumulative	Data Type (1:...
	11/03/1962	5.75	12.25	1749.05	False	1512.9	1
	12/03/1962	3.9	14.1	1763.15	False	1527	1
	13/03/1962	2.65	15.35	1778.5	False	1542.35	1
	14/03/1962	0.6	17.4	1795.9	False	1559.75	1
	15/03/1962	0.3	17.7	1813.6	False	1577.45	1
	16/03/1962	3.25	14.75	1828.35	False	1592.2	1
	17/03/1962	1.15	16.85	1845.2	False	1609.05	1
	18/03/1962	0.5	17.5	1862.7	False	1626.55	1
	19/03/1962	3.6	14.4	1877.1	False	1640.95	1
	20/03/1962	3	15	1892.1	False	1655.95	1
	21/03/1962	3.3	14.7	1906.8	False	1670.65	1
	22/03/1962	2.35	15.65	1922.45	False	1686.3	1
	23/03/1962	4.35	13.65	1936.1	False	1699.95	1
	24/03/1962	4.25	13.75	1949.85	False	1713.7	1
	25/03/1962	1.8	16.2	1966.05	False	1729.9	1
	26/03/1962	6.6	11.4	1977.45	False	1741.3	1
	27/03/1962	6.05	11.95	1989.4	False	1753.25	1
	28/03/1962	3.2	14.8	2004.2	False	1768.05	1
	29/03/1962	8.6	9.4	2013.6	False	1777.45	1
	30/03/1962	8.45	9.55	2023.15	False	1787	1
	31/03/1962	5.6	12.4	2035.55	False	1799.4	1
⊞ year ending 1963							
⊞ year ending 1964							
⊞ year ending 1965							
⊟ year ending 1966							
	01/11/1965	11.8	6.2	6.2	False	0	1
	02/11/1965	9.25	8.75	14.95	False	0	1
	03/11/1965	4.15	13.85	28.8	False	0	1
	04/11/1965	4.6	13.4	42.2	False	0	1
	05/11/1965	6.3	11.7	53.9	False	0	1
	06/11/1965	8	10	63.9	False	0	1
	07/11/1965	10.5	7.5	71.4	False	0	1
	08/11/1965	11.45	6.55	77.95	False	0	1

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