

# Windographer version history

## Version 5.2.8 (October 30, 2023)

- Fixed bug preventing import of certain Ammonit Meteo-40 data files.
- Fixed bug preventing display of time series graphs in the Extreme Winds window.

## Version 5.2.7 (October 23, 2023)

- Fixed bugs in MySQL database communication.
- Added buttons to LTA window to export and import settings.
- Added button to calculate backup displacement height as weighted average of sectoral values.
- Improved speed of MCP algorithm test process.
- Improved text and Excel file import logic.
- Fixed bug in concurrency logic in Wind Speed Sensor Summary and multi-dataset diurnal profile.
- Fixed bug in concurrency logic in multi-dataset turbulence calculations.
- Fixed bug in DCR calculations in monthly and daily stats tables when combining years.
- Fixed bugs causing WindSim WWS and TWS export files to react incorrectly to a user-specified date range.

## Version 5.2.6 (September 27, 2023)

- Allowed Flag With Rules window to execute rules on multiple datasets at once.
- Fixed bug in MCP logic causing incorrect below-speed-cutoff correlation.
- Fixed bug in database import/export of document history notes.
- Improved reporting of curtailed output in the Wind Turbine Output window.
- Adjusted EPE export format slightly.

## Version 5.2.5 (August 24, 2023)

- Allowed drag-and-drop reordering of datasets in Workbook Explorer.
- Made all datasets in the workbook share the same flags and rules.
- Fixed bug preventing import of multiple encrypted RWD files.
- Fixed bug causing occasional crash when importing Kintech WND files.
- Fixed bug in the calculation of error codes in the EPE export format.
- Improved template application process, especially IEA Task43 JSON files.

## Version 5.2.3 (July 13, 2023)

- Added a toolbar button to duplicate datasets.
- Added multi-dataset mode to Delete Data window.
- Added ability to drag-and-drop a Task43 JSON file onto a workbook.
- Improved Export Data window to allow export of multiple files before closing window.
- Made Openwind multi-height export accept direction and temperature sensors at other heights.
- Improved robustness of database import and export processes.
- Cosmetic improvements to Word-format reports.
- Small improvements to raw data file import logic.
- Adjusted number formatting in EPE export file.
- Added the Gumbel fit algorithm option for the MIS extreme wind method.
- Added concurrency restriction to multi-dataset mode of Long Term Patterns window.
- Added correlation-by-sector option to the Correlation analysis window.
- Added the Test Uncertainty button to the Reconstruct Across Datasets window.
- Refined zoom and scroll resolution of time series graphs.
- Fixed bug causing LTA window to display incorrect onsite or reference dataset statistics sometimes.

## Version 5.2.2 (May 18, 2023)

- Fixed bugs in EPE export format.

- Fixed bug in reconstruction logic that produced negative speeds in rare cases.
- Fixed bug that could cause resample process to crash in rare circumstances.
- Fixed bug that could cause TAB file export logic to crash in rare circumstances.
- Fixed recent bug that sometimes prevented time series graph from zooming in or out.
- Made View > Reports visible to everyone, not just UL users.

**Version 5.2.1 (April 21, 2023)**

- Fixed bugs in text file import logic.
- Fixed bug stopping the extrapolation process under certain circumstances.
- Modified EPE export format slightly.
- Refined zooming and scrolling behavior of time series graphs.

### **Version 5.2 (April 3, 2023)**

- Added Correlation analysis window.
- Added Data Destination window, which appears when you drag and drop files.
- Added option to export dataset locations to KML.
- Added export and import of IEA Task 43 JSON files.
- Added speed, direction, and temperature column inputs to the LTA window.
- Added a 'by bin' option to the Apply Scale and Offset window.
- Allowed the scale and offset process to apply only to specifically flagged data points.
- Added the shear-by-layer mode to the Shear Analysis window.
- Allowed vertical extrapolation of TI data even for datasets containing measured TI data.
- Added Notes tab to History window.
- Improved history window descriptions of manual flagging revisions.
- Improved history window descriptions of append revisions.
- Improved history window description of vertical extrapolation revisions.
- Added Tools > Options control of power law exponent decimals.

### **Version 5.1.24 (February 27, 2023)**

- Fixed bug causing Flag Manually window to crash after much use.
- Fixed bug causing time series graph scroll bar to misbehave with long time series.
- Added Data Destination window to help control open, append, add, and drag/drop processes.
- Added Notes tab to Dataset History window.
- Improved History window descriptions of manual flagging revisions.
- Improved History window descriptions of append revisions.

### **Version 5.1.23 (February 9, 2023)**

- Fixed bug causing occasional crash in Flag Manually window.
- Fixed bug in formatting of regression equations.
- Fixed bug in Openwind export causing incorrect densities when exporting only part of a dataset.
- Improved import of Openwind MM files.
- Added Tools > Options control of power law exponent decimals.

### **Version 5.1.22 (January 12, 2023)**

- Fixed bug causing incorrect solar calculations.
- Fixed bug in MCP rule-of-thumb uncertainty equation.
- Improved the history window description of vertical extrapolation revisions.
- Adjusted numbers of decimal places shown in EPE export.
- Made Long Term Patterns window show annual & monthly means in single dataset mode.

### **Version 5.1.21 (December 7, 2022)**

- Fixed bug causing calculated columns to become static in exported resampled windog files.
- Fixed bug in frequency distribution seasonal bias removal logic.
- Added mean of distribution to frequency by bin table.
- Added the Extreme Wind tool window.
- Improved history window description of reconstruction revisions.

### **Version 5.1.20 (December 2, 2022)**

- Fixed bug causing incorrect temperature data when scaling speeds for Openwind export.

- Added mean-of-distribution to the Openwind export tab.
- Fixed bugs in content and format of EPE export file.

#### **Version 5.1.19 (November 22, 2022)**

- Fixed recent bug preventing correct import of some ZX Lidar data files.
- Fixed bug where diurnal profile graph didn't set Y2 units correctly.
- Adjusted order of data columns in EPE export.
- Made database export process more forgiving of failures due to database locks.
- Fixed bugs preventing Openwind export tab from scaling in the case of multiple heights.

#### **Version 5.1.18 (November 1, 2022)**

- Allowed extrapolation of turbulence in datasets containing measured turbulence data.
- Fixed bug causing incorrect calibration of SD columns.
- Fixed bug causing incorrect recalibration of wind direction columns.
- Fixed bug stopping Data Downloader from jumping to the dataset's lat/long.
- Made the desired time step an input in the Representative Year window.
- Improved Data Coverage window by adding a new tabular format.
- Improved data import logic.
- Expanded WIS file to allow identification of date/time data.

#### **Version 5.1.17 (October 5, 2022)**

- Fixed bug causing pattern-based reconstruction to miss some data points under certain conditions.
- Fixed bug causing incorrect scaling of temperature data columns.
- Fixed bug causing database import to fail under certain user settings.
- Improved import of Vortex data files.

#### **Version 5.1.16 (September 22, 2022)**

- Fixed bug causing Tower Distortion analysis window to crash in some situations.
- Fixed bug causing time series graph to crash in certain situations.
- Fixed weakness in reconstruction logic that unnecessarily limited reconstruction.
- Added description column to dataset list in Import From Database window.

#### **Version 5.1.15 (September 7, 2022)**

- Fixed bug causing Wind Rose window to crash in certain circumstances.
- Fixed bug preventing Windographer Data Downloader from connecting to server in some circumstances.
- Slight adjustment to EPE export format.
- Improved Dataset History window to show before-and-after stats table when appropriate.
- Improved robustness of database import/export logic.
- Fixed recent bug causing Import From Database window to hide data coverage chart.

#### **Version 5.1.14 (August 18, 2022)**

- Added reports module that creates reports in Word format.
- Added seasonal profile graph to the Long Term Analysis window.
- Adjusted the latest EPE export format.
- Fixed bugs causing calculated columns not to recalculate in some circumstances.

#### **Version 5.1.13 (July 22, 2022)**

- Added an updated EPE export option.

#### **Version 5.1.12 (July 14, 2022)**

- Improved efficiency of several analysis and export modules.
- Fixed bug causing incorrect query results if sector filter refers to a vane in another dataset.
- Added relative shear parameter restriction to Vertical Extrapolation window.
- Fixed bug in translation of some v4 flag rules (that pertain to quality columns).

#### **Version 5.1.11 (June 29, 2022)**

- Fixed bug causing occasional miscalibration of direction data.
- Improved defaulting of date range filter settings.
- Made F1 button bring up the correct help article in analysis windows.
- Improved import logic to read SCADA data files more effectively.

#### **Version 5.1.10 (June 3, 2022)**

- Improved import of ZX turbine mounted LiDAR files.
- Fixed bug causing occasional blank results in Reconstruction Uncertainty Test window.
- Fixed bug in MCP algorithm performance test diurnal graph.
- Fixed bug stopping Combined tab of Export Data window from spanning multiple datasets.
- Made workbook summary tables available even if the workbook only contains a single dataset.

#### **Version 5.1.9 (May 26, 2022)**

- Fixed bug causing Append Settings window to reappear repeatedly when requiring 'perfect links'.
- Fixed bug in scaling process in Vertical Extrapolation window.
- Added option to filter list of datasets in Import From Database window.

#### **Version 5.1.8 (May 18, 2022)**

- Fixed bug causing LTA window to crash when using MTS algorithm in some cases.
- Added uncertainty test button to the Reconstruct Across Datasets window.

#### **Version 5.1.6 (May 6, 2022)**

- Fixed bugs in Correct Tower Shading window Annex S module.
- Added more reporting when user tests database connection.

#### **Version 5.1.5 (May 2, 2022)**

- Allowed filtering by time of day and by month range.
- Improved import of raw data files with daily time steps.
- Fixed bugs in the display of reconstruction uncertainty test results.

#### **Version 5.1.4 (Apr 28, 2022)**

- Fixed bug preventing database export if dataset properties contained certain Unicode characters.
- Fixed bugs in MCP algorithm performance test module preventing some graphs from appearing.

#### **Version 5.1.3 (Apr 25, 2022)**

- Improved reporting of warnings related to reading WIS files.
- Made the adding and removing of favorite flag rules more robust.

### **Version 5.1.2 (Apr 20, 2022)**

- Fix bug in diurnal profile calculation when requiring concurrency across multiple time contexts.
- Improved Dataset History descriptions of dataset configuration changes.
- Fixed bug causing MTS algorithm to crash in some situations.

### **Version 5.1.1 (Mar 31, 2022)**

- Added new workbook summary table.
- Made the adjustments react correctly to dataset ID changes and reversals via undo.
- Small improvements and fixes to the process of importing data from a database.

### **Version 5.1 (Mar 24, 2022)**

- Added user control over the size of the undo buffer to limit windog file size.
- Added buttons to Dataset History window to allow user to trim revisions to shrink file size.
- Made Turbine Spacing window available to all users.
- Improved performance of Configure Dataset and Long Term Adjustments windows.
- Added Save Template and Load Template buttons to Configure Dataset window.
- Added workbook summary graphs to the main window.
- Added user control over which column types display by default in time series graphs.
- Expanded WIS files so that they can specify data column properties and displacement height.
- Added MCP algorithm performance test window.
- Added Test MCP Uncertainty window that measures uncertainty using a bootstrap analysis.
- Added a 'correct tower shading' mode to the Correct Tower Distortion window.
- Added option to filter by maintenance period in Scatterplot, In Situ, Tower Distortion windows.
- Added high wind hysteresis modeling to Wind Turbine Output window.
- Added temperature shutdown and derating to Wind Turbine Output window.
- Improved data import logic.
- Fixed bugs in EPE export.
- Added the MCP algorithm performance test window.
- Improved efficiency of LTA Extrapolation tab.
- Solved bugs in LTA window causing inconsistencies versus v4.
- Improved efficiency of LTA window.
- Improved handling of dataset templates.
- Improved efficiency of Configure Dataset window.
- Added summary graphs to the main window.
- Added primary columns to Workbook Explorer's dataset list.
- Fixed bug causing flags to move in time after deletion changes the start of the period of record.
- Added ability to open ZPH files.
- Fixed bug in direction calibration logic.
- Added option to export time series files in Windows number format or North American format.
- Improved speed of the Openwind export process.
- Improved import of AQ500 and AQ510 data files.
- Improved identification of time zone during import.
- Improved efficiency of Append Settings window.
- Added option to remove seasonal bias from histograms.
- Added option in time series graphs to show or hide all columns in a dataset.
- Added option to EPE export tab to choose between old and new formats.
- Added XML import and export buttons to the Flag Rule Properties window.

### **Version 5.0 (Aug 17, 2021)**

- Added ability for a workbook to contain multiple datasets.
- Allowed display of multiple analysis windows at a time.
- Added option to undo changes to datasets.
- Allowed import of data with timesteps smaller than one second.
- Changed to 64-bit programming to handle more data.
- Added module for in situ comparison of anemometers.
- Changed RLD import logic to read battery voltage column as well.
- Improved RLD import logic to use the 'Total Direction Offset' value (if any) even if it comes before the 'Offset' value.

### **Version 4.2.23 (Feb 2, 2023)**

- Fixed bug preventing multi-height export to Openwind.

### **Version 4.2.22 (Jan 5, 2023)**

- Improved Kintech import logic to handle new EOL Zenith format.
- Fixed bug causing incorrect scaling of Weibull fit on Histogram tab.
- Added new monthly met tower report.
- Fixed bug where old MCP window's diurnal profile graph sometimes incorporated invalid data.
- Adding mean-of-distribution to Openwind export tab to help comparison to Openwind.

### **Version 4.2.21 (Mar 22, 2021)**

- Improved scatter plot legend to show regression line equation.
- Updated EPE export tab to reflect latest guidance from the Brazilian EPE.
- Added new module to calculate gap fill uncertainty with k-fold cross validation.
- Added option to include flag status in time series export files.
- Improved data import logic.
- Added to Export Data window the option to force North American number format.
- Allowed import of Openwind MM3.2 files.
- Added 70th percentile of TI to turbulence-by-speed table to help support IEC 4th ed.
- Fixed bug in Hottel clear sky radiation model that introduced a half-hour time shift.
- Fixed bug where solar calculations failed to account for the difference between the longitude and the time zone standard meridian.
- Improved Configure Data Set window to rename child columns automatically with parent column.
- Added mean of monthly means table to Tables tab.
- Improved import logic to recognize GHI, DNI, DHI, and battery voltage data columns.
- Added to the Configure Data Set window a button to set time zone from lat/long coordinates.
- Added option to export windog file, optionally with metadata removed or timestep changed.
- Changed the handling of cutoff wind speed in the MCP logic
  - Made cutoff speed apply to both onsite and reference speeds, rather than just reference.
  - Forced omnidirectional below-cutoff regression through the origin.
- Added option to choose columns from which to calculate shear when reconstructing and filling gaps.
- Added Combine Direction Sensors window.

### **Version 4.2 (May 31, 2019)**

- New option to set the time zone in the Configure Data Set window.
- New option to make displacement height vary by direction sector or month.



- Improvements to WindographerMCP
  - New display options on Onsite Data and Long-Term Data tabs.
  - New ability to select subset of data sets for analysis.
  - New ability to define any number of long-term adjustments.
  - New concurrency and filter options.
  - New ability to detect and correct time offsets between data sets.
  - New logic to determine minimum number of data points for regressions.
  - New long-term scaling options including scaling each month separately.
  - Improved control, reporting, and documentation of reconstruction process.
- Improvements to Vertical Extrapolation window
  - Option to restrict the shear parameter range to mean plus/minus X standard deviations.
  - Option to rescale to a desired mean value after extrapolation.
- Improved data import logic.
- Added ERA5 data to Windographer Data Downloader.
- New option to use Larsen & Hansen 'detrending' process on TI columns.
- New Correct Tower Distortion module.
- New data column types for solar irradiance and battery voltage.
- New option to specify multiple RH data columns at different measurement heights.
- Improved Harris1999 Gumbel fit method to make it produce results in a wider range of conditions.
- New option to import and export turbine properties in WTG and OWTG formats.
- Added ability to read from and write to MySQL databases.
- Added Shear tab to Tools > Options window, and made shear evaluation method and shear lookup table type an option the user can set in Tools > Options for speed, speedSD, direction, and temperature extrapolation.

#### **Version 4.1 (January 19, 2018)**

- Added new MCP module capable of handling multiple onsite and reference data sets.
- Added handling of boom orientation
  - a. Added boom orientation to Calibration window.
  - b. Added combine-by-boom-orientation to Combine Anemometers window.
  - c. Added by-boom-orientation mode to Flag Tower Shading window.
  - d. Added logic to read boom orientation from RLD and NDF files.
- Added displacement height to the Configure Data Set window.
- Improved speed of Configure Data Set window and added:
  - a. Buttons to copy data columns and convert to static data columns.
  - b. Ability to specify measured TI columns
- Improved Vertical Extrapolation window:
  - a. New more flexible and more realistic method of extrapolating speed SD data.
  - b. Now allows extrapolation from a specific sensor or the line of best fit.
  - c. User can now specify the type of lookup table used for backup when in by-time-step mode.
  - d. Now shows a preview of synthesized data columns.
  - e. Added option to compare extrapolated time series with column in another (or same) data set.
- Added save button to Flag Manually window
- Improvements to Document History window:
  - a. Complete reporting of vertical extrapolation, gap filling, and scaling processes
  - b. Added Reviewers tab



- Made Tower Distortion Analysis window modeless, and added option to subdivide by year or month
- Improved Data Recovery Analysis window
  - a. New option to display data coverage chart of valid or invalid data
  - b. New table showing missing data
  - c. New option to report valid time steps rather than data recovery rate
- Added 'Openwind' Weibull fit algorithm.
- Added the ability to choose a Weibull fit algorithm in Tools > Options.
- Improvements to Combine Anemometers window:
  - a. Now creates combined max column as well as combined SD column
  - b. New option to combine by boom orientation
  - c. New option to use reconstruct-and-average when combining
- Added to Fill Gaps window the option to replace data flagged to exclude.
- Added option to download MERRA-2 data from Windnavigator.
- Improved gap fill process to reconstruct co-located speed sensors first, using regression-by-sector, before doing shear-based reconstruction.
- Improved Wind Shear Analysis window
  - a. Added speed SD shear.
  - b. Added option to calculate from MoMM or simple mean.
- Improved Compare Data Sets window
  - a. Added speed frequency graph
  - b. Added TI-vs-height and TI-vs-speed graphs
- Added Special Adjustments window to perform NRG TI adjustment.
- Added to Tables tab quarterly and daily stats, 'Data Channel Summary', 'Calibration History'
- Added MoMM to Data Columns table and Environmental Summary table.
- Added calculated columns for speed SD shear, dew point, inflow angle, first difference, density-adjusted wind speed, and energy-weighted air density.
- Added option to auto-create a ratio column for co-located speed sensor pairs.
- Added option whether to use ISA to synthesize temp./pres. data for air density calculated column.
- Improvements to data import process:
  - a. Added ability to open RLD files and Fulcrum3D files.
  - b. Added separate control of append overwrite settings for numeric data and flag status
  - c. Improved import of RWD, MM, NSD, and ASOS files.
- Expanded Openwind export options.
- Added Wind Turbine Output window display options, and option to disable density adjustment.
- Improved Representative Year window to encompass multiple data columns.
- Added 'frequency & energy' display option to the Wind Rose tab.
- Improved Apply Scale and Offset window to allow scaling by month, hour of day, or sector.
- Added trend and discontinuity testing to Long Term Analysis window.
- Improved MTS algorithm
  - a. Added option to subdivide by year divisions.
  - b. Added option to window bins on joint probability distribution.
- Updated database interface to revision 6 by adding displacement height and boom orientation.
- Added option to specify different flags for different reconstruction processes.
- Added user preference to use AWST air density assumptions.
- Added ability to specify height of RH column.
- Added randomness to extrapolated turbulence for more realistic representative TI.
- Added option to include solar radiation data when downloading MERRA data from NASA.

- Made all mean direction calculations report vector means.
- Switched to Yamartino method for calculating standard deviation of directional data.

#### **Version 4.0 (May 18, 2015)**

- New Calibration window.
- Expanded calculated column capability with many new options.
- Ability to import much larger text files.
- New ability to hide data columns from graphs and drop-down boxes.
- Document History window now displays a complete list of configuration changes.
- New Combine Anemometers window for combining co-located anemometers.
- Easier sharing of favorite flags and flag rules within a team.
- New ability to scale (rather than lengthen) the target data set in MCP module.
- MCP performance test now compares different settings as well as different algorithms.
- MCP performance test now allows multiple iterations to help determine uncertainty.
- Vertical Extrapolation window now includes turbulence, directions, and temperatures.
- New ability to export multiple-height data to Openwind in the form of an MM2 file.
- Improved performance and flexibility of gap fill module.
- Turbulence Analysis window now shows data for all heights at once.
- New Representative Year module for creating 'typical year' of data.
- New Forecast Error Analysis module.
- New concurrency option on Diurnal Pattern tab.
- New ability to open ZPH files from ZephIR.
- New ability to offset direction values in TAB files.
- Improved data import logic.

#### **Version 3.3.14 (June 7, 2017)**

- Added menu items for Open Folder and Append Folder.
- Added ability to open multiple files by dragging and dropping a folder into Windographer.
- Added new Append Status window and improved robustness of multi-file append process.
- Added Brazilian EPE export format.
- Improved data import logic.
- Improved processing speed.
- Improved gap fill algorithm.
- Improved flag rules to handle direction ranges spanning true north.
- Improved Mean by Month, Monthly Statistics, and Annual Statistics tables.

#### **Version 3.2 (January 16, 2014)**

- Added free download of MERRA data via Windographer Data Downloader beta.
- Added option to scale a TAB file to a particular wind speed.
- Added to MCP window option to divide by up to twelve yearly divisions.
- Added a third stacked time series graph, and added checkboxes to toggle all spd/dir columns.
- Tower Distortion Analysis window now shows differences as well as ratios.
- Made Append window re-appear during multi-file append process whenever column labels change.
- Improved data import logic.
- Added up/down arrow keys as keyboard shortcuts to zoom in and out on time series graphs.
- Added subtle background colors to indicate data column type in some tables.
- Changed append process to import all data columns, even empty ones.

- Improved the Append window to simplify the mapping of new columns to existing columns.
- Added the ability to specify marker type in graphs (diamond, circle, triangle, X)
- Added shortcut keys to time series graph: +/- for zoom and arrow keys for scroll.
- Added 24 and 36 to the allowable number of direction sector subdivisions in the MCP window.
- Added Monin-Obukhov length column to the Openwind export file (currently just zeroes).
- Added hotkeys to speed flagging in Flag Manually and Flag by Scatter Plot windows.
- Added mouse wheel shortcut for zooming in and out of time series graphs.

### **Version 3.1 (April 17, 2013)**

- Added tabular display to the Flag Manually window.
- Added the ability to test flag rules before executing them.
- Added the Inspect and Remove Flags window.
- Added monthly option and 'stacked bars' wind rose style to Wind Rose tab.
- Added Export Image window.
- Expanded Compare Sites tab of MCP window.
- Added Fix Quantization window.
- Added details pop-up to Document History window.
- Added display options to Wind Turbine Output window.
- Improved TAB file export by reporting mean of time series and of TAB file, and by adding the ability to make the first bin half-sized.
- Added export to export Windfarmer WTI files.
- Added the ability to export to SAM, the Solar Advisor Model.
- Added option to time series export tab to skip empty lines.
- Added to the Delete Data window the ability to delete data points not flagged with specified flags.
- Improved import logic.
- Made all flag windows warn on cancel if it will result in lost changes.
- Changed air density calculations to account for the height of the temperature and pressure sensors
- Updated database interface to version 3
- Changed MIS default independence criterion from 0 to 48 hours, and recommended storm frequency from 100 storms/yr to 20 storms/yr.
- Improved gap fill algorithm to account for correlation between temperature sensors

### **Version 3.0 (August 27, 2012)**

- New improved MCP (measure-correlate-predict) module.
- Added new Compare Data Sets window.
- Added new Extreme Wind Analysis window that implements the Method of Independent Storms.
- Added new Flag by Scatter Plot window.
- Added User-defined calculated data columns.
- New improved Wind Turbine Output window that lets you compete turbines against each other.
- Allowed multiple temperature and pressure sensors at different heights.
- Added new relative humidity data column type.
- Added new modules to analyze wind veer, temperature profile, and long-term trends.
- Added option to filter for a precise date range.
- Improved text file data import
- Added new Wind Speed Ratios window
- Added minimum data coverage requirements for averaging to longer time steps.

### **Version 2.52 (April 3, 2012)**

- Improved and expanded capabilities of MCP window.
- Added Compare Data Sets, Forecast Error Analysis, and Wind Speed Ratios windows.
- Added Ramp Event Analysis window
- Added Wind Turbine Library window and the ability to create groups of turbines.
- Improved Wind Turbine Output, Wind Rose, and Wind Shear Analysis windows.
- Added the 3D colored scatter plot to the Scatter Plot tab.
- Added Openwind export format.
- Changed flag filter logic to exclude unchecked flags, rather than just not including them.
- Improved data import logic.
- Improved the gap fill algorithm to account for correlation between wind direction sensors.
- Added hodograph to, and removed acceleration from, Short Time Intervals window.
- Made shear by time step calculations filter by flag, rather than inheriting flags from speed columns.

### **Version 2.4.14 (January 8, 2015)**

- Added database import/export capability.
- Added to the Histogram tab the option to bin by month or by time of day.
- Added username to Document History window.
- Improved data import logic.
- Improved Tower Distortion Analysis window to handle speed sensors at different heights.
- Added ability to import .wt files into Append Data window via Load Settings button.
- Added 'Wind Speed Statistics for Synthesis' table to Tables tab.
- Improved support for Oracle database integration.
- Added Openwind export format.
- Made database export process export only the newly added, deleted, or modified flags.
- Improved gap fill process to use the highest-availability speed sensor as the anchor sensor.

### **Version 2.3 (May 18, 2011)**

- Improved data import logic.
- Added Append Data window.
- Improved gap fill logic to account for daily and seasonal patterns using windowed CDFs and percentiles.
- Added option for computer-level licensing.
- Changed export files to use the Windows number format.

### **Version 2.2 (December 8, 2010)**

- Added Inflow Angle Analysis window and Data Recovery Analysis window.
- Improved data import logic.

### **Version 2.1 (August 23, 2010)**

- Added ability to open NDF and NSD files.
- Made optional the use of fractional completeness factors in MMM calculation.
- Added option to calculate RMS wind speed SD during downsampling.

### **Version 2.0 (April 30, 2010)**

- New quality control mechanism based on data flagging and filtering by flag status.
- Improved Vertical Extrapolation module.

- New Tower Distortion Analysis and Short Time Interval Analysis modules.
- Improved data import logic.
- Improved WAsP tab file export including option to remove seasonal bias.
- Added new Meteodyn export format.
- Improved downsample logic to properly handle max and SD columns.
- Added ability to import from a SQL database.

**Version 1.52 (January 7, 2014)**

- Fixed various bugs.

**Version 1.4 (February 25, 2009)**

- Added the Time Shift window.
- Improved data import logic.
- Improved Turbulence, Wind Shear, and Date/Time Anomalies windows.
- Improved Scatterplot tab, PDF tab, Export Data window, and Extreme Wind Analysis window.

**Version 1.3 (September 22, 2008)**

- Improved Export Data, Turbulence Analysis, and MCP windows
- Added Reports tab, Frequency Distribution Analysis window, and Compare Data Sets window.

**Version 1.2 (May 6, 2008)**

- Improved control of append process.
- Added Tables tab.
- Improved analysis windows and export module.

**Version 1.1 (March 12, 2007)**

- Improved quality control and filtering.
- Improved Wind Shear Analysis window.
- Added the Tower Shading Analysis window and Turbulence Analysis window.

**Version 1.0 (September 26, 2005)**

- Initial release.