



PCRG Technologies Pty Ltd

WindReader Bulletin

WindReader Variance Profiles and Profile Sets

Introduction

Variance profiles and profile sets are the keys to the power of WindReader. These are the features that facilitate the development of the skills that long range shooters need to score well in multiple wind conditions.

The problem with shooting is that you are at the mercy of the elements. Every time that you go to the range the atmospheric conditions are different. One day the wind will be largely benign and the next the wind will be strong and all over the place. In addition most casual shooters only visit the range on one or maybe two days in any week and usually there is a club shoot on. This makes it very difficult for you to practice and experiment your wind shooting technique in a way that would improve your wind handling skills while probably accepting lower scores while you are doing it.

They say that becoming proficient in any complex skill takes 10,000 hours of practice. It's a bit hard to get this in an unpredictable wind and no chance to practice meaningfully. Not to mention the cost of a buck and more per bullet.

WindReader changes the whole scene. This software allows you to create your own wind and have it behave in any way that you desire. In addition it allows you to repeat that wind over and over again facilitating a powerful training and experimental environment.

WindReader allows you to say "Today I'm going to practice shooting with a 10 MPH wind or maybe a 20 MPH wind coming from this direction or that direction and I'm going to keep at it until I've got it down pat". Not only that, but there will be no bullet costs at all.

How does WindReader achieve this desirable outcome?

It does it via its variance profiles and profile sets. This bulletin explains how this is achieved.

Before We Start

Before we get started with variance profiles we need to explain a few details that the profiles rely upon. This won't take long.

Wind Strength

WindReader describes wind by its strength and its angle.

Wind strength is always declared in miles per hour regardless of whether you are operating the product in imperial or metric modes. This is done because almost all shooters around the world tend to talk of wind in MPH. We could see no reason to complicate the issue by introducing meters per sec if everyone used MPH.

Wind Direction

Wind direction is declared in terms of a clock. Values are from 1 to 12 (as you would expect) and the values are relative to the shooting range. Twelve o'clock always describes wind coming from where the targets are. Six o'clock describes wind coming from the shooters' end. This is regardless of the layout of the range. This layout thus means that nine o'clock will be to the left of the shooter at 90 degrees to the flight of the bullets. Similarly three o'clock will be to the shooter's right and is also at 90 degrees to the flight of the bullets. These two values represent the angles where a wind will inflict the most horizontal deflection of any bullet flying down the range.

Wind at other clock angles will inflict less bullet horizontal deflection than the 3 and 9 o'clock directions. Once the wind angle gets to either 6 o'clock or 12 o'clock (ie straight at the targets or straight at the shooter) it will inflict no horizontal deflection on the flight down the range. As you will see later you can set the direction of wind anywhere around the clock (in half hour increments) and WindReader will take care of calculating the appropriate bullet horizontal deflection as your bullet flies down the range.

Wind Flags

WindReader has two variations of flags corresponding to two different forms in use in various jurisdictions. We call these flag settings W4-8 and W5-10. In the case of W4-8 the whole values of the flag wind values are based on factors of 4 so they are 0,4,8,12,16,20,24. In the case of W5-10 the whole values are based on multiples of 5 so they are 0, 5 10, 15, 20, 25 (all in miles of hour). These are not locked to either imperial or metric systems so the usage of one or the other depends on the particular flags that are setup in the range that a user attends. During startup on the first run of WindReader you were asked to make a choice of one of these two settings. Now that you know what they are you might like to revisit the choice you made and change it if you want to. This is easy, just go to 'Setup|Defaults' and make your choice from the appropriate drop down control.

Flag Images

The images below show you the flags for each of the two flag settings. The values to the left represent the wind strength in MPH. You will note that the flags can show wind increments of one MPH. The flag in the left columns are the whole numbers (eg 0, 4, 8 etc which represent the flags that you see on a range) and the other columns show the intervening values with the crosses representing the numbers incremented by one (eg one cross equals 1 and 2 crosses equals 2 etc. for example the second row shows the 4 MPH flag and this same flag appears in the columns to the right with one cross showing 5 MPH, two crosses showing 6MPH and three crosses showing 7MPH in the 4th row.

Only the flags showing wind coming from the left are shown here and there is a corresponding set of flags flipped over horizontally showing wind coming from the right.

You should get familiar with these images as you need them to judge the wind while shooting.

Flag Images for W4-8 Flag System

0		1		2		3	
4		5		6		7	
8		9		10		11	
12		13		14		15	
16		17		18		19	
20		21		22		23	

Flag Images for W5-10 Flag System

0		1		2		3		4	
5		6		7		8		9	
10		11		12		13		14	
15		16		17		18		19	
20		21		22		23		24	

What are Profiles?

To understand what we are trying to achieve let's look at an example.

Let's assume that you find shooting well becomes difficult every time the wind becomes variable and unpredictable and your scores fall in this situation. You would like to practice

how you handle wind stronger than this. So it would be great if you could just pop down to the range and practice with, say, a 15MPH wind preferably coming from the left. Waiting for suitable variable conditions might take weeks to appear. This is why many of the top shooters have taken twenty or thirty years to be good at this. There is little, or no, opportunity to do formal practice or repetition of skills.

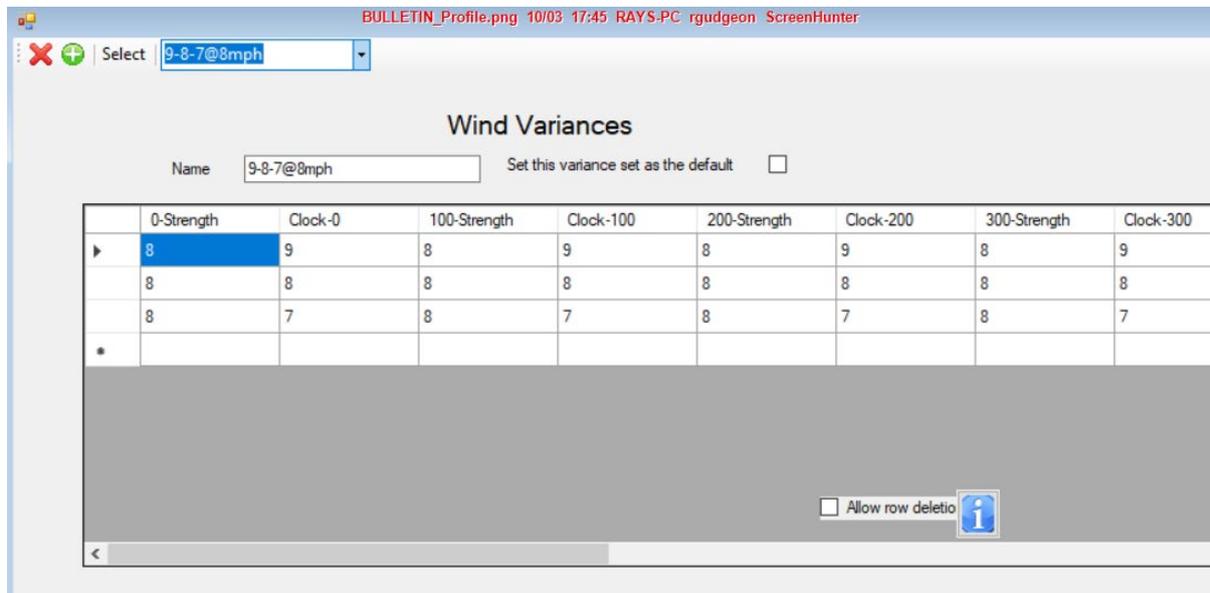
This is why we developed WindReader.

Now you can set up a training session with, not just, 15MPH but with wind strength that is 15 but varies around that value like real wind does. Also you can have the wind, not just emanating from a particular direction but changing in direction (slowly at first and increasing further down the line). As well you can build in the annoying dip in wind caused by that grove of trees that are somewhere down your particular range. Or you can set up various other factors that might affect your bullet flight?

Now you can practice wherever is convenient for you and it won't cost you up to \$2.00 for every bullet you fire.

Enter WindReader Profiles. These can achieve all the above and more.

A 'Profile' is a list of numbers that describe the wind over the whole length of the range that you are working with. The information that is applied defines the wind strength and direction for every 100 yard/metre sector including zero between the shooter and the target. If you are working with a 600 yard target there will be 7 sets of strength (in MPH) and 7 sets of angle (in clock units) (see below).



This is an image of the Wind Variance form in WindReader. You can see that there is a profile called '9-8-7@8MPH'. Only the first three range sectors are visible here but this grid extends out to the right to 11 (including zero) sectors that are just the same (except for the numbers) as the ones you can see here.

Look at the first column labelled 0-Strength. You will see that there are three rows (we will deal with these rows later but for the moment you can see that the strength of the wind at the shooter (column zero) is 8MPH. The column to the right is headed 'Clock – 0' and this is the

direction of the wind. This has a value of 9 o'clock. So the first sector in the range is an 8MPH wind at 9 o'clock.

The next two columns are the same and define the wind at the second 100 yard sector (ie 200 to 300 yards or metres). It so happens that the wind here is the same as that of the first column as you might expect because they are side by side.

This simple process continues right across over to the right out to eleven sectors (including zero) stretching out to 1000 yards/metres. Thus the wind conditions can be defined all the way from the shooter's position down to the target at up to 1000 yards/metres to create your own profile and each sector can be different in strength and angle. All you need to do is think it out and fill in values that make sense.

Note that if you are always shooting at ranges that are shorter than 1000/yards/metres there is no need to fill in values that are beyond the distance you shoot. It is, however, necessary to fill the unused cells in this part of the grid with zeros. Now WindReader will take care of this for you automatically but you must not erase the values in any zero cells as this would cause an error to occur.

Once you have set up a single row of sectors in a profile you will have a static set of conditions for the wind for a range. The critical word here is 'static'. What we want here is a dynamic profile that will regularly vary the strength of the wind and vary the angle from which it comes while you are shooting. So let's see what the extra lines that you see in the image above are all about.

Profile structure

The aim of the 'profile system' is to produce a dynamic environment that mirrors the real thing. It is a simulation after all.

The screenshot shows a software window titled "Wind Variance" with a table of wind data. The table has columns for distance (0, 100, 200, 300, 400 yards) and clock values for each distance. The first row is highlighted in blue. Below the table, there is a checkbox labeled "Allow row deletion" and an information icon.

	0-Strength	Clock-0	100-Strength	Clock-100	200-Strength	Clock-200	300-Strength	Clock-300	400-
▶	0	3	0	3	0	3	0	3	0
	2	3	2	3	2	3	2	3	2
	4	3	4	3	4	3	4	3	4
	8	3	8	3	8	3	8	3	8
	12	3	12	3	12	3	12	3	12
	16	3	16	3	16	3	16	3	16
	20	3	20	3	20	3	20	3	20
	0	9	0	9	0	9	0	9	0
	2	9	2	9	2	9	2	9	2

What happens is that WindReader, during a stage that you are shooting will walk down any lines that exist in the profile that you are using and change the flags and the angle of the wind. So when you turn on the profile on the 'Target Screen' it will start walking through the rows in the profile and implementing the wind structures that are contained in it. This 'walk

through' can be sequential (ie rows 1, 2 ,3 etc) or random (ie rows are selected randomly rather than sequentially).

So in the image above WindReader will process row 1 followed by row 2 followed by row 3 etc (assuming a sequential setting). Each time that the process changes from one row to the next the flags that you see will change both in wind strength and in wind angle. Each time this happens the current shot that you make will fall in a different position on the target just like at a real range.

Thus you will be tested. You must watch the flags to work out how to keep you bullets in the X ring (assuming that this is where they are currently falling)!

Thus a profile can describe one to many wind structures all the way down your range and can cause that wind to vary from one to any number (up to 10 or more) rolling changes that you will have to deal with when you shoot. This is just not possible to do on a real range

How many rows are required? Well one row will be of no assistance to you as the wind will not change at all (where's the fun of that?). Three rows will give you relatively simple changes that you will nail rather quickly. As you increase the number of rows the more complex will become the decisions you need to make and the more you will learn (ten is a reasonable upper limit).

So what are Profile Sets?

Now that you have come across profiles you need to understand profile sets.

It's really quite simple. Profile sets are groups of profiles that can be loaded into WindReader as a block. Normally sets are groups of profiles that share a common scheme. For example they can represent simple profiles, difficult profiles, complex profiles such as fishtail profiles, profiles that are designed to mimic the vagaries of a certain ranges and others.

This is very convenient for you to group together profiles of a similar type so they are available to you in a very convenient way. It also means that you can create profile sets that mimic your local range or perhaps other ranges to which you may be intending to travel for a tournament for example. Once a 'set' is loaded you can just change from one of its profiles to another just by selecting it.

Profile sets also open the opportunity for shooters to swap profiles sets with other people. It also means that we can produce profile sets and release them to the community. To facilitate this we have created a library on our web site that can hold any number of profile sets that our users may find of use and any user can submit profile sets that they think may be of interest to other WindReader users.

Profile Set Structure

Profile sets exist as Microsoft Excel files. These files can be created by starting with an Excel template or by exporting an existing profile set from within WindReader and modifying the content to suite a different purpose.

Once a new profile set is created it can be imported into WindReader and activated making it available to the user.

Creating a New Profile Set

There are three ways to get a new profile set. You can create one from the start using a template, you can modify a profile set that is already in WindReader by exporting it and modify its content or you can download a set from the WindReader library.

Whichever you choose you will end up with an Excel spreadsheet which will need to be imported into WindReader and then be activated (except for a premade profile set from the library which you download as the download process will automatically import the set directly into WindReader – (it will still have to be activated though)

Creating a Profile Set from a Template

There are two profile set templates available on our web site for you to download to your computer at any time. The reason for two of these that the profile sets are keyed to the flag system that you are using. There is one for W4-8 flag settings and another for W5-10 flag settings (see elsewhere in this bulletin for details of this). If you don't know which flag setting you are using just go to 'Setup|Defaults and look at your setting.

You can find the templates on the 'Documents' page at www.windreader.com/documents When you have chosen the template that you are going to use just click it and it will automatically start the download process. You will need to specify a location on your computer where you can find it later. Once the download is complete you need to change the name of the file to something that means something to you (this is because all profile sets must have a unique name in WindReader). You can then proceed to filling the Excel sheet with the wind data you want (see later). You will note that the template is protected and all the information currently in is read only. This is done to preserve the layout of the sheet so that it will upload cleanly into WindReader. You can only enter data into the unprotected data section of the sheet.

Creating a new profile set from an existing one

If the profile set that you already have in WindReader is close to what you want and just needs a few tweaks to fulfil your needs exactly it might be more efficient to just make some changes to it. The way to do this is to export it from WindReader to an external Excel file, modify the parts you want to change, change the name of the file and import it back into WindReader.

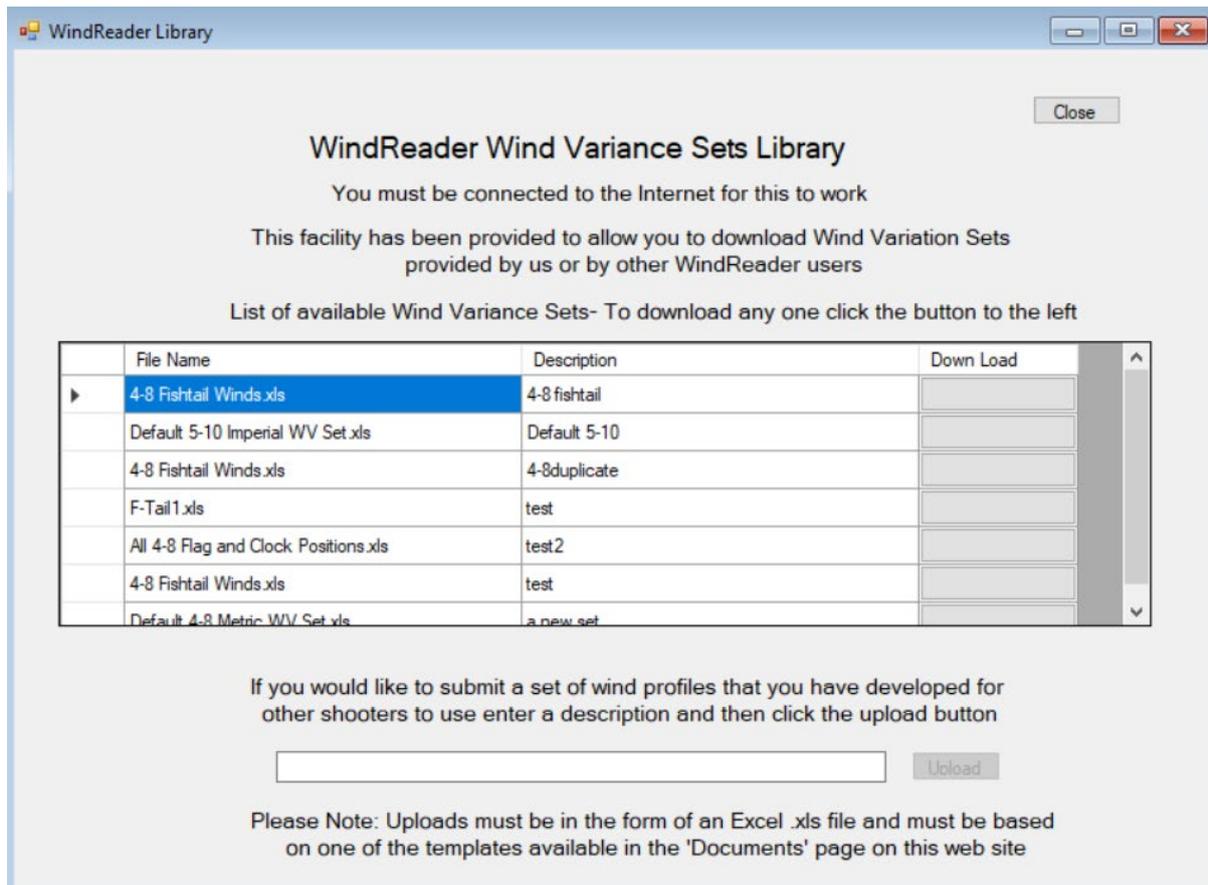
To do this just go to 'File|Export|Variances

WindReader will raise a 'File Open' dialog box where you can choose a location and a name for your new profile set. It will export the data in to this new file where you can make changes (see below) prior to importing it back into WindReader

Importing a Profile Set from the WindReader Library

Importing a profile set from the library is a little different to the other processes in that you don't have to make any changes. In addition the WindReader process removes all the more complex parts of the process.

Access to this library is facilitated directly from inside WindReader itself. To get to it just go to 'File|Library' and you will see all the profile sets that are available as below...



Here you can see all the profile sets that are available. To download a profile set that you want just click the download button (the grey button to the right) next to the item you want.

WindReader will download the profile set directly into the program itself ready for you to activate (see later)

Populating your Profile Set

Once you have a blank or partially populated Excel spreadsheet you can just fill in the data you want. This data will describe the wind structures of your set. Here are a few items that you need to include.

1. A profile set can contain a small or large number of individual profiles. These can be starter profiles that are designed to be easy in the beginning followed by more complex wind conditions that become increasingly difficult in your practice. Or different in other ways that make sense to you.

Each profile needs to have a name. We suggest that you adopt a naming scheme that describes the content of the particular profile. For example a name such as 8-9-10@4mph describes a profile wind that starts with a profile wind direction that swings through 8 o'clock, 9 o'clock at a constant 4MPH. If you adopt such a naming scheme you will be able to come to any profile later and know just what it is.

2. Each row must contain values for wind strength and wind angle. There is one group of two values for each 100 yard/metre from the shooter to the target. Generally this will be eleven sectors for a 1000 yard/metre range but this can be shorter if you never shoot right out to these distances. For example let's say if you never shoot beyond 600 yards/metres you only need to fill in numbers to and including the sixth

sector. However, you must enter zeros in all the empty sector values right out to the 1000 yard/metre sector including zero – empty cells are not acceptable.

3. After you have entered the last line of the last profile that you are intending to fill in you must leave blank the left hand cell that would otherwise contain a new profile name. This blank cell it is important because WindReader recognises this blank line as the end of the profile list that is being created.
4. If you are using a template provided by us you should not unprotect the spreadsheet. All of the information currently in the sheet is required and the only cells in which you can correctly enter data are already unprotected for you. If you are modifying a spreadsheet exported from WindReader you should not change any of the heading data or any of the data in the last column to the right.
5. Valid values for wind strength must be whole numbers between zero and twenty four (0 – 24). No decimal values allowed.
6. Valid numbers for wind direction must be clock hour values and half clock values expressed as decimals (eg 2=2.0, 2:30 = 2.5, 3=3.0, 3.30=3.5 etc).

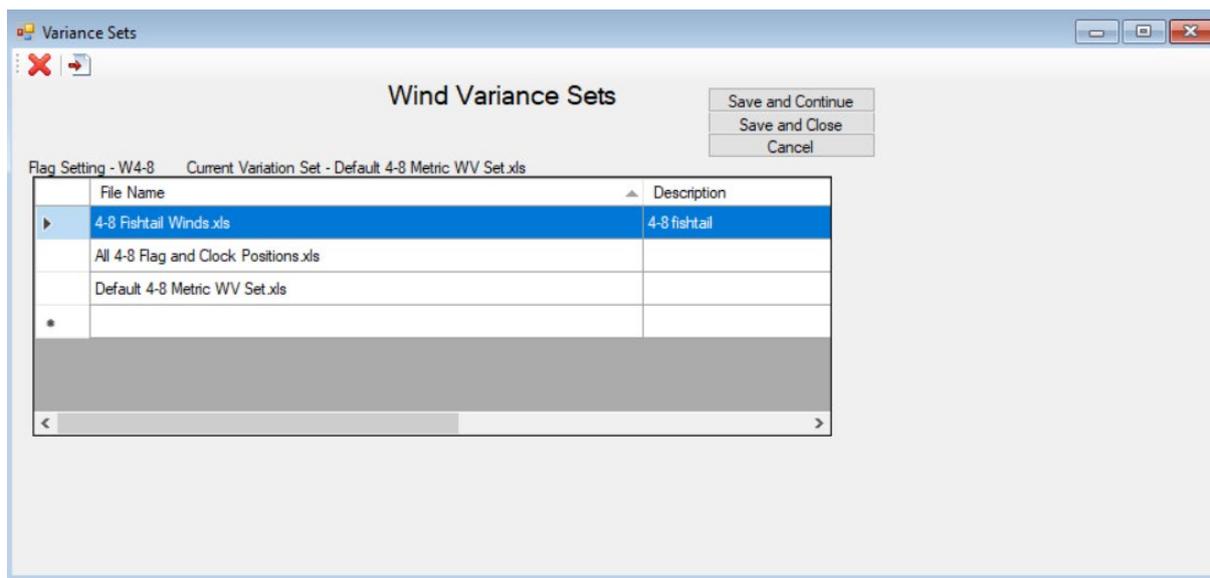
If you follow these guidelines your profile set will load into WindReader without difficulty.

Uploading your Profile Set to WindReader

For those profile sets that need to be uploaded to WindReader (ie all except downloaded 'sets' from our library) make sure that you know where your spreadsheet file is located on your computer and click 'File|Import|Profiles. WindReader will raise a 'file open' dialog where you can select your spreadsheet file and WindReader will upload it into the file repository.

This process just loads to file into WindReader it does not activate it as the 'working file'.

You can see your file by going to 'File|Open|Variation Profile Sets as below.



Making a Profile Set the 'working Set' file in WindReader

Once you have created a new profile set and uploaded it into the WindReader repository you can activate it as the 'working set'. This process uses the Wind Variance Sets form as above. This form allows you to view all the sets you have, allows you to delete unwanted sets and allows you to swap the current 'working set' to your choice of another set at any time. Once a set has been activated here WindReader will use that set for all activities.

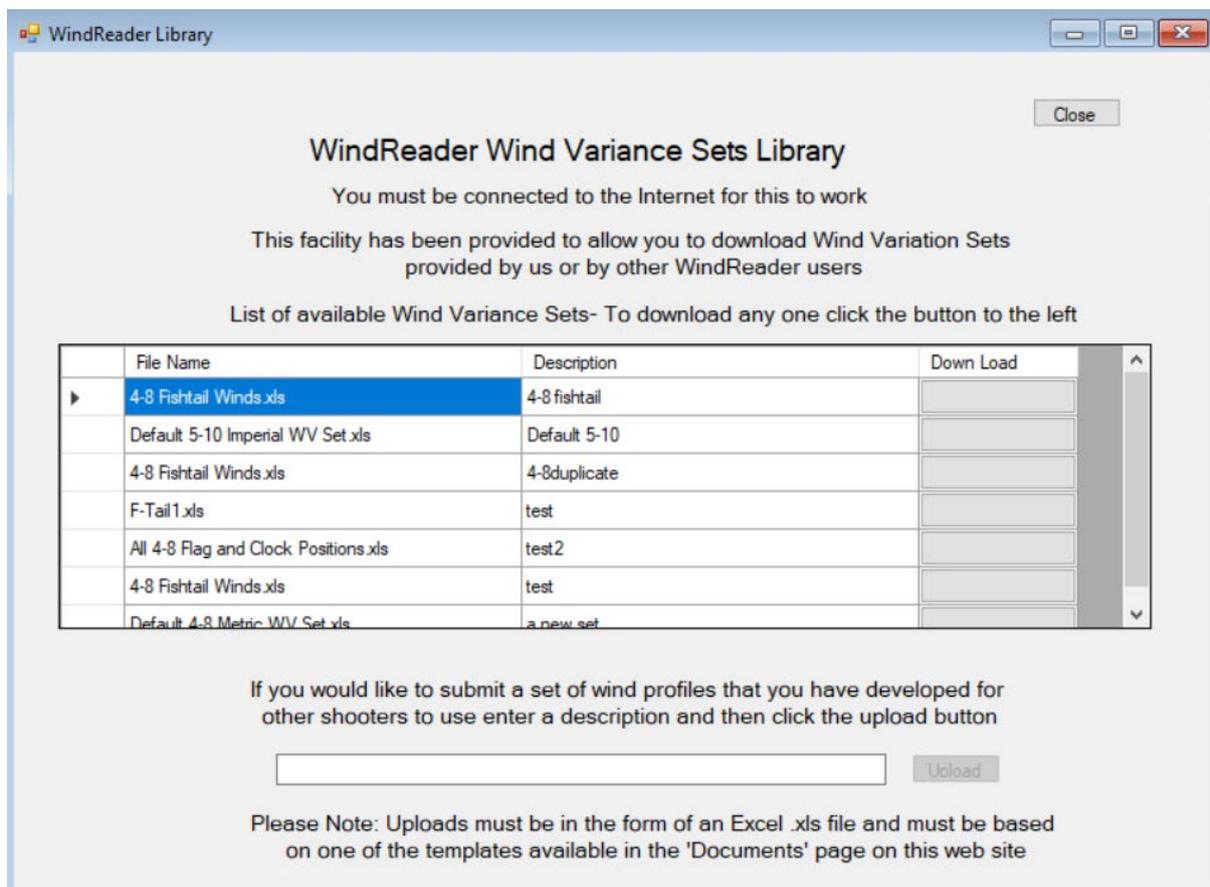
There are two ways you can set a profile set as the 'working set' the first is to click the set you want to select it and then click the second tool at the top left (the one with the red arrow – not the red cross!). The other is to just double click the profile set in the grid that you want (anywhere in the row will work). There will then be a short delay while WindReader saves the current 'working set' in case you have made any changes to it since you set the old set up and replace it with the profile set that you chose. You will see a rotating pattern while this is occurring.

When this process completes and if you have followed all these instructions you now have a new wind profile in WindReader and you can start using it.

Submitting a Profile Set to the WindReader Library

If you feel that you would like to submit one or more profiles sets to the library. This could be for anyone to use or just for your colleagues. You can do this quite easily.

In WindReader you need to export the profile set that you want upload to some location on your computer as described earlier in this bulletin. Then go to File|Library and you will see the form below...



At the lower section there is a text box and an associated push button. You need to enter a description of the set you want to upload. This is what will display in the 'Description' column in the image above and should be descriptive of what this set does (and is understandable to others) Then click the button to the right. WindReader opens a file open dialog where you can select the spreadsheet you want to upload and WindReader will upload it to the library and you will see it in the list.

Conclusion

Wind variance profiles and profile sets make a major contribution to the power of WindReader. They provide the means of presenting an extensive range of wind conditions to a user so he or she can easily develop the ability to handle any wind condition, improve skills and get the benefits of practice without the problems of shooting at a range.

WindReader is the preeminent simulator and training tool for all long distance shooters.