SWS

Speedwell Weather System

SWS Vs 6.1

The Open Weather Derivative Pricing and Risk Management System

Features Summary

SWS is an **internally-installed** and **open system** for pricing weather derivatives and managing risk. SWS supports the needs of both secondary market trading and structured product trading. SWS Version 6 integrates the YellowJacket[R] interface to bring secondary market prices directly into SWS. The product is fully supported. Training is provided.

SWS integrates daily and hourly weather data from multiple data providers via **automated weather data download**. All weather data is persisted with a full audit trail. SWS also integrates deterministic and **ensemble** forecasts via **automated download** from multiple providers. Powerful graphical tools to visualize these forecasts are included. All data and forecasts are persisted with a full audit trail.

SWS allows weather derivatives to be analysed with simultaneous **multiple de-trending and pricing methods.** SWS also supports valuation and risk management of a wide variety of complex types. These include **spread options**, **basket options,** and **multi-triggers.** Exotic indices can be defined by **entering a user formula**. For ultra-exotic indices that cannot be handled within any pro-forma, the index values can be imported into the system for full analysis and risk management support. Compound structures can be assembled using the option builder to construct them from more simple structures.

SWS provides **portfolio analysis** and **VaR** analysis. An unlimited number of portfolios can be generated. The marginal impact on a portfolio of a proposed trade can easily be assessed. Portfolio risk can be analysed using simulation and historical analysis. A single press of a button at the end of the day revalues a portfolio using latest weather data, calculates VaR and generates **client credit risk exposure** reports. **Multinormal** and **Copula** simulation engines are available.

SWS generates **P&L reports**. Transaction reports show daily, from-inception and from-year-end profit reports as well as Greeks.

SWS incorporates features specially tailored for **secondary market trading** including a **configurable market view screen** where both real-time market prices and calculated prices for multiple structures can be viewed in one grid. From this screen it is possible to book trades, view correlation matrices, record OTC market levels, view the swap curve, generate option pricing matrices, back out implied volatility and value spread or basket trades.

SWS offers the flexibility required by **traders, structurers, risk managers** and **back office** as well as those **selling** the weather product. SWS offers full control of **user permissioning** covering functions such as pricing, data importation, back office and middle office functions

SWS components can be used in other applications (eg Microsoft Excel [TM])

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Trading Features Summary

Pricing of vanillas, baskets, spreads and exotic structures using historical burn, fitting of multiple distributions and simulation. Stand-alone and portfolio pricing. Run multiple pricing methods at a single press of a button.	Y
Support for a wide range of structures including call, puts, swaps, digitals, strangles, collars, barrier up-and-outs, barrier down-and-outs; all capped or uncapped.	Y
Centralised real-time calculation server allows sharing of information between traders.	Y
Multiple detrending methods including linear, bi-linear, Lowess and polynomial detrending. All detrending methods available for underlying weather parameters as well as indices. Seasonal based data de-trending: trends broken down into individual months.	Y
Full support and automatic integration of deterministic *and* ensemble forecasts for pricing and risk management of weather derivative structures.	Y
Graphical rendering of ensemble forecasts as path and box plots.	Y
Screens to analyse the marginal impact of forecasts on pricing and portfolio risk.	Y
Daily rainfall and temperature simulation model.	Y
Facility to specify index weightings to different historical years to account for the El Nino and La Nina weather effects or to eliminate certain years.	Y
Support for indices based on CDDs, HDDs, GDDs, CTDs, CATs, GTZ, rainfall, average temperature, cumulative indices and many others as well as user-specified indices using own formula or compound structures.	Y
Support for strips and multi year deals.	Y
Weather Data Scenario support at both pricing and portfolio levels. For example, it is possible to look at the prices under conditions like: what happens if it is 1 degree warmer or if it rains 10% more on every single day of the period.	Y
Facility to assemble a more complex option by amalgamating simpler structures.	Y

Automated generation of multi-period means, volatilities and payoffs both detrended and non-detrended.	Y
Option to exclude specific days of the week or occasional days (e.g. bank holidays) when building an index.	Y
Automatic leap year adjustment (variety of methods can be used).	Y
Option pricing matrix: plot option price in a grid as a function of strike and volatility or any two parameters.	Y
Calculation of option greeks.	Y
Black model option pricer.	Y
Display of option greeks in pricing and transaction reports.	Y
Time value of money taken into account.	Y
Back out implied volatility or forward or strike from a market price.	Y
Spread calculator for easily comparing the value of two or more structures as a spread or basket.	Y
Valuation of in-period contracts including graphical representation of contract progress vs. historical extremes and averages ("Cone").	Y
Weather structure price reporting feature: automatically create Microsoft Word ® document report of pricing of a structure for a client or paper-based audit trail .	Y
Extraction of option volatility smile.	Y
Easy recording of OTC market levels and trades for historical charting and marking to market.	Y
Distribution Analysis tool: automatically assess best descriptive distribution, with Kolmogorov Smirnov goodness of fit tests and Maximum Likelihood Estimation Fitting engine. Helps objective assessment of optimal pricing methods.	Y
Export and import any data to / from Microsoft Excel including facility to override means and volatilities used in portfolio.	Y
Swap forward curve implementation, index volatility cone and term structure of volatility.	Y

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Market Information Features Summary

Live delivery of futures and option prices to the trader via optional YellowJacket [R] interface for delivery of market data into a "Market View Grid". Any structures which are priced via YellowJacket and not already defined are <u>automatically</u> created within SWS.	Y
Live delivery of futures and option prices to the trader via optional SWS CME interface for delivery of market data into a "Market View Grid".	Y
User configurable grids showing market prices, modeled prices, historical data, positions and greeks of an unlimited number of structures simultaneously.	Y
Shortcuts to allow the user to book trades, immediately value spread trades or baskets (select and click), view correlation matrices, view historical value analysis directly from the market view grid.	Y
Ability to manually enter and record OTC market prices to override market feeds.	Y
View historic bid and ask prices numerically and graphically.	Y
View relationship between forward and a swap.	Y
View forecast impact and accrued index values in the market view grid.	Y
Facility to automatically update CME swap levels.	Y

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Portfolio Features Summary

Portfolio VaR calculation comprising expiry and daily or period-VaR.	Y
Create an unlimited number of portfolios.	Y
Automatic counterparty credit risk report.	Y
Multinormal and Copula simulation engines.	Y
Option to globally override option pricing parameters for marking to model.	Y
Support for super-exotic structures via "back door" entry of index values for subsequent use in portfolio.	Y
Automatic marking to model of portfolio and / or mark to market.	Y
Transaction report showing daily, year to date and from-inception P&L.	Y
Summary of Greeks by portfolio and by index.	Y
Historical portfolio analysis: best, worst, averages, burn.	Y
Screens to analyse the marginal impact of forecasts on portfolio risk.	Y
Tool for the analysis of futures positions.	Y
Portfolio-Constraint-Builder tool that returns the required price of a weather derivative subject to certain specifiable constraints.	Y
Middle office can apply different models for analysis of risk.	Y
Stochastic dominance methodology applied to portfolios.	Y

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Back Office Features Summary

Ticket booking and back-office trade flow	**Y**
Back office cashflow reports	**Y**
Permissioning of client as authorised trading counterparty	**Y**
Monitoring weather derivative trade life cycle	**Y**
Automatic calculation of settlement value	**Y**
Transaction reporting	**Y**
Settlement processing and reporting	**Y**
Post-settlement adjustment processing and reporting and automatic alert to any requirement for post-settlement adjustment	**Y**
Trade settlement life cycle management	**Y**
Company contact list	**Y**
Client contact list	**Y**

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Weather Data Features Summary

Open system: import data from any source.	Y
Fully automated data download from numerous data and forecast providers including WeatherXchange, Metra Information Limited, the Australian Bureau of Meteorology, AER, EarthSat and SMHI. Automatic download of any new files on FTP server whether daily updates or historical. SWS sweeps FTP sites automatically for any new data or forecast files.	Y
Full support for climate (NCDC), reconstructed synoptic (NOAA) and multiple other weather data types.	Y
Full audit trail of weather data changes and source file names.	Y
Full quality control testing and reporting functions for detailed data integrity assessment.	Y
Support for CME weather futures and options contracts.	Y
System security screen for easy configuration of standard user security features.	Y
SWS Data Cache Centre. This component caches weather datasets so that SWS does not need to reload the weather data each time it needs them for pricing purposes thereby optimising performance.	Y
Precipitation filling tool for the application of precipitation filling models.	Y
Easy import of deterministic and ensemble forecast data into SWS.	Y
Easy copy and paste of weather data from spreadsheets.	Y
Automated weather data analysis tool (check for data errors).	Y
Automatic WRMA gap-filler utility for missing temperature data including hourly data.	Y
Automatic gap-filler utility for missing hourly temperature data.	Y
Automatic gap-filler utility for daily or hourly rain and snow data.	Y

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Weather Dependency Analysis Features Summary

Weather dependency analysis tool with automatic Microsoft PowerPoint reporting tool: automatically test a client's weather exposure or any time series such as energy price against different weather variables on a daily or period basis.	Y
User friendly wizard facility for quick and easy specification of weather dependency analysis	Y
Revenue vs. volume or price risk analysis	Y
Time series vs. single weather index analysis	Y
Time series vs. multiple indices optimisation analysis	Y
Automated client risk report hard copy	Y
Option protection effect analysis tool	Y
Portfolio protection effect analysis tool. Automatically back test a client's weather exposure to different weather variables on a daily or period basis.	Y

Other Documents available

The following other documents are also available on request:

- ➢ SWS Features Summary (abridged)
- ➢ SWS Features Summary (PowerPoint)
- ➢ SWS Back office Features (PowerPoint)
- ➢ SWS Secondary Market Features (PowerPoint)
- ➢ SWS FAQs
- ➢ SWS Technical Requirements
- ➢ SWS Network Architecture
- ➢ SWS List of weather data and forecast providers
- ➢ SWS Getting Started document
- ➢ SWS User document (chm)
- ➢ SWS Calculation Methods Used
- ➢ SWS Notes on Bilinear filtering
- ➢ SWS Data filling methodologies
- ➢ SWS Index Simulations Overview
- ➢ Using the SWS Smile Curve Extraction
- ➢ SWS Weather Derivative Object Architecture (PowerPoint)
- ➢ New Features Introduction (for all versions from 2 to 6.1)

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If you think SWS could help your business we would be happy to offer you a demonstration of the product's capabilities. Alternatively we would be happy to provide a free trial.

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