

Release 5 ZVI

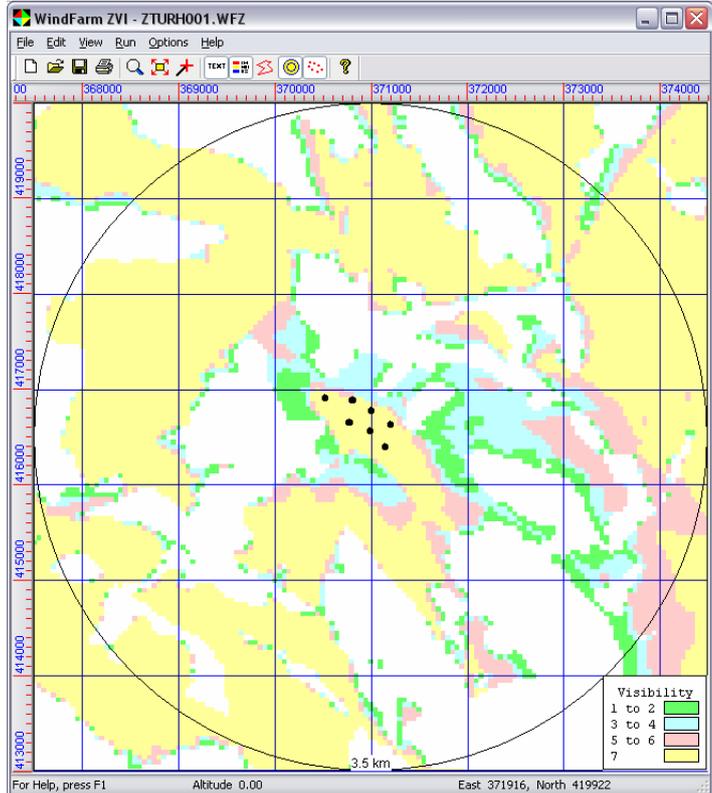
The new features are:

- 1 The toolbar has been extended to enable easier toggling of some of the display attributes
- 2 Exclusion zone boundaries treated as barriers
- 3 A local radius can be specified for each wind farm
- 4 Circles drawn at the local radius
- 5 Display results up to the radius from each turbine

Open the TURH project and start the ZVI module.

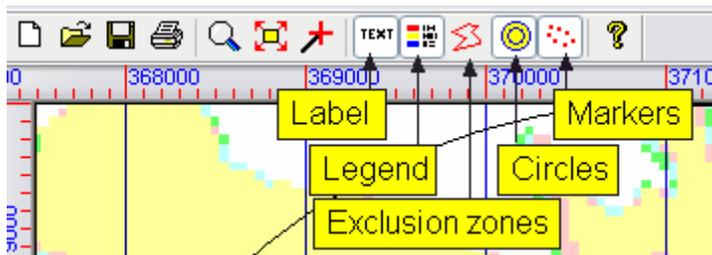
Select the ZVI run file ZTURH001.WFZ, which is a single wind farm calculation.

Select Calculate ZVI from the Run menu.



New Toolbar Buttons

Note the new buttons in the toolbar. They are also in the View menu.

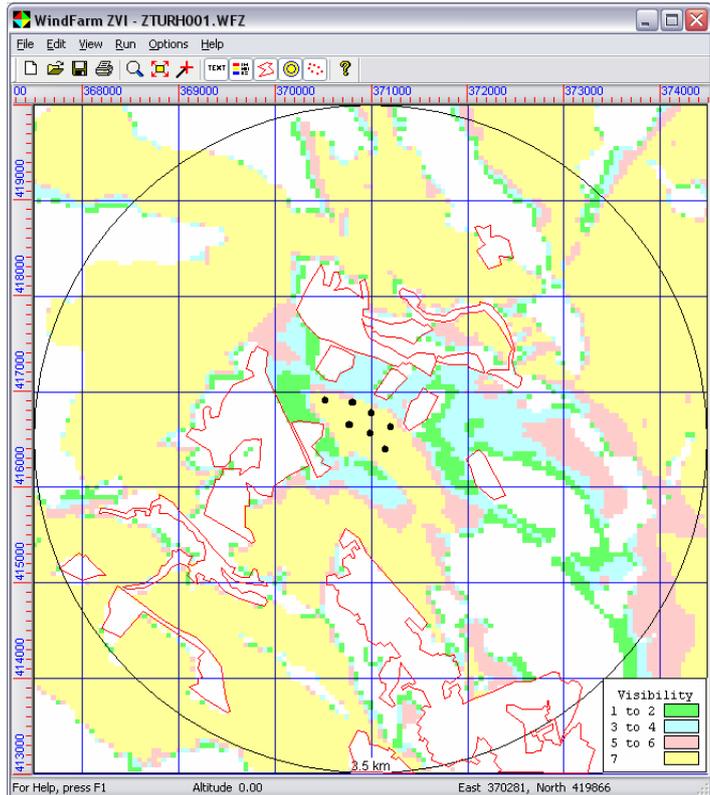


Exclusion Zones

Switch on the display of exclusion zones from the View menu or with the new toolbar button.

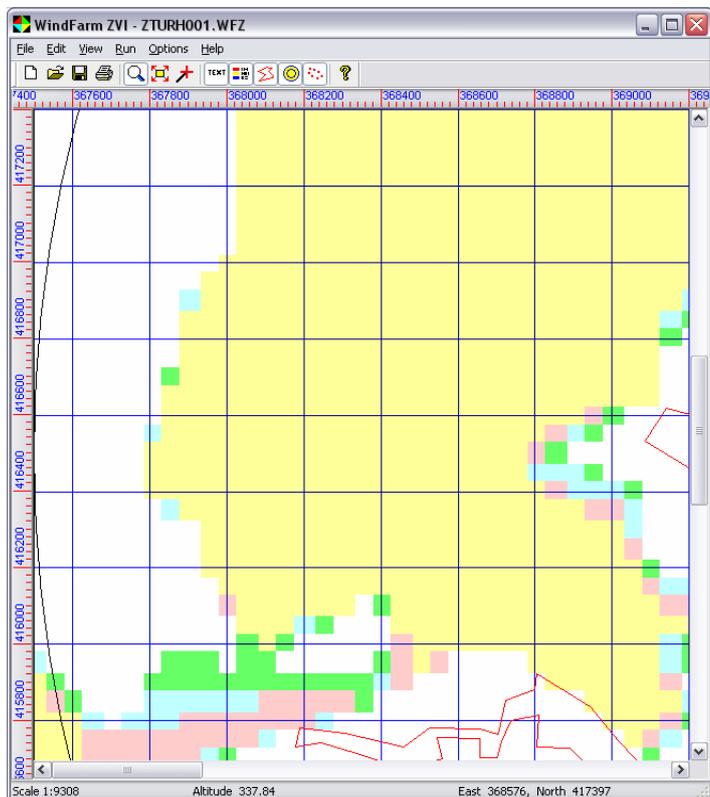
The ZVI exclusion zone calculation is handled by blanking the region within a zone and also by changing the height field in a zone. This means that at the edges you have a slope between outside and inside points. A limited amount of shading would therefore happen on the side of the exclusion zone away from the wind farm. However, it is possible that a narrow zone (e.g. a hedge) could have no height points inside it and therefore no effect at all. At the best it may have holes in the zone's effect due to missing points.

To improve this the boundary of a zone is now treated a barrier with a separate calculation if it intersects the line of sight i.e. the edges of a zone are now vertical and the missing point problem is eradicated.



Use the zoom button to zoom in the middle of the 1 km square (368000,416000) to (369000,417000).

Select Add exclusion zones / Digitise exclusion zones from the Edit menu. The ZVI display will clear.



Click on the map and select New exclusion zone

Specify the height of the exclusion zone to be 100m and click on OK.



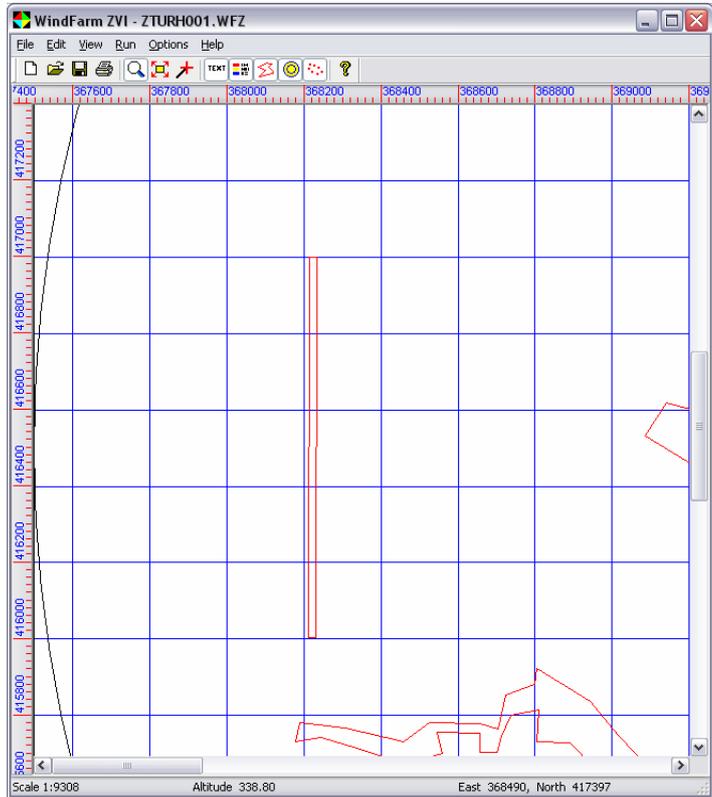
Now digitise a narrow exclusion zone between 416000 and 417000 North.

Make sure that it is narrower than 50m and between the 50m height points in the East-West direction.

When done right-click and select Close and save exclusion zone, then Exit.

You now have an exclusion zone that does not include any height points.

Zoom back out to complete the process and select Save from the File menu.



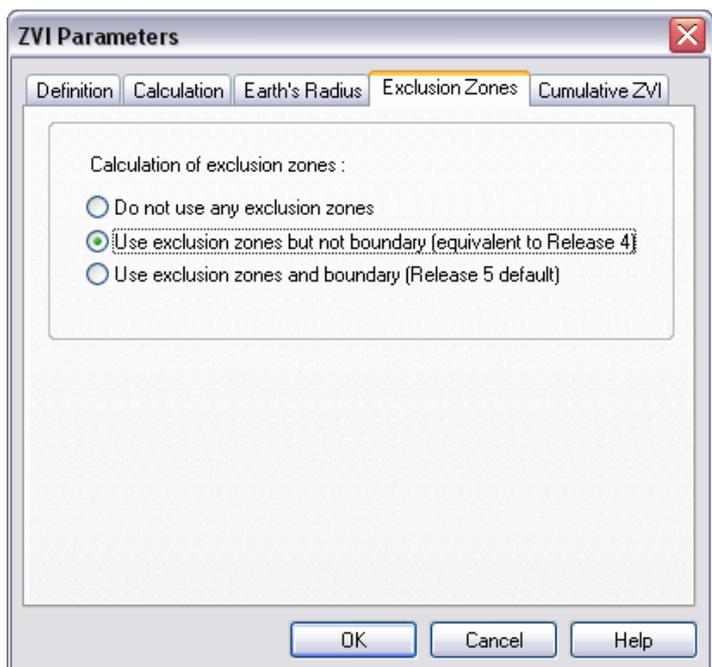
Select Run Data from the Edit menu and then the new Exclusion Zone tab.

This shows the new calculation options for exclusion zones.

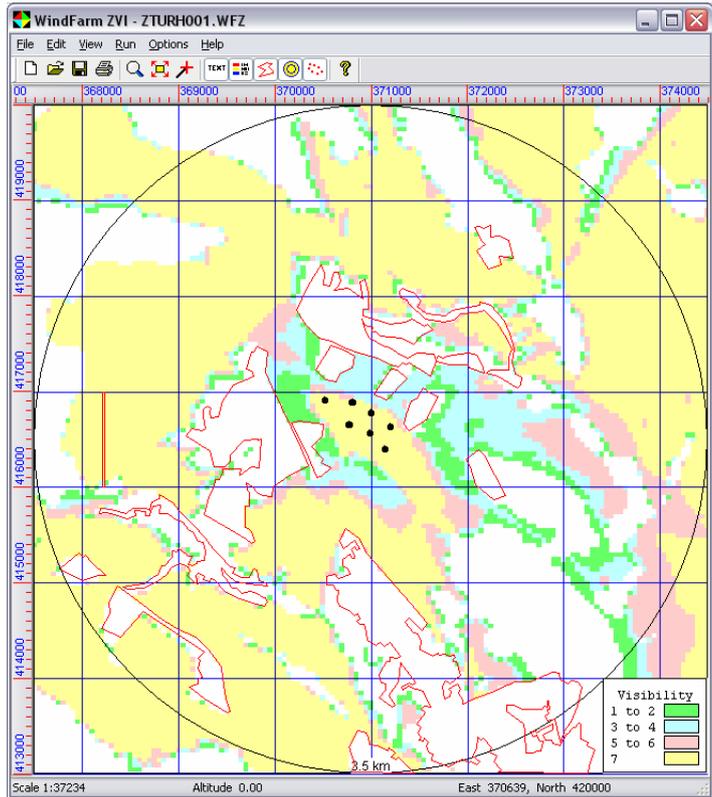
You can choose to calculate using the exclusion zones but not the boundary effect. This is equivalent to the standard release 4 calculation. If a release 4 run file is opened this will be the default setting.

The 3rd option is to make the calculation including the boundary as a barrier. This is the default setting for new release 5 runs.

Leave it set to the 2nd option (release 4) and click on OK.



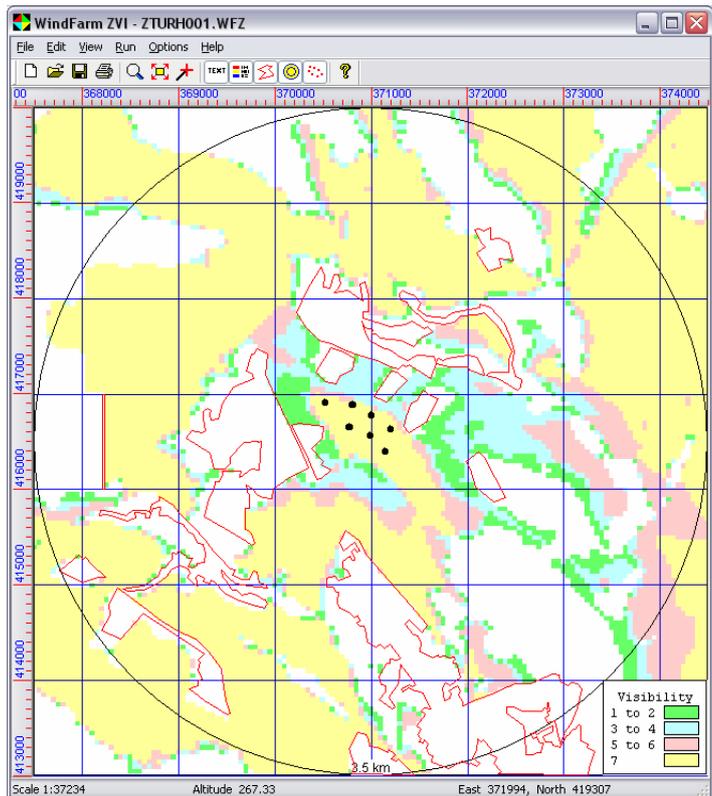
Select Calculate ZVI from the Run menu and the results displayed will be the same as that shown earlier. The new exclusion zone has been ignored.



Go back to editing the run data and set the 3rd option for the exclusion zone calculation (release 5).

Select Calculate ZVI from the Run menu and the result displayed will be noticeably different where the new barrier is located. The region to the West of the barrier is where the turbines can no longer be seen.

Also note that the regions shaded by a zone have also changed slightly (see the West of the zone immediately to the East of the barrier).



Local Wind Farm Radius

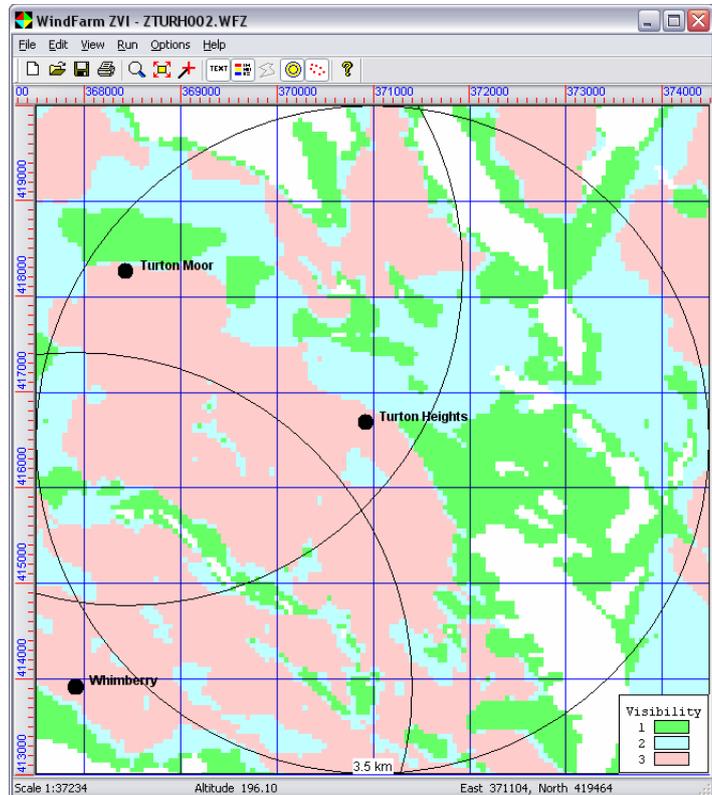
Single turbines have become more prolific and they are often near large wind farms. Therefore it has become necessary to use different radii in a ZVI to represent different distances that planning authorities may require for each wind farm. A large wind farm may need a ZVI radius of 30km, whereas a single (possibly small) turbine might be as little as 10km.

This capability is now available.

Select the ZVI run file ZTURH002.WFZ, which is a cumulative wind farm calculation with three wind farms.

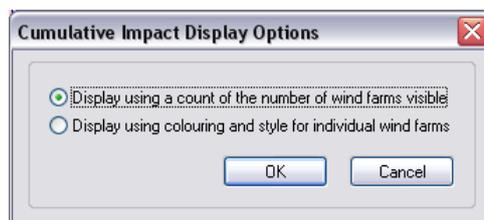
Select Calculate ZVI from the Run menu to show the results.

Select Display Data from the Edit menu.



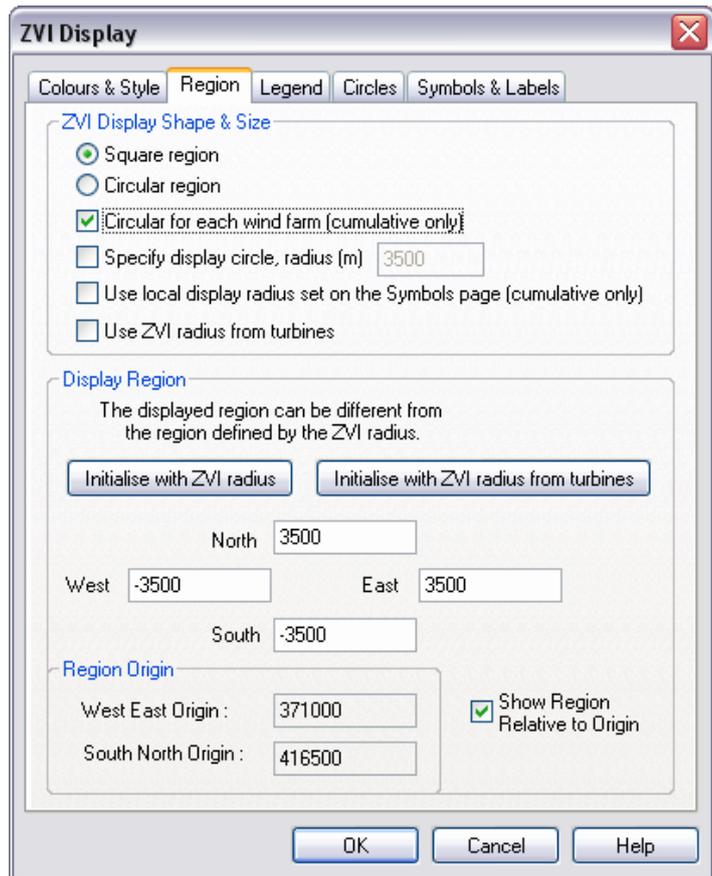
In the Cumulative Impact Display Option page select Display using a count of the number of wind farms visible.

Click on OK.



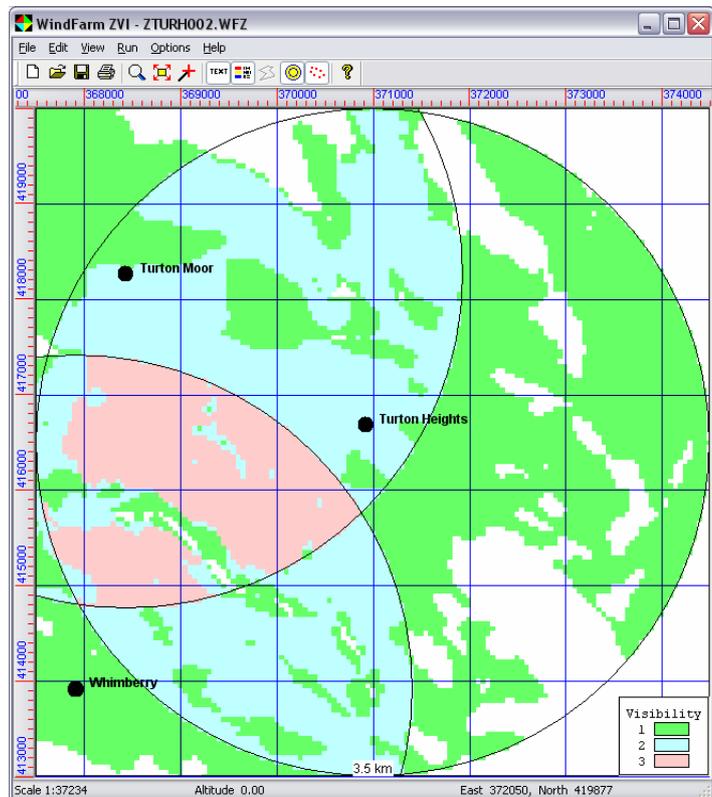
In the ZVI Display dialog select the Region page and set the Circular for each wind farm check box on.

Click on OK.



This is now a typical release 4 display.

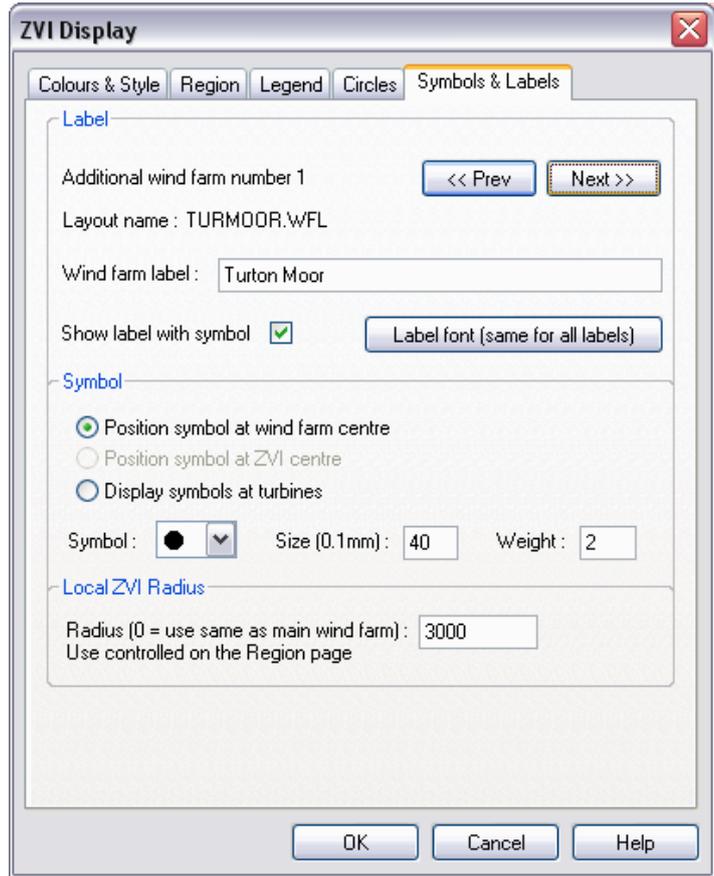
Select Display Data again from the Edit menu.



In the ZVI Display dialog select the Symbols & Labels page.

There is a new edit box at the bottom to set the local ZVI radius for the wind farm being displayed. The default setting is 0, which means an additional wind farm will inherit the radius set for the main wind farm.

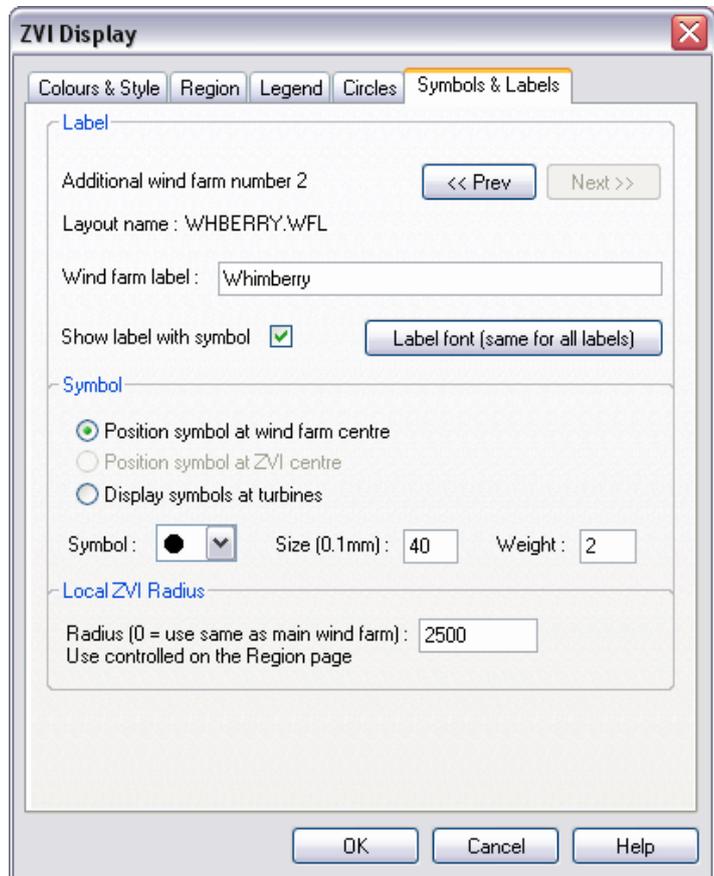
Click on Next to select the Turton Moor wind farm and then set the local ZVI radius to 3000.



The screenshot shows the 'ZVI Display' dialog box with the 'Symbols & Labels' tab selected. The 'Label' section includes 'Additional wind farm number 1' (set to 2), 'Layout name : TURMOOR.WFL', and 'Wind farm label : Turton Moor'. The 'Show label with symbol' checkbox is checked. The 'Symbol' section has three radio buttons: 'Position symbol at wind farm centre' (selected), 'Position symbol at ZVI centre', and 'Display symbols at turbines'. The 'Symbol' dropdown is set to a solid black circle, with 'Size (0.1mm)' at 40 and 'Weight' at 2. The 'Local ZVI Radius' section has a text box containing '3000'.

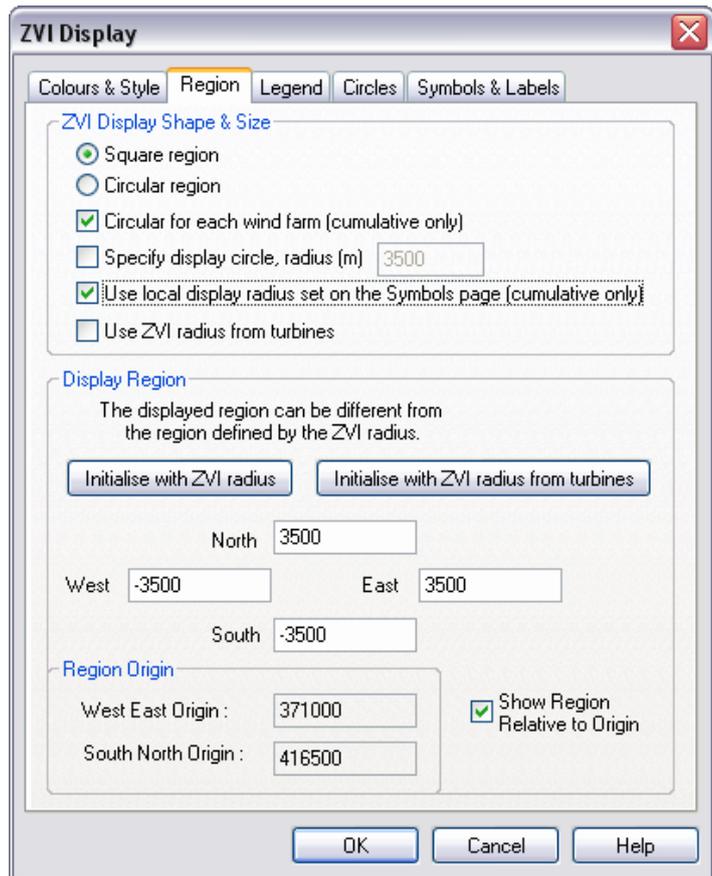
Click on Next again and set the Whimberry wind farm to a local ZVI radius of 2500.

Click on OK.



The screenshot shows the 'ZVI Display' dialog box with the 'Symbols & Labels' tab selected. The 'Label' section includes 'Additional wind farm number 2' (set to 2), 'Layout name : WHBERRY.WFL', and 'Wind farm label : Whimberry'. The 'Show label with symbol' checkbox is checked. The 'Symbol' section has three radio buttons: 'Position symbol at wind farm centre' (selected), 'Position symbol at ZVI centre', and 'Display symbols at turbines'. The 'Symbol' dropdown is set to a solid black circle, with 'Size (0.1mm)' at 40 and 'Weight' at 2. The 'Local ZVI Radius' section has a text box containing '2500'.

Select the Region page and set the Use local display radius check box on.



ZVI Display

Colours & Style | **Region** | Legend | Circles | Symbols & Labels

ZVI Display Shape & Size

- Square region
- Circular region
- Circular for each wind farm (cumulative only)
- Specify display circle, radius (m)
- Use local display radius set on the Symbols page (cumulative only)
- Use ZVI radius from turbines

Display Region

The displayed region can be different from the region defined by the ZVI radius.

North

West East

South

Region Origin

West East Origin : Show Region Relative to Origin

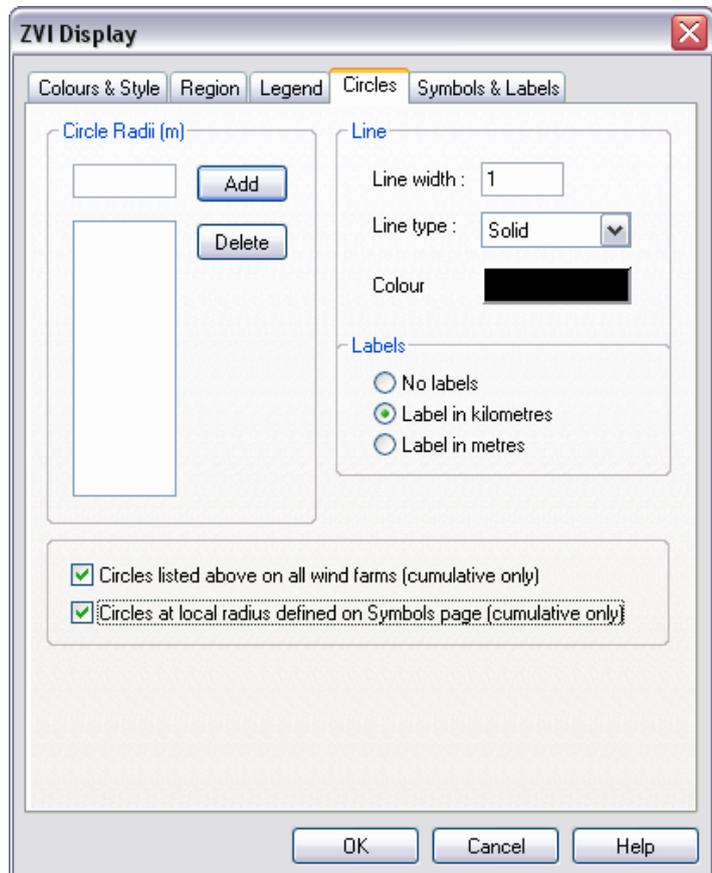
South North Origin :

Select the Circles page.

Select the 3500 radius that is set and then click the Delete button to remove it.

At the bottom set the new Circles at local radius check box on.

Click on OK.



ZVI Display

Colours & Style | Region | Legend | **Circles** | Symbols & Labels

Circle Radii (m)

Line

Line width :

Line type :

Colour

Labels

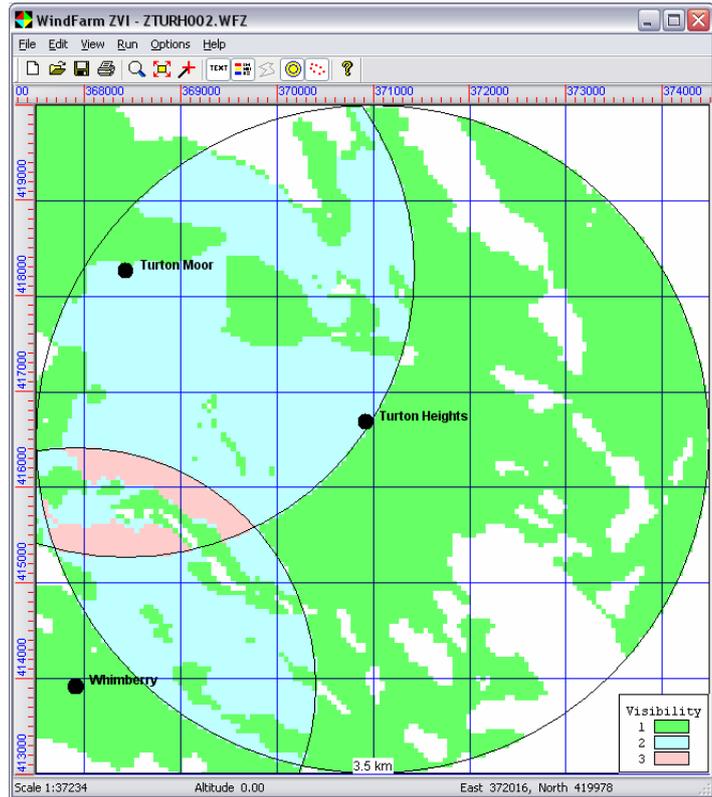
- No labels
- Label in kilometres
- Label in metres

Circles listed above on all wind farms (cumulative only)

Circles at local radius defined on Symbols page (cumulative only)

The display of the results has now changed to use the local radii and also draw the circles at the local radii.

Select Display Data again from the Edit menu.

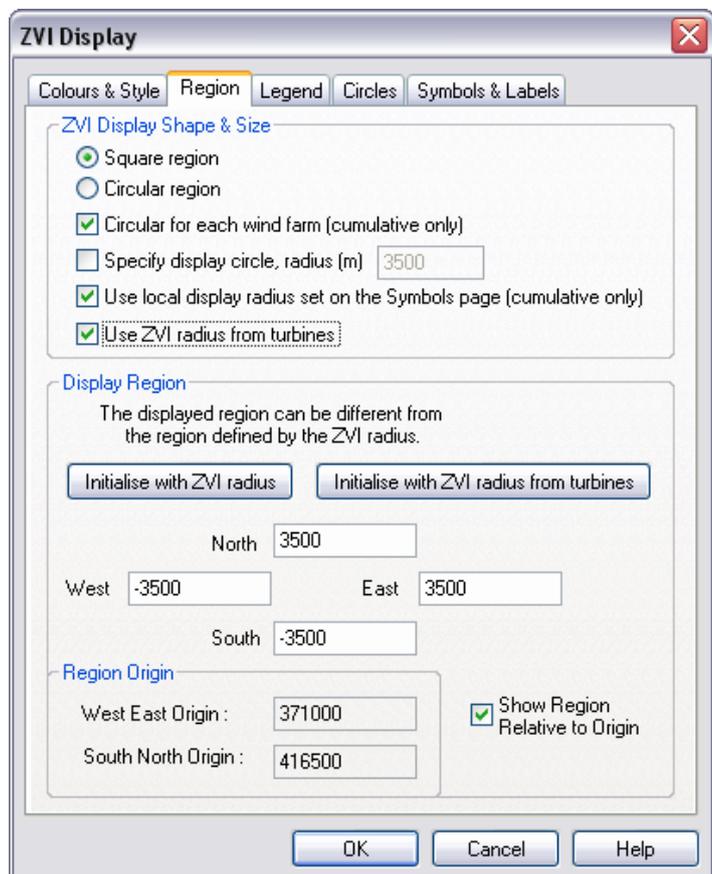


ZVI Radius Measured from the Turbines

Some planning authorities require the ZVI results displayed to a specified distance measured from individual turbines and not the centre of the wind farm. This would certainly be relevant where the wind farm comprised a long line of turbines.

Select the Region page and set the Use ZVI radius from turbines check box on.

Click on OK.



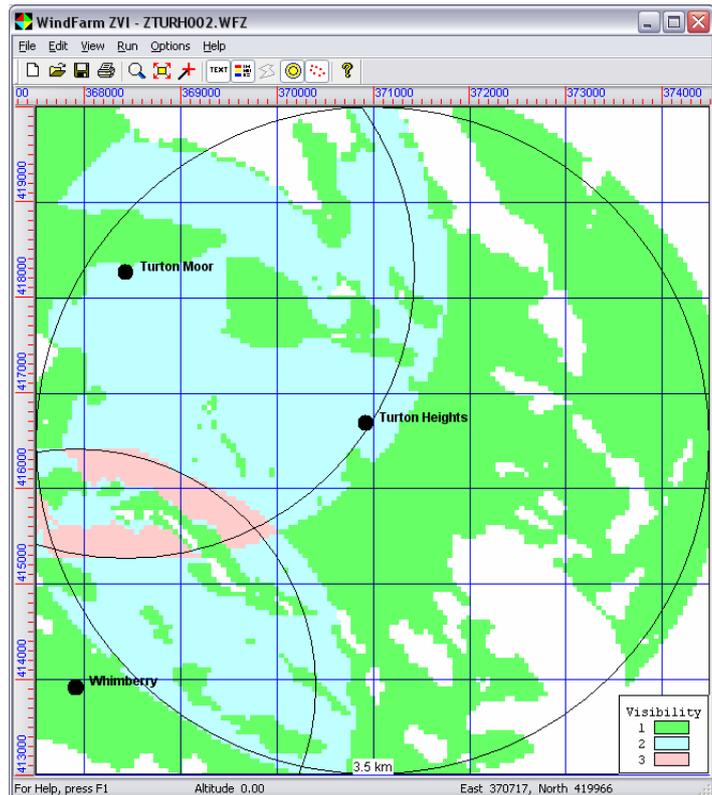
The change in the displayed results is to include a wind farm's results up to the distance specified by the local radius from each turbine.

Therefore the overlapping display regions extend beyond the local radius identified by the circles, which are based on the centre of the wind farm.

This technique can also be applied to single wind farms.

The results can also be displayed to show the full extent of the effect of using the radius from each turbine in the main wind farm.

Select Display Data again from the Edit menu.

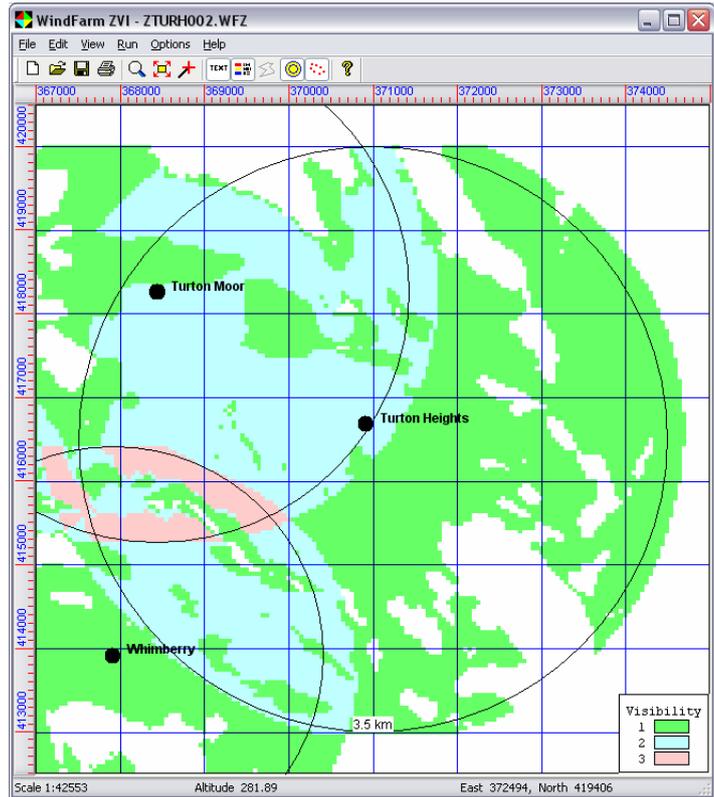


Select the Region page and click on the Initialise with ZVI radius from turbines button.

The region set will change to +/- 4000m. The extended region calculation is made automatically for any ZVI run and therefore the data will always be available.

Click on OK.

The full extent of the calculation can now be seen. The clear region along the top is where there is missing height data.

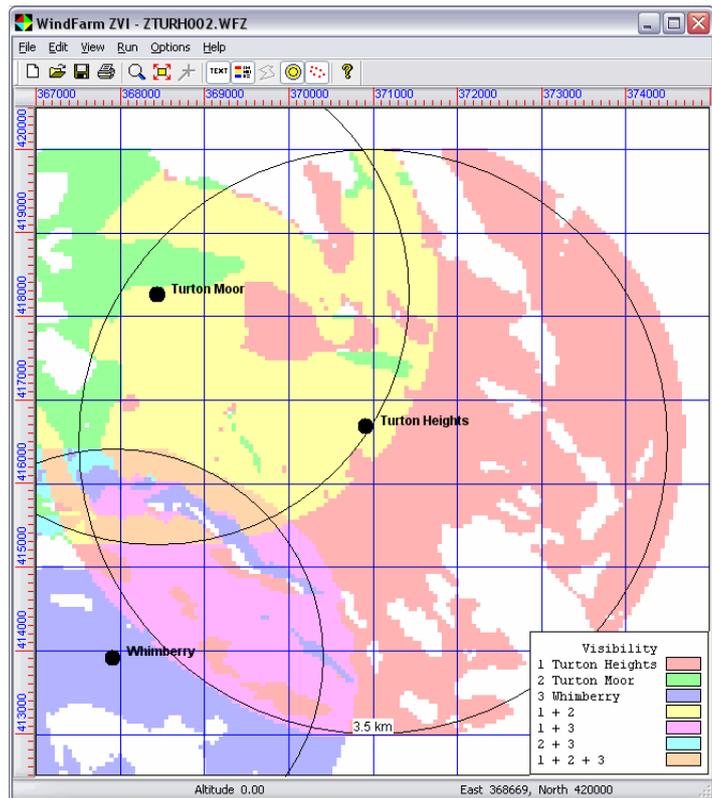


Select Display Data from the Edit menu and this time choose the Display using colouring and style for individual wind farms option.

Click on the RGB default button and then click on OK.

Wind Farm Groups	Show	Colour	Intensity %
1	<input checked="" type="checkbox"/>	Red	30
2	<input checked="" type="checkbox"/>	Green	40
3	<input checked="" type="checkbox"/>	Blue	30
1 + 2	<input checked="" type="checkbox"/>	Yellow	35
1 + 3	<input checked="" type="checkbox"/>	Magenta	30
2 + 3	<input checked="" type="checkbox"/>	Cyan	35
1 + 2 + 3	<input checked="" type="checkbox"/>	Orange	33

The alternate colouring scheme shows the results in the same way.



Summary

The following new features have been explained:

- 1 The extended toolbar
- 2 Using exclusion zone boundaries as barriers
- 3 Specifying a local radius for each wind farm
- 4 Drawing circles at the local radius
- 5 Displaying results up to the radius from each turbine