

# Speedwell Weather



## **An Introduction**

# Company Introduction

## Environmental Finance

Annual Market Rankings

Winners: 2007-2015

Best Advisory/Data Service

## Environmental Finance 2016

Annual Market Rankings

Winner

Best Global Weather Risk  
Management Advisory / Data Service  
Winner for 10 years

- Independent, company providing weather services since 1999 owned by its senior employees
- Offices in the United Kingdom and the United States
- Our origins lie in index-based weather risk management: emphasis on quality
- Major provider of quality weather data and forecasts world-wide
- Major provider of software to the weather derivative industry for pricing and portfolio management: the Speedwell Weather System, SWS, since 2002
- Major provider of Settlement Data and Calculation Services for weather risk contracts
- Serving over 100 clients in insurance, weather derivatives, banking, energy and agriculture sectors world-wide
- weatherXchange Limited, FCA regulated subsidiary providing the weatherXchange® Platform which helps companies access index-based weather risk protection

[www.speedwellweather.com](http://www.speedwellweather.com)

# What we do

## Speedwell Weather

Speedwell Weather Limited

Speedwell Weather  
Data 

World-wide quality weather data. We consider weather data as a form of financial market data

Speedwell Weather  
Forecasts 

Forecasts for energy and agriculture industries

Speedwell Weather  
Speedwell Weather System 

Enterprise weather risk management software

Speedwell Weather  
Commodity Product 

Tools for energy and agriculture traders

weatherXchange

weatherXchange Limited

A platform which helps companies access index-based weather risk protection providing free access to data and price comparison

Speedwell Settlement Services

Speedwell Settlement Services Limited

Provision of data and services for settlement of index based weather contracts

Speedwell Calculation Services

Speedwell Calculation Services Limited

Provision of weather derivative valuation services

# Speedwell Weather Quality Weather Data

We carry tens of thousands of historical weather data sets from around the world.

We quality-control thousands of data sets every day.

We are the major settlement agent for over-the-counter weather risk contracts around the world.

**Speedwell SuperPack®** makes available an unprecedented range of quality historical weather data and weather data feeds for a single annual fee.

## Speedwell Cleaned Data

Cleaned data is data that has been processed to fill missing values and correct erroneous observations. The end result is a data set that is ready to be used for analysis. We clean weather data from thousands of weather stations every day.

Speedwell's proprietary cleaning methodologies use a mixture of automated processing to flag possible errors followed by manual inspection.

## Speedwell Recalibrated Data

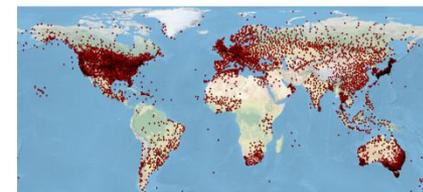
Recalibrated Data is an adjusted historic temperature time series which has been re-based to take into account discontinuities such as those arising from site moves or instrument changes.

***Recalibrated data is the best possible baseline for risk analysis and weather risk contract pricing***

## Speedwell Gridded Data

Dozens of gridded data sets including proprietary wind speed data sets calibrated to required mast height.

|              |              |             |
|--------------|--------------|-------------|
| Albania      | Greece       | Panama      |
| Algeria      | Greenland    | Pakistan    |
| Antarctica   | Guatemala    | Paraguay    |
| Antigua      | Honduras     | Philippines |
| Argentina    | Hong Kong    | Poland      |
| Armenia      | Hungary      | Portugal    |
| Aruba        | India        | Puerto Rico |
| Australia    | Indonesia    | Romania     |
| Austria      | Iran         | Russia      |
| Bangladesh   | Ireland      | Saudi Ar.   |
| Barbados     | Israel       | Senegal     |
| Belarus      | Italy        | Serbia      |
| Belgium      | Jamaica      | Singapore   |
| Belize       | Japan        | Slovakia    |
| Benin        | Kazak.       | Slovenia    |
| Bolivia      | Kenya        | S. Africa   |
| Bosnia       | Korea S.     | Spain       |
| Botswana     | Latvia       | Sri Lanka   |
| Brazil       | Lebanon      | Syria       |
| Bulgaria     | Liechtenst'n | Sweden      |
| Burkina Faso | Lithuania    | Switz.      |
| Canada       | Lux.         | Taiwan      |
| Cape Verde   | Macedonia    | Tajikistan  |
| Chile        | Malaysia     | Tanzania    |
| China        | Maldives     | Thailand    |
| Columbia     | Mali         | Togo        |
| Croatia      | Malta        | Trinidad    |
| Cyprus       | Mauritania   | Tunisia     |
| Czech R.     | Mauritius    | Turkey      |
| Denmark      | Mexico       | Turkmenist' |
| Dominican    | Moldova      | UK          |
| Egypt        | Mongolia     | Ukraine     |
| Estonia      | Montenegro   | Uruguay     |
| Ethiopia     | Morocco      | USA         |
| Faroe Isles  | Netherlands  | Uzbekistan  |
| Finland      | New Zeal.    | Vietnam     |
| France       | Niger        | Zambia      |
| Georgia      | Nigeria      | Zimbabwe    |
| Germany      | Norway       |             |
| Gibraltar    | Oman         |             |

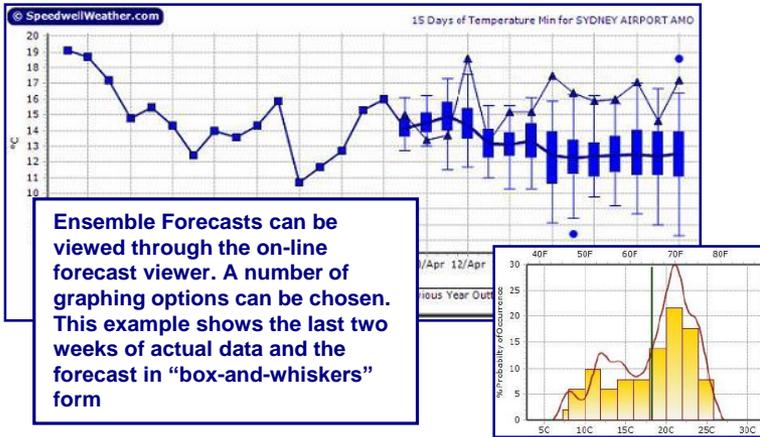


# Speedwell Weather Forecast Products

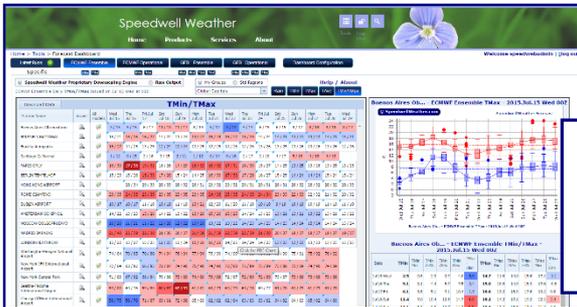
## Speedwell Site-Specific Ensemble Forecasts

Downscaled site-specific ensemble forecasts for both single sites and weighted baskets are available for over 3,000 sites across the world covering 15-day and monthly periods.

The ensemble forecast is a fully downscaled **probabilistic** forecast which inherently captures information that is normally lost in a traditional deterministic forecast: the uncertainty of the forecast at each time step.

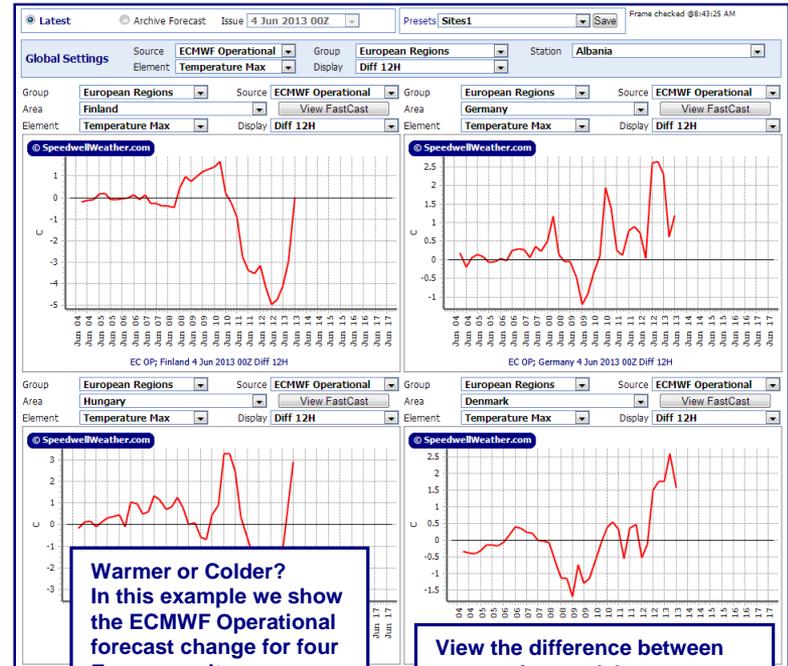


## Forecast Dashboard



## FastCast® Forecasts

Ultra-fast graphical representation of the change in forecast from the previous run. Updated as each time step becomes available.



View the difference between successive model runs or previous runs  
Diff 6hr, 12hr, Diff 24hr, Diff 48hr, Diff 72hr

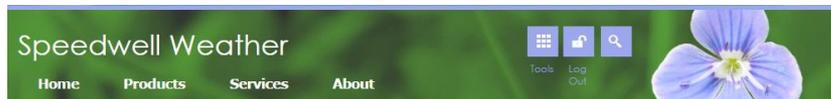
## WDD: U.S. Weighted Degree Days

Uses weather data and forecasts combined with regional population data to estimate the EIA natural gas storage and withdrawal statistics.



# Speedwell Weather Commodity Product

The Speedwell Commodity Product-Agriculture is a platform designed to bring weather data and forecast information directly to the trader in a concise format for a wide range of global agricultural crop areas. The equivalent Commodity Energy provides similar information for modelling regional energy consumption.



Home > Tools > Commodity Product Welcome speedwebadmin | [log out]

Speedwell Commodity Product provides latest historical and forecast weather data for key crop regions worldwide. 12 updates per day using ECMWF and GFS forecast models.

Getting Started Help.

- Barley
- Cattle (Beef)
- Cattle (Dairy)
- Citrus
- Cocoa
- Coffee
- Corn
- Cotton
- Hogs
- Nuts and fruits
- Oats
- Palm Oil
- Potatoes
- Rapeseed / Canola
- Rice
- Rye
- Shipping Ports
- Sorghum
- Soybean
- Sugar Beet
- Sugarcane
- Sunflower
- Tobacco
- Wheat (Winter)
- Wheat (Spring)

| Warning | Commodity  | Index Type       | Posted On | Type           | Title                  | Summary  | Level | Details |
|---------|--|------------------|-----------|----------------|------------------------|--|-------|---------|
|         | <a href="#">Wheat (Winter) - Australia West</a>            | Precipitation    | 17-Aug-15 | Data Alert     | Australia Winter Wheat | Conditions have turned drier again                       | MED   |         |
|         | <a href="#">Rapeseed / Canola - Canada</a>                 | Mean Temperature | 17-Aug-15 | Data Alert     | Canada Canola          | Weekend frost risk in western areas                      | MED   |         |
|         | <a href="#">Wheat (Winter) - Brazil</a>                    | Precipitation    | 14-Aug-15 | Data Alert     | Brazil Winter Wheat    | Mostly dry weather favors crop development               | MED   |         |
|         | <a href="#">Sunflower - Russia (South)</a>                 | Precipitation    | 14-Aug-15 | Forecast Alert | Russia Sunflower       | Rain and cooler temperatures may ease crop stress        | MED   |         |
|         | <a href="#">Wheat (Winter) - UK</a>                        | Precipitation    | 14-Aug-15 | Data Alert     | UK Winter Wheat        | Harvest kicks off across the region                      | MED   |         |
|         | <a href="#">Coffee - Brazil Arabica Minas Gerais South</a> | Precipitation    | 14-Aug-15 | Forecast Alert | Brazil Coffee          | Dryness aids harvest, but raises concern for next season | MED   |         |
|         | <a href="#">Corn - Germany</a>                             | Precipitation    | 13-Aug-15 | Forecast Alert | Germany Corn           | Adverse conditions affect crops                          | MED   |         |
|         | <a href="#">Wheat (Spring) - Canada</a>                    | Precipitation    | 13-Aug-15 | Data Alert     | Canada Spring Wheat    | Dryness concerns persist in some areas                   | MED   |         |

Local Run | ECMWF Ensemble | ECMWF Operational | GFS Ensemble | GFS Operational | Commodity Home | World Map | Help

Showing -> Downcasted GFS Ensemble issued on Nov 07 Fri at 06Z

Sort by: Name, Latitude, Longitude

| Commodity | Region        | Station                  | Last 90 Days | Last 60 Days | Last 30 Days | Last 15 Days | Last 7 Days | Forecast All Days | Forecast 15 days data + Precip | Temp  | Precip | Temp Fcast | Precip Fcast | Wind | Humid | Cloud | Visib | Pressure |
|-----------|---------------|--------------------------|--------------|--------------|--------------|--------------|-------------|-------------------|--------------------------------|-------|--------|------------|--------------|------|-------|-------|-------|----------|
| Barley    |               | Argentina Corn Index     | 217.2        | 183.3        | 108.9        | 69.2         | 54.8        | 7.6               | 25.7                           | 115.0 |        |            |              |      |       |       |       |          |
| Citrus    |               | Brazil Corn Index        | 311.0        | 253.6        | 114.7        | 88.0         | 38.3        | 31.6              | 31.8                           | 145.4 |        |            |              |      |       |       |       |          |
| Cocoa     |               | Bulgaria Corn Index      | 221.7        | 145.3        | 63.6         | 54.7         | 0.0         | 5.3               | 10.0                           | 54.1  |        |            |              |      |       |       |       |          |
| Coffee    |               | Canada Corn Index        | 223.8        | 127.7        | 36.4         | 23.8         | 11.2        | 18.5              | 10.1                           | 43.7  |        |            |              |      |       |       |       |          |
| Corn      | Argentina     | China Corn Central Index | 245.5        | 190.6        | 95.8         | 5.1          | 1.1         | 0.5               | 2.2                            | 7.3   |        |            |              |      |       |       |       |          |
|           | Brazil        | China Corn North Index   | 127.4        | 40.9         | 19.5         | 4.9          | 1.5         | 1.2               | 2.7                            | 7.6   |        |            |              |      |       |       |       |          |
|           | Bulgaria      | China Corn South Index   | 404.5        | 261.1        | 88.4         | 60.8         | 26.9        | 8.4               | 15.6                           | 83.7  |        |            |              |      |       |       |       |          |
|           | Canada        | France Corn Index        | 197.3        | 141.2        | 87.6         | 37.9         | 37.0        | 22.1              | 35.0                           | 75.9  |        |            |              |      |       |       |       |          |
|           | China         | Germany Corn Index       | 214.0        | 126.7        | 73.7         | 16.0         | 13.0        | 8.8               | 18.6                           | 34.8  |        |            |              |      |       |       |       |          |
|           | China Central | Hungary Corn Index       | 244.0        | 175.3        | 81.7         | 30.7         | 3.4         | 7.7               | 15.7                           | 25.0  |        |            |              |      |       |       |       |          |
|           | China North   | India Corn Index         | 380.6        | 170.1        | 69.2         | 28.2         | 0.1         | 14.4              | 16.9                           | 44.6  |        |            |              |      |       |       |       |          |
|           | China South   | Italy Corn Index         | 230.1        | 152.4        | 87.6         | 48.8         | 46.7        | 43.8              | 80.0                           | 110.1 |        |            |              |      |       |       |       |          |
|           | France        | Poland Corn Index        | 185.5        | 101.2        | 43.1         | 1.4          | 0.7         | 7.0               | 14.1                           | 18.7  |        |            |              |      |       |       |       |          |
|           | Germany       | Romania Corn Index       | 175.5        | 120.8        | 56.1         | 32.5         | 0.0         | 6.0               | 11.0                           | 27.6  |        |            |              |      |       |       |       |          |
|           | Hungary       | Russia Corn Index        | 97.7         | 76.8         | 42.5         | 10.1         | 5.1         | 2.2               | 0.2                            | 16.6  |        |            |              |      |       |       |       |          |
|           | India         | Serbia Corn Index        | 213.8        | 148.5        | 57.0         | 11.3         | 0.3         | 6.5               | 13.4                           | 14.9  |        |            |              |      |       |       |       |          |
|           | Italy         | South Africa Corn Index  | 97.7         | 92.5         | 47.8         | 30.8         | 30.2        | 18.5              | 20.5                           | 67.8  |        |            |              |      |       |       |       |          |
|           | Poland        | Spain Corn Index         | 165.5        | 148.2        | 96.8         | 35.1         | 15.1        | 19.4              | 36.1                           | 73.7  |        |            |              |      |       |       |       |          |
|           | Romania       | Ukraine Corn Index       | 98.3         | 64.8         | 20.4         | 5.1          | 0.0         | 1.6               | 7.1                            | 9.4   |        |            |              |      |       |       |       |          |
|           | Russia        | US Corn (Delta) Index    | 0.8          | 6.8          | 3.7          | 1.1          | 0.8         | 0.1               | 0.3                            | 1.6   |        |            |              |      |       |       |       |          |
|           | Serbia        | US Corn (East) Index     | 10.8         | 6.4          | 2.1          | 0.7          | 0.5         | 0.2               | 0.5                            | 1.2   |        |            |              |      |       |       |       |          |
|           | South Africa  | US Corn (West) Index     | 9.9          | 4.8          | 1.4          | 0.2          | 0.1         | 0.2               | 0.4                            | 0.5   |        |            |              |      |       |       |       |          |
|           | Spain         | US Corn Index            | 10.5         | 5.6          | 1.7          | 0.4          | 0.2         | 0.2               | 0.4                            | 0.8   |        |            |              |      |       |       |       |          |
|           | Ukraine       |                          |              |              |              |              |             |                   |                                |       |        |            |              |      |       |       |       |          |

Standard Deviation from normal (Z-Score = equal to the difference from the mean divided by the standard deviation)

< -2.0   < -1.5   < -1.0   < -0.5   Normal   > 0.5   > 1.0   > 1.5   > 2.0

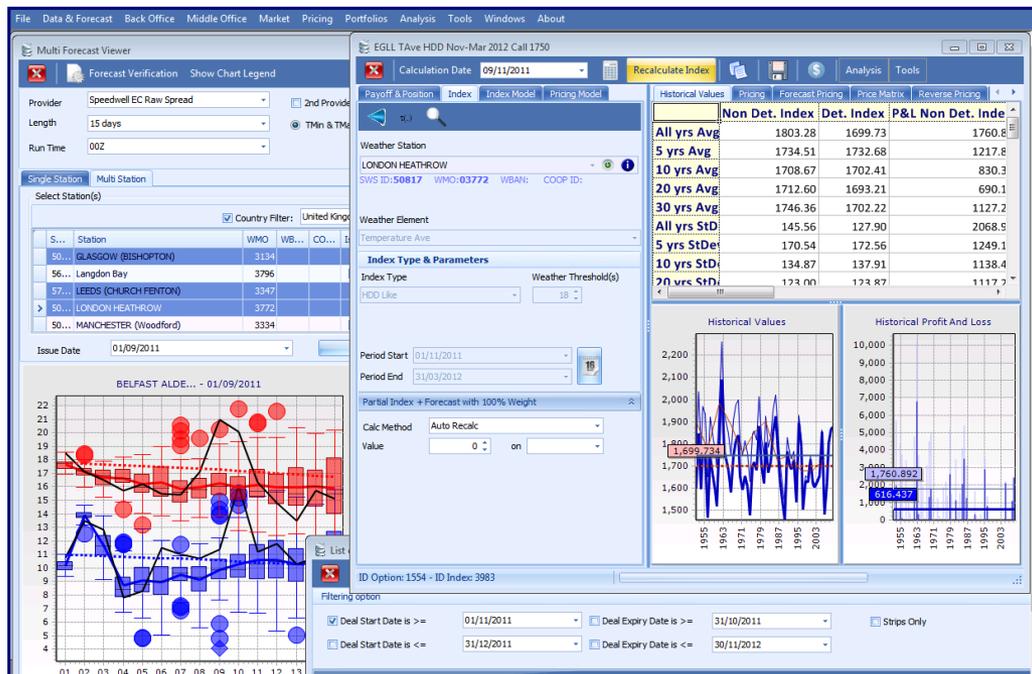


# Speedwell Weather Enterprise Weather Risk Management Software

The Speedwell Weather System (SWS) is the definitive enterprise weather derivative pricing and risk management system. The product of over fifteen years' of continuous development, SWS offers sophisticated pricing tools as well as portfolio management and full back and middle office functionality including regulatory reporting.

SWS functions as a central warehouse for weather data and forecasts, automatically downloading into its data base. SWS is used by banking, insurance, energy and investment fund clients in the USA and Europe.

SWS is an open system and is available as an internally installed application or can be hosted remotely.



- **Weather risk contract pricing tools**
- **Gas-quanto pricing**
- **Portfolio management**
- **Back office trade flow management / settlement / Dodd Frank / EMIR regulatory reporting**
- **Automatic weather data and forecast importation into dedicated weather data base**

weatherXchange® is a platform which helps companies with weather risk access index-based weather risk protection. The weatherXchange platform provides unprecedented access to tools and services:

- Free access to the highest-quality weather data for thousands of sites, basket indexes, and gridded data
- Free structuring tools to help new hedgers through the process of designing a hedge
- Free price comparison through streamlined communications between market participants
- Integrating access to Settlement Services
- Integrating access to independent middle-office Calculation Services
- Compliant with required regulations to address users based in the EU/UK/Switzerland, Australia, Bermuda, Brazil, Colombia and USA

weatherXchange Limited is regulated by the Financial Conduct Authority  
weatherXchange®

1 - Location | 2 - Index | **3 - Parameters** | 4 - Results | 5 - Save

Editing Draft Contract: London Heathrow 2017 Jan 01 to 2017 Mar 31

Calculation Date: 2016.Dec.01

**Protection Details**

Location: London Heathrow  
Element: Temperature Average -24H  
Protection Period: 2017.Jan.01 to 2017.Mar.31  
Index Type: Cumulative T24  
Days Excluded: None

**Historical Values Summary**

| Num. Of Years | Index Average | Trend-Adjusted Index Average |
|---------------|---------------|------------------------------|
| 20            | 581.76        | 568.66                       |
| 15            | 571.07        | 559.14                       |
| 10            | 564.95        | 555.88                       |
| 5             | 560.26        | 554.92                       |
| 1             | 560.48        | 578.64                       |

**Historical Index Values**

**BUY PROTECTION** | **SELL PROTECTION**

Protection against a high index (Call Option)
  Protection against a low index (PUT Option)

**Payout conditions**

Protection Start Level (Strike): 400

Maximum number of Index Units (Cap): 100

Protection Value per Unit (Tick): 100,000

Protection Max Payout: GBP 10,000,000

- Get Advice/Prices from Broker-Advisors
- Get Prices direct from Protection Sellers
- Request Settlement Data
- Request End of Day Valuations
- Rename this Draft Contract
- Move Draft Contract to Folder
- Edit Draft Contract
- Copy Contract Template
- View Historical Payouts
- Download Contract Spec
- View Historical Data
- View Forecasts

# Speedwell Settlement Services

Speedwell is the major provider of Settlement Data for index-based weather risk contracts world-wide. Even the highest quality weather data is subject to missing values, erroneous observations, delayed reporting, instrument failure, and the potential for observation tampering. Speedwell Settlement Services (SSS) ensures accurate and reliable observations for the settlement of weather risk contracts.

## Weather Station Installation

The installation of weather stations is sometimes required in order to provide advanced quality control of pre-existing weather stations or to establish an observation point in close proximity to a risk location (minimize “basis risk”). SSS has many years of experience in the data requirements necessary for cost-effective weather risk placement. Using the latest instrumentation and communications systems weather stations can be deployed on quick notice to meet the needs of weather risk market.

## Notable Projects

**World Bank: UTE Transaction:** \$450 million dollar hedge providing protection for UTE, a Uruguayan state-owned hydropower company. Speedwell’s role in this project included the installation of back-up weather stations across the region and provision of Settlement Data. Speedwell also acted as Calculation Agent and provided in-period valuations for the counterparties.

**EPM, Colombia:** \$250 million dollar hedge based upon cumulative precipitation at two weather stations. Multi-year project. Speedwell’s role in this project includes the installation of back-up weather station and performing in-depth quality control of observations as observed by the hedge counterparty.



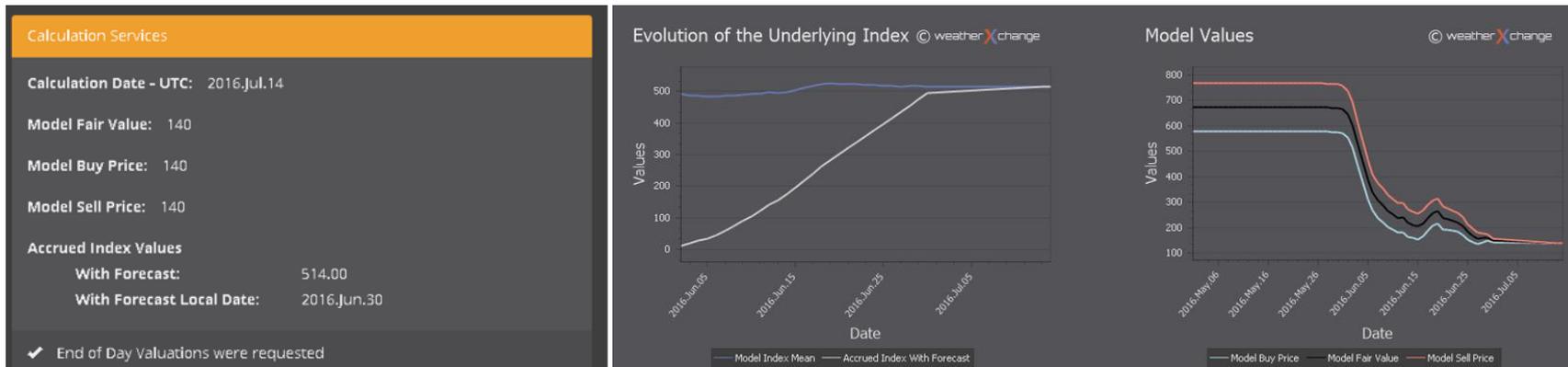
Speedwell Weather Station Installation: Chilean Andes

# Speedwell Calculation Services

Speedwell Calculation Services provides weather risk contract valuations and middle office metrics via the weatherXchange platform. End of day valuations, VaR and greeks can be provided.

Regulatory reporting requirements are satisfied with an exportable report

Optionally, full portfolio based valuations can also be provided



**Historical Values Summary** Export To Excel

| Calculation Date | Model Fair Value | Model Index Average | Model Index StDev | Partial Index With Forecast | Partial Index Date With Forecast | Model Buy Price | Model Sell Price | Delta  | Gamma | Vega |
|------------------|------------------|---------------------|-------------------|-----------------------------|----------------------------------|-----------------|------------------|--------|-------|------|
| 2016-Jun-30      | 149              | 514.89              | 3.34              | 494.50                      | 2016-Jun-29                      | 142             | 156              | 10.00  | 0.00  | 0.00 |
| 2016-Jun-29      | 161              | 516.84              | 6.74              | 476.00                      | 2016-Jun-28                      | 148             | 174              | 161.02 | 0.00  | 0.28 |
| 2016-Jun-28      | 159              | 516.92              | 9.65              | 455.50                      | 2016-Jun-27                      | 141             | 178              | 159.42 | 0.91  | 1.23 |
| 2016-Jun-27      | 157              | 516.45              | 12.39             | 434.50                      | 2016-Jun-26                      | 135             | 180              | 157.23 | 0.03  | 2.05 |
| 2016-Jun-26      | 148              | 513.20              | 15.25             | 415.00                      | 2016-Jun-25                      | 142             | 185              | 156.24 | 0.60  | 2.37 |

**End of Day Risk Reports**

End of Day Risk Reports are calculated between 2pm and 4pm UK local time and provide independent mark to model values, value at risk measures and sensitivities.

Reporting Date: 14/07/2016 Refresh Export To Excel

| Executed Contract Name | Buy?  | Counterparty | Model Fair Value | Model Buy Price | Model Sell Price | Expiry VaR 97.5% | Expiry VaR 99% | Expiry VaR 99.9% | Model Index Average | Model Index StDev |
|------------------------|-------|--------------|------------------|-----------------|------------------|------------------|----------------|------------------|---------------------|-------------------|
| Miami TMax Jul-Aug-16  | False |              | 165              | 126             | 204              | -350             | -350           | -350             | 2.16                | 3.19              |
| Long Miami             | True  |              | 500              | 500             | 500              | 300              | 300            | 300              | 30.10               | 10.27             |

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**nb:**

- Expiry VaR values are inclusive of the premium cashflow.
- Model Values are estimated using many different models to reduce model sensitivity for a given trade. In particular, several detrending methods are used, several forecasts are used, several history length are used, several stress-testing scenarios are used.

Please feel free to [contact us](#) for any additional information regarding the risk models.

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