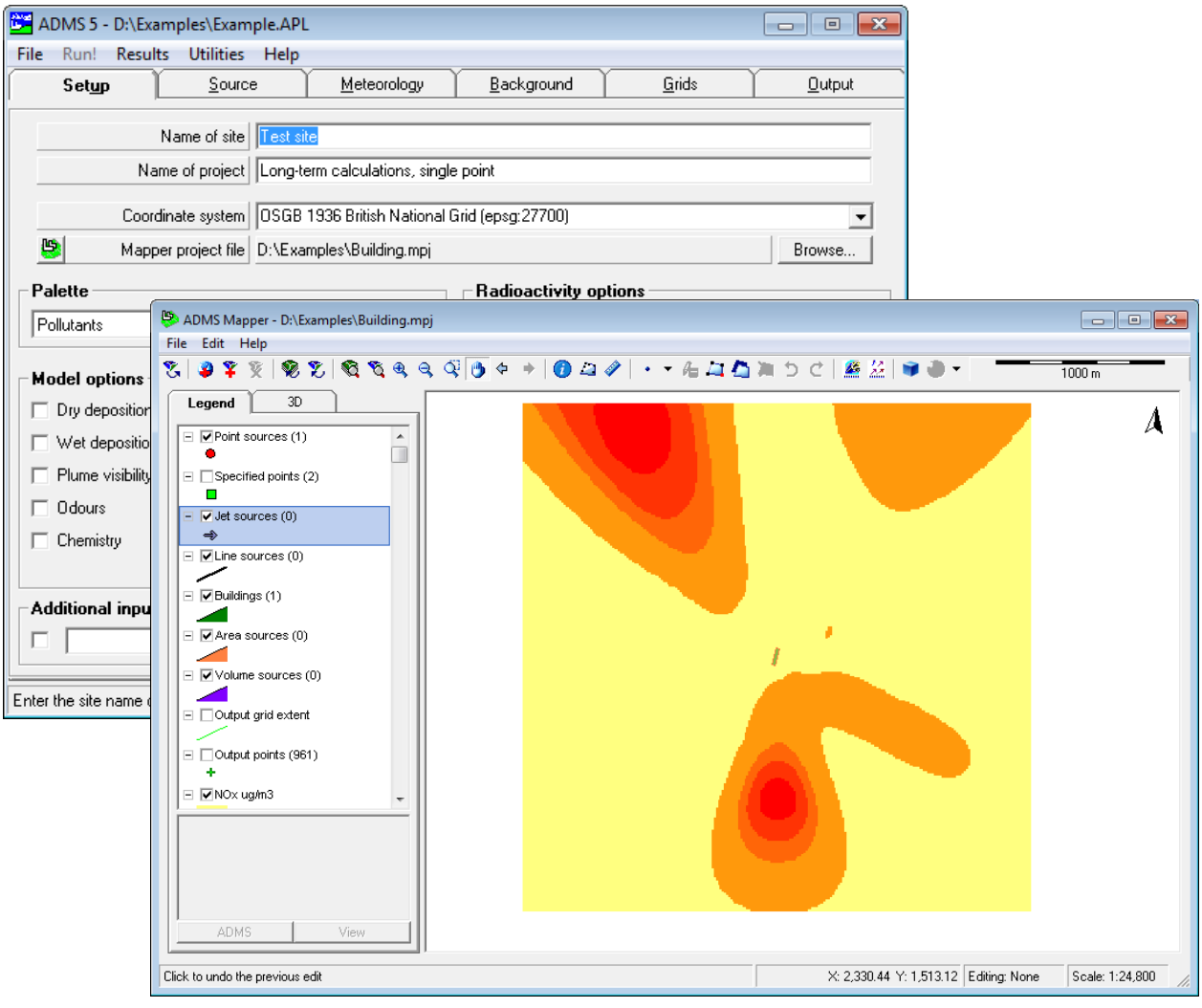
ADMS Mapper



User Guide CERC

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ADMS Mapper

User Guide

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Cambridge Environmental Research Consultants Ltd.
3, King's Parade
Cambridge
CB2 1SJ
UK

Telephone: +44 1223 357773
Facsimile: +44 1223 357492
Email: help@cerc.co.uk
Web site: http://www.cerc.co.uk

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SECTION 1 Introduction to the ADMS Mapper

1.1 Overview of the ADMS Mapper

The ADMS Mapper is a visualisation and editing tool common to a number of CERC models, which allows model features to be created, edited and displayed graphically. The features you see in the ADMS Mapper vary depending on which model it is being used with; for example, some are available across all models and some are specific to ADMS, ADMS-Screen, ADMS-Urban, ADMS-Roads or ADMS-Airport.

The ADMS Mapper can be used to create, edit and display the following model features:

- Point, jet, line, area, volume and road sources,
- Buildings,
- Specified point receptors,
- Output grids.

Additionally,

- Grid sources and aircraft sources can be displayed,
- Specified points given in an **.asp* file can be displayed,
- Terrain and roughness files can be visualised,
- A background map can be added to the ADMS Mapper to assist in locating features,
- Model output can be displayed in the ADMS Mapper as contour or vector plots by using the 2D output plotter,
- A 3D visualisation of the features can be made.

Instructions on how to launch the ADMS Mapper are in Section 1.2.

Figure 1 shows the ADMS Mapper with the main features labelled. The menu options available from the menu are described in Section 1.3, the key interactions available are discussed in Section 1.4 and the toolbar buttons in Section 1.5. The remaining parts of the ADMS Mapper, the layer panel and the map view window, are discussed in Sections 1.7 and 1.8 respectively. Instructions on how to set the coordinate system in the ADMS Mapper are given in Section 1.9.

Following this introduction, Section 2 describes how to set up and save an ADMS Mapper project file and edit features of the ADMS input using the ADMS Mapper; Section 3 explains how to view model results in the ADMS Mapper; Section 4 describes how to modify the appearance of a layer; finally Section 5 deals with additional items such as importing background images, visualising input in 3D and exporting to Google Earth, together with other advanced features.

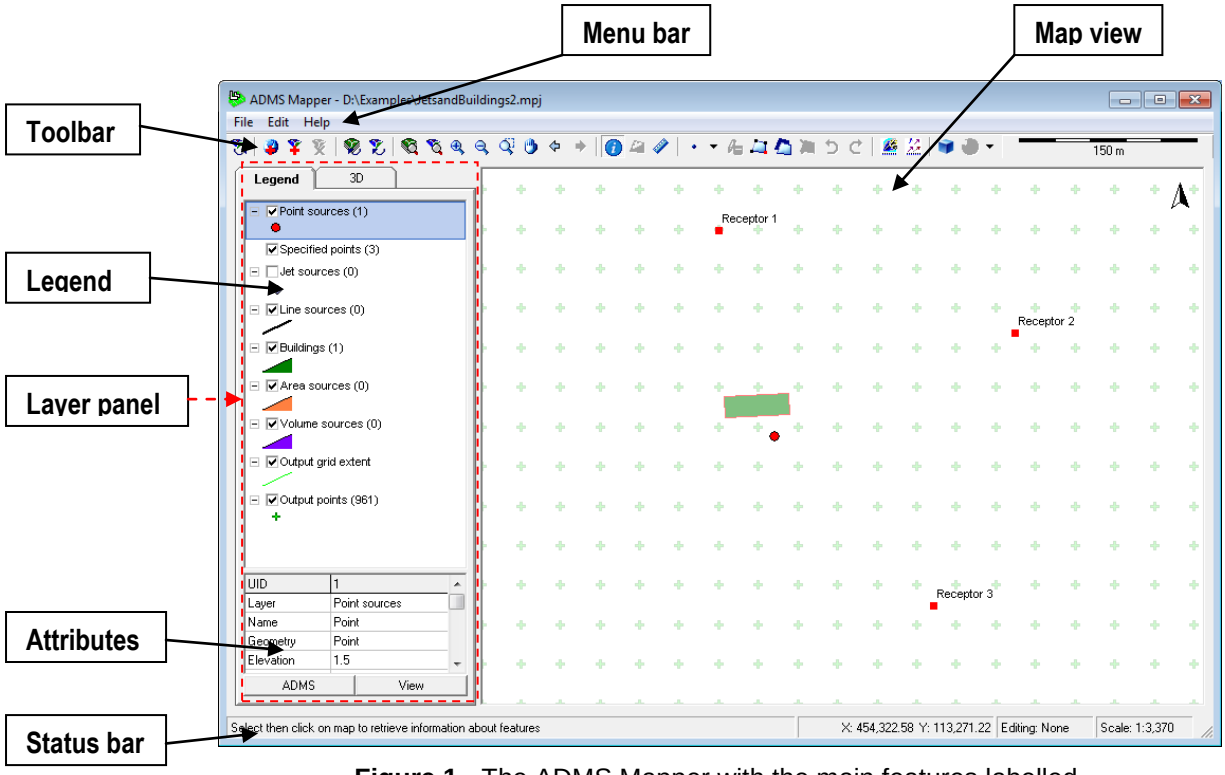


Figure 1 - The ADMS Mapper with the main features labelled.

1.2 Launching the ADMS Mapper

To launch the ADMS Mapper from the ADMS model interface, select the **Open Mapper** option on the **Utilities** menu or click on the  button on the **Setup** screen.

1.3 Menu options

There are two main menus: **File** and **Edit**. The **File** menu includes options to save, open and close a project: to add, remove and export layers; to save layer settings or restore the factory settings; to edit preferences for viewing and gridding options; to generate a print preview of the map; and to exit the ADMS Mapper. The **Edit** menu allows copying of images to the clipboard and allows any changes made to the **Sources**, **Buildings** and **Specified points** layers to be saved to the model. There is an option to extract data from raster layers. Finally, it also allows you to define whether the coordinates are part of a known projected or geographic system, e.g. Ordnance Survey OSGB coordinates, via the **Set map coordinate system** option – this is described further in Section 1.9. Additionally there is a **Help** menu. The menu options available are outlined in **Table 1**.

Menu	Option		Use
File	**New Project**		Opens a new project.
	Open project…		Open a previously saved project file.
	Save project		Save the current project under the current file name.
	Save project as…		Save the current project with a user-specified file name.
	Add layer		Allows a layer to be added, e.g. a background map.
	Add WMS layer		Allows you to add a URL for a WMS layer
	Remove layer		Removes the selected layer from the map view.
	Export layer…		Allows the selected layer to be exported to file in a choice of formats.
	Save all layer settings		Saves the current appearance of the layers (colour, symbol etc.) as the default appearance.
	Restore factory settings		Restores the default appearance of the ADMS layers.
	Preferences	**Snap to shape**	Option to snap to nearby shapes when adding and editing vertices.
		Display north arrow	Option to show/hide the north arrow.
		Gridding option	Allows selection of gridding method.
	Print...		Brings up a print preview showing a printable version of the map.
	Close		Closes the ADMS Mapper.
Edit	**Save edits**		Saves the edits made to the model.
	Copy map to clipboard		Copies the current view in the map window to the clipboard.
	Copy legend to clipboard		Copies the **Legend** tab layer panel to the clipboard.
	Copy scalebar to clipboard		Copies the scalebar to the clipboard.
	Extract all data from raster layers		Converts entire raster layers to comma delimited file format.
	Use the ADMS coordinate system		Sets the coordinate system used in the ADMS Mapper to the same as that defined in the ADMS interface.
	Set map coordinate system		This allows you to set the coordinate system to a projected or a geographic system, or to turn off the coordinate system.
Help	**User guide**		Opens the ADMS Mapper User Guide.
	About ADMS Mapper		Displays information about the ADMS Mapper, e.g. version number and CERC contact details.

Table 1 - Menu options in the ADMS Mapper.

1.4 Keyboard & mouse interactions

There are several keyboard interactions for functions in the ADMS Mapper, as listed in **Table 2**.

Action	Function
Legend	
Delete	Pressing the delete key while a user layer is selected in the legend will delete that layer.
Pan and zoom	
Shift – Mouse click	Holding down the shift key temporarily changes the mouse interaction with the map to pan, allowing you to move the map view.
Mouse wheel	Rolling the mouse wheel back and forth zooms the map view out and in
Ctrl – Mouse click	When in zoom mode, holding down the control key whilst using the mouse to zoom by click-and-drag will interactively scale the map image to indicate the amount of zoom (in or out) that will be applied when you release the mouse.
Editing	
Delete	Deletes the currently selected shape
Escape	Cancels/reverts current edits/changes
Enter	Completes current edits and deselects the shape, but doesn't save edits to the ADMS interface
Double click	

Table 2 – Key interactions in the ADMS Mapper.

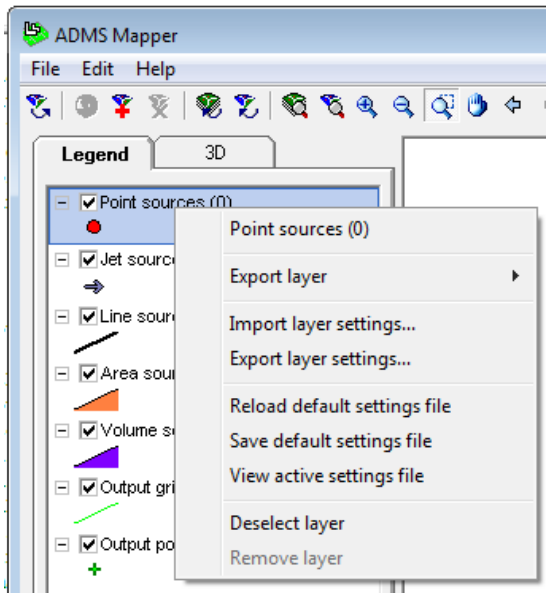
Note that the pan and zoom functions can be used whilst editing a feature. This is useful, for example, if you are drawing a source which covers a large distance such as a road.

1.5 Pop-up menus

You will find context-sensitive pop-up menus when you use the mouse to right-click in the ADMS Mapper. These give quick access to relevant actions while you are working with the ADMS Mapper.

1.5.1 The legend context menu

When you select a layer in the Legend and right-click with the mouse, the following context menu will appear. The menu is context-sensitive and only the menu options that apply will be enabled.

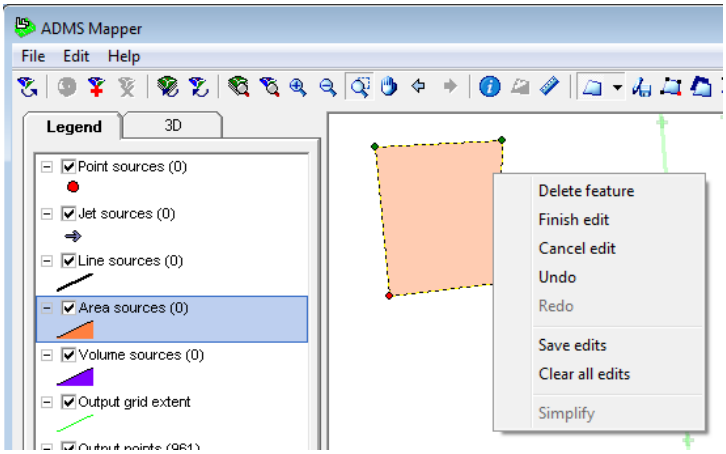


The details of these actions can be found in the relevant sections of this document.

Menu option	Use
[Layer name]	Opens the layer properties dialog. See Section 4 and Section 5
Export layer	Quick access to common file export options such as Google Earth and ESRI Shape. See Section 5.12.
Import layer settings…	Changes the appearance of the layer. See Section 4.8.
Export layer settings…	Saves the layer settings to file for re-use later. See Section 4.8.
Reload default settings file	Resets the appearance of the layer. See Section 4.8.
Save default settings file	Saves the layer settings as the defaults so they will automatically be used the next time you open the ADMS Mapper. See Section 4.8.
View active settings file	Opens the current layer settings file in a text editor.
Deselect layer	Deselects the currently selected layer in the legend
Remove layer	Removes the selected layer from the legend and map view. This is only available for user layers. See Section 1.7.1.

1.5.2 The add/edit context menu

When adding or editing features in the map view you can display a pop-up menu specifically dealing with different edit options when you right-click on the map or an edited feature.



The details of these actions can be found in the relevant sections of this document.

Menu option	Use
Delete feature	Delete the selected feature from the current layer. See Section 2.3.5
Finish edit	Finish editing the currently selected feature without saving all edits. See Section 2.3.2
Cancel edit	Cancel the edits to the currently selected and deselect it.
Undo	Undo the edits to the currently selected feature without deselecting it.
Redo	Redo the edits that have just been undone.
Save edits	Save the edits made during the current editing session to the model.
Clear all edits	Clear all edits made during the current editing session
Simplify	Simplify the geometry of the current feature if possible

1.6 Toolbar buttons

The toolbar contains buttons that allow layers, features in the ADMS layers, and the map view to be edited, as well as providing access to the 2D output plotter. The purpose of each of the buttons is summarised in **Table 3** and **Table 4**. The remaining sections then illustrate how these are used to view, create and edit data.

As the cursor is moved across the toolbar, explanations appear in the status bar at the bottom of the ADMS Mapper window explaining the function of each button. When using a tool that requires the user to specify a location in the map view window, the appearance of the cursor will change.

Button	Name	Cursor	Function
	**Export layer**	N/A	Export the current layer to a file.
	**Add background map**	N/A	Adds a background map to the map view window.
	**Add layer**	N/A	Add a new layer from a file.
	**Remove layer**	N/A	Remove the selected layer from the layer panel and map view. This is only available for user created layers.
	**Refresh layers**	N/A	Obtain the latest data from the model for all the layers and update the map view.
	**Refresh layer**	N/A	Obtain the latest data from the model for the selected layer and updates the map view.
	**Zoom to layers**	N/A	Set the map view to show all the data in all the layers.
	**Zoom to layer**	N/A	Set the map view to the extent of the selected layer.
	**Zoom in**	N/A	Zoom in.
	**Zoom out**	N/A	Zoom out.
	**Zoom**		Zoom to display an area defined by clicking with the mouse on the map and dragging the cursor. A single left-click of the mouse on the map will make a fixed zoom in at the point clicked. A right-click will make a fixed zoom out.
	**Pan**		Move the map view without altering the scale.
	**Previous extent**	N/A	Return to the previously displayed extent in the map view.
	**Next extent**	N/A	Go to the next extent in the map view window.
	**Information**		View information about a model feature in the map view window.
	**Extract data from raster layers**		Converts raster data to comma delimited file format.
	**Measure**		Measure the distance between two or more points in the map view window.
	**Add feature**		Add a feature to the selected layer, e.g. a point, a polygon etc.
	**Save edits**	N/A	Save the edits made during the current editing session to the model.
	**Edit feature**		Edit the geometry of a feature in the selected layer.
	**Shift feature**		Move a feature in the selected layer.
	**Delete feature**	N/A	Delete the selected feature.
	**Undo**	N/A	Undo the current changes while editing.
	**Redo**	N/A	Redo the last Undo.
	**Contours**	N/A	Launch the Output Plotter for concentration plots.
	**Flow field**	N/A	Launch the Output Plotter for flow field plots.
	**Change view**	N/A	Toggle the map view between 2D and 3D mode. The icon changes depending on the map mode. When viewing in 3D mode additional buttons are available as shown in **Table 4**.

Table 3 - ADMS Mapper toolbar buttons

Button	Name	Cursor	Function
	**Camera position**		Changes the camera pan mode so that the camera position is changed by yaw and pitch rotations. Use the drop down arrow to change the mode.
	**Camera XYZ**		Changes the camera pan mode so that the camera position is changed by vertical translations and left-to-right horizontal translations.
	**Camera XY**		Changes the camera pan mode so that the camera position is changed by left-to-right and forward-and-backward translations in the horizontal plane.
	**Camera rotation**		Changes the camera pan mode so that the camera position is changed by point-of-view rotation.
	**Sun position**		Changes the light and shade of the display.
	**Zoom**		Zoom in and out.

Table 4 - ADMS Mapper toolbar buttons for 3D display

The **Add Feature** button will change appearance depending on the layer currently selected. For the **Buildings** layer, the appearance of the **Add Feature** button depends on the shape of the building to be added; this can be changed using the drop down arrow to the right of the button. Some of the buttons are only available under certain conditions; for instance, the **Add Feature**, **Edit Feature** and **Shift Feature** buttons are only available if the current selected layer can be edited from within the ADMS Mapper. If a button is not currently available it will be greyed out.

1.7 The layer panel

There are two tabs in the layer panel: **Legend** and **3D**. The former shows the ADMS data layers and a feature attributes table, and the latter shows the additional options for visualising in 3D. The 3D manipulation is described in Section 5.9 and the **Legend** is described next.

1.7.1 The Legend

The **Legend** shows the ADMS data layers along with any user defined layers, such as contour plots or background images. The layers that are present when the parent interface and ADMS Mapper are first launched are referred to as ADMS layers. These layers contain all the sources, buildings, and output locations for the **.apl* or **.upl* file currently open in the model interface. Unlike user layers, you will not be able to delete these layers directly from the ADMS Mapper legend. To update the display to reflect any changes that have been made in the model interface, e.g. through opening a new **.apl* or **.upl* file, or adding a new source, click on the **Refresh All Layers** button on the toolbar. 

For each of the ADMS layers that can contain multiple features the **Legend** shows the name of the layer, the number of features in that layer (e.g. the number of point sources) and the symbol used to represent that layer. Details of how you can change the symbology and other layer options are given in Section 3.2. The **Output grid extent** layer only shows the name of the layer and the symbol used to represent the layer.

*The number displayed in the **Legend** provides a handy count of the number of sources of each type that have been entered into the interface.*

User defined layers can be contours generated using the **Concentration** button , vector or flow field plots generated using the **Flowfield** button , or web map services (WMS), background images and data layers added using the **Add Layer** button . Any user defined layers can be removed by first selecting the layer and then clicking on the **Remove Layer** button ; alternatively they can be removed by selecting the layer in the layer panel, right-clicking on the layer and selecting **Remove layer** from the pop-up menu, or simply hitting the delete key on the keyboard. Details about creating contour layers can be found in Section 3 and instructions for adding a background map as a layer can be found in Section 5.2.

1.7.2 Attributes table

An **Attributes** table is displayed beneath the layer panel. The **Attributes** table is populated when you select the **Information** tool and click on a feature; refer to Section 5.5 for full details. The splitting and the sizes of the attributes table and layer panel can be adjusted by dragging the horizontal divider. Similarly, the vertical divider between the layer panel and the map view window can be adjusted.

1.7.3 Showing and hiding layers

If a layer is visible then the data contained in that layer are shown in the map view window. A layer can be hidden by unchecking the checkbox next to the layer name. To make the layer visible again recheck the checkbox.

1.7.4 Reordering layers

The ordering of the layers in the **Legend** determines the order in which they are shown in the map view window. Features from layers at the top of the **Legend** are shown on top of features from layers further down and thus may hide them from view. To reorder the layers within the **Legend** click on the layer you wish to move, holding down the mouse button move it to its new position, and then release the mouse button. The symbol used to represent a layer can be made partially transparent to allow features in layers below them to be seen. See Section 3.3 for more details on making layers transparent.

1.8 The map view window

The map view window is where the data from the current visible layers are shown. Both the ADMS and user-defined layers are shown in this window. The scale of the map view window is given as a scalebar on the toolbar and as a numerical scale on the right hand side of the status bar. The position of the cursor in the map view window is given in the status bar.

The scale and extent of the map view window is controlled by various toolbar buttons:

- To zoom and centre the window on the features of all the (unhidden) layers click on the **Zoom To Layers** button on the toolbar. 
- To zoom and centre the window on the features of the currently selected layer click on the **Zoom To Layer** button on the toolbar. 
- To zoom in to a central point in the map view window click on the **Zoom In** button on the toolbar. 
- To zoom out from a central point on the map view window click on the **Zoom Out** button on the toolbar. 
- To view a selected region in the map view window click on the **Zoom** button on the toolbar. 

  Click in the top left corner of the region you want to view, and while holding down the mouse button drag the cursor to the bottom right corner of the region you want to view, then release the mouse button to set the extent of the map view window.

- To move the view in the map view window without altering the scale click on the **Pan** button on the toolbar. 

  Then click and drag the mouse in the map view window to move the view.

- To return to a previous viewing extent in the map view window click on the **Previous Extent** button on the toolbar. 
- To go to the next viewing extent in the map view window click on the **Next Extent** button on the toolbar . This option is only available after the **Previous Extent** button has been used.

1.9 Coordinate systems

There is an option to set the coordinate system within the ADMS Mapper. The choice of the coordinate system affects the way the ADMS layers are shown in the ADMS Mapper map view window. Note that the coordinate system must be selected before certain features of the ADMS Mapper can be used; for example, before exporting ADMS Mapper files to **.kml* files for use in Google Earth.

Coordinate systems can also be defined separately for each layer. This is necessary to ensure that additional features, such as background maps, use the correct coordinate system for the data they are displaying. Typically you would set the map coordinate system to match that used by the parent interface. However, if you have a lot of data in a user layer with a different coordinate system, you might choose that for the map to avoid CPU-intensive re-projection of the data as you move about in the map view. The coordinate system for the ADMS layers should not be changed in the ADMS Mapper – this is set for all ADMS layers in the model interface; see the relevant model User Guide for more details.

Full details of how to set the coordinate system are given in Section 5.1.

SECTION 2 Using the ADMS Mapper

This section outlines how to use the ADMS Mapper to view, create and modify the geometry of the model data. The model data that can be manipulated with the ADMS Mapper varies depending on which model it is being used with, but include sources, buildings, specified output points, output grids and terrain and roughness files.

2.1 ADMS Mapper projects

ADMS Mapper projects are a convenient way to manage files and data you wish to view in the Mapper that are associated with a given task. Any data added to the ADMS Mapper project, such as a background map or contour plot, will remain in the project after saving. The project will also remember any custom settings for the ADMS layers that you may have configured. The file name extension of an ADMS Mapper project file is **.mpj*.

To save the current ADMS Mapper project, select the **Save project** command from the **File** menu, or, to save the current project under a new name, select **Save project as**... from the **File** menu. Once the project has been saved, the filename will appear in the form title at the top of the Mapper. When using the Mapper with a compatible model, for example ADMS, the project will also be entered into the **Mapper project file** panel on the **Setup** screen of the ADMS interface. In this way you can associate **.apl* files with a project so that all your added data is loaded automatically when you start the ADMS Mapper.

Note that the project file has a required associated file with the file extension *.ttkgp. *If the ADMS Mapper project is moved to a different directory after it has been created, the associated* *.ttkgp *file must be moved with it.*

You can choose to open an ADMS Mapper project at any time, regardless of any **.apl* or **.upl* file you may have loaded in the parent interface. This will display all the user layers referenced by the project, and also apply the project configuration to the ADMS layers. It also reassigns the Mapper project file in the parent (e.g. ADMS) interface.

To close the ADMS Mapper project, select the **New** command from the **File** menu, the current project will then close, clearing all the user layers and project configuration settings, and leaving only the ADMS data displayed in the ADMS Mapper using the default layer configurations.

To view existing data from an **.apl* or **.upl* file refer to Section 2.2; or to add, modify the geometry of, move, or delete a feature refer to the instructions in Sections 2.3 to 2.8.

2.2 Viewing existing data

To view existing sources, buildings, specified output points, the output grid and output points, first open the **.apl* or **.upl* file in the model interface. Then return to the ADMS Mapper and click on the **Refresh Layers** button  on the toolbar. Some layers will only appear in the ADMS Mapper once they have been selected for modelling in the parent interface. This can include buildings, specified output points, the output grid, complex terrain and surface roughness options. For details of how to set these options see the model user guide.

2.3 General source editing

This section covers how to add, move or delete sources using the ADMS Mapper. To follow these instructions, make sure you already have the **.apl* or **.upl* file which is to be edited open in the model interface, i.e. the file to which you wish to add, move or delete sources. Also make sure that the ADMS Mapper is open.

2.3.1 Adding a source

Step 1 Select the appropriate layer in the **Legend** e.g. the **Point sources** layer, the **Area sources** layer etc.

Step 2 Click on the **Add Feature** button on the toolbar to select it. Note that the **Add feature** button changes appearance depending upon which type of source is being edited. For example the **Add feature** button for point sources uses a dot symbol, . For area and volume sources, click on the drop down arrow and select either **Polygon** or **Circle**.

Step 3 Click in the map view window at the location where you want the source to be placed. If you are adding a line source you will need to click at the location of either end of the line; remember a line source must have precisely two vertices in ADMS 5. If you are adding a polygonal area or volume source you will need to click in the map view window at each vertex location, and double click when placing the last vertex to finish defining the source. If you don't double click at the end of the drawing, you can still complete the edit by pressing enter on the keyboard or right-clicking with the mouse and choosing **Finish edit** from the pop-up menu. If you are adding a circular area or volume source, you will need to click in the map window on the location of the centre of the source, and while holding down the mouse button, move the cursor until the circle is of the required diameter before releasing the mouse button. This will create a polygon representation of the circle.

*When drawing road sources, for example, enable the **Snap to shape** option from the preferences in order to easily connect road ends of adjoining sources, or disable it for fine edits.*

Step 4 For non-point features such as area or volume sources, you will need to click on the **Save edits** button on the toolbar, , to complete all editing in the layer and commit the new features. Single vertex features such as point or jet sources are added instantly when you click on the map view using the mouse.

Step 5 A new source of the appropriate type is created and displayed in the **Source** screen of the model interface. The source coordinates have been filled in automatically but you will need to fill in the other parameters for the source. Refer to the model user guide for further details.

2.3.2 Editing a source

Follow these steps to edit an existing source from within the ADMS Mapper.

Step 1 Select the appropriate layer in the **Legend** e.g. the **Area sources** layer.

Step 2 Click on the **Edit Feature** button on the toolbar to select it.

Step 3 Select the source you want to edit by clicking on it.

Step 4 If you are editing a source with multiple vertices (e.g. area source) and wish to add a new vertex, click on the vertex nearest to the desired location of the new vertex, and then click on that location. To move a vertex, click and drag that vertex to the new location before releasing the mouse button. To delete a vertex, click on the vertex you wish to delete in order to select it, and then click on that vertex again.

For multiple vertex sources, the modified shape of the selected source will appear as a dashed line during editing. The vertices of all the sources of the selected type will appear as coloured dots. The vertices of the selected source will be green with the current selected vertex red. The vertices of the other sources of this type will be yellow.

Step 5 If you want to edit other sources in the same layer without saving all edits, you can complete the current edit by pressing enter on the keyboard or right-clicking with the mouse and choosing **Finish edit** from the pop-up menu. You can now select another source to edit as in Step 3.

Step 6 Click on the **Save Edits** button on the toolbar to save the changes to the model. Alternatively right click the mouse to bring up a pop-up menu and select the **Save edits** option.

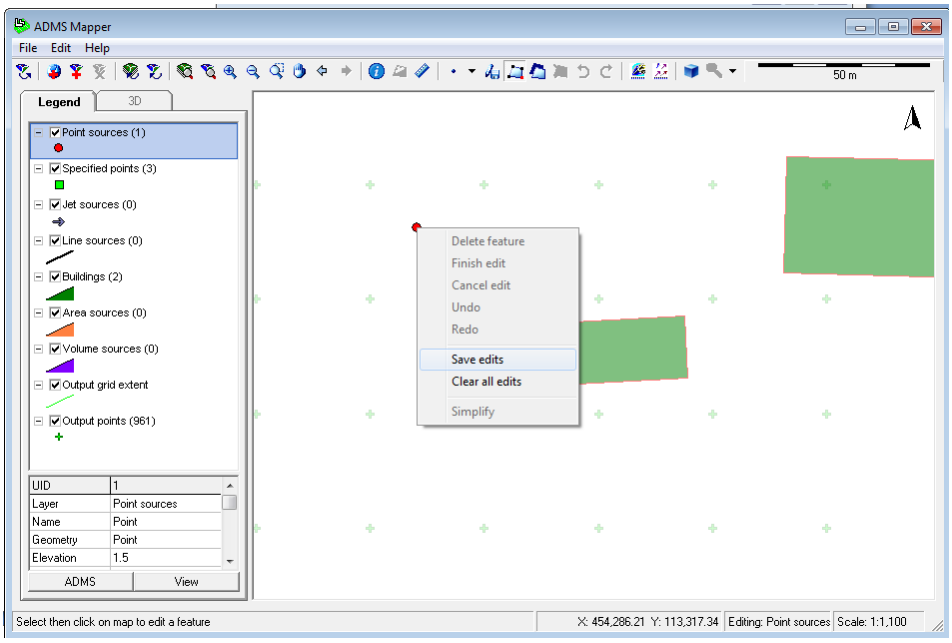


Figure 2 – Pop-up menu showing editing options.

2.3.3 Simplifying source geometry

When you are editing a source with multiple vertices (e.g. a road source) you can use the **Simplify** option from the right-click pop-up menu in **Figure 2** to reduce the number of vertices. This will remove as many vertices as possible while preserving the approximate shape of the original source. **Simplify** uses the Douglas-Peucker vertex removal algorithm with a tolerance of 1 m to systematically remove vertices and simplify the polyline or polygon.

2.3.4 Moving a source

Follow these steps to change the location of an existing source from within the ADMS Mapper.

Step 1 Select the appropriate layer in the **Legend** e.g. the **Point sources** layer.

Step 2 Click on the **Shift Feature** button on the toolbar to select it. 

Step 3 Click on the appropriate source, and while holding down the mouse button move the cursor to the new location for the source before releasing the mouse button.

Step 4 Click on the **Save Edits** button on the toolbar to save the changes to the model.. Alternatively right click the mouse to bring up a pop-up menu and select the **Save edits** option.

2.3.5 Deleting a source

Follow these steps to delete an existing source from within the ADMS Mapper.

Step 1 Select the appropriate layer in the **Legend** e.g. the **Point Source** layer.

Step 2 Click on the **Edit Feature** button on the toolbar to select it.

Step 3 Select the source you want to delete by clicking on it in the map view window. For point or jet sources, the selected source will have a red dot on it; all of the other sources in that layer will have yellow dots.

Step 4 Click on the **Delete Feature** button on the toolbar. . Or press the `Delete` key on your keyboard.

Step 5 Click on the **Save Edits** button on the toolbar to save the changes to the model. . Alternatively right click the mouse to bring up a pop-up menu and select the **Save edits** option.

Step 6 Repeat this process to delete further sources.

2.4 Grid sources and aircraft sources

Grid sources and aircraft sources can be displayed in the ADMS Mapper, but they can only be added, edited or deleted in the model interface.

To view a grid or aircraft source add the source in the model interface following the instructions in the ADMS-Urban or ADMS-Airport User Guide. In the ADMS Mapper click on the **Refresh Layers** button. The sources will now be displayed.

2.5 Buildings

This section outlines how to add, move, edit or delete buildings using the ADMS Mapper. To follow these instructions, make sure you already have open in the model interface the **.apl* or **.upl* file to which buildings are to be added, edited or deleted. Make sure that the ADMS Mapper is also open. Also make sure that the **Buildings** option is selected in the **Setup** screen of the model interface.

Rectangular buildings must consist of 4 vertices and be rectangular in shape. If the shape entered is not rectangular but is convex and has 4 vertices then the ADMS Mapper will convert the shape to be rectangular.

The main building will be shown with a red outline. See the relevant model User Guide for more details about setting the main building.

2.5.1 Adding a rectangular building

Step 1 Select the **Buildings** layer from the **Legend**.

Step 2 Use the drop down arrow on the **Add Feature** button on the toolbar to select **Polygon** and then click on this button to select it.

Step 3 Click in the map view window on the locations of the four vertices of the building in order, either clockwise or anticlockwise. Double click when placing the last vertex to finish defining the building.

Step 4 A new building will have been created and is displayed in the **Buildings** screen in the model interface. Enter the rest of the parameters for this building and then exit the **Buildings** screen. See the model user guide for more details.

Step 5 Repeat this process to add further rectangular buildings.

2.5.2 Adding a circular building

Step 1 Select the **Buildings** layer from the **Legend**.

Step 2 Use the drop down arrow on the **Add Feature** button on the toolbar to select **Circle** then click on the button to select it.

Step 3 Click in the map view window on the location of the centre of the building, holding down the mouse button move the cursor until the circle is of the appropriate diameter and then release the mouse button.

Step 4 A new building will have been created and is displayed in the **Buildings** screen in the model interface. Enter the rest of the parameters for this building and then exit the **Buildings** screen. See the model user guide for more details.

Step 5 Repeat this process to add further circular buildings.

2.5.3 Editing a rectangular building

Step 1 Select the **Buildings** layer from the **Legend**.

Step 2 Click on the **Edit Feature** button on the toolbar to select it. 

Step 3 Select the rectangular building whose geometry you wish to alter in the map view window. The vertices of the selected building will appear as red or green dots and the vertices of the other buildings will appear as yellow dots.

Step 4 For each vertex you want to move, click on that vertex, and while holding down the mouse button, move the cursor to the new location of that vertex before releasing the mouse button.

Step 5 Click on the **Save Edits** button on the toolbar to finish editing this building and save the changes to the model. . Alternatively right click the mouse to bring up a pop-up menu and select the **Save edits** option.

Step 6 Repeat this process to edit the geometry of further rectangular buildings.

2.5.4 Editing a circular building

Step 1 Select the **Buildings** layer from the **Legend**.

Step 2 Click on the **Edit Feature** button on the toolbar to select it. 

Step 3 Select the circular building whose geometry you wish to alter in the map view window. The outline of the selected building will appear as a series of green or red dots, the other buildings will have yellow dots.

Step 4 Click in the map window on the location of the centre of the new location for the building, and while holding down the mouse button, move the cursor until the circle is of the required diameter before releasing the mouse button.

Step 5 Click on the **Save Edits** button on the toolbar to save the changes to the model. . Alternatively right click the mouse to bring up a pop-up menu and select the **Save edits** option.

Step 6 Repeat this process to edit the geometry of further circular buildings.

2.5.5 Moving a building

Follow these instructions to use the ADMS Mapper to change the location of an existing building, either rectangular or circular, without altering its shape.

Step 1 Select the **Buildings** layer in the **Legend**.

Step 2 Click on the **Shift Feature** button on the toolbar to select it. 

Step 3 Click on the building you wish to move, and while holding down the mouse button, move the cursor to the new location of this building before releasing the mouse button.

Step 4 Click on the **Save Edits** button on the toolbar to save the changes to the model. . Alternatively right click the mouse to bring up a pop-up menu and select the **Save edits** option.

Step 5 Repeat this process to move other buildings.

2.5.6 Deleting a building

Step 1 Select the **Buildings** layer in the **Legend**.

Step 2 Click on the **Edit Feature** button on the toolbar to select it. 

Step 3 Select the building you wish to delete by clicking on it in the map view window. The vertices of the selected building will appear as red or green dots and the vertices of the other buildings will appear as yellow dots.

Step 4 Click on the **Delete Feature** button on the toolbar, . Or press the **Delete** button on your keyboard.

Step 5 Click on the **Save Edits** button on the toolbar to save the changes to the model. . Alternatively right click the mouse to bring up a pop-up menu and select the **Save edits** option.

Step 6 Repeat this process to delete further buildings.

2.6 Specified output points

In this section we look at how to add, move or delete specified output points using the ADMS Mapper. To follow these instructions, make sure you already have open in the model interface the **.apl* or **.upl* file to which specified points are to be added, edited or deleted. Also make sure that the ADMS Mapper is open. Also ensure that the output type is set to either **Specified Points** or **Both** in the **Grids** screen of the model interface.

2.6.1 Adding an output point

Step 1 Select the **Specified Points** layer from the **Legend**.

Step 2 Click on the **Add Feature** button on the toolbar to select it.

Step 3 Click on the location in the map view window where you wish to place the specified output point.

Step 4 A new specified output point has been created and is displayed in the **Grids** screen of the model interface. The **X** and **Y** (or **R** and **Theta**) co-ordinates have been automatically entered but the rest of the parameters need to be filled in. See the model user guide for more details.

Step 5 Repeat this process to add further specified output points.

2.6.2 Moving an output point

Step 1 Select the **Specified Points** layer from the **Legend**.

Step 2 Click on the **Shift Feature** button on the toolbar to select it.

Step 3 Click on the specified output point you wish to move, and while holding down the mouse button, move the cursor to the new location for the specified output point before releasing the mouse button.

Step 4 Click on the **Save Edits** button on the toolbar to save the changes to the model. . Alternatively right click the mouse to bring up a pop-up menu and select the **Save edits** option.

Step 5 Repeat this process for all the specified output points you wish to move.

2.6.3 Deleting an output point

Step 1 Select the **Specified points** layer from the **Legend**.

Step 2 Click on the **Edit Feature** button on the toolbar to select it.

Step 3 Select the specified output point to delete by clicking on it in the map view window. The selected specified output point will have a red dot on it; all of the other specified output points will have yellow dots.

Step 4 Click on the **Delete Feature** button on the toolbar, , or press the Delete button on your keyboard.

Step 5 Click on the **Save Edits** button on the toolbar to save the changes to the model. . Alternatively right click the mouse to bring up a pop-up menu and select the **Save edits** option.

Step 6 Repeat this process to delete further specified output points.

2.6.4 Viewing points in an **.asp* file

If you wish to add a large number of specified points you can do this quickly by including an **.asp* file in the ADMS model interface to define their locations. Refer to your model user guide for instructions on how to do this. The locations of the specified points defined in the **.asp* file can be viewed in the ADMS Mapper by following these steps.

Step 1 Add the file path for the **.asp* file to the model interface, refer to the model user guide for instructions on how to do this.

Step 2 In the ADMS Mapper click on the **Refresh Layers** button. The specified points in the **.asp* file will now be displayed.

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*The specified points in the *.asp file cannot be edited or deleted using the ADMS Mapper; this can be done only by editing the *.asp file directly.*

*For very large *.asp files, only the first 500,000 points will be displayed.*[1]

*If polar coordinates are used then the points in the *.asp file cannot be displayed in the ADMS Mapper.*

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[1] The maximum number of data points shown in any layer can be edited manually in the Mapper settings file.

2.7 Output grids and output points

In this section we look at how to define a new output grid using the ADMS Mapper. To follow these instructions, make sure you already have open in the model interface the **.apl* or **.upl* file with the output grid you wish to redefine, and ensure that the ADMS Mapper is also open.

All types of grid and output points can be displayed in the ADMS Mapper, but only regular, Cartesian grids can be defined using the ADMS Mapper. Other types of grids must be defined in the ADMS interface. Therefore, if you wish to define the output grid with the tool in the ADMS Mapper, ensure that the output type is set to either **Gridded** or **Both**, the co-ordinate system is set to **Cartesian** and the output grid spacing set to **Regular** in the **Grids** screen of the model interface

You can only redefine an output grid; you cannot move, edit or delete an existing output grid.

2.7.1 Defining an output grid

Step 1 In the ADMS interface, ensure that the output type is set to either **Gridded** or **Both**, the co-ordinate system is set to **Cartesian** and the output grid spacing set to **Regular** in the **Grids**.

Step 2 Select the **Output Grid Extent** layer in the **Legend**.

Step 3 Click on the **Add Feature** button on the toolbar to select it. 

Step 4 Click on the location of one corner of the output grid in the map view window, and while holding down the mouse button, move the cursor to draw the output grid required before releasing the mouse button.

Step 5 A new output grid has been defined and is displayed in **Grids** screen of the model interface. The new extent of the grid will have been filled in automatically but if any other parameters need to be changed these must be altered from the interface. Refer to the model user guide for more details.

*Note that the grid point locations are shown in **Output Points** layer but they cannot be edited in the ADMS Mapper. The number of points in the grid is displayed in brackets.*

Any type of grid point can be displayed in the ADMS Mapper.

2.8 Terrain and roughness files

Any complex terrain or variable surface roughness that has been included in the model can be visualised in the ADMS Mapper. To view this data in the ADMS Mapper, first make sure that the complex terrain option has been selected in the model interface and that either the terrain file path (**.ter*) or the roughness file path (**.ruf*) has been selected and specified. Refer to the model user guide for further details on modelling and including complex terrain and variable roughness.

After the complex terrain file(s) have been included click on the **Refresh Layers** button  in the ADMS Mapper. A representation of the variable terrain or surface roughness, or both, will then be displayed in the map view window. Initially, the variable terrain or roughness layer is shown with a default colour scale and default number of height or roughness levels. These can be edited, see Section 4.6.

It is possible to view a 3D visualisation of the terrain and other input. Further details on this are given in Section 5.9.

Extremely large terrain and roughness files can be displayed in the ADMS Mapper, but only the first 500,000 points will be displayed. This limit can be changed in the Mapper settings file, or alternatively the terrain file can be converted to a grid instead, see Section 5.6 for more details.

SECTION 3 Viewing model results in the ADMS Mapper

Contour and vector plots of model output results can be created and viewed in the ADMS Mapper. The 2D output plotter can produce contour plots using the in-built interpolator, or using Golden Software's Surfer, if the user has this program installed. Section 3.1 describes how to plot model output. Section 3.2 describes how to plot flow field output. For details on changing the appearance of a contour layer once it has been produced refer to Section 4.5.

3.1 Contour plotting

Step 1 Use the **File** – **Preferences** – **Gridding option** menu to select the **Interpolator** or the **Surfer** option as desired and then click on the button. 

Step 2 The **2-D Output Plotter** screen will appear. The **Interpolator** mode is shown in **Figure 3**.

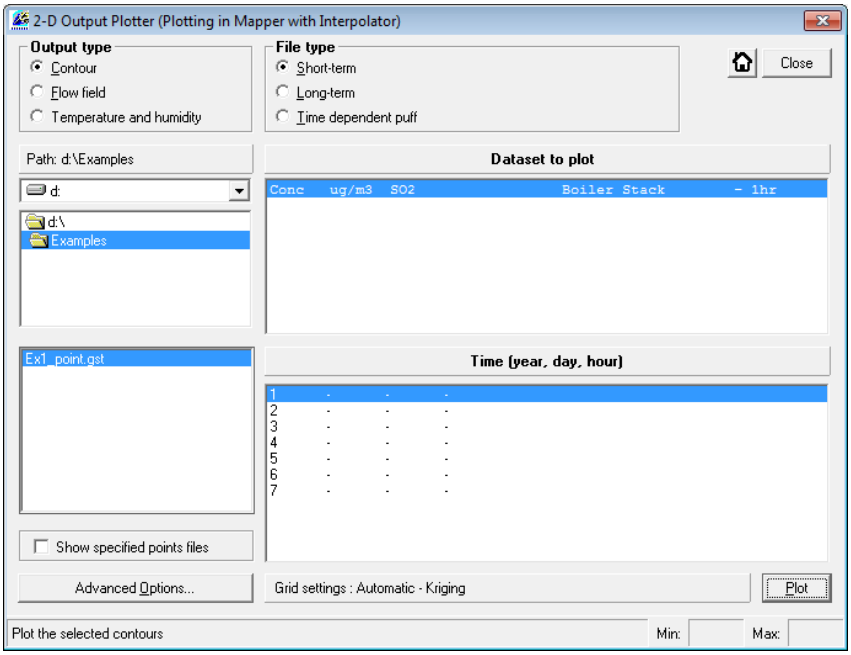


Figure 3 - The **2-D Output Plotter** with Interpolator screen.

Step 3 Select the averaging period (short *or* long term), the file containing the results, the **Dataset** and the **Time** (if required) to be plotted.

Step 4 If required, use the **Advanced Options...** button to change the number of grid lines or to specify user defined contour levels, as shown in **Figure 4**. The **Gridding method** can also be changed. The options available with the **Interpolator** option are **Kriging**, **Kriging (all points)** and **inverse distance weighting** (additional options are available with Surfer). The appearance of the output contours will depend on which of these has been chosen. **Kriging** is a suitable choice in most instances. Once advanced options have been selected, click

Close to return to the main contour plotter screen.

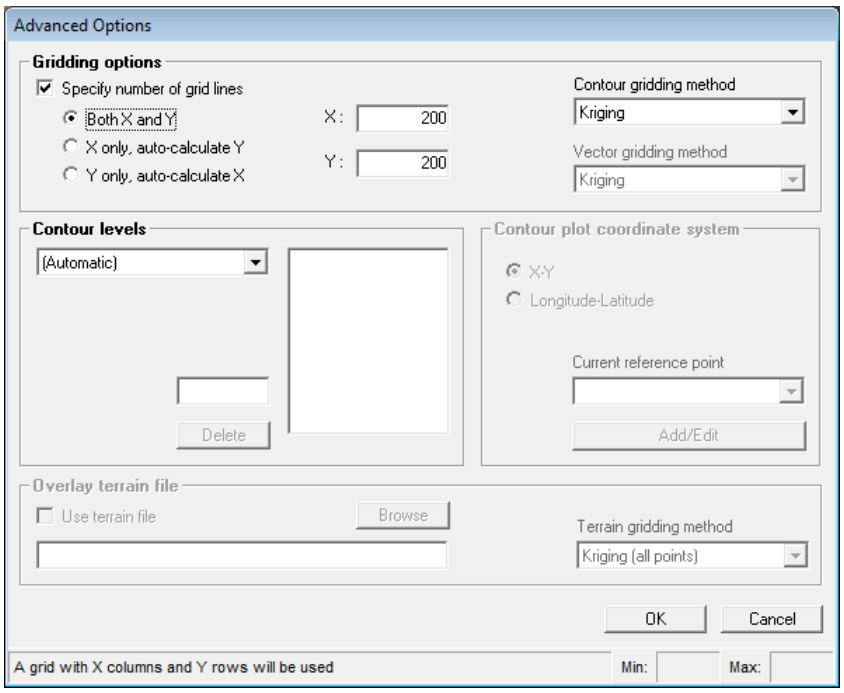


Figure 4 - The **Advanced Contour Options** screen for the ADMS Contour Plotter with Interpolator.

Step 5 Click on the **Plot** button.

Step 6 You are asked to enter a name for the grid file. After entering a file name click on the **Save** button.

Step 7 The contour plot will appear in the ADMS Mapper map view window.

Figure 5 shows an example of a contour plot in the ADMS Mapper.

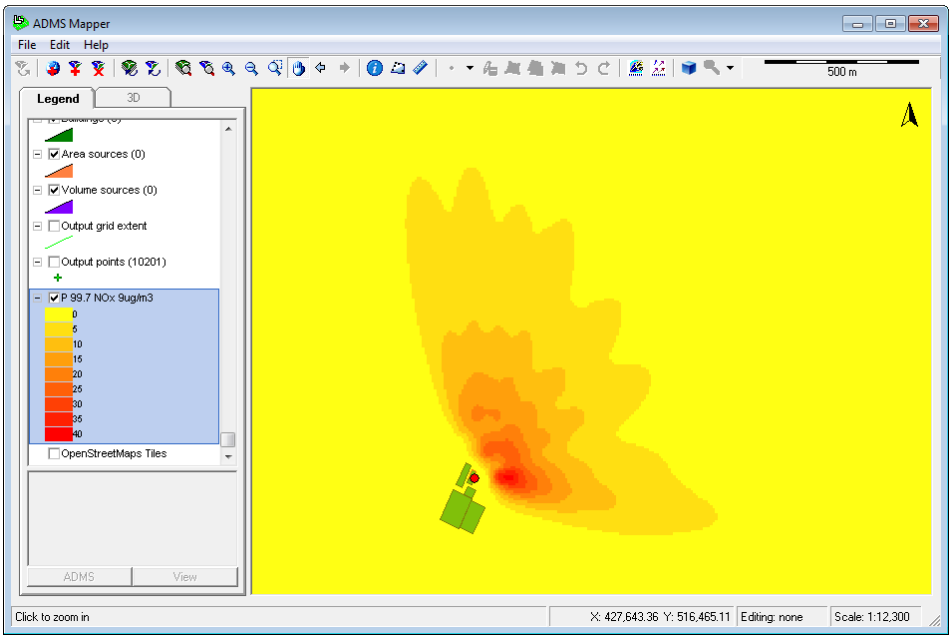


Figure 5 – Example contour plot.

3.2 Flow field plotting

Step 1 Use the **File** – **Preferences** – **Gridding** option menu to choose either the **Interpolator** or **Surfer** option. Click on the flow field button. The rest of this example assumes that the in-built interpolator has been selected.

Step 2 The **2D Output Plotter** screen will appear, as shown in **Figure 3**.

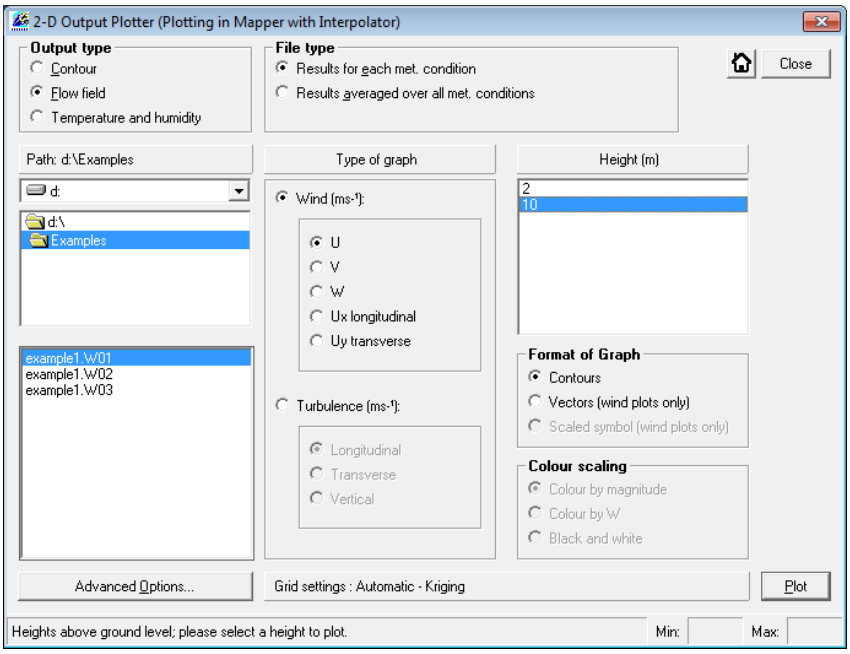


Figure 6 - The **2-D Output Plotter** with Interpolator screen.

Step 3 Select the averaging period (**Results for each met. condition** *or* **Results averaged over all met. conditions**), the file containing the results, the type of graph (**Wind** or **Turbulence**), the height for which the flow field is to be plotted and the format of the graph (**Contours** or **Vectors**). If contours are being plotted then you must select which component of the flow field or turbulence that you wish to plot.

Step 4 If required, use the **Advanced Options...** button to change the number of grid lines or to specify user defined contour levels, as shown in **Figure 4**. The **Gridding method** can also be changed. The options available are **Kriging** and **inverse distance weighting** and the appearance of the output contours will depend on which of these has been chosen. **Kriging** is a suitable choice in most instances. Once advanced options have been selected, click **OK** to return to the main contour plotter screen.

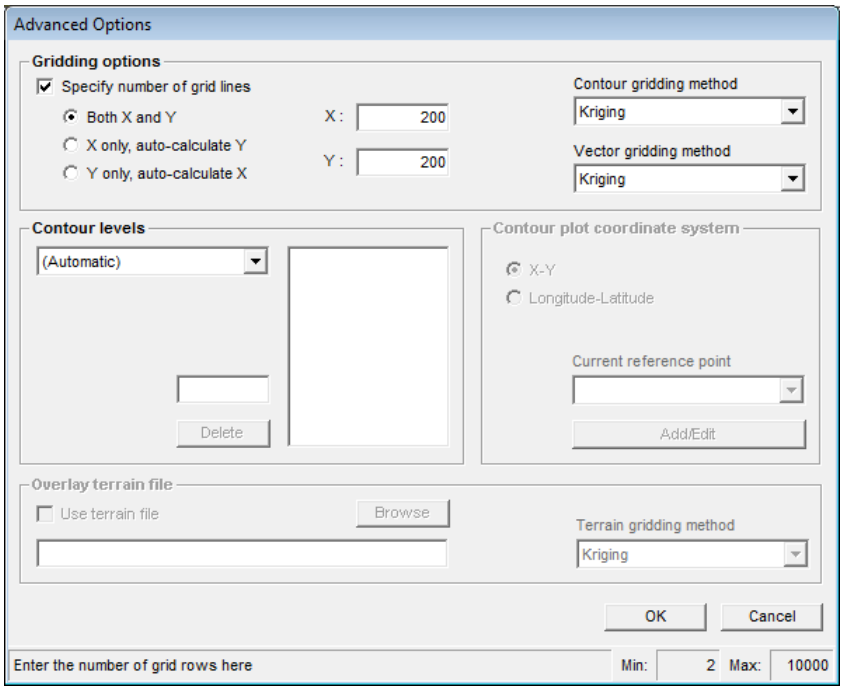


Figure 7 - The **Advanced Contour Options** screen for the ADMS Contour Plotter with Interpolator.

Step 5 Click on the **Plot** button.

Step 6 You are asked to enter a name for an intermediate file. After entering a file name click on the **Save** button.

Step 7 The plot will appear in the ADMS Mapper map view window.

Figure 8 shows an example of a flow field vector plot in the ADMS Mapper.

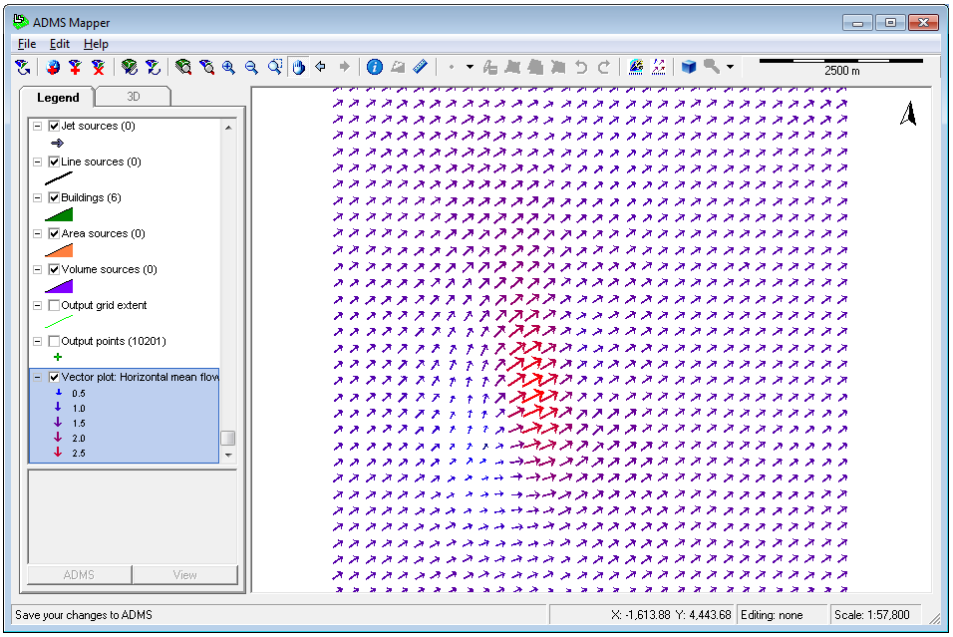


Figure 8 – Example vector flow field plot.

3.3 Viewing numerical results

After an ADMS model run numerical results are written to **.gst*, **.glt*, **.pst*, or **.plt* files (see the relevant model user guide for further details). The data in these files can be displayed as a new layer in the ADMS Mapper. The example below is for a **.gst* file, but the method is similar for the other file types.

Any data file that is in comma-separated format can be displayed as a layer in the ADMS Mapper provided it has some spatial information to place the data on the map. See Section 5.5 for more details about this feature.

Step 1 Click on the Add Layer tool. A new window will appear as shown in **Figure 9**.

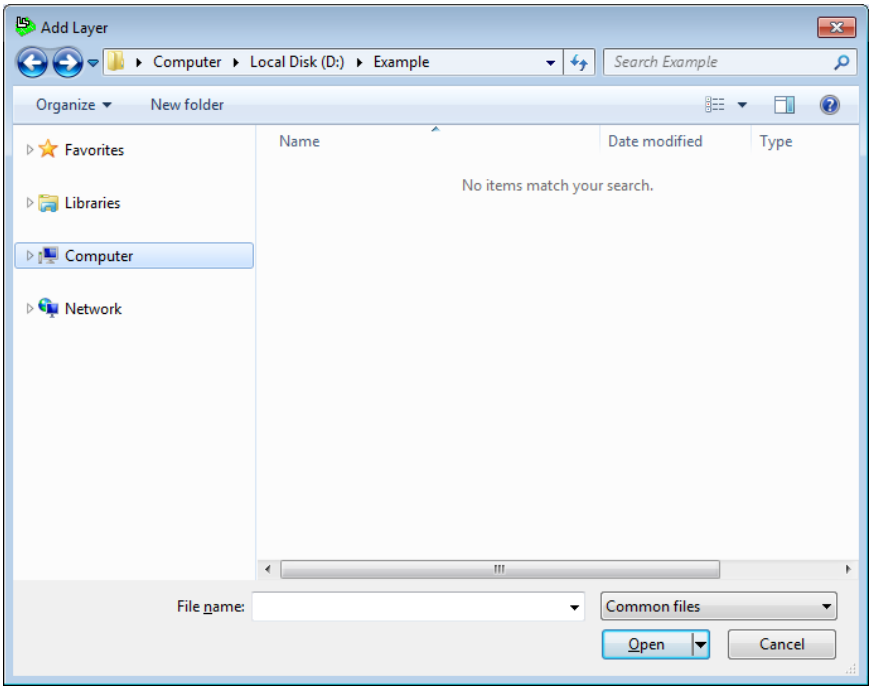


Figure 9 – Add Layer window.

Step 2 Change the file type from **Common files** to **All Files (*.*)**.

Step 3 Navigate to the **.gst* file you wish to view and click Open. A new window will appear as shown in **Figure 10**.

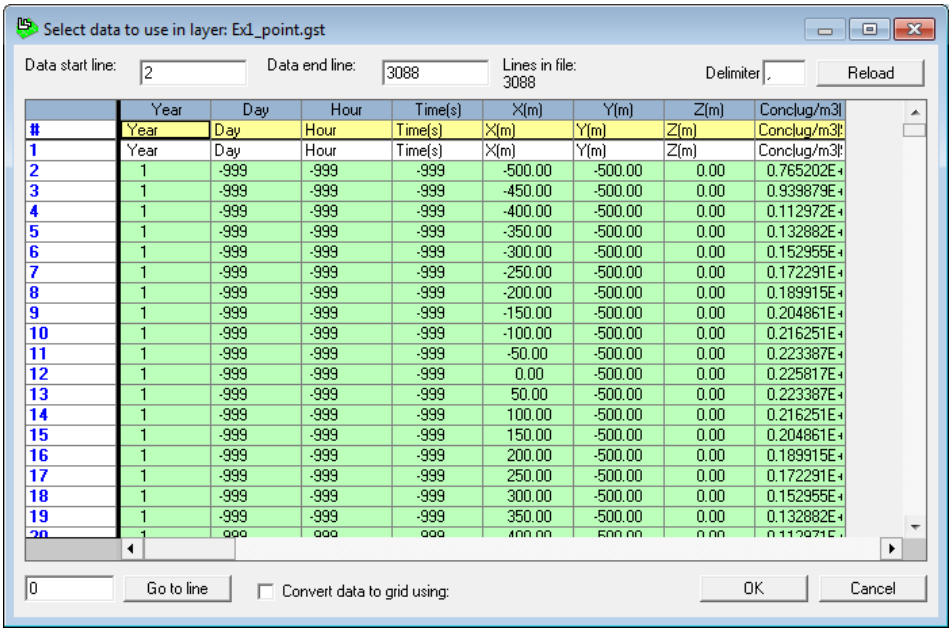


Figure 10 – Data from **.gst* file

Step 4 This window can be used to select which data you wish to display in the ADMS Mapper. By default all of the data is selected. To change the selection first scroll to the desired start line of data and right click on the index (the number in blue) for that line. When the menu appears select **Set as first data line**. An example is shown in **Figure 11** for which the data for hour 4 is being selected for display in the ADMS Mapper. After it is selected that line will be highlighted in green.

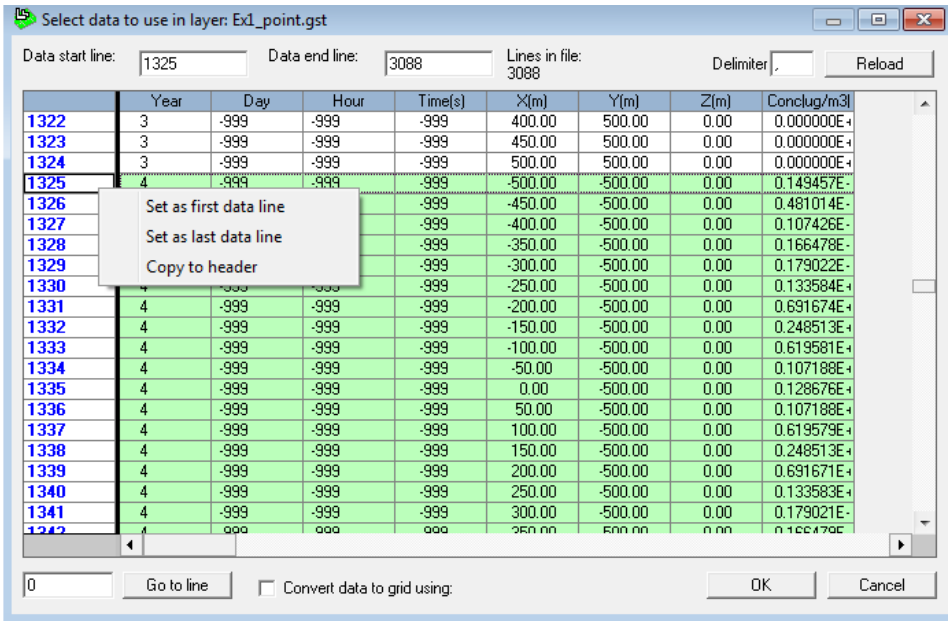


Figure 11 – Setting the first data line

Step 5 Similarly, to set the last data line scroll to the desired line, right click on the index, and click in **Set as last data line**. The selected line will be highlighted in red.

The information at the top of the window shows you how much data is in the file and which lines of data have been selected.

Step 6 At this point you have the option to grid the selected data or add it as a set of discrete points. To grid the data select the tick box beside the **Convert data to grid** option, see Section 5.6 for more details about gridding data. Once you have selected the data that you wish to display click OK. If you have not gridded the data, it will then be displayed in the ADMS Mapper using the default red square symbol as shown in **Figure 12**.

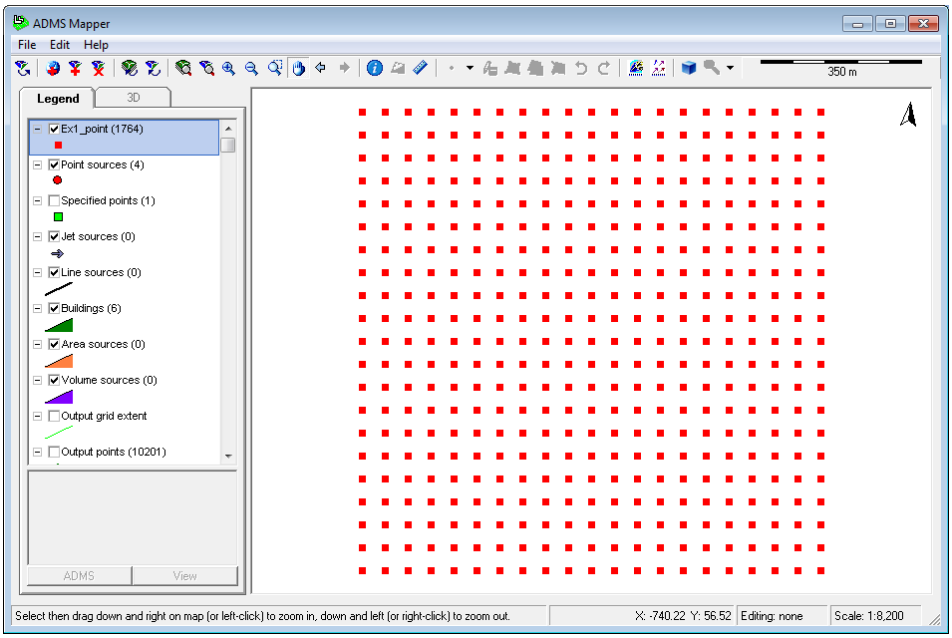


Figure 12 – Data from the **.gst* file displayed in the ADMS Mapper.

Step 7 Information about the data can then be viewed. Ensure that the data layer is selected in the **Legend**. Select the information tool and click on one of the data points. Full details on the information tool can be found in Section 5.5. Information is then displayed at the bottom of the layer panel in the **Attributes table**, as shown in **Figure 13**. The information includes the name of the point, its elevation and location, the hour or time for which the data comes from, the pollutant concentrations at that point, and the spatial extent of the whole data in the data file.

It is possible to colour the points according to their concentration, for example. By importing a configuration file you can quickly apply the same colour settings to multiple layers. See Sections 4.6 and 4.8 for further details.

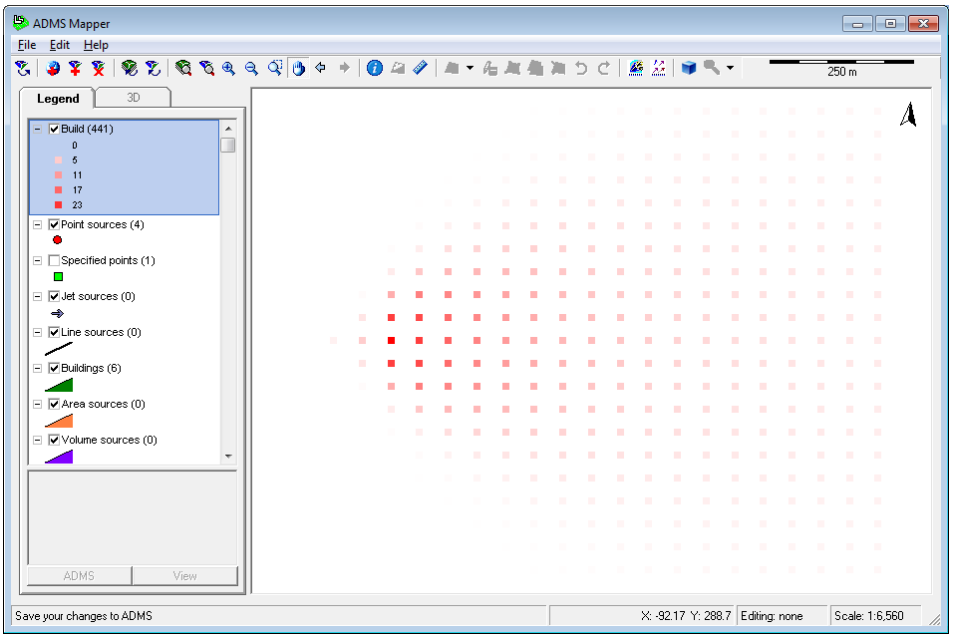


Figure 13 – Information from the numerical data displayed in the ADMS Mapper.

SECTION 4 Modifying the appearance of layers

This section outlines how to modify the appearance of layers. The types of modification that can be made depend on the type of layer you wish to modify. Sections 4.1 to 4.7 give details of various different types of modification that can be made and the types of layer to which these modifications can be applied. After modifying the appearance of the ADMS layers the new appearance can be saved as the default appearance for ADMS layers by selecting **Save ADMS layer settings** from the **File** menu. The default appearance for ADMS layers can be restored at any time by selecting **Restore factory settings** from the **File** menu. Note that this will save the current appearance of all of the ADMS layers. The settings for individual layers can be saved or reloaded by right-clicking on the layer and selecting **Save default settings file** or **Reload default settings file** respectively. There is also the option to **View active settings file**, selecting this option brings up a text file containing the current codes for the selected layer. The settings for an individual layer can also be exported and then imported to other layers, or imported in new maps later. This can be achieved using the **Import layer settings...** and **Export layer settings...** obtained by right-clicking on the layer. These options are discussed in Section 4.8.

4.1 Modifying the transparency of a layer

The transparency of any layer can be changed. The transparency determines how "see-through" the layer is and thus whether any features in a lower layer can be seen through features in this layer. To change the transparency of a layer, follow these steps:

Step 1 Double click on the layer in the **Legend** or select **[Layer name]** from the **Legend context menu** to bring up the layer properties window.

Step 2 Select the **Layer** tab and then the **Parameters** section, as shown in **Figure 14**.

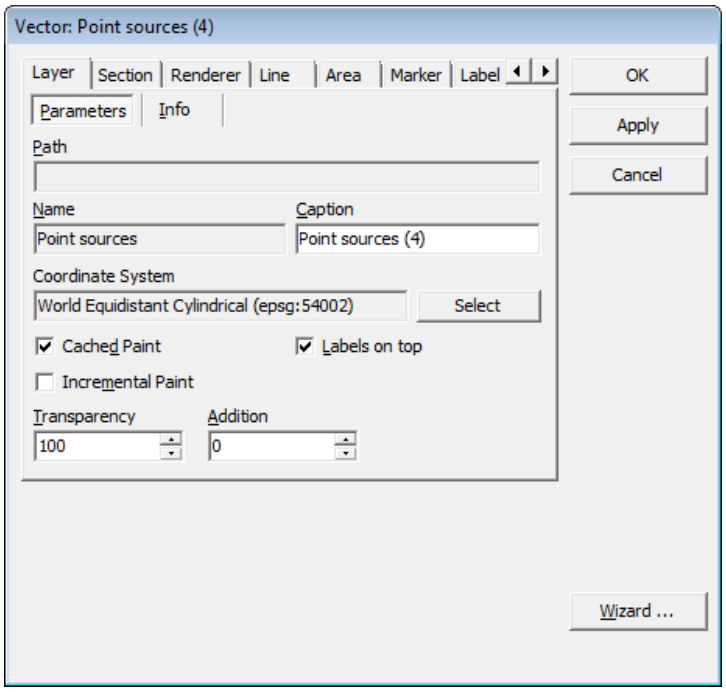


Figure 14 - The **Layer** tab of the layers properties screen.

Step 3 Alter the **Transparency** value as required, 0 is completely transparent and 100 is completely opaque.

Step 4 Click on the **OK** button to make the changes and return to the ADMS Mapper window, or click on the **Apply** button to make the changes but remain in the layer properties window, or click on the **Cancel** button to discard the changes and return to the ADMS Mapper window.

4.2 Modifying the appearance of a marker layer

Markers are used to represent any layer of data defined as single points. For instance, the ADMS layers for point sources are marker layers. To modify the appearance of one of these layers follow these steps:

Step 1 Double click on the layer of interest in the layers panel to bring up the layer properties window, e.g. the **Point Sources** layer.

Step 2 Select the **Marker** tab, as shown in **Figure 15**.

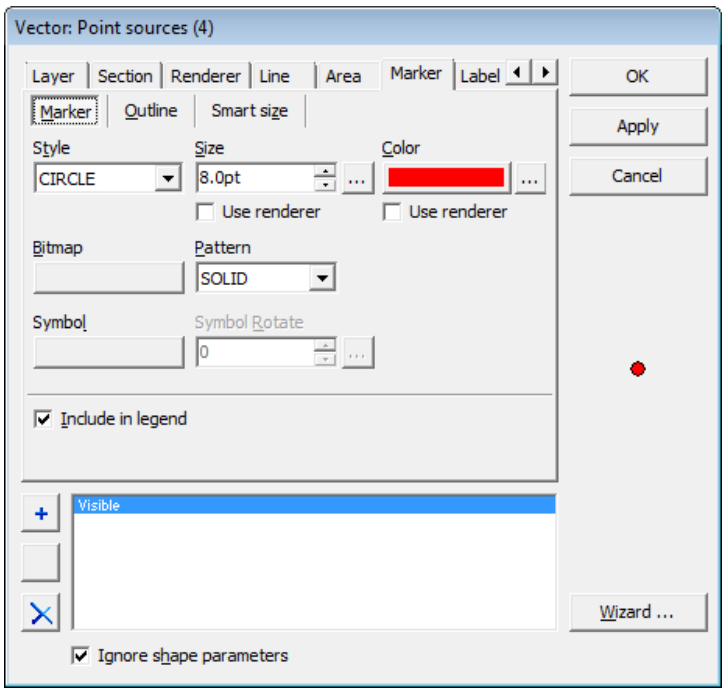


Figure 15 - The **Marker** tab of the layer properties screen.

Step 3 The **Marker** and **Outline** sections can be used to alter the look of the markers used to represent the features in this layer.

Step 4 Click on the **OK** button to make the changes and return to the ADMS Mapper window, or click on the **Apply** button to make the changes but remain in the layer properties window, or click on the **Cancel** button to discard the changes and return to the ADMS Mapper window.

4.3 Modifying the appearance of a line layer

Coloured lines are used to represent any layer of data defined as lines such as line sources. To modify the appearance of this layer follow these steps:

Step 1 Double click on the layer of interest in the **Legend** to bring up the layer properties window, e.g. the **Line Sources** layer.

Step 2 Select the **Line** tab, as shown in **Figure 16**.

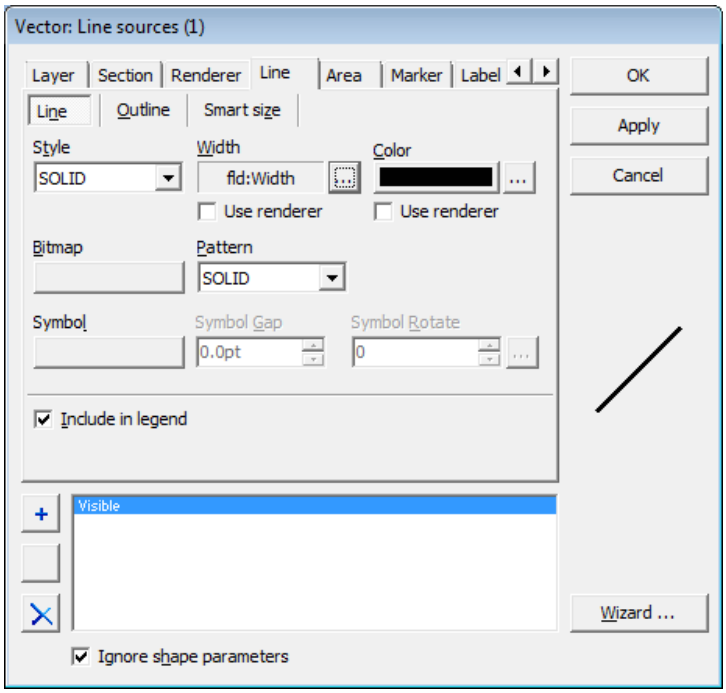


Figure 16 - The **Line** tab of the layer properties screen.

Step 3 The **Line** and **Outline** sections can be used to alter the appearance of the lines used to represent the features in this layer.

Step 4 Click on the **OK** button to make the changes and return to the ADMS Mapper window, or click on the **Apply** button to make the changes but remain in the layer properties window, or click on the **Cancel** button to discard the changes and return to the ADMS Mapper window.

4.4 Modifying the appearance of an area layer

Coloured areas are used to represent any layer of data represented by two-dimensional regions in the ADMS Mapper such as area or volume sources, for instance. To modify the appearance of one of these layers follow these steps:

Step 1 Double click on the layer of interest in the **Legend** to bring up the layer properties window, e.g. the **Area Sources** layer.

Step 2 Select the **Area** tab, as shown in **Figure 17**.

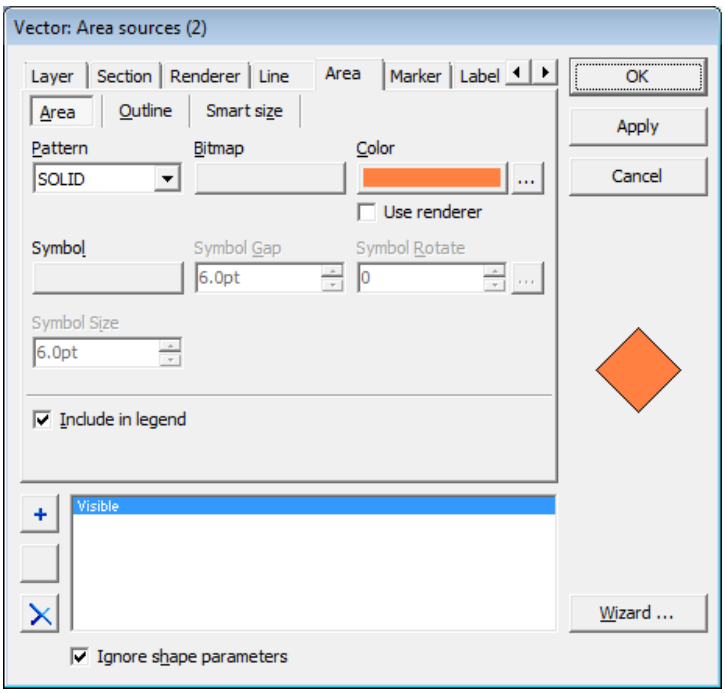


Figure 17 - The **Area** tab in the layer properties screen.

Step 3 The **Area** and **Outline** sections can be used to alter the appearance of the shapes used in this layer.

Step 4 Click on the **OK** button to make the changes and return to the ADMS Mapper window, or click on the **Apply** button to make the changes but remain in the layer properties window, or click on the **Cancel** button to discard the changes and return to the ADMS Mapper window.

4.5 Modifying the appearance of a contour layer

The colour scheme and number of contour levels used for a contour plot can be changed either manually, by altering each of the individual levels, or by applying a new colour scheme.

The contour levels can be manually altered by double clicking on the appropriate contour layer in the **Legend** to open up the layer properties window and then selecting the **Grid** tab, as shown in **Figure 18**.

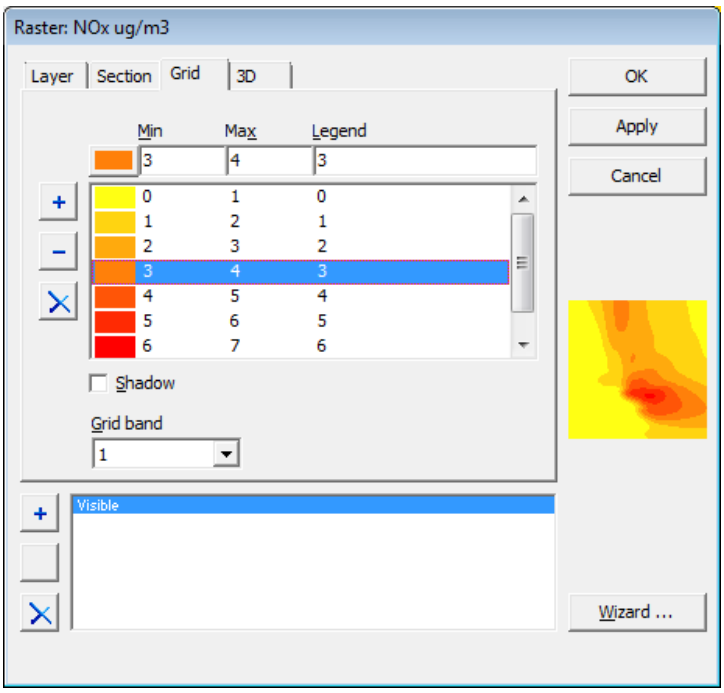


Figure 18 - The **Grid** tab for the layer properties screen for a contour layer.

To select a contour level click on it, the following options are then available

- Add a new contour level with the same properties as the current selected contour level just above the current contour level by clicking on the **Plus** button  next to the contour levels.
- Delete the current selected contour level by clicking on the **Minus** button next  to the contour levels.
- Delete all of the contour levels by clicking on the **Cross** button  next to the contour levels.
- Alter the colour of the contour level by clicking on the **Colour** button  and selecting a new colour.
- Alter the **Min**, **Max** or **Legend** values of the contour level by editing the contents of the text boxes.

When the changes have been made, click on the **OK** button to make the changes and go

back to the ADMS Mapper window, click the **Apply** button to make the changes but remain in the layer properties window, or click on the **Cancel** button to discard the changes and return to the ADMS Mapper window.

A facility exists to automatically create a new graduated colour scheme for a contour layer. To alter the colour scheme in this way, follow these instructions.

Step 1 Double click on the contour layer you wish to alter in the **Legend** to bring up the layer properties window.

Step 2 Select the **Grid** tab, see **Figure 18**.

Step 3 Click on the **Wizard**... button.

Step 4 This brings up the **Grid Wizard** window, as shown in **Figure 19**.

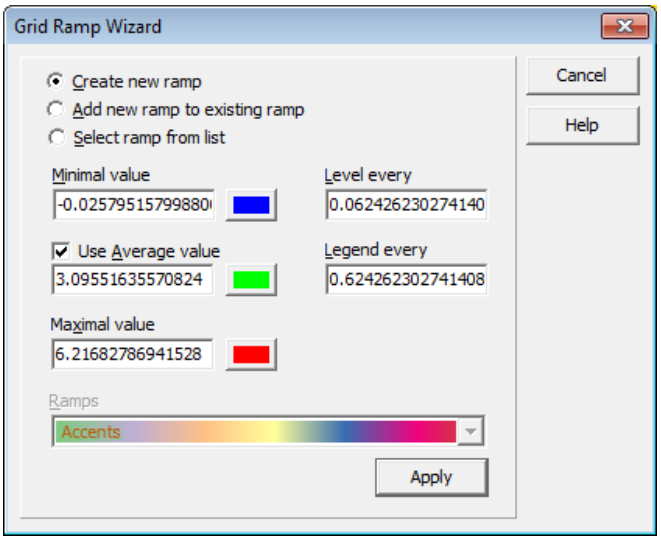


Figure 19 - The **Grid Wizard** screen for creating a new contour colour scheme.

Step 5 From here set the **Minimal** and **Maximal** values and the colours to be used to represent these.

Step 6 If required, set a middle value and the colour to be used to represent this. If this is not required then uncheck the **Use Average value** check box.

Step 7 Set the spacing required between colour levels, **Level Every**, and the spacing between legend entries, **Legend Every**.

Step 8 Click on the **Apply** button.

Step 9 Uncheck the **Shadow** checkbox on the **Grid** tab.

Step 10 If required, manually edit contour levels.

Step 11 Click on the **OK** button to make the changes and return to the ADMS Mapper window, or click on the **Apply** button to make the changes but remain in the layer properties window, or click on the **Cancel** button to discard the changes and return to the ADMS Mapper window.

Alternatively a colour scale from an existing colour ramp can be selected using the radio button and selecting the ramp from the drop-down menu.

4.6 Colouring a layer according to its properties

You may wish to colour a layer according to its properties. For example, you may wish to colour a terrain file according to elevation; or a spatially varying roughness file according to the roughness value; or you may wish to colour sources according to their emission rates. This section describes how to make these changes.

Step 1 Double click on the layer which you wish to modify, for example the terrain layer, to bring up the properties window, see **Figure 20**.

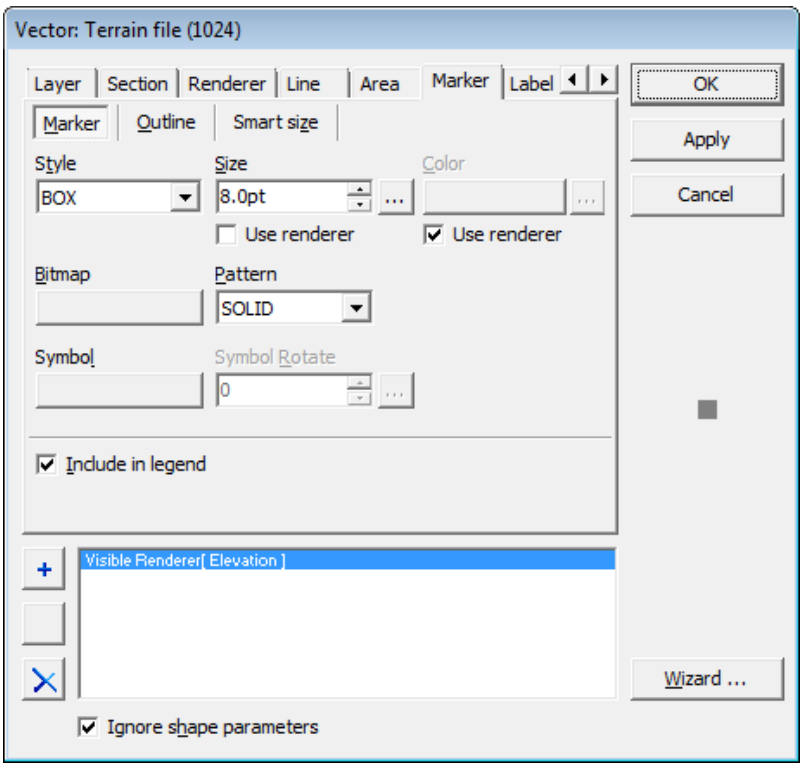


Figure 20 – The properties wizard for the terrain and roughness plots

Step 2 Click on the **Wizard...** button. The **Rendering Wizard** dialogue box appears as shown in **Figure 21**

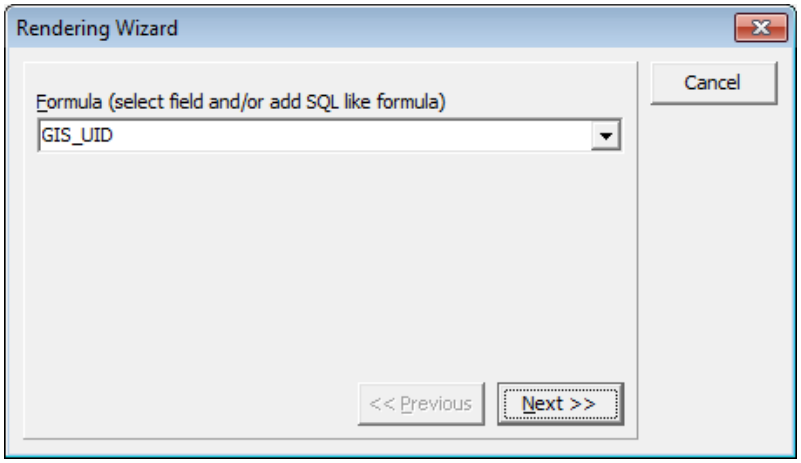


Figure 21 – The **Rendering Wizard** dialogue box

Step 3 Using the drop down menu select the property according to which you wish to colour the layer. For example, for a terrain layer select **Elevation**. Click on **Next>>.**

Step 4 The next screen allows a choice between colouring by **Unique values** or by **Continuous values**. The choice depends on the property you are using to colour the layer. For the terrain layer, for example, it is appropriate to choose **Continuous values** so there is a smooth gradation in colours from low elevations to high elevations. On the other hand, when plotting surface roughness, for example, the changes in roughness may be discrete, and it is likely that there will be only a small number of different roughness values across the region, so colouring by **Unique values** is more appropriate. The choice can be made by selecting the appropriate radio button, and in the continuous case you can also specify the range of values to use when colouring the layer, see **Figure 22**. Click on **Next>>**.

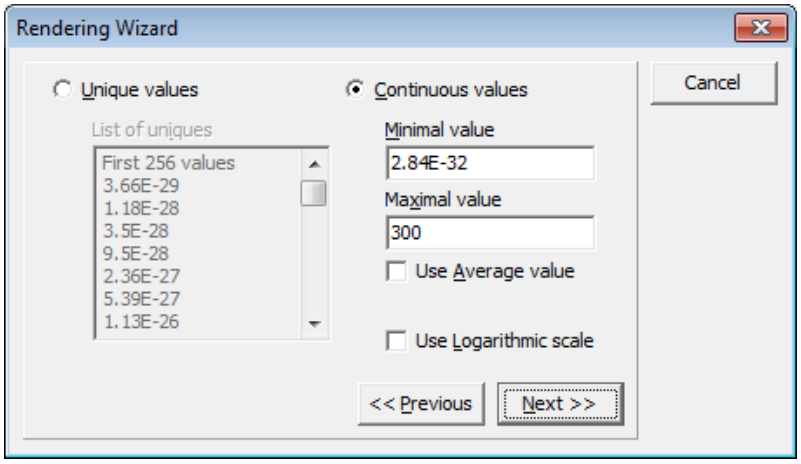


Figure 22 – Selecting unique or continuous values

Step 5 On the final screen make sure that **Render by Color** is selected and then click on **Apply**.

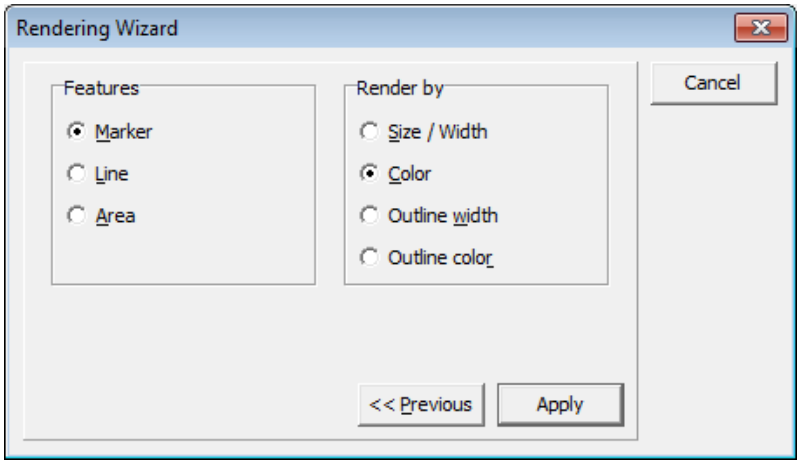


Figure 23 – Render by Color

Step 6 The next step is to choose the colour scheme for the layer. The method for doing this depends on whether the layer is being coloured by continuous or unique values.

For continuous values click on the **Renderer** tab in the properties wizard, see

Figure 24. You can then change the minimum and maximum values at which the start and end colours will be applied. You can also choose the colours used at these points by clicking on the start or end colour and selecting a new colour from the palette.

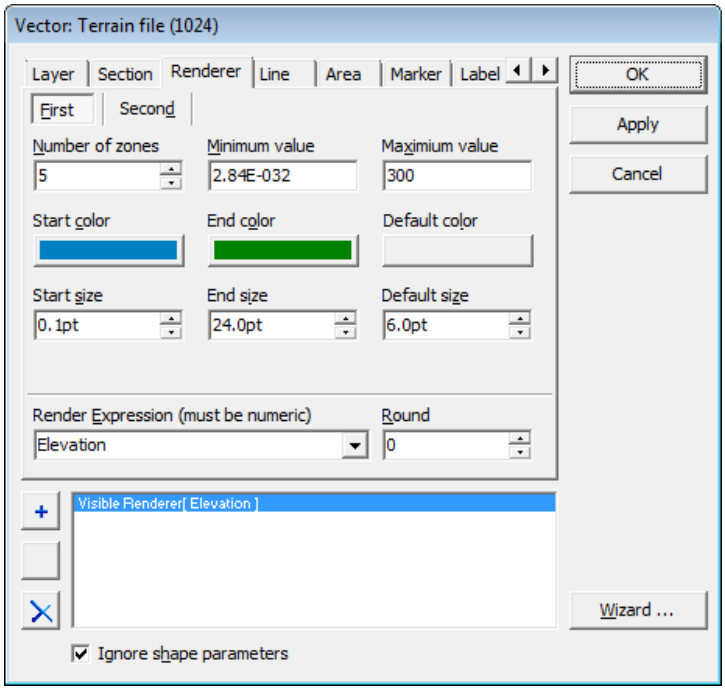


Figure 24 – The **Renderer** tab

For unique values a separate colour can be selected for each individual level. To do this, click on the appropriate tab in the properties wizard, e.g. the **Marker** as shown in **Figure 25**. Then select each level in turn from the window and choose the colour by clicking on **Color** and selecting your choice from the palette.

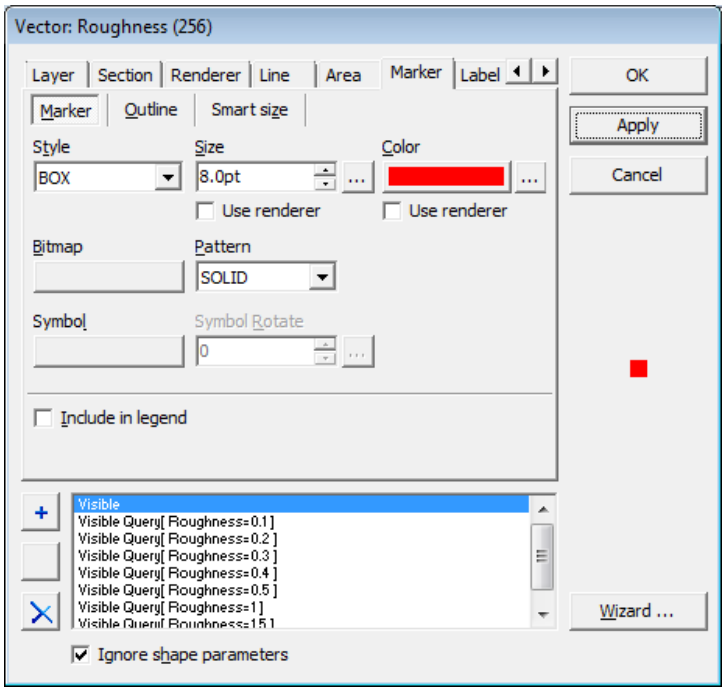


Figure 25 – The **Marker** tab

Step 7 Finally, click **OK** to apply your changes.

If you wish to colour point sources by their emission rates, for example, then the steps above can be followed, but at the stage when you select the formula from the drop down window in the Rendering Wizard you should choose the pollutant emission rate with which you want to colour the layer, e.g. [NOx (g/s)].

*It is possible to define new formulas in the Rendering Wizard, e.g. if you wished to colour area sources by their total NO_X emission rate you could specify the formula: [NO_X (g/m2/s)]*GIS_AREA by typing in the formula box.*

4.7 Displaying feature names

Any of the default ADMS layers can display the names of the features within that layer. To show these names follow these instructions.

Step 1 Double click on the layer of interest in the layers panel to bring up the layer properties window.

Step 2 Select the **Label** tab, as shown in **Figure 26**.

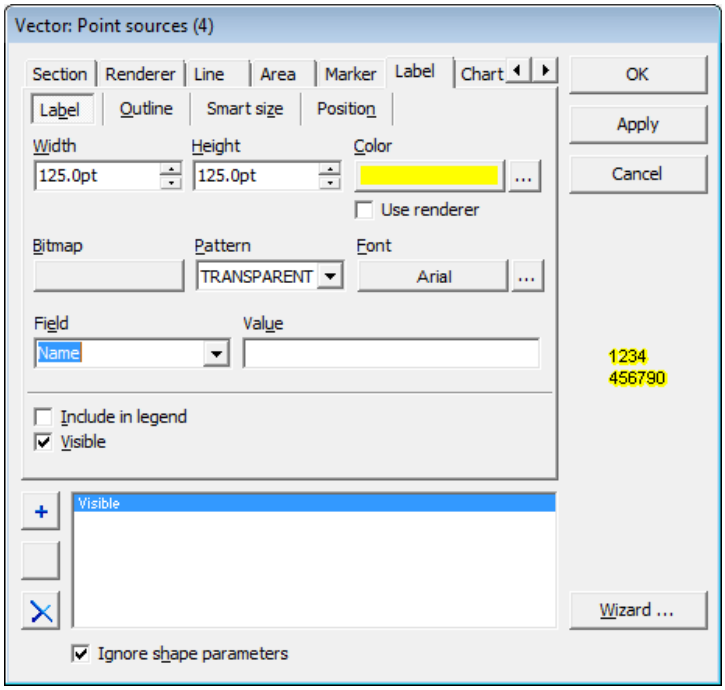


Figure 26 - The **Label** tab of the layer properties screen.

Step 3 In the **Label** tab set the **Field** to be Name.

Step 4 The **Label**, **Outline** and **Position** sections can then be used to alter the properties of the labels.

Step 5 The labels can be removed by unchecking the **Visible** checkbox in the **Label** section.

Step 6 Click on the **OK** button to make the changes and return to the ADMS Mapper window, or click on the **Apply** button to make the changes but remain in the layer properties window, or click on the **Cancel** button to discard the changes and return to the ADMS Mapper window.

4.8 Exporting, importing, saving and reloading layer settings

Once the layers have been modified as desired the layer settings can be exported so that they can be used in other layers or in other maps. Similarly, existing layer settings can be imported. The layer settings can also be saved and reloaded. The steps are highlighted in the examples below.

Step 1 Right click on the layer you wish to export. This brings up the menu shown in **Figure 27**.

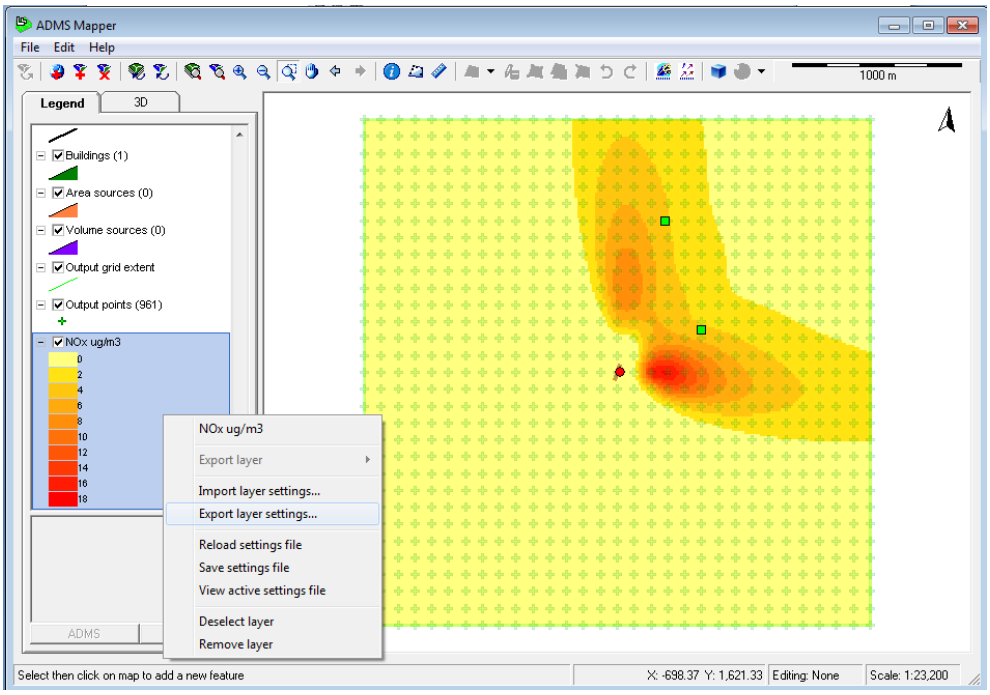


Figure 27 – The menu for exporting/importing layer settings.

Step 2 Click on **Export layer settings...** .

Step 3 A window opens prompting you to save the configuration file for the layer. Choose a location and save the file with extension *.ini.

Step 4 Right click on the layer to which you wish to import the settings. From the menu select **Import layer settings...** .

Step 5 Navigate to the layer configuration file that you have just created and click on **Open**.

Step 6 The layers are now displayed using the same layer settings.

The settings for an individual layer can be saved by right-clicking on the layer and selecting **Save default settings file**. These settings are then stored in a file so if you wish to return to the saved settings, after making modifications, you can right-click on the layer and select **Reload default settings file**. This undoes any changes you have made.

SECTION 5 Additional features

This section describes some of the more advanced features available in the ADMS Mapper.

5.1 Setting the map coordinate system

There are two aspects to consider when setting coordinate systems within the ADMS Mapper: the map and the individual layers. The map coordinate system determines the way the layers are displayed in the map view window, and you can choose one that suits your needs provided it is compatible with the data. It can be either a projected or geographic system. On the other hand, the layers each have a coordinate system, but these must correspond to the data values in the layer. For example, the ADMS layers' coordinate system is set in the parent interface and acts on all the ADMS layers. This should be set to whatever coordinate system you are using for your work in the model. For user layers you often find the data have associated projection or world files that will define the coordinate system for the layer automatically. This allows layers with data in different coordinate systems to be projected correctly onto the map coordinate system for easy comparison.

The map coordinate system is used as the default coordinate system for user layers with no associated world file or other georeferencing information.

The coordinates of a point in the map view window (as given in the status bar) are in the units associated with the map coordinate system. For example, if the map coordinate system has been set to **WGS 84** then the coordinates are degrees longitude and latitude.

The map coordinate system must be selected before certain features of the ADMS Mapper can be used; for example, before exporting ADMS Mapper layers to **.kml* files for use in Google Earth.

The coordinate systems for the ADMS layers should not be changed in the ADMS Mapper – these are set in the parent interface, see the relevant model User Guide for more details.

To set the coordinate system that is used in the ADMS Mapper select either **Use the ADMS coordinate system** or **Set map coordinate system** from the **Edit** menu, as shown in **Figure 28**. The first option ensures that the system currently defined in the ADMS interface is used in the ADMS Mapper; the second option allows you to choose the coordinate system from an extensive list of options.

You should choose a map coordinate system that is compatible with the ADMS coordinate system.

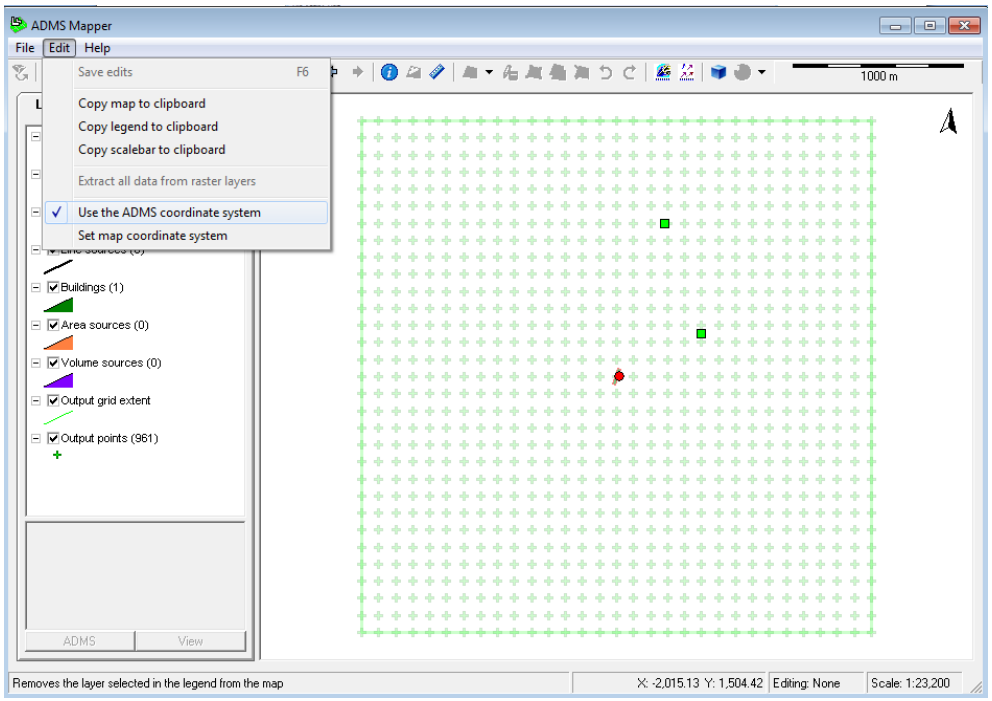


Figure 28 – The coordinate systems options in the **Edit** menu.

If the **Set map coordinate system** option is selected then a new window appears, as shown in **Figure 29**, where the coordinate system can be chosen from an extensive list of options. To select a **Projected system**, click on the radio button and then choose the system from the drop-down list.

*Rather than scrolling through the entire list of options to find your desired choice you can click in the box and type the name of the coordinate system you wish to use. For example, to quickly find the Ordnance Survey grid for Great Britain type **OSGB**. You can also type part of the name and then click on the drop down arrow to see a shorter list of options.*

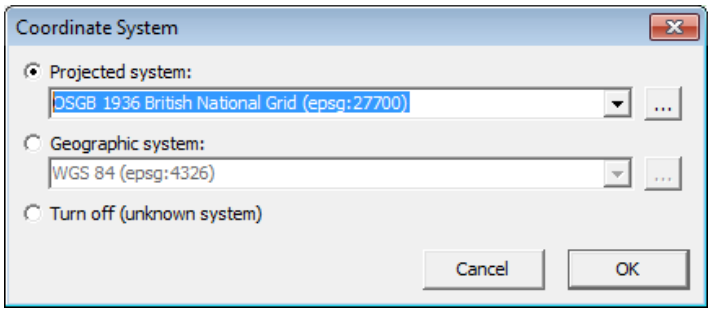


Figure 29 – Choice of the coordinate system

A **Geographic system** can be chosen in a similar way to a **Projected system**.

If you wish to use the **Unspecified regular Cartesian** grid from the model interface, i.e. if the coordinates are site specific, for example distances relative to a source centre, then the **Turn off (unknown system)** option must be chosen.

5.2 Adding a background map

Background maps can easily be added to the map view window in the ADMS Mapper. This is done using the **Add background map** button on the toolbar. This uses a WMS link to add a dynamic layer to the map view. See section 5.4 for more details.

Step 1 Check that a valid coordinate system has been set for the ADMS Mapper. See Section 5.1

Step 2 Click on the **Add background map** button on the toolbar.

Step 3 A map layer will be added to the ADMS Mapper **Legend.**

The map service used for the background map will depend upon the BackgroundMap setting in the [MapperInterface] section of the parent model's configuration file. An example service is supplied with the model install via a Protocol Layer Connector file (.ttkwp), but you can change this if you have an alternative WMS you would prefer to use.

5.3 Displaying background images

Background images can be added to the map view window in the ADMS Mapper. This is done using the **Add Layer** button on the toolbar. The add layer feature allows files with a wide variety of formats to be loaded into the ADMS Mapper.

To load an image to use as a background map, the image must be correctly georeferenced, which can be done using world files or MapInfo **.tab* files. For British OS Map data, world files are available from the Ordnance Survey website. These instructions show how to load an OS map tile as a background map using the corresponding world file to georeference it.

Step 1 Ensure the map tile image file (**.tif*) and world file (**.tfw*) have the same name and are in the same directory.

Step 2 Check that a valid coordinate system has been set for the background layer. See Section 5.3.1.

Step 3 In the ADMS Mapper click on the **Add Layer** button on the toolbar.

Step 4 The **Add Layer** screen is then displayed, as shown in **Figure 30**. Browse to find the **.tif* file for the map tile, then click on the **Open** button.

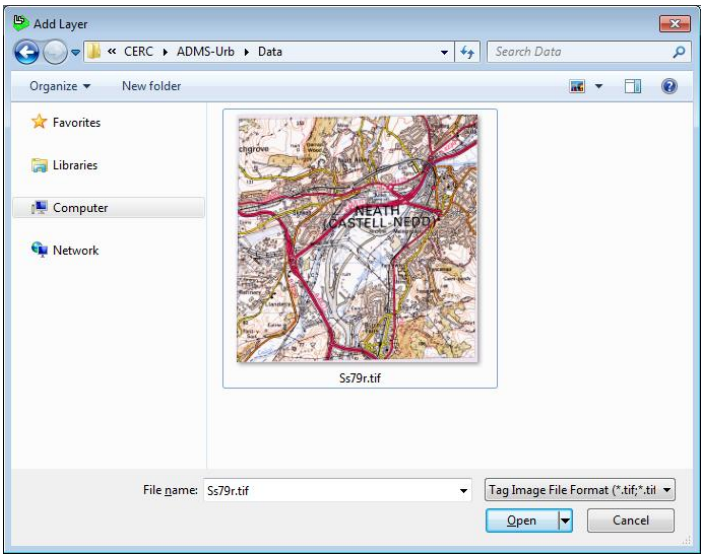


Figure 30 - The **Add Layer** screen.

Step 5 The map tile will be added to the map view window. This layer will be at the top of the **Legend** and will need to be dragged down to allow the ADMS layers to be seen.

5.3.1 Setting the coordinate system for a background layer

To set a coordinate system for a background map you will need to create a **.prj* file as follows. Suppose that the background map you wish to add has the filename *map.tif*. Then follow these steps:

Step 1 Double click on one of the layers in the **Legend**, a new window will appear.

Step 2 Select the **Layer** tab to view the layer information, as shown in **Figure 31**.

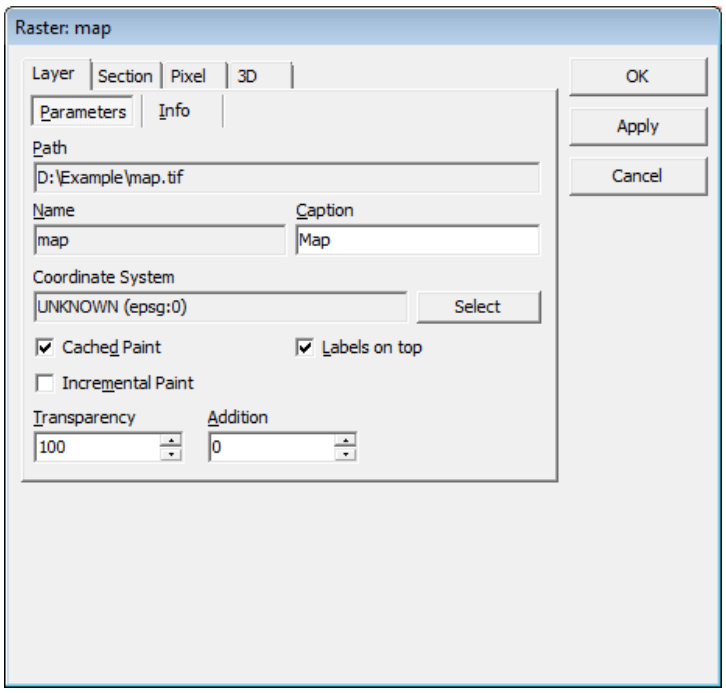


Figure 31 – The **Layer** tab.

Step 3 Click on the **Select** button next to the **Coordinate System** cell to bring up the dialogue box shown in **Figure 29**.

Step 4 Choose the coordinate system you wish to use in the background layer from the available list and then click on the ellipsis (…). This will bring up the **Coordinate System Setup** screen shown in **Figure 32**.

You must choose a coordinate system that is the same as, or consistent with, the coordinate systems used for the other layers.

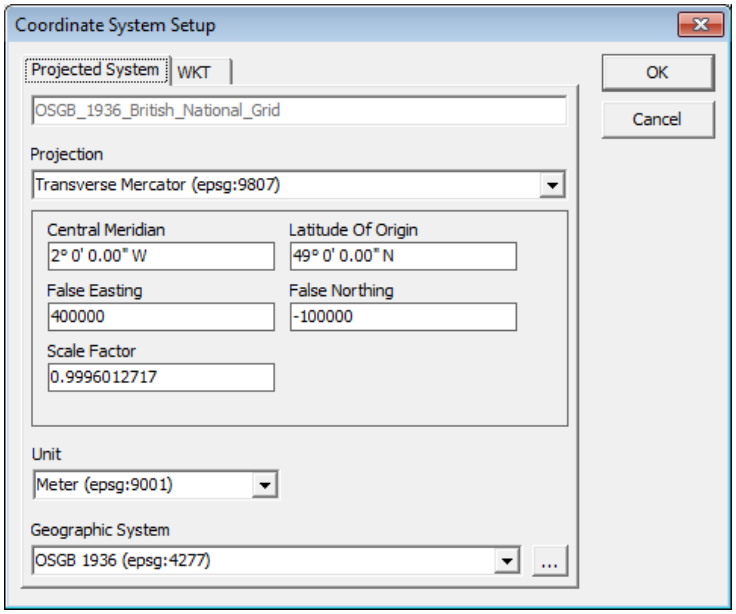


Figure 32 – The **Coordinate System Setup** screen.

Step 5 Click on the **WKT** tab. The screen will be similar to that shown in **Figure 33**.

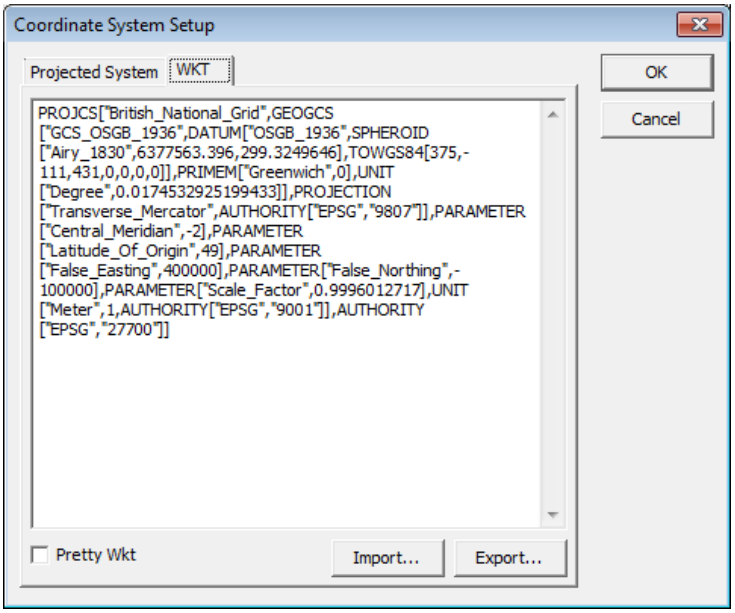


Figure 33 – The **WKT** tab.

Step 6 Click on **Export...** and save the file in the same location as the *map.tif* file with the file stem *map.tif* and extension *.prj*, i.e. save the file with name *map.tif.prj*.

The same procedure applies to other file types, not just *.tif *files. In general for a file with name* <filename>.ext, *where* .ext *is any extension, the name of the projected file must be* <filename>.ext.prj

Step 7 After you have saved the **.prj* file click **Cancel** to close the three sub-screens that appeared in the process of creating the **.prj* file.

5.4 Adding background map imagery from a Web Map Service (WMS)

It is possible to add a background map layer in the ADMS Mapper from a Web Map Service (WMS). The background map imagery can help display and locate your data and results. There are two methods for adding background map imagery: one is to use the **Add WMS layer** command from the **File** menu to specify a URL to a web map service; the other is to use a special Protocol Layer Connector file (.ttkwp).

5.4.1 Adding background map imagery with the Add WMS layer command

Step 1 First ensure that the coordinate systems in the ADMS interface and the ADMS Mapper are set appropriately for the map that you wish to use. For example, in the UK the coordinate system for the ADMS interface is often set to OSGB 1936 British National Grid. (Refer to your relevant model user guide for full details on how to do this). In the ADMS Mapper the coordinate system can either be set to use the ADMS coordinate system (i.e. the coordinate system specified in the ADMS interface), or a particular coordinate system can be defined (e.g. WGS 84). This is done under the **Edit** menu. See Section 5.1 for full details on how to set the coordinate system in the ADMS Mapper. Also ensure that all the coordinates in the interface are given using the specified coordinate system.

Step 2 Select the **Add WMS layer** command from the **File** menu.

Step 3 A window appears as shown in **Figure 34**. Specify the URL for the web map service and click **OK**.

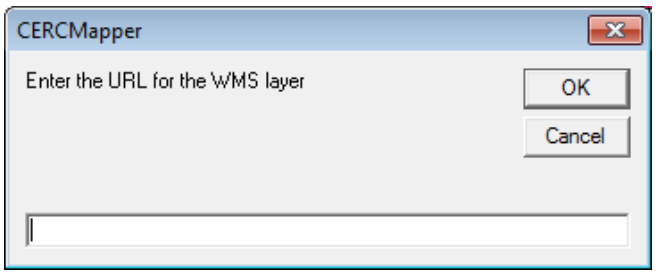


Figure 34 – The **Add WMS Layer** window.

Step 4 The map will be displayed. The layers may need to be reordered to view the map and other layers properly (see Section 1.7.4). An example is shown in **Figure 35**.

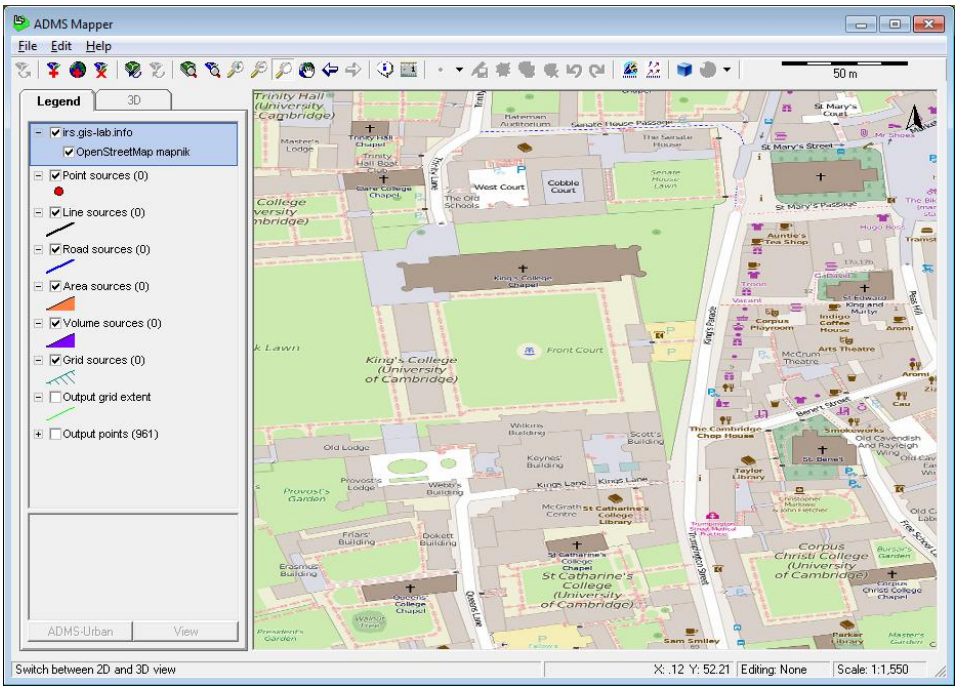


Figure 35 – Background map imagery in the ADMS Mapper; © OpenStreetMap contributors www.openstreetmap.org/copyright.

For best results, Map layers and data layers should use the same coordinate system. Some coordinate systems may not be mutually compatible.

5.4.2 Adding background map imagery using a Protocol Layer Connector file

Alternatively a background map may be added by using a Protocol Layer Connector file as described here. An example file is included in your ADMS install directory: this links to the OpenStreetMap WMS.

Step 1 Ensure that the coordinate systems in the ADMS interface and the ADMS Mapper are set appropriately for the map that you wish to use. (Refer to the relevant model user guide and Section 5.1 of this user guide).

Step 2 Click on the **Add Layer** tool .

Step 3 Navigate to the directory containing your **.ttkwp* file. Select **Files of type: Protocol Layer Connector (*.ttkwp)** to display the files:

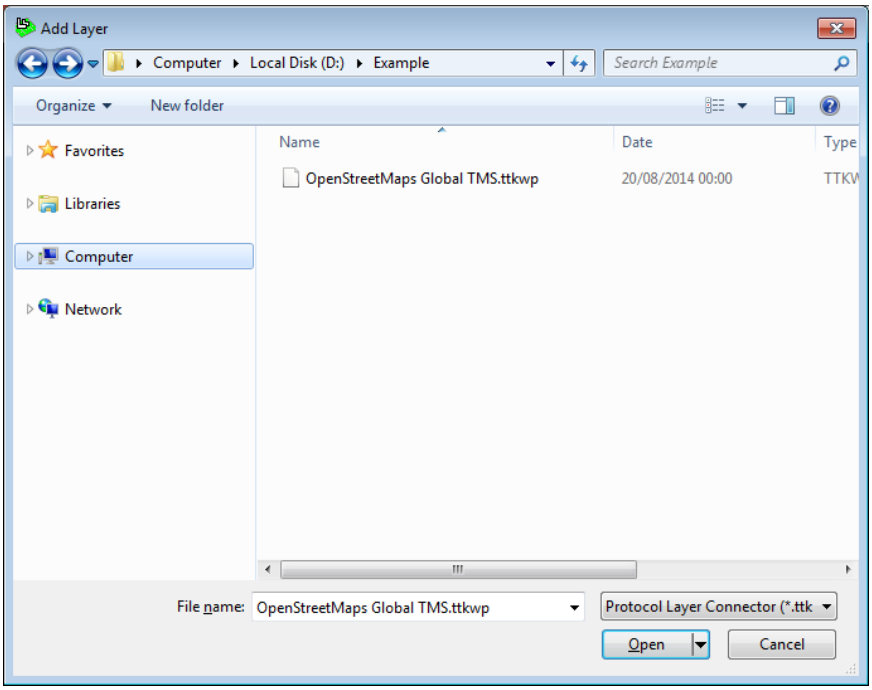


Figure 36 – Selecting Protocol Layer Connector files.

Step 4 Select a (**.ttkwp*) file that covers the geographic location of your sources and click **Open**.

Step 5 The new layer will be displayed in the ADMS Mapper. By default, the view is zoomed to the full extent of the new layer (**Figure 37**). The layers may need to be reordered so that the background image does not obscure the view of the other layers. Information on reordering layers can be found in Section 1.7.4.

*Contact the CERC helpdesk for help setting up *.ttkwp files for other maps.*

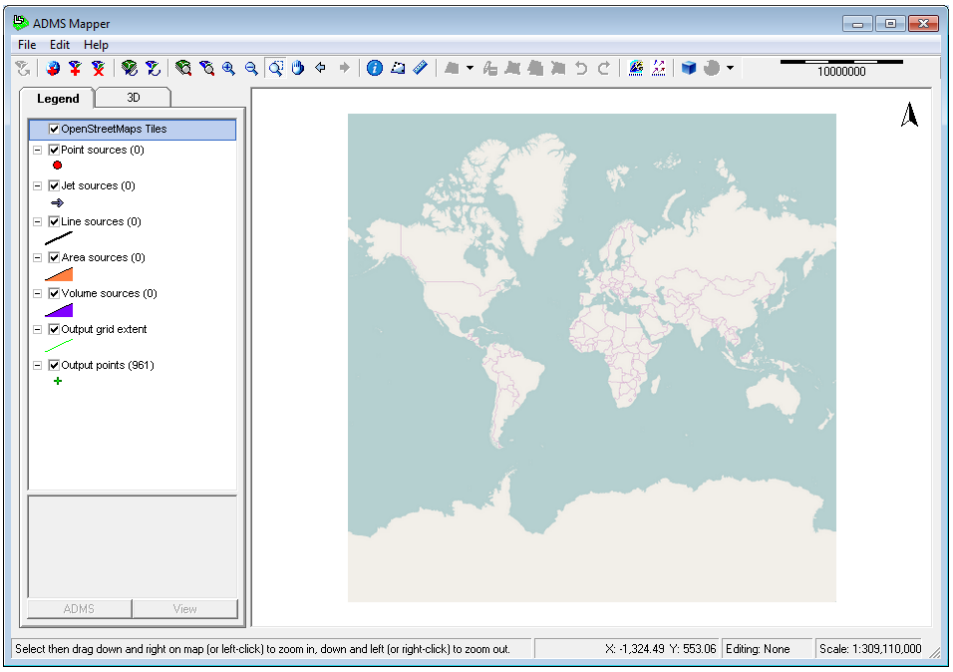


Figure 37 – New layer in the ADMS Mapper; © OpenStreetMap contributors www.openstreetmap.org/copyright.

Step 6 Select the output grid extent or largest source layer and select **Zoom to layer**.

Step 7 This will zoom to the correct location on the map (**Figure 38**).

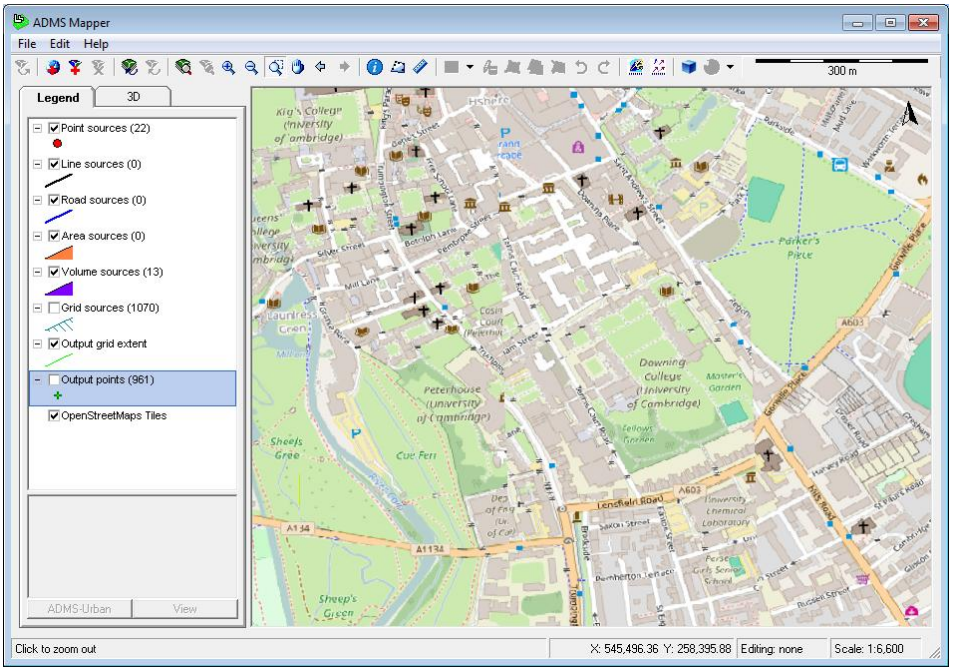


Figure 38 – Background image displayed in the ADMS Mapper; © OpenStreetMap contributors www.openstreetmap.org/copyright.

For best results, Map layers and data layers should use the same coordinate system. Some coordinate systems may not be mutually compatible.

5.5 Displaying data layers

Data from external files can be displayed in the ADMS Mapper using the **Add layer** toolbar button. Recognised formats such as ESRI shape files (.shp) and MapInfo Interchange Format files (*.mif) will be displayed automatically, but generic delimited data files such as comma separated variables (.csv) will first prompt you to define data fields as well as selecting the data that you wish to display.

Data layers created from files are not editable, but their appearance can be modified as outlined in Section 4.

5.5.1 Using drag and drop

When you are selecting data files to add to the ADMS Mapper you can click on the **Add layer** tool, and browse to the file.

Alternatively you can locate the file that you wish to add to the ADMS Mapper in Windows Explorer, click and drag it to the Legend panel of ADMS Mapper. If the file is a recognised format it will then be added immediately, otherwise further steps need to be followed as detailed in Section 5.5.3.

5.5.2 Data from recognised file formats

If you choose **Add layer** and select a file in a recognised format, such as an ESRI shape file (.shp), the ADMS Mapper will automatically display it in the map as a new layer.

This applies to all supported vector files, see Appendix A.3 for a list of recognised file types. For pixel (image) or grid files, see Section 5.2.

Step 1 Click on the **Add Layer** tool. A new window will appear as shown in **Figure 39**.

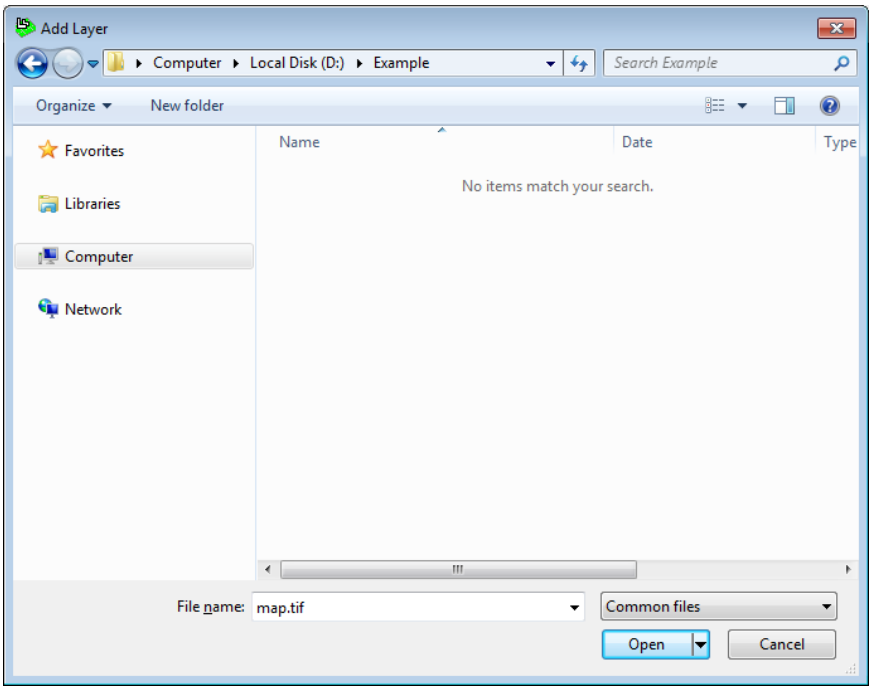


Figure 39 – Add Layer window.

Step 2 Change the file type from **Common files** to **ArcView Shape Files (*.shp)**.

Step 3 Navigate to the file you wish to view and click Open. The data will then be displayed in the ADMS Mapper as shown in **Figure 40**.

As an alternative to Steps 1-3 you can use drag and drop.

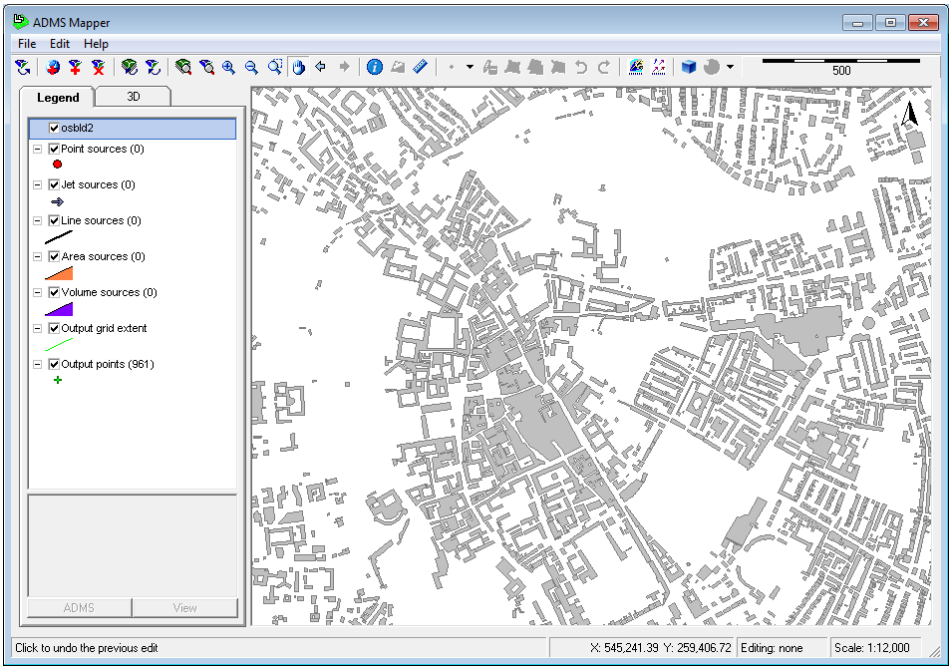


Figure 40 – Data from the shape file displayed in the ADMS Mapper.

Step 4 Information about the data can then be viewed. Select the information tool and click on one of the shapes. (Full details on the information tool can be found in Section 5.5). Information is then displayed below the layers in the

legend panel, as shown in **Figure 41**. The information available will depend on the file type and the file data.

It is possible to colour and label shapes according to their properties. See Sections 4.6 and 4.7 for further details.

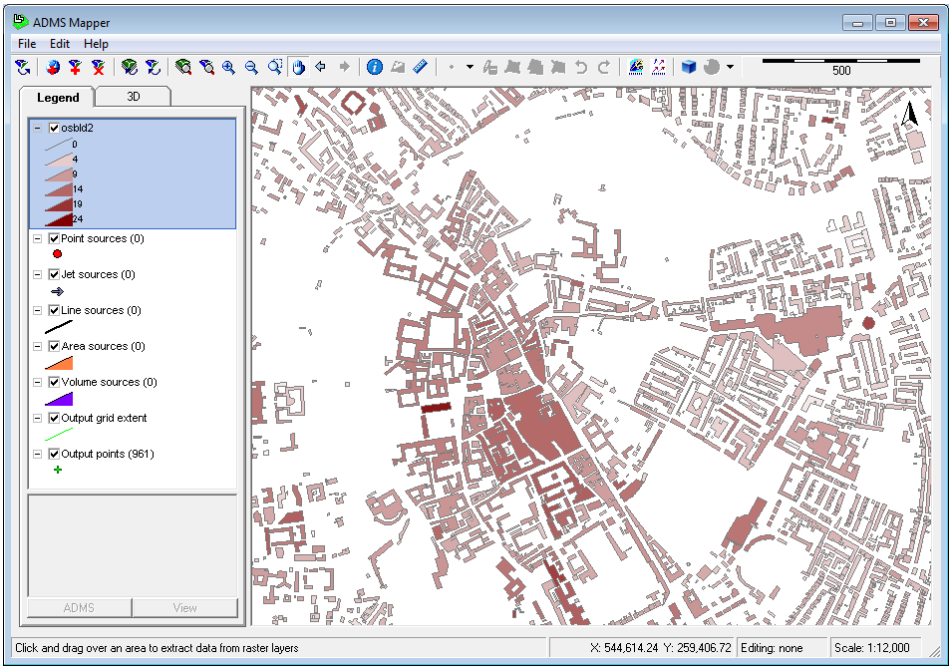


Figure 41 – Information from the numerical data displayed in the ADMS Mapper.

5.5.3 Data from CSV and other delimited text files

If you display data from a CSV file or unrecognised text file, the ADMS Mapper will attempt to load it into a layer, providing an intermediary window for selecting data from the file. If the file contains a header line, the ADMS Mapper will attempt to find it and identify the start of the data lines; otherwise you need to manually enter the column headers.

Data can be displayed as points or lines, but must be identified as such in the column headers by following a specific naming convention, while all other columns are treated as properties. In both cases this can be done in the file or in the ADMS Mapper data window:

* For point layers, there must be an easting and a northing named appropriately in order to display the data.
  * The easting must be named as one of X, X(m), or X (m)
  * The northing which must be named as one of Y, Y(m), or Y (m)

    The elevation will be recoginsied if it is one of Z, Z(m), Z (m), or ELEVATION. Elevation can also be set to any column by right clicking the column header and selecting **Set as elevation field.** To clear, right click on the elevation field again and select **Clear elevation field**.
  *

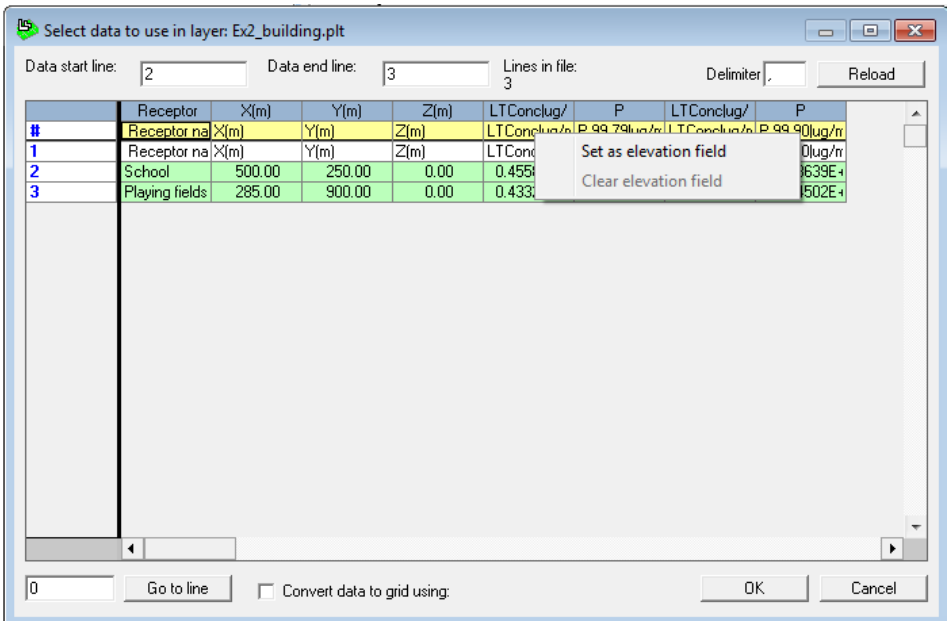


Figure 42 – Setting the Elevation field in the ADMS Mapper.

* For line layers, the start and end points must be named appropriately in order to display the data.
    * For the start point, the easting must be named as X1 and the northing must be named as Y1
    * For the end point, they must be named as X2 and Y2 respectively
    * The elevation must be named as one of Z, Z(m), Z (m), or ELEVATION

The data window – shown in **Figure 43** – has the following options for data selection:

* The option to enter the **Data start line** and **Data end line**. The delimiter can also be entered.
* An editable header line (yellow background) lets you choose which columns are included as properties in the layer. Columns that have '-' or whitespace for their header not included as layer properties.
* A right-click menu on the **#** column that has the following options:
    * **Set as first data line** – selects a new data start line; this line will be highlighted in green.
    * **Set as last data line** – choose a new data start line; this line will be highlighted in red.
    * **Copy to header** – Replaces the contents of the editable header line with the selected line.
* **Go to line** button – Brings the line specified in the box to its left into view in the table.
* **Reload** button – Refreshes the table
* **Convert data to grid using:** – check this option at the bottom of the data window if you require a **.grd* file of your data. Once the selection box has been checked, set the elevation field by right clicking the mouse over the relevant column of data. Then press the **OK** button.

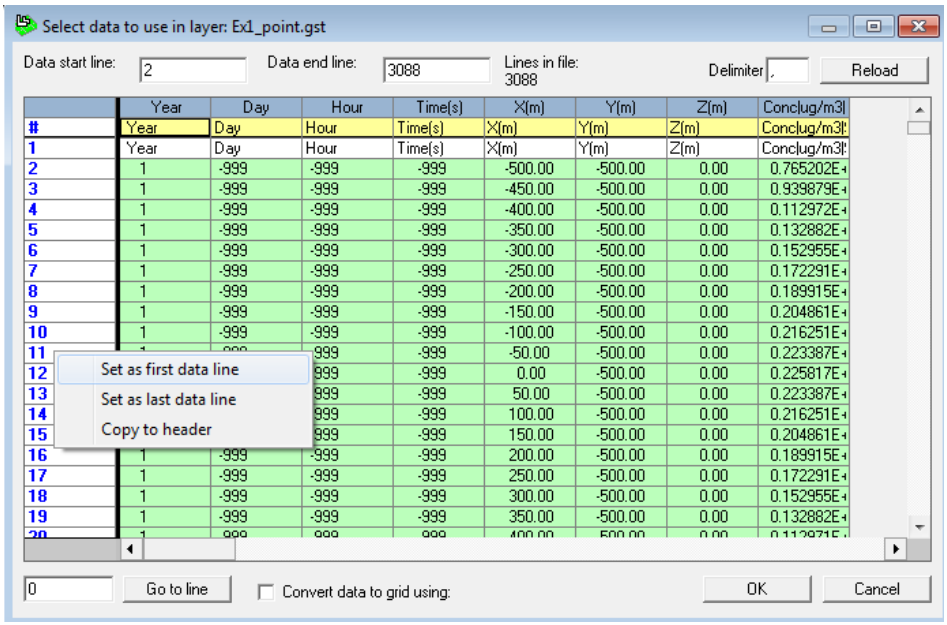


Figure 43 – Data window

Suppose that you wish to display data from a tunnel file *Tunnels.csv* alongside data in *Example6b.upl* (these examples files are not supplied with ADMS 5). Ensure that the UPL file is loaded and follow these steps:

Step 1 Click on the Add Layer tool. A new window will appear as shown in **Figure 44**.

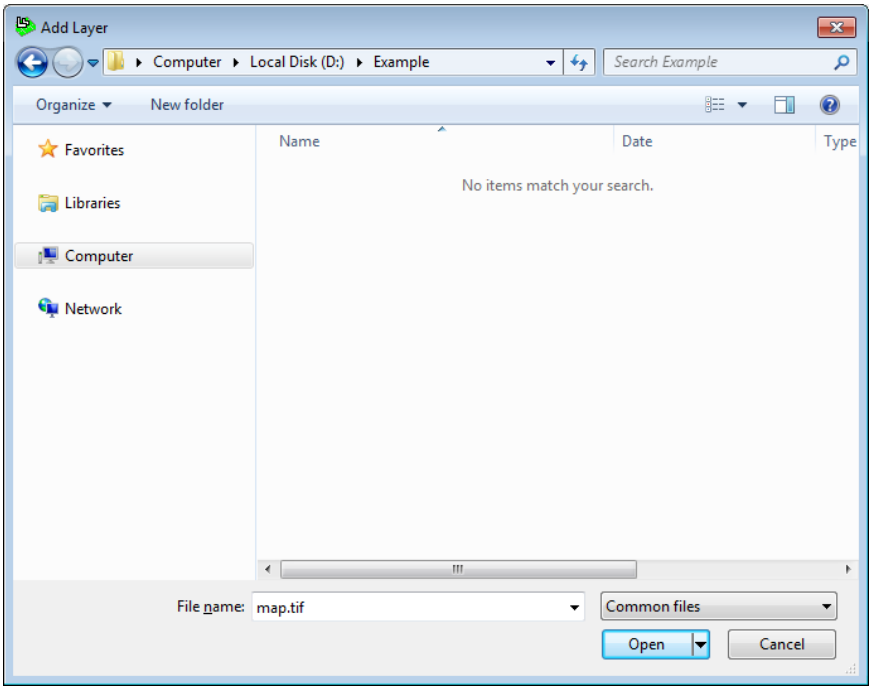


Figure 44 – Add Layer window.

Step 2 Change the file type from **Common files** to **All Vector Files**.

Step 3 Navigate to the **.csv* file you wish to view and click Open. A new window will appear as shown in **Figure 45**.

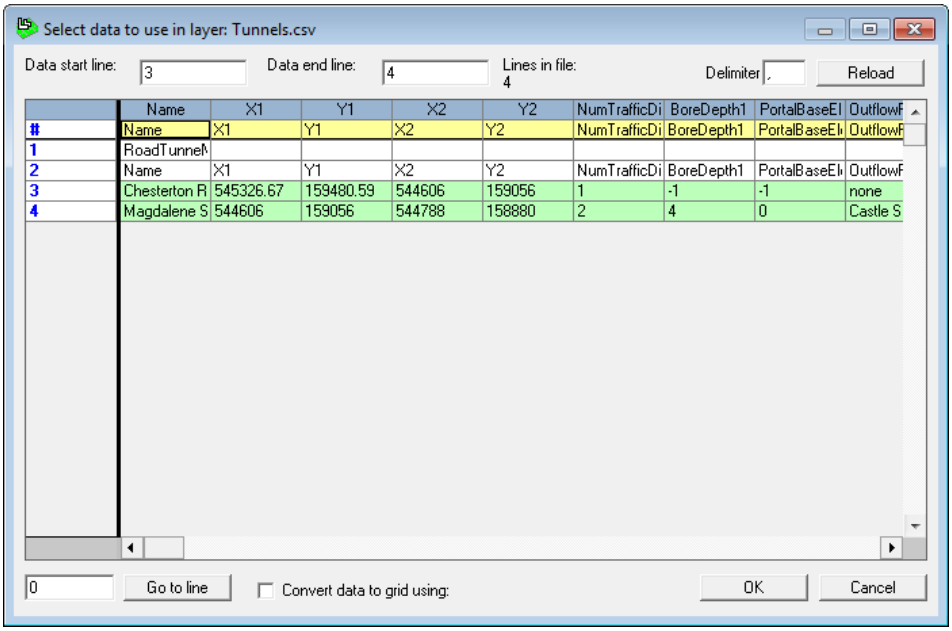


Figure 45 – Data from *Tunnels.csv*

Step 4 This window can be used to select which data you wish to display in the ADMS Mapper. See Section 3.3 for an example that requires data selection.

Step 5 Once you have selected the data that you wish to display click OK. The data will then be displayed in the ADMS Mapper as shown in **Figure 46**. The default line appearance is a thin black line.

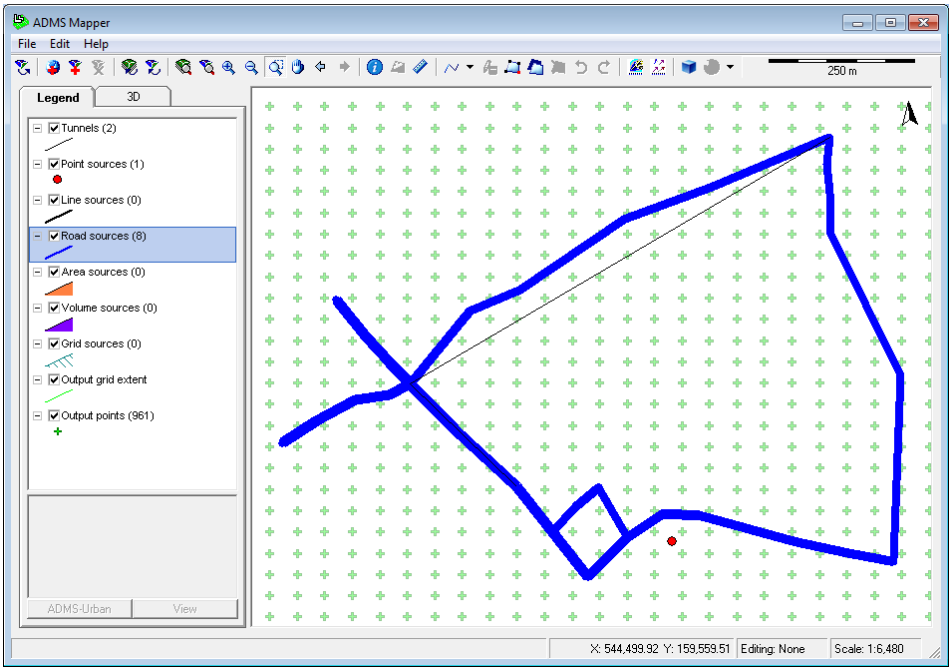


Figure 46 – Data from the *tunnels.csv* file displayed in the ADMS Mapper.

Step 6 Information about the data can then be viewed. Ensure that the data layer is selected in the **Legend**. Select the information tool and click on one of the data points. (Full details on the information tool can be found in Section 5.5). Information is then displayed in the **Attributes** table, as shown in **Figure 47**. The information includes all of the columns shown in the data window.

It is possible to colour the data according to its properties. See Section 4.6 for further details.

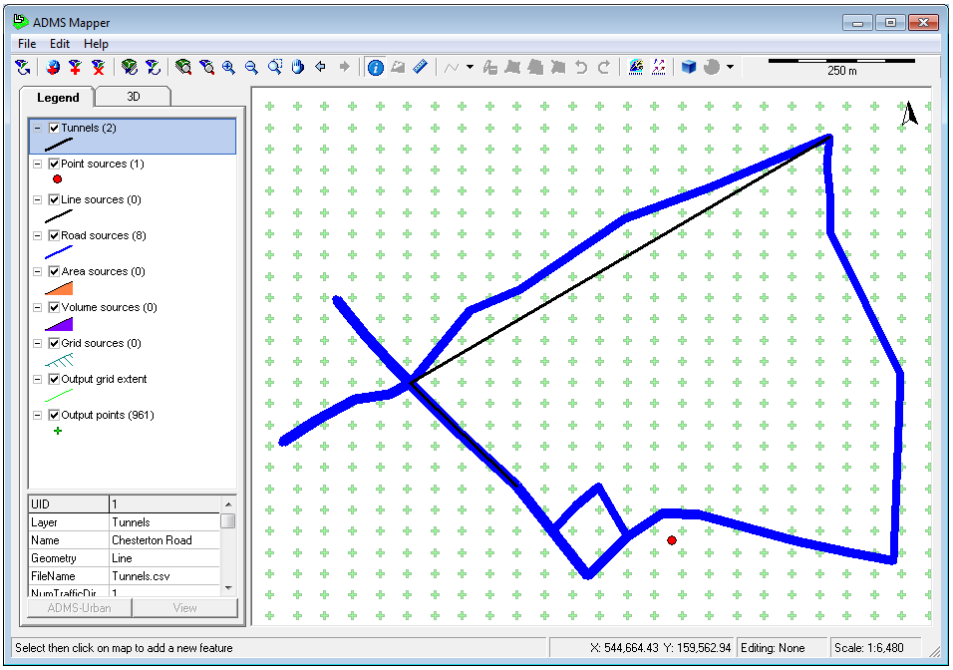


Figure 47 – Information from the *tunnels.csv* file displayed in the ADMS Mapper.

5.6 Extract data tool

If raster data has been added to the ADMS Mapper, it is possible to extract the data from this raster layer into **.csv* format. This can be achieved through a simple process, although there are more advanced options to satisfy precise requirements for the output data.

5.6.1 Using the Extract data tool

This can be done by following these instructions.

Step 1 Add the raster data file to the ADMS Mapper, in this example an OS terrain 50 file will be added and a section of the terrain data extracted, for use with ADMS.

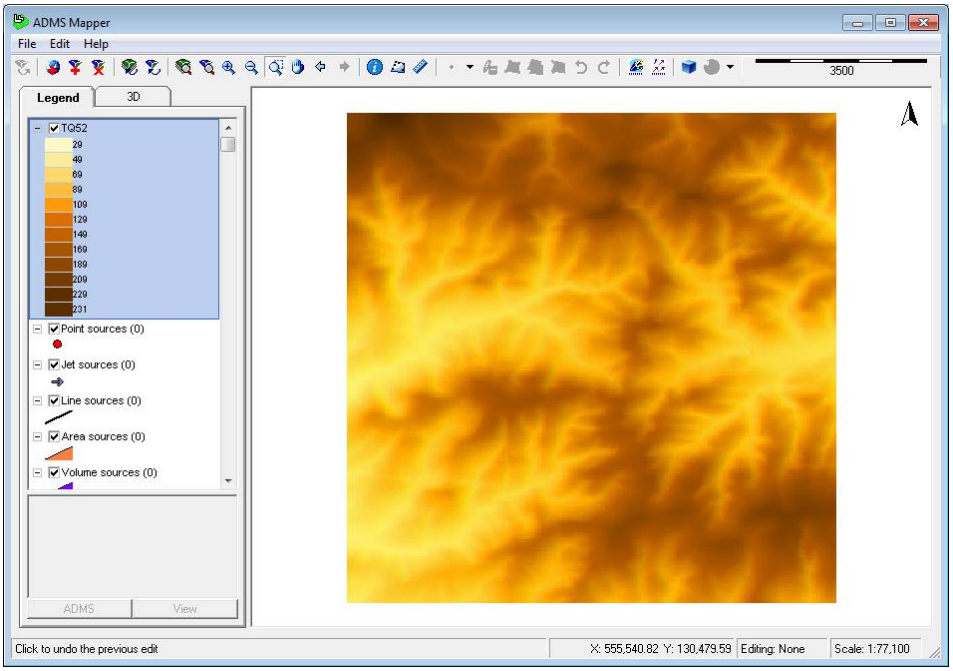


Figure 48 – ADMS Mapper showing an OS terrain 50 file, which has been coloured by terrain height.

Step 2 Select the raster file in the Legend, and press the button **Extract selected data from raster layers**, .

Step 3 Click on the map at the location of one of the corner vertices of the extraction area. Without releasing the mouse, pull the curser until the full extent of the desired output area is selected. Release the mouse to bring up the **Extract data** screen.

Step 4 Check the selected data layers and customise output data options if necessary; see Section 5.6.2 for a description of the available options.

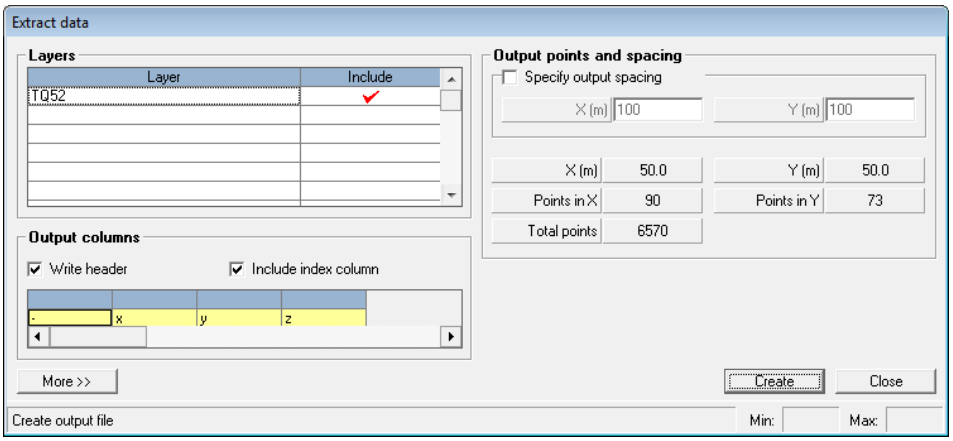


Figure 49 – Extract data screen showing basic options

Step 5 When you have confirmed all the settings are as you desire, click **Create**. You will be prompted to enter the name of the output file. Once the file has been successfully created, a notification dialog will inform you of the number of points written to the file.

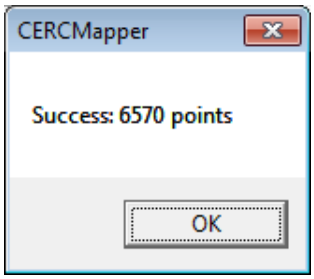


Figure 50 – Notification of successful data extraction

Step 6 The resulting output **.csv* file can be added to the ADMS Mapper or viewed numerically in an editor such as Excel.

5.6.2 Extract data options

There are a range of options that can be used to customise the extraction of data including altering the location, spacing and coordinate system.

* Basic options:
  * Choose the layers to extract data from. Layers that overlap the selected area are included by default. Layers with a single data band (e.g. OS terrain data) and layers with multiple data bands (i.e. Red-Green-Blue raster data) are mutually exclusive.
  * Choose whether or not to write a header row to the data file by selecting or deselecting the relevant checkbox. If you choose to write a header row, the column headings can be edited.
  * Select whether or not to include an index column.

When creating an ADMS format terrain file, it should not have a header row, but an index column should be included.

* The output spacing should be set to the required resolution in the X and Y directions. You can specify a different spacing in each direction if required. The maximum number of output points is 500,000. If the output spacing entered would result in more than this number of output points it is automatically be reset to the nearest value that reduces the number to within tolerance.

* Additional options:

  * The coordinate system for the output data can be selected. By default this is set to the map coordinate system, but it can be changed to match the raster layer or ADMS coordinate systems.

When creating an ADMS format terrain file, the coordinate system should match the ADMS model data that it will be used with.

  * It is also possible to manually edit the **Output extent** in the **Extract data** screen if you feel you have not selected the correct range of X and Y coordinates in Step 3. To do this check the **Specify selected extent** box, and type in the **Min X**, **Max X**, **Min Y** and **Max Y** values in the boxes provided.

  * Some layers can have regions with no data; you can specify the value to be entered in these regions, e.g. some formats of terrain data files do not report values over areas of sea, and in this case the terrain height should be set to zero.

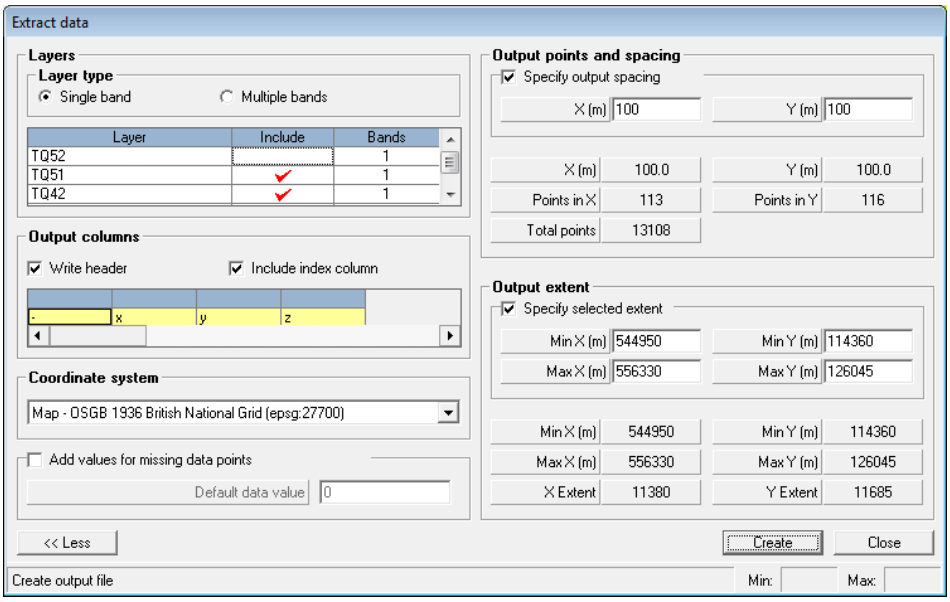


Figure 51 – Extract data screen showing all options

5.7 Information about a feature

The ADMS Mapper allows you to view information about a model feature from within the ADMS Mapper. To display the information about a model feature, follow these instructions.

Step 7 Click on the **Information** button on the toolbar.

Step 8 Then click on the feature in the map view window.

Step 9 Information will be displayed about the feature in the attributes table, as shown in **Figure 52**.

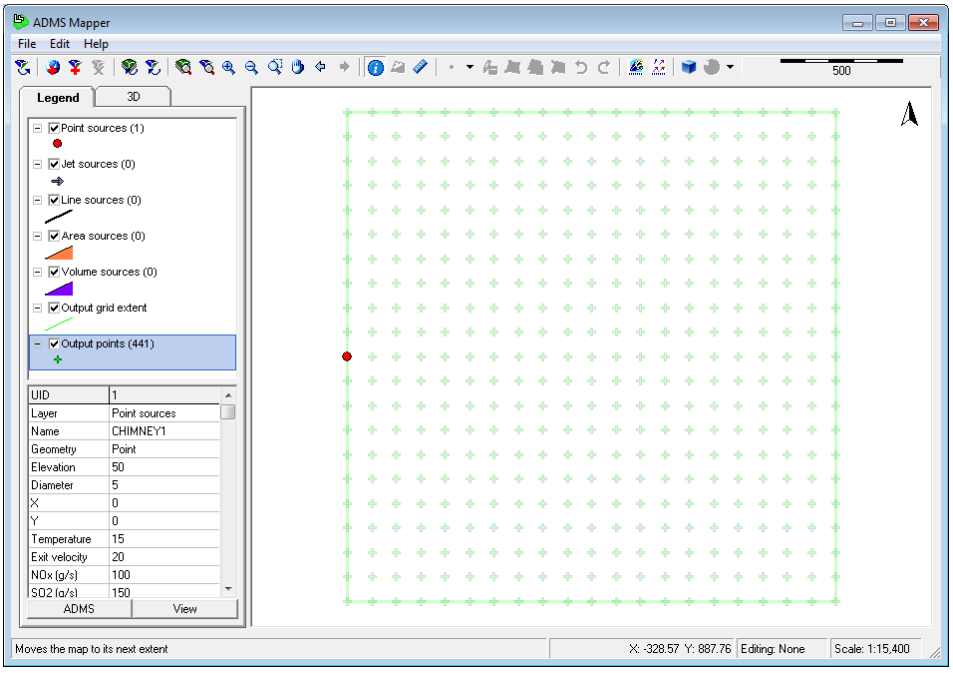


Figure 52 – The feature information screen for a point source.

Step 10 Click on the **ADMS** button to be directed to the feature in the model.

Step 11 Click on the **View** button for the feature to be highlighted in the ADMS Mapper.

5.8 Measuring distances

The ADMS Mapper comes with a tool that allows you to measure the distance between two or more points in the map view window. Follow these instructions to measure distances in the map view window.

Step 1 Click on the **Measure** button on the toolbar.

Step 2 Click on the map view window at the first point of interest, and then click on a second point. A dotted line is produced between the two points of interest and the distance between the two points is shown on the status bar in the bottom left hand corner of the ADMS Mapper window, as shown in **Figure 53**.

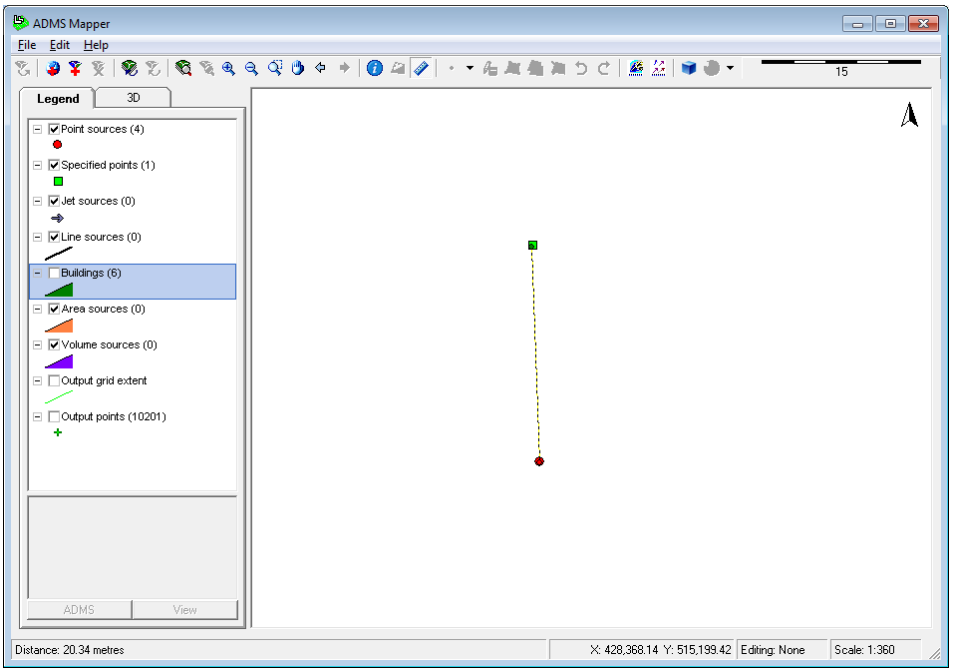


Figure 53 – Measuring distances in the ADMS Mapper, the distance is given in the bottom left corner.

Step 3 Clicking on further points adds further lines and the cumulative distance is displayed in the status bar.

Step 4 The position of the points can be modified as follows:

- To add a point, click on the existing point that lies before the desired location of the new point and then click where you want the new point to be.
- To move a point, click on the point, and while holding down the mouse button, move the cursor to the new location for the point before releasing the mouse button.
- To delete a point, first click on the point to select it, and then click on it again.

The points that the distance is being measured between appear as coloured squares. The current selected point is red and the other points are green.

Step 5 To remove all the defined points whilst using the measuring tool, double click anywhere in the map view window.

5.9 Displaying the north arrow

It is possible to toggle the display of an arrow in the ADMS Mapper that indicates the direction of north, see **Figure 54** . The north arrow is only displayed when the plot is in 2D mode.

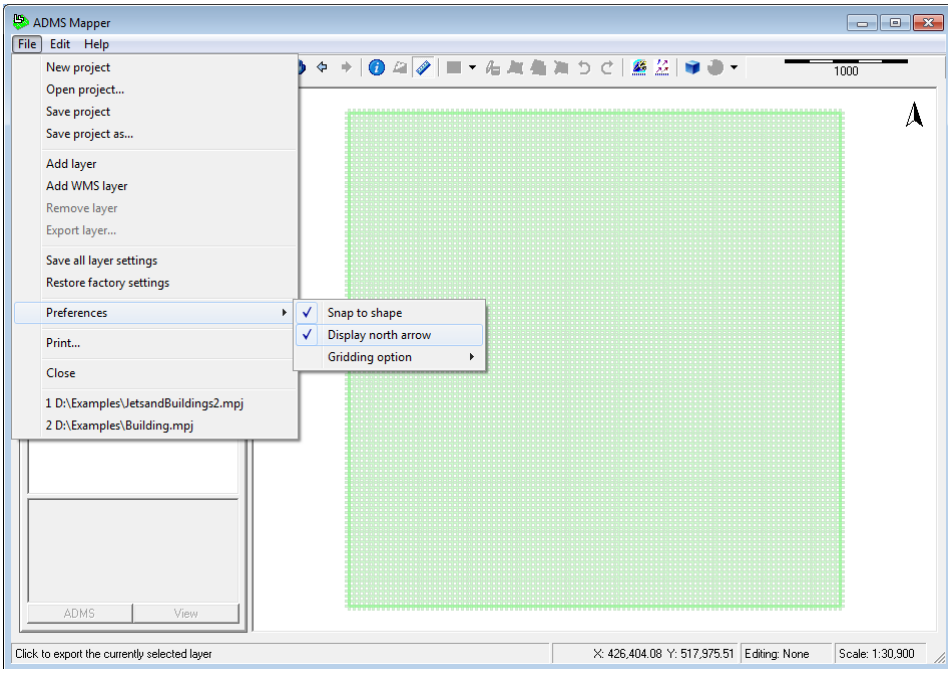


Figure 54 – The north arrow is displayed in the top right hand corner of the map window.

To toggle the north arrow select the **File – Preferences – Viewing option** menu and select or deselect **Display north arrow** as desired.

5.10 Viewing features in 3D

Features in the ADMS Mapper can be viewed in 3D. This can be especially helpful when checking building or source heights, or when examining complex terrain, variable roughness or concentration fields.

To see a 3D visualisation of the features in the ADMS Mapper first click on the Change View icon. After doing this, the map view will change and the Change View icon will also change. To return to the 2D planar view, click again on the new Change View icon.

When in 3D mode, three axes are shown: vertical (blue), east-west (red) and north-south (green). By clicking and holding the mouse you can rotate the map to examine the 3D visualisation from various points of view. A new button appears which enables you to change the method of panning the camera – the options available are summarised in **Table 4**.

See for example **Figure 55** which shows a view of buildings in the ADMS Mapper when in standard mode and when in 3D mode.

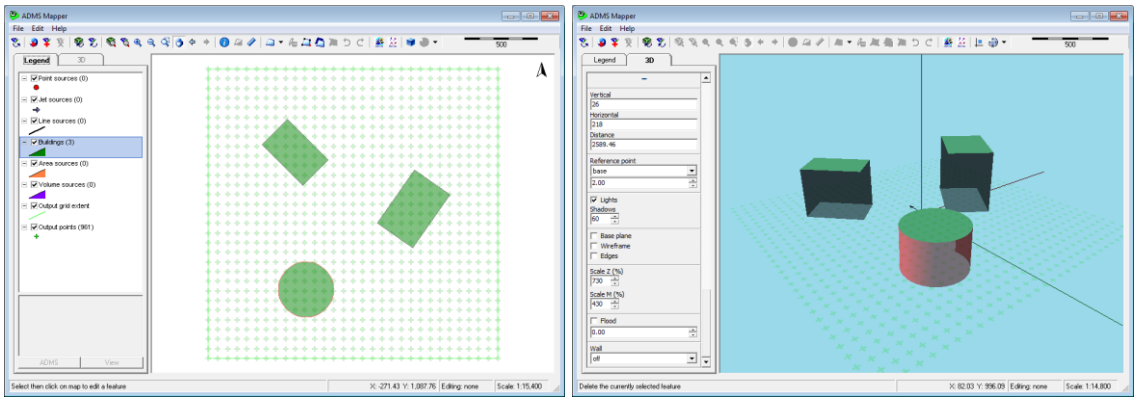


Figure 55 – Buildings viewed in 2D and 3D modes.

Some layers will have both a height (Z) and a depth (M), for example a building can be at a terrain height Z, with a depth of M.

*The vertical scale can be exaggerated using the **Scale Z (%)** and **Scale M (%)** options in the 3D tab. This may be required for clarity if the horizontal extent of the modelling region is much larger than the vertical extent of the buildings, sources, terrain, etc.*

5.10.1 Options in the 3D panel

When in 3D mode the view can also be changed a variety of ways by using the options under the 3D tab in the layer panel.

- **Vertical**, **Horizontal** and **Distance** – allows manual setting of the position of the camera in spherical coordinates. The **+** and **–** buttons change the distance of the

camera from the origin of the X,Y,Z axis.

- **Reference point** – positions the origin along the Z axis (altitude) relative to the layers shown:
  - **Base** – if there is at least one layer which is a digital elevation model (DEM), then the base is set to the lowest Z value found in the DEM
  - **Zero** – the value is set to zero regardless of the Z coordinates found in the open layers
  - **Lowest** – lowest value of all Z coordinates in all the layers
  - **Highest** - highest value of all Z coordinates in all the layers
  - **On DEM** – the value of the Z coordinate read from the DEM at the longitude and latitude of the origin pointer, this does not change if the origin pointer changes
  - **Fly on DEM** – as **On DEM**, but the value updates if the position of the origin pointer changes
- **Lights** – toggles the directional light on/off
- **Shadows** – sets the intensity of shadows when the directional light is turned on; varies from 0 (no shadows) to 100 (darkest shadows)
- **Base plane** – toggles a base plane on/off
- **Wireframe** – toggles the wireframe display mode on/off
- **Edges** – toggles edges on/off on the 3D objects
- **Scale Z (%)** – scales the height (Z) coordinate of all open layers; 100 is the actual size
- **Scale M (%)** – scales the depth (M) coordinate of all open layers; 100 is the actual size
- **Flood** – toggles on/off a floodplains simulation; the numerical value is the flood level (in metres)
- **Wall** – if there is at least one digital elevation model (DEM) among the open layers, this option sets the appearance of the DEM boundaries:
  - **Off** – no DEM walls
  - **Colour** – grey walls with contour lines
  - **Texture** – textured walls with contour lines

5.11 Copying the map view window to the clipboard

An image of the current view in the map view window can be copied to the clipboard for pasting into other Windows applications. To copy the current view from the map view window select **Copy Map To Clipboard** from the **Edit** menu. This image can then be pasted into a document or picture editing software and saved.

The **Copy Legend To Clipboard** option from the **Edit** menu can be used to copy an image of the **Legend** to the clipboard. If only a part of the **Legend** is required, for instance the legend for a contour plot, then this image of the **Legend** should be pasted into image processing software and then cut down as appropriate.

*The Attributes section of the **Legend** is not copied to the clipboard.*

5.12 Export features

The default ADMS layers can be exported to a variety of formats. Some popular formats available are

- ArcView Shape Files (**.shp*)
- Autocad (**.dxf*)
- Digital Line Graphs (**.opt*) – line sources only
- Geographic Markup Language (**.gml*)
- GPS Exchange Format (**.gpx*)
- Keyhole Markup Language (**.kml*)
- MapInfo Interchange (**.mif*)

To export a layer into any of these formats first click on the layer in the **Legend** to select it. Then click on the **Export Layer** button on the toolbar. This brings up the export layer screen, as shown in **Figure 56**. Select the file type you wish to export to, give the file a name then click on the **Save** button.

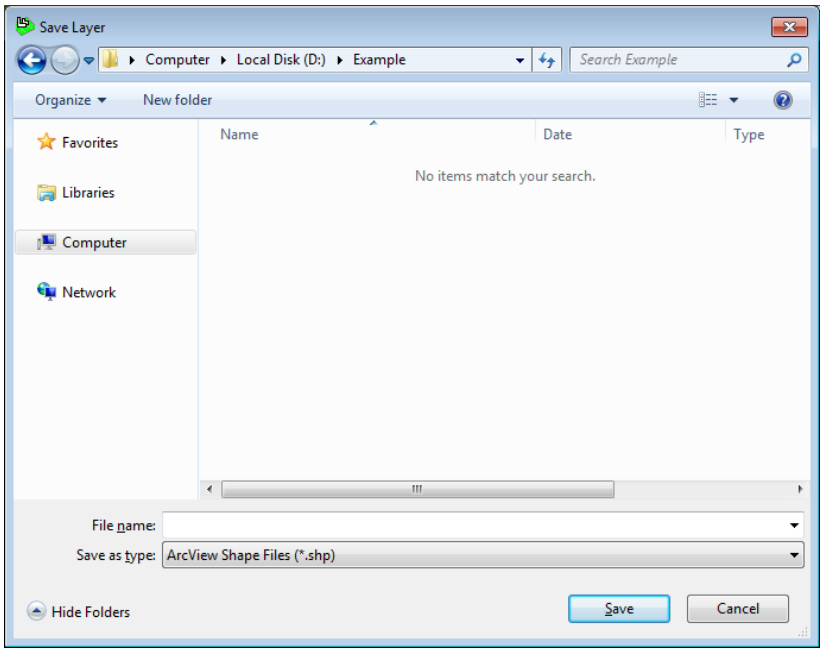


Figure 56 - The **Export Layer** window.

Alternatively a layer can be exported by selecting it and then right-clicking to display the menu. Select **Export layer** and then select the file type from the sub-menu which offers three formats, i. e. t**o SHP**...., t**o KML**....and t**o CSV**....

---

*A wider range of export file types is available using the **Export Layer** button on the toolbar.*

A new window will appear which you can use to save the file in your desired location. The file type will be selected automatically and a default name for the file is

suggested, based on the name of the layer.

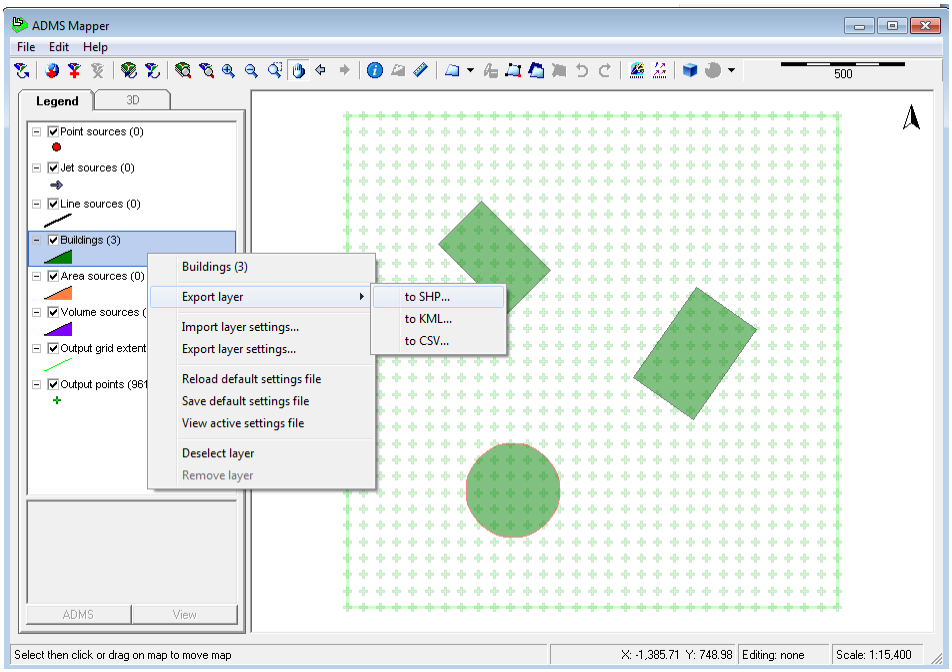


Figure 57 - The **Export Layer** right-click option.

5.12.1 Exporting to Google Earth

The layers can be exported so that they can be viewed in Google Earth. This may be useful for checking the locations of sources and buildings etc. against a satellite image of the area being modelled. To do this, follow these steps:

Step 1 Set the coordinate system for the map, see Section 5.1.

Step 2 Ensure that a valid projected or geographic coordinate system has been set for the layers that are being exported. Refer to Section 5.2 for details on how to do this.

---

*The coordinate systems for the ADMS layers do not need to be changed in the ADMS Mapper. These are set automatically from the option defined in the ADMS interface. The **Unspecified regular Cartesian** grid cannot be used if you wish to export an ADMS layer to Google Earth.*

Step 3 Export the layer to Keyhole Markup Language (**.kml*) by following the instructions given just above.

Step 4 Open the **.kml* file in Google Earth.

APPENDIX A Advanced topics

A.1 Label formatting

This section[2] outlines how to format the display labels using some of the more advanced features available in the ADMS Mapper.

A.1.1 Overview

The ADMS Mapper provides a simple markup language for custom label formatting. You can apply this in the **Label** tab of the layer properties dialog for the layer.

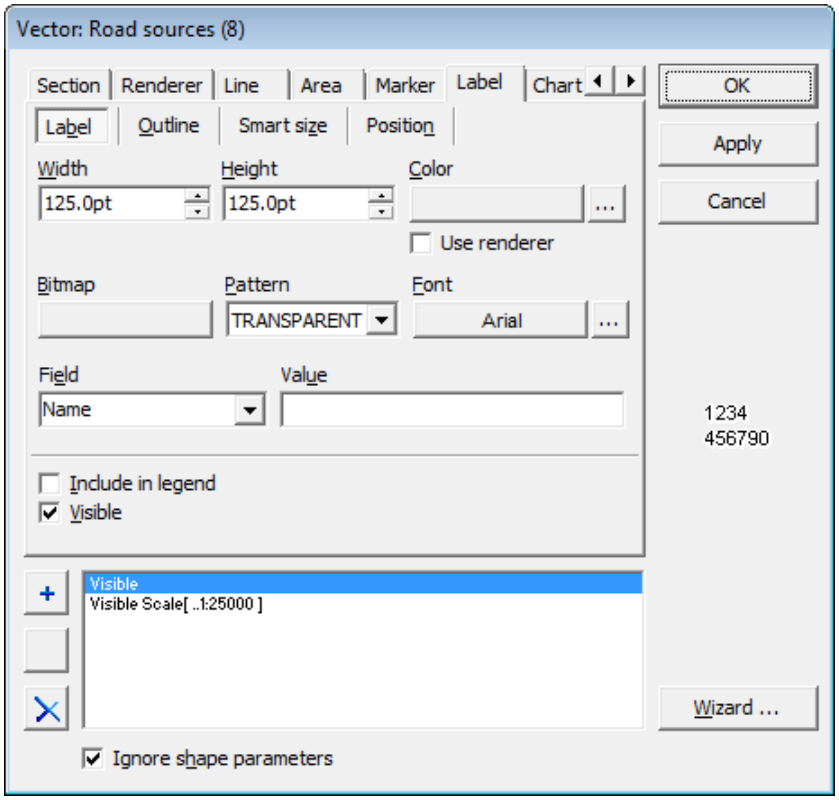


Figure 58 - Layer label properties

You can use the **Value** to both define and format the label using format descriptors described in the rest of this section. The label can be any combination of fixed text and fields () defined in the current layer. A simple example would be to have the fixed text "Canyon" and then use the CanyonHeight field to display the canyon height for all roads using the specified formatting.

[2] This information is taken from the following site:
http://docs.tatukgis.com/EDT/ENU/Help/index.htm?mnulayerpropertiesvectorlabelformatting.htm

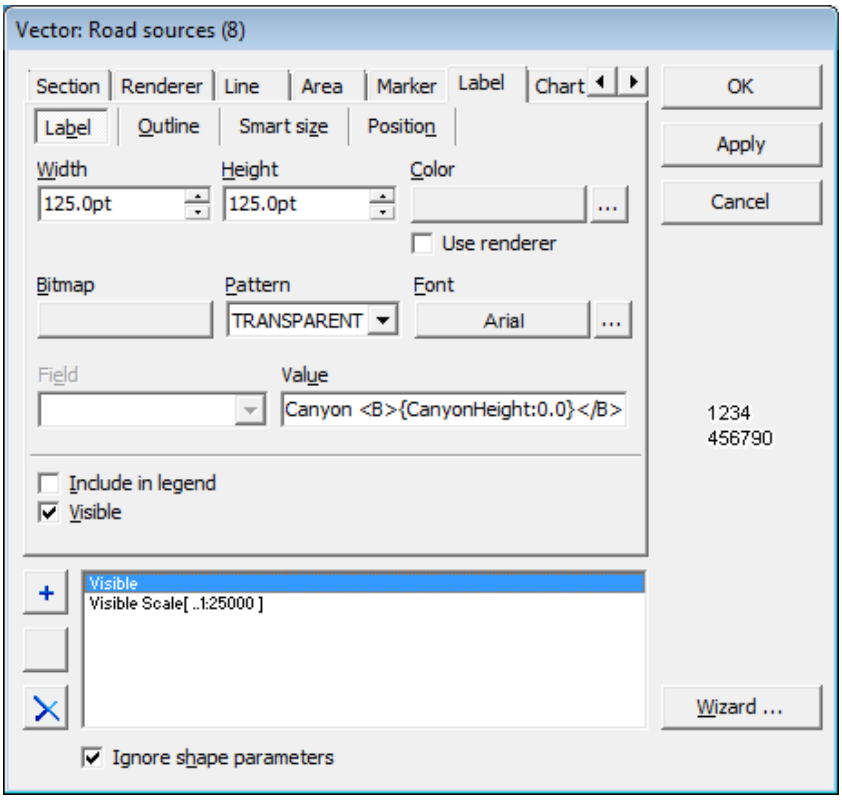


Figure 59 - Setting the label value option

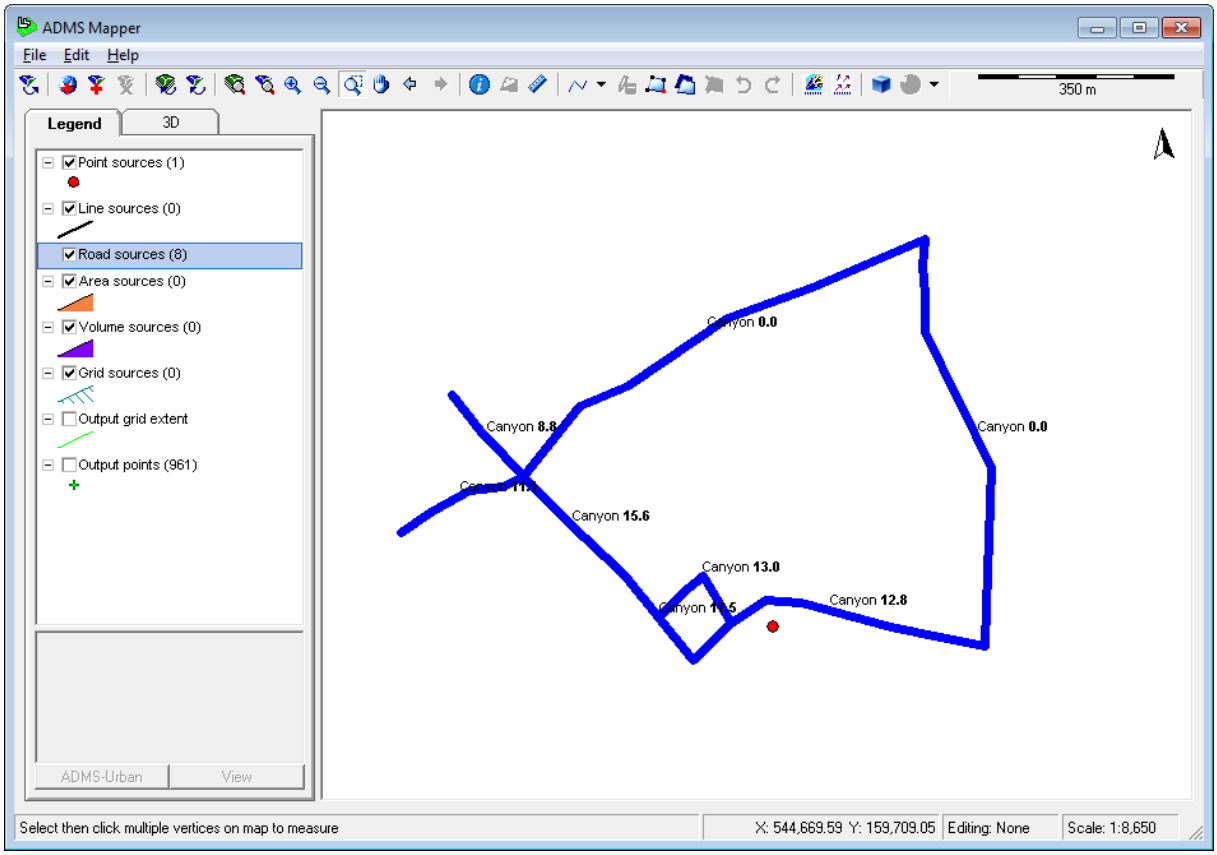


Figure 60 - Map with formatted labels

A.1.2 Visual formatting

The **Value** input supports some of the standard HTML markers for visual formatting:

Markup	Description
<B></B>	Text inside is displayed in bold
<I></I>	Text inside is displayed in italic
<U></U>	Text inside is underlined
<HR>	Horizontal line
 	Line break
<P></P>	Text inside is treated as a complete paragraph
<STRONG></STRONG>	Text inside is displayed in extra bold font
<FONT SIZE="S" NAME="F" COLOR="C"></FONT>	Text inside is displayed in the F font of the size S and colour C F: ARIAL, TIMES, TAHOMA, etc. C: BLACK, BLUE, FUCHSIA, GRAY, GREEEN, LIME, MAROON, NAVY, OLIVE, PURPLE, RED, SILVER, TEAL, WHITE, YELLOW The C colour can be also given in the RGB representation #RRGGBB, where RR, GG and BB are two digit hexadecimal number representations of the red, green and blue colour intensities
&	The ampersand (&) sign
	Forced insertion of space
>	The great-than (>) sign
<	The less-than (<) sign

Table 5 - Simple markup

Example

```
 <U><FONT NAME="ARIAL" COLOR=#FF0000><I>value1</I></FONT> <FONT
NAME="ARIAL" COLOR=#0000FF><B>&lt;</B></FONT> <FONT NAME="ARIAL"
COLOR=#00FF00><BOL>value2</BOL></FONT></U>
```

The above code will result in the following label: *value1* **<** **value2** .

A.1.3 Inserting fields

The code **{FIELD_NAME:FORMAT}** inserts the value of a field or attribute named **FIELD_NAME** with formatting defined by the format string **FORMAT**. The format string is attribute type specific.

A.1.4 Formatting of NUMBER and FLOAT type attributes

Automatic formatting

Format character	Format name	Description
C or c	Currency	Integer following the character defines the number of digits displayed after the decimal point (default is 2). Uses the currency marker from the system settings.
D or d	Digit (integer)	Integer next to the character defines the minimum number of digits to be displayed; number will be padded with zeroes if necessary; non integral value will be rounded first.
E or e	Scientific (exponential)	Integer next to the character defines the number of digits displayed after the decimal point (default is 2); number formatted as *Scientific* is always displayed in exponential form;
F or f	Fixed-point	Integer next to the character defines the number of digits displayed after the decimal point (default is 2).
G or g	General	Displays the number in a format best suited for the value; Integer next to the character defines the number of significant digits.
N or n	Number	Integer following the character defines the number of digits displayed after the decimal point (default is 2); inserts thousand separators accordingly to the system settings.
P or p	Percent	The number is multiplied by 100; Integer following the character defines the number of digits displayed after the decimal point (default is 2)
R or r	Round-trip	Equivalent of *General*; Integer next to the character is ignored.
X or x	Hexadecimal	Integer next to the character defines the minimum number of hexadecimal digits to be displayed; number will be padded with zeroes if necessary; non integral value will be rounded first.

Table 6 - Automatic number formatting

Custom formatting:

Format character	Name	Description
#	Digit placeholder	Defines optional position of a digit; if corresponding digit in the value does not exist, the digit placeholder is neglected.
0	Zero placeholder	Defines obligatory position of a digit; if corresponding digit in the value does not exist, the zero placeholder is replaced by '0'.
.	Decimal point	Defines the position of the decimal point.
[other]		Other characters are displayed without any change.

Table 7 - Custom number formatting

Examples:

Code	Attribute value	Result string	Note
{FIELD_NAME:#.###}	123.59	'123.59'	
{FIELD_NAME:#.000}	123.59	'123.590'	
{FIELD_NAME:#.####0}	123.59	'123.59000'	
{FIELD_NAME:#####.###}	-123.59	'-123.59'	
{FIELD_NAME:00000.###}	123.59	'00123.59'	
{FIELD_NAME:0-0-0-0-0}	123.59	'0-0-1-2-4'	rounding
{FIELD_NAME:over #;below #;zero #}	123.59	'over 124'	rounding
{FIELD_NAME:over #;below #;zero #}	-123.59	'below 124'	rounding, no minus sign
{FIELD_NAME:over #;below #;zero #}	0	'zero '	no zero sign
{FIELD_NAME:over #;below #;zero 0}	0	'zero 0'	
{FIELD_NAME:;below #;zero#}	123.59	''	empty string
{FIELD_NAME:over #;;zero#}	-123.59	''	empty string
{FIELD_NAME:over #;below #;}	0	''	empty string

Table 8 - Number formatting examples

A.1.5 Formatting of BOOLEAN type attributes

Automatic formatting:

Code	Attribute value	Result
{FIELD_NAME}	True	'True'
{FIELD_NAME}	False	'False'

Table 9 - Automatic Boolean formatting

Examples:

Code	Attribute value	Result	Note
{FIELD_NAME:yes;no}	True	'yes'	
{FIELD_NAME:yes;no}	False	'no'	
{FIELD_NAME:yes}	True	'yes'	
{FIELD_NAME:yes}	False	''	empty string
{FIELD_NAME:;no}	True	''	empty string
{FIELD_NAME:yes;}	False	''	empty string
{FIELD_NAME:yes;no1;no2}	False	'no1;no2'	

Table 10 - Boolean formatting examples

A.1.6 Formatting of DATE type attributes

Note: character in brackets represents a string consisting of any number of this character.

Format string	Format name	Description
d	Day	Day as a number 1 to 31
dd	Day	Day as a number 01 to 31
ddd	Day	Day as an abbreviated name of the day of the week; depends on system regional settings
dddd(d)	Day	Day as a full name of the day of the week; depends on system regional settings
f	Second fraction	Most significant digit of the second fraction
ff	Second fraction	Two most significant digits of the second fraction
fff	Second fraction	Three most significant digits of the second fraction
ffff	Second fraction	Four most significant digits of the second fraction
fffff	Second fraction	Five most significant digits of the second fraction
ffffff	Second fraction	Six most significant digits of the second fraction
fffffff(f)	Second fraction	Seven most significant digits of the second fraction
F	Second fraction	Most significant digit of the second fraction; if zero then nothing will be displayed
FF	Second fraction	Two most significant digits of the second fraction; trailing zeros will be truncated
FFF	Second fraction	Three most significant digits of the second fraction; trailing zeros will be truncated
FFFF	Second fraction	Four most significant digits of the second fraction; trailing zeros will be truncated
FFFFF	Second fraction	Five most significant digits of the second fraction; trailing zeros will be truncated
FFFFFF	Second fraction	Six most significant digits of the second fraction; trailing zeros will be truncated
FFFFFF(F)	Second fraction	Seven most significant digits of the second fraction; trailing zeros will be truncated
h	Hour	Hour as a number 1 to 12
hh(h)	Hour	Hour as a number 01 to 12
H	Hour	Hour as a number 1 to 24
HH(H)	Hour	Hour as a number 01 to 24
m	Minute	Minute as a number 0 to 59
mm(m)	Minute	Minute as a number 00 to 59
M	Month	Month as a number 1 to 12
MM	Month	Month as a number 01 to 12
MMM	Month	Month as an abbreviated name of the month; depends on system regional settings

MMMM(M)	Month	Month as a full name of the month; depends on system regional settings
s	Seconds	Seconds as a number 0 to 59
ss(s)	Seconds	Seconds as a number 00 to 59
t	AM/PM	First character of the 'AM' or 'PM' string; depends on system regional settings
tt(t)	AM/PM	'AM' or 'PM' string; depends on system regional settings
y	Year	Year as a two digit number; if year has less than two digits then one digit number will be displayed
yy	Year	Year as a two digit number; if year has less than two digits then result will be padded with zero
yyy	Year	Year as a three digit number; if year has less than three digits then result will be padded with zeros
yyyy	Year	Year as a four digit number; if year has less than four digits then result will be padded with zeros
yyyy(y)	Year	Year as a five digit number; if year has less than five digits then result will be padded with zeros
[other]		Other characters are displayed without any change

Table 11 - Custom date formatting

Examples:

Code	Attribute value	Result
{FIELD_NAME:d}	3rd of June 2008: 17:09:03.650, US English	'3'
{FIELD_NAME:dd}	3rd of June 2008: 17:09:03.650, US English	'03'
{FIELD_NAME:ddd}	3rd of June 2008: 17:09:03.650, US English	'Tue'
{FIELD_NAME:dddd}	3rd of June 2008: 17:09:03.650, US English	'Tuesday'
{FIELD_NAME:M}	3rd of June 2008: 17:09:03.650, US English	'6'
{FIELD_NAME:MM}	3rd of June 2008: 17:09:03.650, US English	'06'
{FIELD_NAME:MMM}	3rd of June 2008: 17:09:03.650, US English	'Jun'
{FIELD_NAME:MMMM}	3rd of June 2008: 17:09:03.650, US English	'June'
{FIELD_NAME:y}	3rd of June 2008: 17:09:03.650, US English	'08'
{FIELD_NAME:yy}	3rd of June 2008: 17:09:03.650, US English	'08'
{FIELD_NAME:yyy}	3rd of June 2008: 17:09:03.650, US English	'008'
{FIELD_NAME:yyyy}	3rd of June 2008: 17:09:03.650, US English	'2008'
{FIELD_NAME:yyyyy}	3rd of June 2008: 17:09:03.650, US English	'02008'
{FIELD_NAME:h}	3rd of June 2008: 17:09:03.650, US English	'5'
{FIELD_NAME:hh}	3rd of June 2008: 17:09:03.650, US English	'05'
{FIELD_NAME:H}	3rd of June 2008: 17:09:03.650, US English	'17'
{FIELD_NAME:HH}	3rd of June 2008: 17:09:03.650, US English	'17'
{FIELD_NAME:t}	3rd of June 2008: 17:09:03.650, US English	'P'
{FIELD_NAME:tt}	3rd of June 2008: 17:09:03.650, US English	'PM'
{FIELD_NAME:m}	3rd of June 2008: 17:09:03.650, US English	'9'
{FIELD_NAME:mm}	3rd of June 2008: 17:09:03.650, US English	'09'
{FIELD_NAME:s}	3rd of June 2008: 17:09:03.650, US English	'3'
{FIELD_NAME:ss}	3rd of June 2008: 17:09:03.650, US English	'03'
{FIELD_NAME:f}	3rd of June 2008: 17:09:03.650, US English	'6'
{FIELD_NAME:ffff}	3rd of June 2008: 17:09:03.650, US English	'6500'
{FIELD_NAME:FFFF}	3rd of June 2008: 17:09:03.650, US English	'65'
{FIELD_NAME:yyyy/MM/dd HH/mm/ss.ffff}	3rd of June 2008: 17:09:03.650, US English	'2008/06/03 17:09:03.6500'

Table 12 - Date formatting examples

A.1.7 Formatting of STRING type attributes

Note: i is a placeholder for an integer number.

Format character	Name	Description
`$`	normal text	Text displayed without any changes.
`S`	uppercase	Text displayed in uppercase.
`s`	lowercase	Text displayed in lowercase.
i *[at the beginning]*	first character	**i**>0 defines from which character (counting from the beginning of the string) should be the string displayed; if **i**<0 then the characters are counted from the end of the string.
i *[at the end]*	last character	**i**>0 defines up to which character (counting from the beginning of the string) should be the string displayed; if **i**<0 then the characters are counted from the end of the string.
`H`	force HTML	force HTML interpretation of <> symbols

Table 13 - Custom string formatting

Examples:

Code	Attribute value	Result string	Note
{FIELD_NAME:$}	'Abcdefghij'	'Abcdefghij'	
{FIELD_NAME:S}	'Abcdefghij'	'ABCDEFGHIJ'	
{FIELD_NAME:s}	'Abcdefghij'	'abcdefghij'	
{FIELD_NAME:1$-1}	'Abcdefghij'	'Abcdefghij'	
{FIELD_NAME:1S3}	'Abcdefghij'	'ABC'	
{FIELD_NAME:1s3}	'Abcdefghij'	'abc'	
{FIELD_NAME:1$-3}	'Abcdefghij'	'Abcdefgh'	
{FIELD_NAME:-3$-1}	'Abcdefghij'	'hij'	
{FIELD_NAME:4$-4}	'Abcdefghij'	'defg'	
{FIELD_NAME:8$-8}	'Abcdefghij'	''	empty string
{FIELD_NAME:H}	'A<b>c'	'A<b;>c'	
{FIELD_NAME:H$}	'A<b>c'	'A<b;>c'	
{FIELD_NAME:HS}	'A<b>c'	'A<B;>C'	
{FIELD_NAME:Hs}	'A<b>c'	'a<b;>c'	
{FIELD_NAME:H1s3}	'A<b>c'	'a<b'	

Table 14 - String formatting examples

A.2 Using symbology files

The ADMS Mapper supports symbology (SYM) files, which use a series of command instructions to create custom line styles. When drawing the layer using a symbology file, the ADMS Mapper will follow the rendering instructions to draw custom lines. The "mini-language" used to code the instructions is set out in **Table 15**.

A.2.1 Transparent roads example

There are times when you wish to see the concentration contours but when the source is displayed the contours are obscured. This can be the case for **Road sources** where the highest concentrations are along the road. Hiding the road layer off (unticking it in the **Legend**) is a possibility, but then you lose the visual information about the road layout. On solution would be to display road sources with the contour plot showing through – i.e. delineated by their borders alone so that the main body of the polyline would be transparent.

The following example demonstrates how a symbology file can be applied to the **Road sources** layer in order to produce the transparency effect described above.

Step 1 Double click on the layer of interest in the layers panel to bring up the layer properties window – in this case bring up the properties for the **Road sources** layer as shown in **Figure 61**.

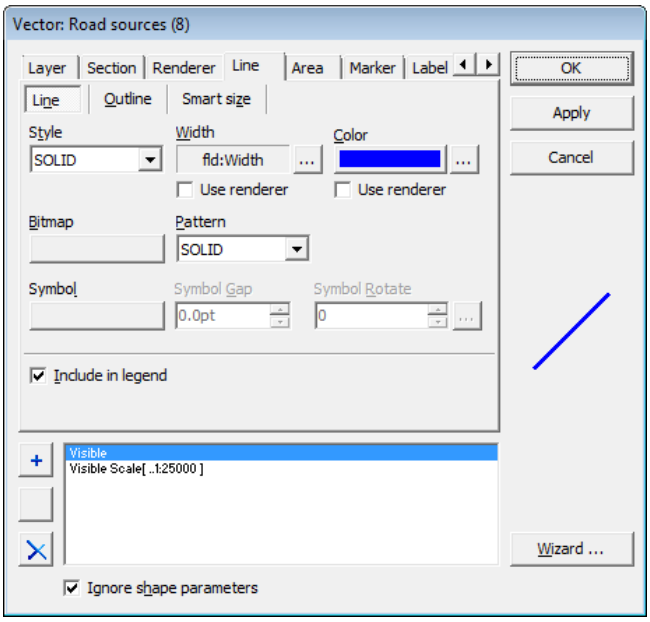


Figure 61 - Layer properties window

Step 2 On the **Line** tab, select the **Line** section and click the **Symbol** button in order to bring up the **Symbol** dialog, see **Figure 62**.

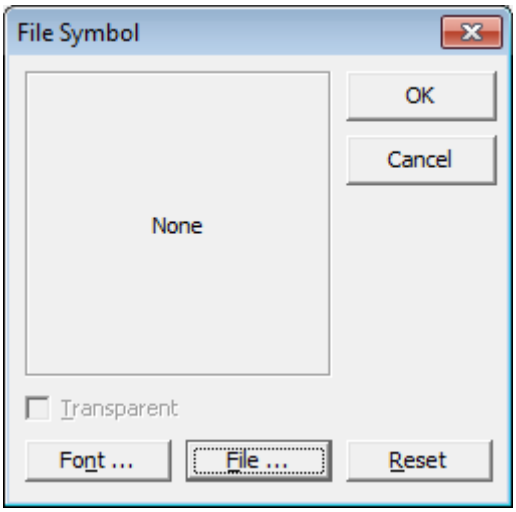


Figure 62 - Symbol dialog

Step 3 Click the **File** button in the **Symbol** dialog and browse for the example *.sym* file supplied with the installation, **Figure 63**. A sample rendering should be displayed in the **Symbol** dialog, **Figure 64**.

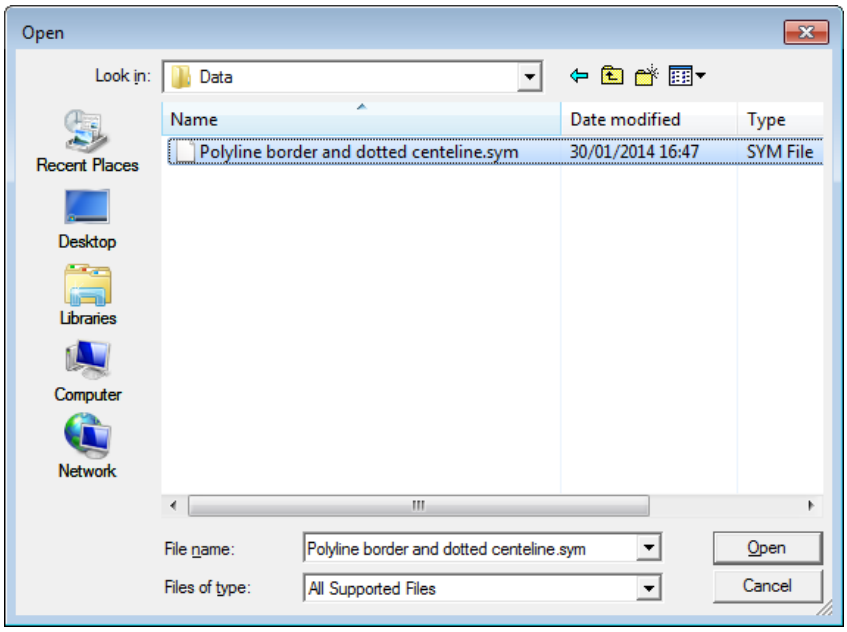


Figure 63 - Selecting a symbology file

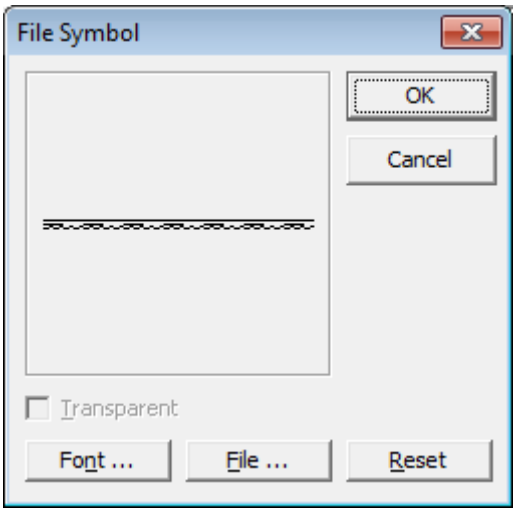


Figure 64 - Symbol dialog showing example symbology

Step 4 Click **OK** to return to the Layer properties window (**Figure 65**) and either click **Apply** or **OK** to apply the chosen symbology to the **Road sources** layer, **Figure 66**.

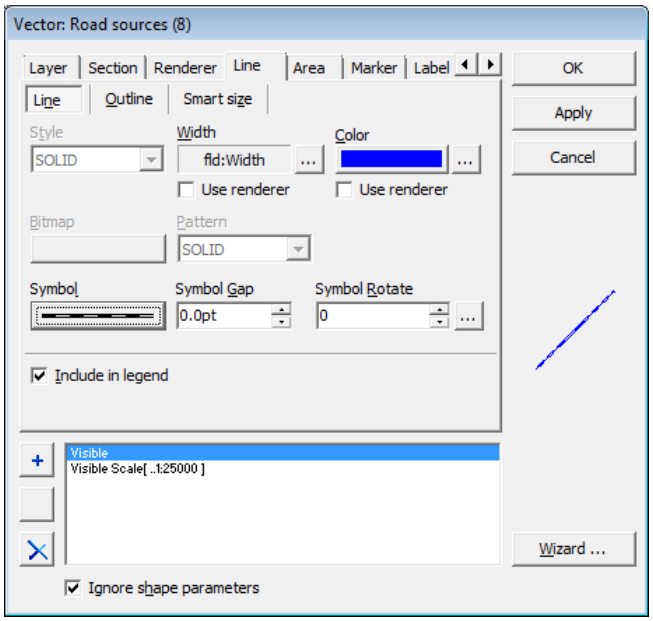


Figure 65 - Layer properties window with symbology selected

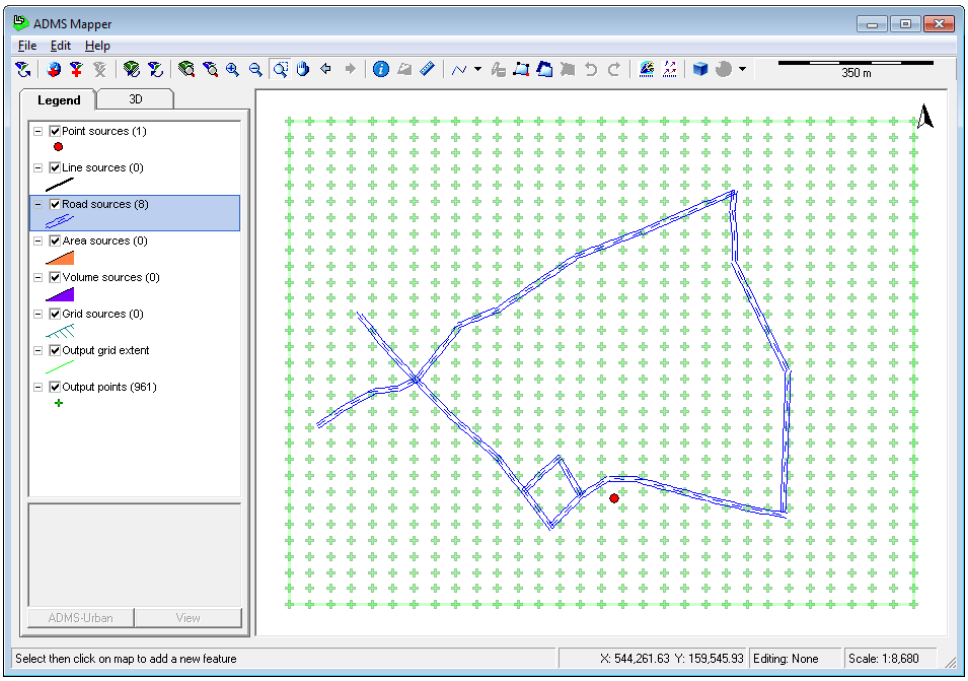


Figure 66 - Roads layer with symbology applied.

Step 5 Load a contour layer to see the effects of the new rendering, **Figure 67** and **Figure 68**.

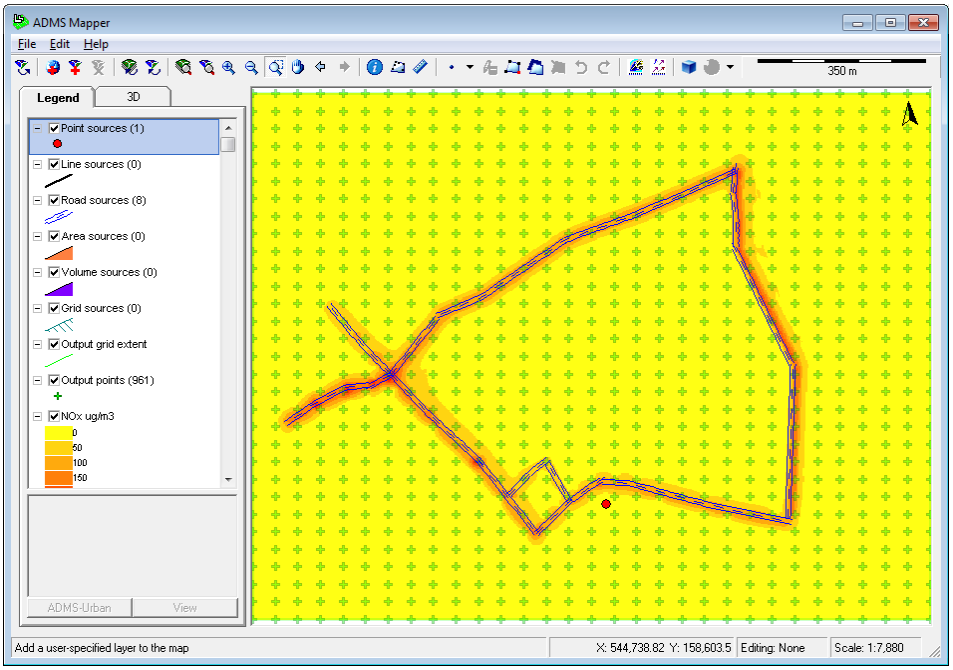


Figure 67 - Roads layer with symbology applied over a contour layer.

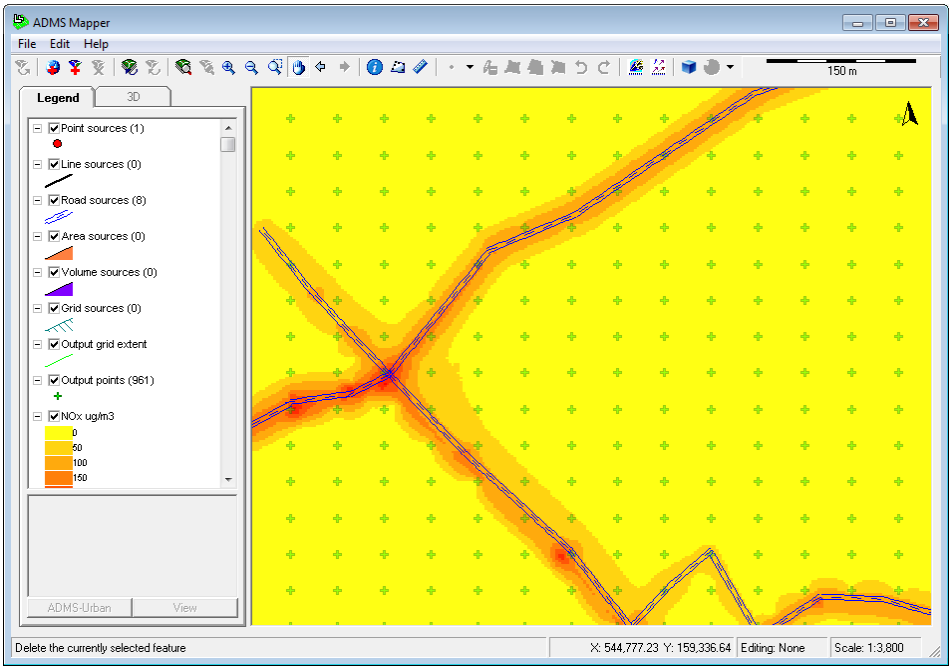


Figure 68 - Close up of Roads layer with symbology applied over a contour layer.

A.2.2 Making symbology files

The following list summarises the key elements of using symbology files

- All parameters (except GOTO) are relative and move the "drawing position" cursor along the shape.
- The X coordinate moves cursor along the shape. The Y coordinate moves curser perpendicularly.
- Drawing can contain as many commands as desired.
- Using GOTO(0) enables drawing over an already drawn line.
- FOR..END loop cannot be embedded into another loop.
- The more complicated the symbol, the slower the drawing speed.

Commands

Full	Short	Description	Sample
;		Comment out whole line	;A comment
GOTO(x)	G	Move drawing position along the shape to an arbitrary position.	GOTO(10%) G(10%)
MOVE(dx,dy)	M	Move drawing along line by a delta.	MOVE(10,-10) M(+10-10)
DRAW(x1,y1,x2,y2,..,xn,yn)	D	Draw a vector segment.	DRAW(5,5 5 -5) D(+5+5+5-5)
OUTLINE(x1,y1,x2,y2,..,xn,yn)	O	Draw a line symbol with the rotation point at the place of the current "drawing position". Whole symbol will be rotated with the same parameters. First set of coordinates means the starting point of the shape.	OUTLINE(5,5 -10,0 0,-10 10,0 0,-10) O(+5+5-10+0+0-10+10+0+0-10)
FILL(x1,y1,x2,y2,..,xn,yn)	I	Draw a filled symbol with the rotation point at the place of the current "drawing position". Whole symbol will be rotated with the same parameters. First set of coordinates means the starting point of the shape.	FILL(5,5 -10,0 0,-10 10,0 0,-10) I(+5+5-10+0+0-10+10+0+0-10)
FOR(x)	F	Start of the loop. Parameters for the distance the loop will be repeated. Default is 100%. A negative value means calculation starting from the end of the line. For example, FOR(-45%) means repeat until 45% of the distance of the entire line length, starting from the end of the line.	FOR(50%) F(50%)
END()	E	End of the loop.	END() E()
WIDTH(x)	W	Change line width.	WIDTH(10W) W(10W)
COLOR(r,g,b)	C	Change drawing color.	COLOR(255,0,0) C(255,0,0)
COLOR(mode)	C	Change drawing color to: 0 - line/area color 1 - outline color	COLOR(1) C(1)

Table 15 - Symbology commands summary

Values option

Option	Description	Sample
None	Default – pixels	GOTO(10)
X	Device independent pixels - 1 pixel in 96dpi. Multiplied by 10 so 10X means one "pixel"	GOTO(10X)
T	Twips (1/1440 of inch)	GOTO(700T)
W	Line width (as set for Line.Width) expressed multiplied by 10. So 15T means 1.5 line widths.	GOTO(15T)
S	Line with scaled device independent pixels (similar to 'X'). Scales means that wider lines will result no proportional scaling: 10X for thin lines means really same as 10X but for wider line it will be represented by smaller value for better visual effect	GOTO(10S)

Table 16 - Symbology measuring settings

A.3 Recognised file types

The ADMS Mapper supports loading the following recognised file types and formats natively. This allows them to be displayed in the map view as new non-editable layers. The list is not comprehensive, but gives the most commonly supported file types.

Format	*File extension*
• ArcExplorer Project File	*.aep
• Arcinfo Ascii Grid	*.asc
• Arcinfo Binary Grid	*.adf
• Arcinfo Export Format	*.e00
• Arcinfo Float Grid	*.flt
• ArcView 3.xx Project File	*.apr
• ArcView Shape Files	*.shp
• AutoCAD (DWG 2000 & 2003)	*.dwg
• AutoCAD (DXF)	*.dxf
• Binary Terrian Grid	*.bt
• CADRG Compressed ARC Digitized Raster Graphics	*.toc
• Census 2000 TIGER/Line	*.rt1
• Comma Separated Values point layer (CSV)	*.csv and others
• Digital Elevation Model (ASCII GRID or SPOT)	*.dem
• Digital Line Graphs (DLG)	*.opt;*.dlg
• Digital Terrain Elevation Data	*.dt0;*.dt1;*.dt2
• Enhanced Compressed Wavelet	*.ecw
• ERDAS IMAGINE Image File Format	*.img
• ESRI File Geodatabase API for vectors	*.ttkls
• FME Feature Store	*.ffs
• GDAL Wrapper for raster formats	(multiple)
• Geographic Data Files	*.gdf
• Geographic Markup Language	*.gml;*.xml
• GeoJSON	*.json;*.geojson
• Global Self-consistent Hierarchical High-res Shorelines GSHHS	*.rim;*.b
• Golden Software Surfer Grid	*.grd
• Google Earth Keyhole Markup Language	*.kml
• GPS Exchange Format	*.gpx
• Graphic Interchange Format	*.gif
• IHO S-57 ENC	*.000
• JPEG 2000 via ECW	*.jp2
• JPEG 2000 via MRSID	*.jp2
• JPEG File Interchange Format	*.jpg;*.jpeg
• LandXML	*.xml
• LiDAR LAS (ASPRS)	*.las
• Lizardtech MrSID	*.sid
• MapInfo Interchange Format	*.mif
• MapInfo Native Format	*.tab
• MapInfo WorkFile	*.wor

• MapInfoX Project File	*.gst
• MicroStation Native Format	*.dgn
• OGR Wrapper for vector formats	(multiple)
• OpenStreetMap Format	*.osm
• Pictometry Oblique Images	*.psi
• Portable Network Graphic	*.png
• Protocol Layer Connector	*.ttkwp
• QGIS Project File	*.qgs
• SDTS Raster Profile and Extensions	*.ddf
• SDTS Topological Vector Profile	*.ddf
• SPOT Binary In-line Format	*.bil;*.dem
• SQL Layer Connector	*.ttkls
• SRTM HGT Grid	*.hgt
• Tag Image File Format	*.tif;*.tiff
• TatukGIS PixelStore	*.ttkps
• TatukGIS Project File	*.ttkgp
• Vector Product Format (VPF)	*.dht; *.lht
• Window Bitmap	*.bmp
• XYZ Point Cloud data	*.xyz; *.asc; *.ply