

DYNAMIC MAPS



Version 3.0 Manual

TCO CEE Terrestrial Carbon Warehouse Workshop 16-21 November 2002

With the support of:

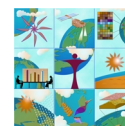


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An FAO and SKE **DYNAMIC ATLAS**® Product



SKE

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SKE Inc.

40 Linelle St. Toronto, ON M2N 2J3 Canada

www.skeinc.com

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Section 1. Dynamic Maps at a Glance

Thank you for using Dynamic Maps – a key part of SKE’s Dynamic Atlas suite of software products. Dynamic Maps makes it easy for anyone to use maps in their everyday work. Dynamic Maps provides a map-based window onto your information, providing easy access to and manipulation of maps, associated tabular data, and related documents, pictures, web sites and more. Dynamic Maps is “generic”, not business-specific, and therefore can be used in many ways with any data.

Design Philosophy

Dynamic Maps puts an “atlas” of information into your hands – quickly, cost-effectively, and in a way that is open for growth and change. Dynamic Maps reflects a new philosophy to working with maps on computers. Often these systems are too costly and complex. Most people’s needs can be met by data access and straightforward data viewing, manipulation, and map creation. They need:

- A system that’s easy to use and learn.
- Access to data and information.
- The ability to quickly produce maps and ask questions.
- The ability to integrate maps with other applications.
- A system that doesn’t cost an “arm and a leg”.

That’s what Dynamic Maps delivers.

Running Dynamic Maps

Dynamic Maps needs to be set up before it can be used so that the software “knows” where to find the warehouses (atlases) it will be using. Please see **Appendix 1** for instructions about installing Dynamic Maps and running it for the first time.

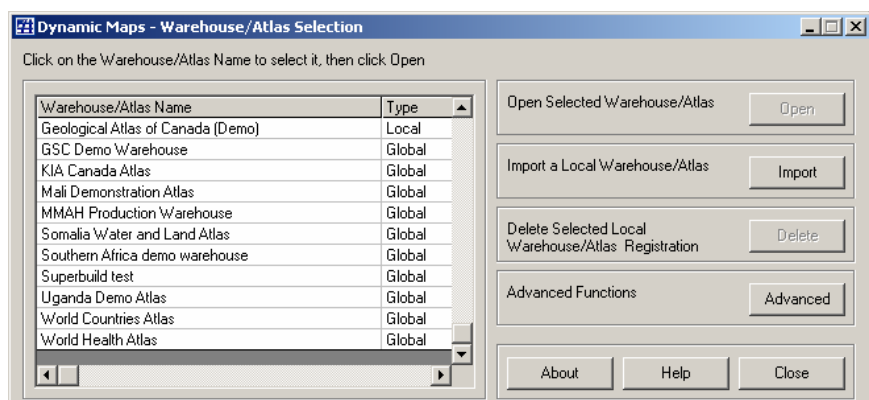
When you launch Dynamic Maps, open the warehouse that you want to connect to.

If there are no warehouses in this list, see **Appendix 1** for instructions about running Dynamic Maps for the first time.

Functionality Highlights:

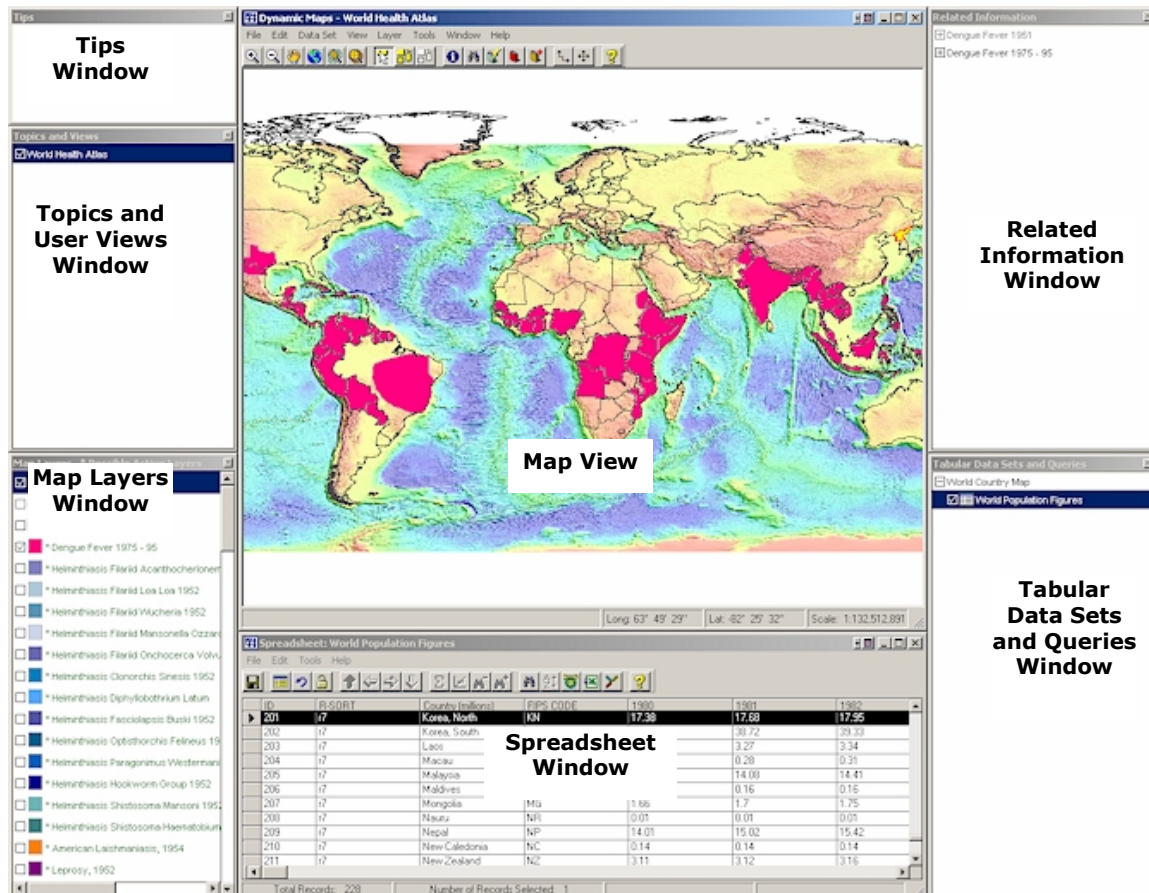
- Link associated tabular data to a map layer’s features without having to know anything about the database, its structure or how to connect to it.
- Publish and access documents and URLs based on map features.
- Integrate with PowerPoint for map publishing and presentation.
- Integrate with Excel for sophisticated tabular processing and output.
- Create “views” of all or part of the geographic area of interest and its various features.
- Change the look of and label selected map features to emphasize their display.
- Quickly generate a hard copy map.

Dynamic Maps provides a powerful access point to all your data integrated into the concept of a warehouse or atlas. Plus it integrates with Microsoft Office to provide easy publishing of maps in PowerPoint and related data analysis in Excel.



Overview of the Interface

Dynamic Maps' windows present the information available for any atlas topic. When an atlas is opened its default topic is loaded and the information associated with that topic is displayed.



Tips Window

Watch this window for tips on using the system.

Topics and User Views Window

The atlas' topics are listed here along with any views that you create. These dictate what information in the atlas is available for use.

Map Layers Window

The Map Layers window lists all the topic's map layers. By turning a map layer on and off, you can see the various relationships and information in the map view.

"Possible Active Layers" are green and have an asterisk (*) in front of them. These layers can be made active by clicking on them. When they are active, you can select features, identify features, and find features on that map layer.

Map layers names that are not green are background layers and can only be turned on/off.

The terms "Warehouse" and "Atlas" mean the same thing. A warehouse is an integrated collection of maps, tabular data sets, and related information organized into topics.

A "User View" is a way to save your work within a topic.

The Active Layer Rules:

- Only one map layer can be active.
- Only active layers have related data and information objects.
- Only active layers can have their features identified, found and selected.

Related Information Window

The Related Information window lists the map layers that have related information, and lists the name of the related information object. Clicking on the object's name will launch the object and will make its associated map layer active (if it isn't already.)

Tabular Data Sets and Queries Window

This window lists the map layers and their associated tabular data sets and any queries you generate. Clicking on a data set or query will launch it in the spreadsheet and will make its associated map layer active (if it isn't already).

Spreadsheet Window

The spreadsheet provides the interface between the tabular data and the map layer and shows the fields and values for the records in a data table or query. The records in the spreadsheet are linked with their relative map features.

Section 2. Dynamic Maps Functions

Dynamic Maps has the functionality you need to create maps for publishing and observing various relationships between the tabular data, related information and their associated map layers.

Section 2a. Topics and User Views

Topics and Views Explained

Topics are predefined for an atlas using SKE's "Dynamic Knowledgebase" software.

Each atlas has a "default" topic that is launched with the atlas. Topics have a unique set of map layers, data sets and related information depending on the characteristics of the data, geographic extent and the subject matter. You can add and save new user data sets and related information to a topic but you cannot add new map layers without Dynamic Knowledgebase.

Topics are stored in a hierarchy so that they can be related to each other in a logical way.

Views are the maps that you have created perhaps because you're frequently working on a particular area of interest with a consistent set of map layers with various rendering properties. When a view is created it is stored in the hierarchy underneath its related Topic. A "view" is a snapshot of a topic's map layers at a particular location and scale, and includes various rendering properties for the maps and perhaps, a class rendering of a map layer based on a related tabular data set.

User Views do not store selected features or any user drawn objects. Instead the characteristics of the view are stored in the database, thus if the data changes so does the view.

Using Topics and Views

To access a Topic, click on its name in the list or on the check box. There may be a hierarchy of topics and views, in which case click on the "+" sign first to see them all. Topics in an Atlas cannot be added or deleted.

Saving a View

To save a new view, use the **File / Save View As** function and provide a unique name and a description (optional). This view will now be available whenever you launch this atlas in Dynamic Maps on your computer (user views are not transportable across computers). Saving a view will also save your class rendering properties.

Updating a View (Save View)

When you make changes to a view you created – either by changing its extent, relative location, or the rendering properties of the map layers, use **File / Save View** to update the view.

Deleting a View

To delete a view from the list, use **File / Delete View**. Deleting a view does not affect the data in the warehouse -- you are not deleting data. You cannot delete the view you're in.

Section 2b. Map Layers

Map Layers Explained

The **Map Layers** window lists all the map layers registered for the Topic. A lot can be accomplished just by selecting what map layers are displayed.

Map layers are visible in the map view based on their scale. If the current scale of the map is too small (i.e. too far away) or too large; then the map layer will look greyed out in the list. Clicking on a greyed out layer will force the map view to zoom and/or pan to the extent of that map layer so that it can be seen.

Q> Why aren't all map layers visible all the time?

A> *Some map layers may have too much detail or they may be only representative of a particular geographic area so it would not make sense to display them at smaller scales or when looking at a different area. These map layers are greyed out to indicate this.*

Some map layers may be "value-rendered" – meaning that different types of features on the same map layer will be rendered differently. For example, a road network might have highways and local roads, both of which could look different.

Any map layers that are turned on will be part of the map legend when you output the map to PowerPoint or a printed map composition.

Using Map Layers

Rendering Map Layers

You can change how a map layer looks i.e. its "rendering properties" – except image layers. Different map layers will have different rendering property options, depending on whether the layer is composed of polygons, lines, points, or labels.

To change the rendering properties of any map layer, **right-click** on its name or, for value rendered map layers, on the particular layer legend value you want to change. Save changes by saving the view (**File/Save View As**).

Map layers can be one of five types:

- polygons – e.g. countries, admin. areas, building footprints;
- lines – e.g. rivers, utility networks;
- points – e.g. cities, well locations;
- labels – e.g. province names;
- images – e.g. satellite imagery.

Active Layers

Almost everything you do in Dynamic Maps will be done on the "active" layer. An active layer has the focus for related tabular data and related information objects. An active layer can have its features found, identified and selected. Only specific map layers can be made active. These appear in **green** and they have an asterisk (*) in front of them.

A map layer can be made active by:

- Clicking on its name in the list.
- Clicking on the name of a tabular data set.
- Clicking on the name of a related information object.
- Selecting an active layer from **Layer / Active Layer** in the menu.
- Going into Related Information, find, identify and select modes and then selecting an active layer.

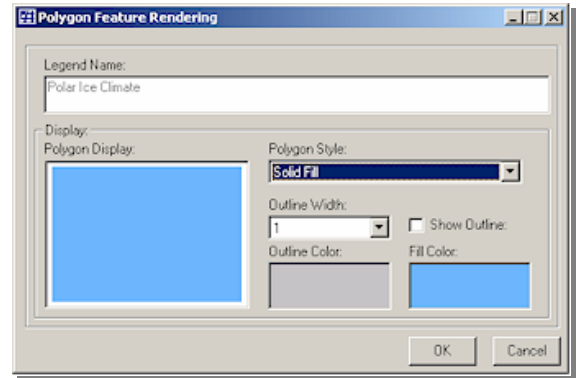
To turn on a map layer, click on its name or check box in the Map Layers window. To turn it off, click in the checkbox beside the name. The check box only controls the visibility; clicking on the name itself will also make the map layer active – for any layer that can be made active.



Rendering Polygon Layers

The rendering parameters include:

- **Color:** Map features' fill color.
- **Polygon Style:** Map features' fill style. A highly transparent fill is useful if you want a solid shade but still want to see features underneath. When you set a "transparent" fill, it is essentially the same as setting no fill. You are able to "see through" these polygons to other feature layers.
- **Outline Color:** Map features' border color.
- **Outline Width and Show Outline:** Map features' outline width and whether or not the outline appears at all. If the polygon style is set to transparent fill, you cannot turn "Show Outline" off.



Rendering Line Layers

The rendering parameters include **Line Style**; **Line Weight** = Map features' width; and, **Line Color**.

Rendering Point Layers

For point layers, you can change several features including symbol type and size.

- **Symbol Type:** When you select the **True Type** marker you can use any font on your system. Some widely available fonts – such as Wingdings – provide interesting and useful markers. If you choose True type marker, you may need to wait a moment while the font names are loaded.
 - **Symbol:** The field shows the list of available letters and icons in the font.
 - **Rotation:** The rotation field indicates how much the symbol will be rotated in a counterclockwise direction starting from North – 0 degrees. The values are in 15-degree increments.
- **Size:** The size is set in either pixels for the circle, square, triangle and cross markers or in font size points for True type markers.
- **Rotation Field:** If the map layer itself contains a field with symbol rotation values, these can be used instead. This allows for each point feature on the map layer to have unique rotation for its symbol. Note, if this is specified then it will override the general rotation value specified above.



Windows 98 systems will not display outline widths and line widths greater than 1 and line style types other than solid because of a bug in the operating system.

Rendering Label Layers

Rendering parameters include **Font Name**; **Font Color**; **Font Size**; as well as:






- **Rotation:** Labels can rotate counterclockwise in values of 15° intervals from 0 to 345 degrees.
- **Horizontal Alignment:** You can orientation / position the feature relative to the label: Left, Right, or Center.
- **Vertical Alignment:** You can position the label relative to the feature it represents: Top, Bottom, or Center.


The following four fields are used in special cases where the map layer has rendering fields for labels.


- **X Offset Field:** Works based in map units. The X-Offset describes the number of map units to the left or right of the feature center that the label will be placed.
- **Y Offset Field:** As with the X-Offset, the Y-Offset describes the number of map units above or below the center of the feature that the label will be placed.
- **Rotation Field:** The number of degrees rotation for the label counterclockwise.
- **Text Height Field:** The text height field describes the size of the text in the label based in map units. When the Text Height field is used the Font Size is ignored.


Using the Map View


Getting the View You Want – Zoom and Pan

Move around the map with: zoom in , zoom out , zoom to selected feature , zoom to active layer , and pan .

Zoom to Selected features  will center any selected features on the map and zoom in to them.

Zoom to Active Layer  will center the view on the active layer and zoom in or out to its maximum extent.


Pan  enables you to change the center point of your view. Left click on the map view and hold down the mouse while you drag in the direction opposite to what you want to see.

Zoom to dB Extent  resets the map view to the Topic's extent.

The visibility of map layers often depends on the scale.

If your active layer has selected features and you try to zoom in or out past the extent at which these features are visible, the system will stop at the minimum or maximum extent to prevent the selected features from being lost.

Finding and Identifying a Feature on the Active Layer


 Use **Find** to locate a feature on the active layer. The find function gives you the choice to **Search Current View**, or **Search All**. If you choose to **Search All**, all the features in the active layer will be listed regardless of whether or not they're in that geographic area.

The Find form gives several options:

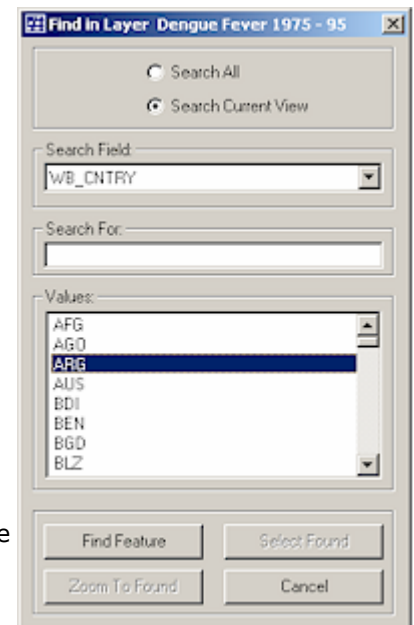
- Find Feature – the found feature will be highlighted.
- Zoom to Found – the map will zoom in to the found feature.
- Select Found – the found feature will be selected.

You also can select the **Search Field** from the dropdown list. The **Search Field** lists all the fields in the map layer's attribute file, so there may be a number of attributes that you can choose from to do your search.

You can also start typing the name of the feature in the "**Search For**" field and the system will start matching the name based on the first few letters.

 Use **Identify** to identify the active layer's features. When you are in identify "mode", the cursor will change and every feature in the active layer you click on will become highlighted and labeled.

Set **Tools/Advanced Identify** to see all the information about a feature from the map layer's attribute table.



Changing How Found and Identified Features Look

Use **View / Render Find/Identify** to change the default style for found and identified features. Any changes you make to these default rendering properties are only active for the session. They will be lost if you refresh/change your warehouse connection or exit.

Use **View / Label Found** to turn labels on and off for found features. Default is on.

Selecting Features on an Active Layer

There are many ways to select features on the active layer directly from the map view.



Select by Pointing. Use **Select by Pointing** to select features on the active layer by clicking on them. You can select multiple features by holding the CTRL key while clicking.

Features are also “unselected” in this manner. Holding the CTRL key and clicking on a selected feature will unselect that feature but leave other features selected.



Select All. Use **Select All** to select all the features on the active layer.



Unselect All. Use **Unselect All** to clear all feature selections on the active layer.

Select by Name: Use **Edit / Select Features / Select by Name** to select a feature(s) by choosing its name from the listing of features in the active layer. With **Select By Name** you can choose to select only those features in the active layer that are visible in the current view, or all features in the active layer. To select multiple features by name, hold the CTRL key while selecting the names from the list.

Select by Rectangle: Use **Edit / Select Features / Select by Rectangle** to select all features within or touching a rectangle that you define on the map.

Select by Circle: Use **Edit / Select Features / Select by Circle** to select all features within or touching a circle that you define on the map.

Select by Polygon: Use **Edit / Select Features / Select by Polygon** to select all features within or touching a polygon that you define on the map.

How it's done: Draw the bounding polygon by marking one corner by clicking then move the cursor to the next corner and click, and then to the next corner, and so on. When all sides are defined, double-click.

Select by Intersecting: Use **Edit / Select Features / Select by Intersecting** to select features on another map layer based on the selected features on your active layer.

How it's done: First select the features you want to use as your intersection “template” on the current active layer. Then choose **Edit / Select Features / Select by Intersecting** from the menu and pick from the menu that appears the map layer whose features you want to intersect with.

Example: A topic contains both a district layer and a village layer. You want to select all the villages within a specific district. Select the district and use **Select by Intersecting** to select all the villages by choosing the Villages layer as the intersection layer.

The intersection process may take a few moments to calculate and display.

Other Ways to Select Features

Features can also be selected by highlighted a related record in the Spreadsheet, by opening a Related Information object and by going into Related Information Mode and selecting/clicking on a feature.

Changing How Selected Features Look

Use **View / Render Selected** to change the default style of selected features. Any changes you make to the default rendering properties are only active for the session. They will be lost if you refresh/change your warehouse connection or exit.

Changing How Selected Features are Labeled

Use **View / Label Selected** to turn labels on and off for selected features. Default is on.

Use **View / Render Labels** to define how the labels will appear when a feature is selected.

Printing a View

Use File / Print View to print the view directly – rather than go through the process of creating a map composition.

Tip:

While the Print View function prints what you see on the screen, map creation is normally done with the map composer.

Copying a View

Use **Edit / Copy All** to capture the current map view for use in another Windows-based program, such as Word.

Copying Selected Features



Use **Edit / Copy Selected** to copy the selected features and their labels as they appear in the map view. All other map features and layers will not appear in the resulting image. The **Copy Selected** function also copies any user drawn features.

Drawing and Annotating

Your map view can be used as a canvas for drawing shapes and annotation. The drawing functions are all available on the button bar when you use **Tools / Draw**.

Drawn objects are saved with your map composition as part of the overall graphic file created when you generate a map composition. Also, if you want a quick copy of them, you can select a layer feature and use **Edit / Copy Selected** or **Edit / Copy All**. These functions will copy the drawn features into the Windows clipboard as a single "image", and the image can then be pasted into any other Windows application such as your word processor.

Tip:

If you need more advanced drawing and annotation capability, you have a few options depending on your needs and your system's software.

1. The export to ArcView (Tools-ArcView) function will take your map view and associated data and create a project within ArcView. ArcView has some more powerful cartographic tools and capabilities. Once in ArcView, however, there is no direct way to bring the map view back into Dynamic Maps. Registration of new data would have to be done through Dynamic Knowledgebase.
2. The PowerPoint Slide option in the Map Composer exports your map view as a graphic file to PowerPoint along with other surround features (which you could turn off if you'd like). PowerPoint has several design options and capabilities. Once the map view is in a graphic format, it cannot be imported back to Dynamic Maps.
3. You can use the Copy All function in the Edit menu to copy your view to any graphic-based Windows program.
4. You can use the Copy Selected function in the same way as noted above to move the selected features into the Windows clipboard for pasting into other graphic applications.

You must first have a selected feature(s) on an Active Layer for this function to be available.

The objects you draw are only available for this session. Drawn objects cannot be edited, they must be deleted and redrawn.

Tip:

If you plan to create different lines, shapes and text on the same map view, try creating a map composition template with that map view and then exporting it to PowerPoint. Once in PowerPoint you can create several versions of the same map with various lines and graphics that you can store separately.

Draw Points

You can draw points of various styles, weight, and color using either default styles or any true type font on your system using **Tools / Draw**.

Draw Line

You can draw a complex line of various styles, weight, and color on your map using **Tools / Draw**.

Draw Polygon Draw Rectangle and Draw Circle

You can draw many kinds of closed features with various fill patterns, fill color, and line color using **Tools / Draw**.

Delete User Drawn Features

Use **Delete User Drawn Features** to delete drawn objects and text.

Delete All User Objects

Use **Delete All User Objects** to delete all drawn objects and text at once.

Add Text

The Add Text function in **Tools / Draw** lets you create additional labels for features or add other relevant information on your map. Adding text may take a few tries and experimentation, since there are many parameters such as the text size, what it says, and its path that you need to define before it appears on the map.

How it's done:

1. Select the **Add Text** button. The Label Feature Rendering form will appear, with a default size color and font face and example text. Click **OK** once you have assigned the appropriate parameters to the text.
2. Once you click **OK**, you are brought back to the map to define a path for the text. Text is input on a line (path) that you create on the map. The line can be straight, or it can have several segments. Use the cursor to define this path, keeping in mind the size of text and its approximate length. At the end of the path, double-click the cursor.
3. Once you have defined the path, a form will appear in which you input the text. You can only insert one line of text at a time.

Notes about Adding Text:

- If your text is longer than the path you define, the text will continue in the same direction as the path. If your text is shorter, the text will appear centered on the path.
- Text follows the direction the path was drawn. Therefore, text will appear differently on a path drawn top to bottom than bottom to top.
- Sharp corners in the path will be automatically smoothed by the text so that changes in direction appear gradual rather than sudden.
- To create text that is upside-down on the image, draw the path from right to left.

Other Functions on the Map View

Measuring Distance and Area



Use the **Measure Distance** button to measure the distance in kilometers or meters along a line you define on the map.



Use **Measure Area** to measure the area of a polygon that you define on the map.

Technical Info:

When measuring distance or area on a map layer that is based on geographic coordinates, the resultant distance or area is only an approximation. The actual calculations are done on a generalized map surface and not on the reference ellipsoid using geodetic distances.

The accuracy of a distance or a polygon area also depends on the accuracy of the original maps used to create the warehouse, any processing of the digital data that's been done, the screen resolution that you are using when defining the locations and the viewing scale.

Linking with ArcView




If you have ArcView on your computer, use **Tools / ArcView** to automatically launch ArcView and pass your current view's map layers data into an ArcView project. Some notes about the link with ArcView:

- Once you have exported your maps to ArcView, any changes you make to the maps are not reflected in Dynamic Maps. You cannot export any user-defined features (circles, added text, etc.) from your view.

Section 2c. Related Information

Related Information Explained

Geography is a powerful way to reference information. Just as a printed atlas is more than maps, Dynamic Maps enables you to access documents, pictures, URLs, and more that are linked to map features. Plus, Dynamic Maps also gives you the ability to add your own information to map features – and even publish these for everyone else using the warehouse/atlas if it's online or web-enabled.

Related information are shown in the Related Information window. There are three "types" –  documents (any digital file);  URL (an Internet link); and  descriptions.

For "Documents", the file extension will dictate how your computer treats the file. For example, if its extension is .doc, the computer will launch Microsoft Word; if it's ".exe", it will try to run the file like a program. Common extensions that many computers will read are: image formats like .gif, .jpg, .wmf, .bmp; document formats like .doc, txt, .pdf, .htm, .html, .rtf; multimedia formats like .ppt, .pps, .mpeg, .wav, .mov, .ram, and other formats like .exe and many more.

URL's default to <http://> when being added, however, this default can be changed to, for example, <ftp://> for ftp sites. If you are not on a network, you can register a text-only .htm file as a "Document".

"Descriptions" are treated as text files and are useful when describing sources of information that either aren't digital files or online (such as libraries, videos, paper maps)

Using Related Information

The Related Information window shows what information objects are available for each of the map layers. The easiest way to access related information is to click on the object's name or on the check box. Doing so will launch the object and will select the map layer feature(s) to which it is related.

Show Related Information

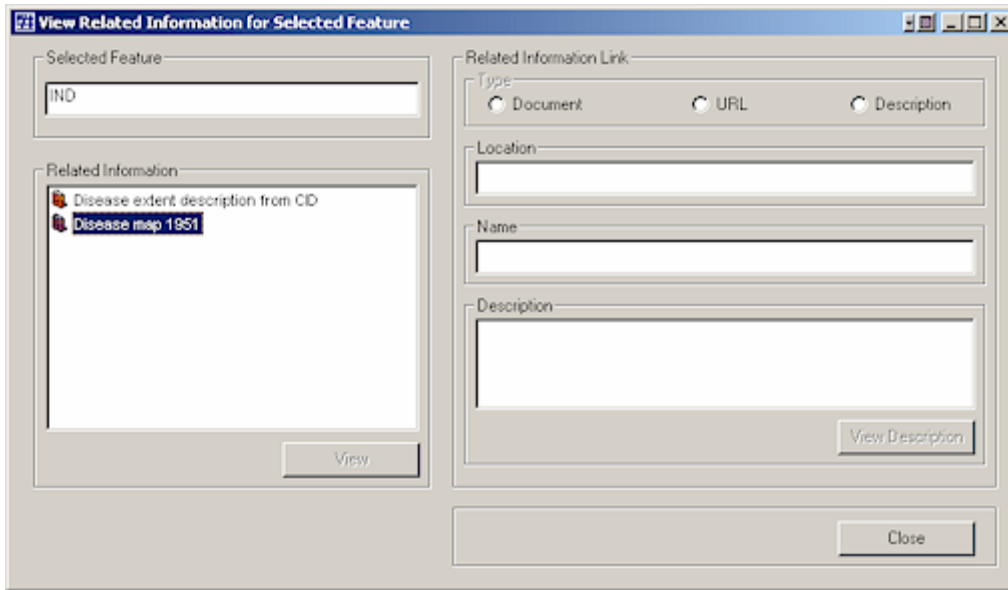


Use the Show Related Information function to see what related information exists for one or more selected features. When a feature(s) is selected, clicking Show Related Information will launch a form listing the related information for that feature enabling the related information objects to be selected; or, if there is only one related information object associated with that feature, that object will be launched automatically.

Related Information Mode



Use Related Information Mode to access any related information for features on the map view in the active layer. When you are in Related Information Mode, any map feature in the active layer that you click on will become selected and if there is related information, these will become available.



If there is only one selected map feature and the feature has one information object registered against it, then that object will be launched automatically. If there are more than one related objects associated with the feature, the system will list them on a form. Select the object of interest and click the View button.

Adding (Publishing) Related Information

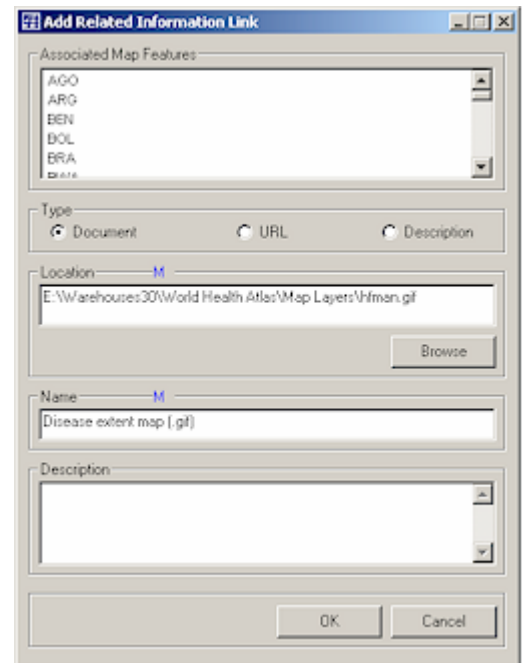


Use Add Related Information to add documents, web links, pictures, etc. to selected features.

When a document is added, a copy of the file is taken and placed into the warehouse structure and made available to anyone else using the warehouse locally or over the Internet.

Tips:

- If you publish a document that later changes, say, from "Draft" to "Complete", you need to delete the old document and republish the new.
- Do not publish a document that is open for editing. Close the document in its native program before adding it.
- Provide useful descriptions including, for example, the contact, file size, copyright, and creation date.



Updating Related Information Names, Descriptions, and URL

Use **Tools / Related Information / Update** to update the name and/or description and/or URL of a related information object. From there you can choose to list all related information for a map layer, or just the related information for the selected feature(s). You do not have to have any map features selected to update or delete information objects associated with the active map layer.

You cannot change the map features against which an object is related.




Deleting Related Information

Use **Tools / Related Information / Delete** to delete a related information object. The function removes the relationship to all the object's related map features. The actual file, however, is not deleted.

Password Protection for Related Information

A password may be required to add, update and delete related information. The password is specified in Dynamic Knowledgebase when the atlas was developed. The passwords are atlas-specific – not user-specific, so everyone with access to an atlas will be using the same password to manage related information. The atlas creator sets up the password to help manage who can add related information.

Section 2d. The Spreadsheet, Tabular Data Sets and Queries

	= System data sets.
	= User data sets.
	= Queries.

The Spreadsheet's Basic Functionality

Opening a Data Set in the Spreadsheet

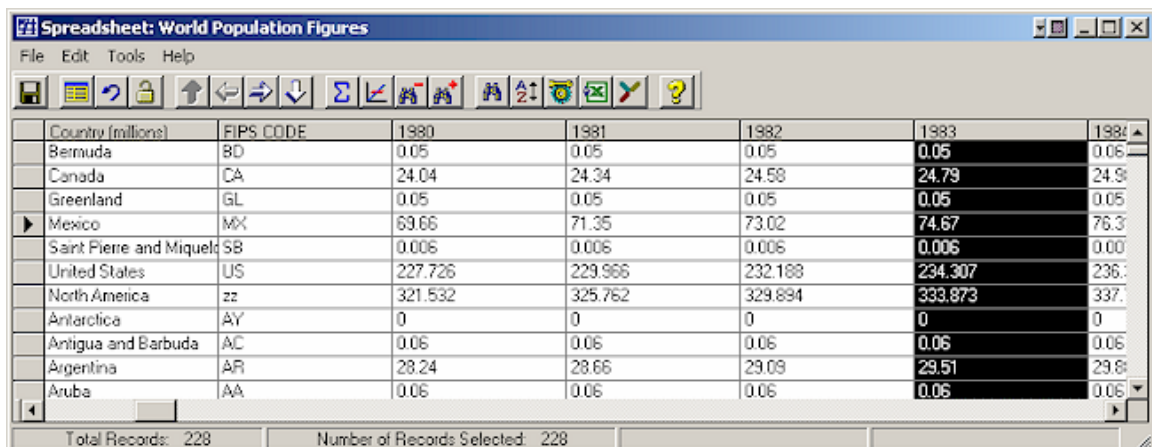
The Tabular Data Sets and Queries window lists all available data sets in the topic. Clicking on a data set name or the check box will make its associated map layer active (if it isn't already) and will populate its records in the spreadsheet window.

Tabular Data Sets and Spreadsheet Explained

Data set records relate to features on an active map layer. For example, a city population database might relate to the features on a map layer of cities. Because of this relationship, Dynamic Maps enables you to use the map and its features as a unique and powerful "window" onto the data and it enables you to visualize data in a way not possible without this type of software.

There are three types of data sets that can be listed in the Tabular Data Sets and Queries window – System Data Sets, User Data Sets, Queries.

- System data sets have been defined by the creator of the warehouse/atlas and are available to everyone with access to the atlas. They cannot be modified.
- User data sets are "imported" or created by you and stored on your computer locally. Unlike system data sets, these are NOT visible to anyone else accessing the atlas.
- Queries are created by you in the spreadsheet using a system or user data set. They are temporary and are not saved in the atlas after you close the session although you can save the results by selecting all the records and using the File / Save Selected Records function.



Country (millions)	FIPS CODE	1980	1981	1982	1983	1984
Bermuda	BD	0.05	0.05	0.05	0.05	0.05
Canada	CA	24.04	24.34	24.58	24.79	24.9
Greenland	GL	0.05	0.05	0.05	0.05	0.05
Mexico	MX	69.66	71.35	73.02	74.67	76.3
Saint Pierre and Miquelon	SB	0.006	0.006	0.006	0.006	0.00
United States	US	227.726	229.966	232.188	234.307	236.1
North America	zz	321.532	325.762	329.894	333.873	337.1
Antarctica	AY	0	0	0	0	0
Antigua and Barbuda	AC	0.06	0.06	0.06	0.06	0.06
Argentina	AR	28.24	28.66	29.09	29.51	29.8
Aruba	AA	0.06	0.06	0.06	0.06	0.06

Total Records: 228 Number of Records Selected: 228

Selecting Records

As you select and unselect records, the records' associated map features become selected and unselected on the map view. Likewise, selecting a feature on the map selects its associated record(s). While going from data set to map is usually a one-to-one relationship, selecting from the map is not necessarily, since a map feature might have several records associated with it in a data set. Note, it is possible in Dynamic Atlas to use feature identifiers that allow multiple features to have the same ID. In this case the system will treat this as one logical feature.

To select a record, the most straightforward way is to click on the little square to the immediate left of the record where a black arrowhead appears. To select multiple records, hold down the Ctrl key while you click on the record.

You have other direct ways to select records on the spreadsheet. You can:

- Select features on the map view's active layer. This will cause all related records in the spreadsheet to become selected (if there are any).
- Select a spreadsheet column and then use the **Find Minimum** or **Find Maximum** functions. This will cause the record(s) with the minimum or maximum value to become selected.

Depending on the tabular data set's content, there may be map features that do not have any associated tabular records, i.e., when you select a feature on the map you may not see any records selected.

If the selected feature(s) does not appear on the Map View, it may be because your view is at the wrong location. You may need to pan or zoom out to see the selection or use the **Zoom to Selected** button on the map to find the selected feature(s).

Find Records



Use **Find** to find a string of alphanumeric characters in the field values for the records in the spreadsheet.

How it's done: Type in the character or numeric string in the "Find What" field and click the **Find Next** button. The string you type does not have to be the entire length of a word or number. For example, if you type "old", the Find will locate records with "golden", "Old Site", etc. Turn "Match Case" checkbox on for a case-sensitive search.

Tip:

To find many records at the same time, build a query – which will also create a subset of the data set containing just those "found" records.

Other selection functions include:

Select All



Use **Select All** to select all the records in a data set and their corresponding map features.

Inverse Selected



Use **Inverse Selected** to make all unselected records selected, and makes the selected records unselected along with their corresponding map features.

Unselect All



Use **Unselect All** to release all the currently selected records.

Tip:

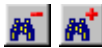
If you want to work with only the selected records use File / Save Selected Records and work with the resulting data set.

Move to Selected



The Move buttons enable you to navigate from one selected record to another. Use these to jump to: the first selected record in the list, the next selected record, the previous selected record, and the last selected record.

Finding Minimum and Maximum



Use the Find Minimum and Find Maximum to find **and select** the record in a field that has the lowest or highest value. If more than one record has the same minimum or maximum value, they are all selected.

Tip:

Some columns may have inappropriate "0" values in a field. Use a query to get rid of these records, then use Find Minimum and Find Maximum.

Sorting Records



Use **Sort Records** to arrange records in either ascending or descending order. To choose the field you want to sort on, click its field name. You cannot maintain selected records when sorting.

If you need to sort simultaneously on multiple fields, you can transfer the data to Excel and use its Data/Sort function.

Tip:

You may want to use the sort function first as you start your work with a data set since the records are automatically sorted based on the first field / column in the data set which may not be the field of most interest.

Using Sum Column and Column Average



Use **Sum Column** and **Average Column** to get the sum and average value of a numeric field in the database. Select the field by clicking on the field name and then click the sum or average button. The results are displayed in the status bar at the bottom of the spreadsheet.

These functions can only be used on a numeric column. If a column looks like it contains numeric values but the math functions are not enabled, then the field (column) is actually defined in the database as an alphanumeric field.

Tip:

When determining the average value of a field, you may want to delete any inappropriate "0" value fields using a query, since these will affect the calculation.

Linking with Excel

Dynamic Maps is able to integrate **dynamically** with Excel by sending all the records or the selected records from the spreadsheet directly into an Excel spreadsheet while maintaining a connection with the map. This gives you powerful and popular chart and graphic presentation and data analysis capabilities with the map as an interface.



Use **Launch Excel** to send all the records in the spreadsheet to Excel. Use **File / Excel - Selected Records** to send only the selected records to Excel.

Tips:

- To sort data in Excel use Excel's Data/Sort function. This will ensure that the order between the records in Excel and the map features does not get corrupted, i.e., the link to Excel can become scrambled if you sort on an individual column and not on the whole spreadsheet.
 - If you want to use that chart or graphic into your Map Composition, save it as a .bmp file and then use the **"More"** function on the business graphics form in Map Composer.
 - If you transfer data from one Excel worksheet to another, the link with the map is not maintained in the new Excel worksheet.
 - If you make changes to the data in Excel and want to bring it back into Dynamic Maps, you can import the new data set by using the Import Data Set function.
- You may need to be patient! The process of transferring large data sets to Excel can take time.

Query Builder

The query builder provides a powerful and easy way to quickly create a subset of the data set that contains only the records and fields you are interested in. Once the query is built, the results can be reflected in the map view as selected records, used for class rendering, and/or sent to Excel for further analysis, chart making, and business graphics.

The results of a query only stay active while the spreadsheet is open.

If you want to save the result of a query as a user data set, select all the records then use File / Save Selected Records.

How to Define a Query



Launch query builder and:

1. Choose the **Field Name** (column headings) against which the (first) selection criteria will be applied.
2. Choose an **Operator**.
 - If numeric, use equals (=), less than (<), greater than (>) or not equal (<>).
 - If text, use equals (=), not equals (<>) or "Like". The "Like" operator produces records containing the text of the chosen field value. For example, Like "China", would produce records with "China", "South China Sea", "East China", etc.
3. Choose the **Compare Method**:
 - Use **"To Field Value"** to list the values in the field you've chosen. In this case you are defining a selection criterion that selects records based on this value in the field; or
 - Use **"to Another Field"** to compare against a field other than the one you've chosen. In this case you defining a selection criterion that selects the records based on the relationship between the **"Field Name"** values and the values in "another field". Use this for example, if you want your query to return all the records in one field that have the same value as records in another field.

The screenshot shows the 'Query Builder: World Population Figures' dialog box. It is organized into several numbered sections:

- 1. Field Name:** A dropdown menu showing '1993'.
- 2. Operator:** A dropdown menu showing '>'.
- 3. Compare Method:** Radio buttons for 'to Field Value' (selected) and 'to Another Field'. Below is a list of values: 0, 0.0003, 0.002, 0.005, 0.01 (highlighted), 0.012.
- 4. Selection Method:** Radio buttons for 'AND (Restrict Selection)' (selected) and 'OR (Expand Selection)'.
- 5. Build Query:** A text box containing '[1993] > 0.01' with 'Add New Selection' and 'Remove Last Selection' buttons.
- 6. Query Name:** A text box containing '1993 Query Values' with 'Clear' and 'OK' buttons.
- 7. Output:** A 'Customize Output' button, 'Help', and 'Cancel' buttons.
- Output Options:** 'Available Fields' (empty), 'Selected Fields' (list: 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998), and 'Sort Field' (Ascending/Descending radio buttons, 'Close Options' button).

4. Choose the **Selection Method**:

- Use **"AND (Restrict Selection)"** if this is the first expression you have defined for the query. Use AND also to join two query selection statements in which both conditions must be met. Using multiple **AND** statements tends to **reduce** the number of records that will be returned, since selected records must meet each and all of the criteria that you set.
- Use **"OR (Expand Selection)"** to broaden the criteria when there are more than one query statements. When you use **OR**, you are likely **increasing** the number of records that the system will return because if either condition is met, the record will be returned.

For example, use **OR** when you want to capture all records that have a field with a value greater than some high value or less than some low value. Set up the first "greater than" criteria and then the second "less than" criteria with the **OR**.

With the "OR" statement, you can set up several criteria "sets" that can include multiple "AND" statements – with each "set" started by an "OR" statement. With each "OR" statement, the query builder will know when the new set of criteria begins and will return records that meet any of the criteria sets.

5. **Build Query:** Click **Add New Selection** to put the expression into the criteria statement. Click **Remove Last Selection** to remove the last criteria in the query statement.

Customize the output of the query by defining how the resulting data set will be output – what fields (columns) it will contain, how they will be sorted, and what the name of the query will be.

6. Provide a name for the query in the **Query Name** field.

7. Click **Customize Output** to determine what fields you want the query to contain. The system defaults to having all fields available. Move any fields you don't want from the Selected Fields to Available Fields. If you want, choose the field the resulting spreadsheet should be initially sorted by.

The data set's Link Field will automatically be added to the spreadsheet when you build a query so that a link with the Map View is maintained.

Note: The Selected Fields you put into the output do not have to be the same fields on which you based the criteria. For example, if you are setting up a relationship to show the number of cattle greater than 100 for farms in a province, then the Selected Field might only need to be the "Number of Farms" field and the query's criteria might be something like "Number of Cattle > 100".

Troubleshooting:

If you get a message that says "No records returned from this query", this may have happened because:

- a) For criteria statements that have more than one criteria, a common mistake is the improper use of "AND" when "OR" is meant. Every time the AND selection method is used, the records must satisfy the criteria in each statement.
- b) For criteria statements with one criterion, the Greater Than (>) operator may have been used with the maximum numeric value, or the Less Than (<) operator may have been used with the minimum numeric value.
- c) For criteria statements that match the values of one field against another, the fields may have no values that match.

Remove unwanted "0" value or "-9999" value fields using the query.

Class Rendering

With class rendering you are able to divide the spreadsheet's records into meaningful value-ranges or partitions ("classes") and then display these on the map in different colors and styles. This is a particularly useful when you want to illustrate spatial trends and distributions in the data.

Break Value	# Records	# Features	Symbols	Legend Text
0.15	58	58	[Pink square]	1984 0.15 or less
3.24	57	57	[Cyan square]	1984 greater than 0.15 to 3.24
15.27	57	57	[Purple square]	1984 greater than 3.24 to 15.27
	56	49	[Green square]	1984 greater than 15.27

Class rendering is different from the query function. The query function acts on the various records and returns a certain subset of the database. With class rendering, you are working on a particular numeric field and all that field's values. Therefore, if you only want to class render a few records in the database, first run a query to return only those records.

Class rendering is only done against numeric fields.

Most class rendering parameters are saved when you save a view (except the Break Method).

How to Use Class Rendering



Select **Class Rendering** and:

1. Select the numeric field from the **Class Fields** list against which the classes will be defined.
2. Select the **Class Assignment**. Class Assignment is needed sometimes when a geographic feature that is being rendered has more than one class associated with it – i.e. a map feature has several associated records that fall into more than one class.

For example, you have assigned different classes based on a field that contains budget information for projects in districts. If several projects are underway in the same district and they have widely varying budgets, then that district could belong to different classes at the same time. Since the district can only be rendered with one set of properties (belong to only one class), Class Assignment enables you to tell Dynamic Maps how to treat these instances of multiple classes for one map feature.

- When Class Assignment is "**Minimum**", then the associated geographic feature will be rendered based on the rendering characteristics assigned to the lowest valued class applicable.
- When Class Assignment is "**Maximum**", the associated map feature will be rendered based on the rendering characteristics assigned to the highest valued class applicable.
- When Class Assignment is "**Average**", the various records associated with that geographic feature will have their Class Fields averaged, and the appropriate rendering color will be assigned to that feature based on that average value.

See the "**Class Assignment Scenario**" below for an example of how class assignment works.

3. Choose the **Number of Classes** to be used. Dynamic Maps displays the Minimum Value, Maximum Value and Average Value in the "**Statistics**" area. Use these values to help decide:
 - a) how many "classes" or categories/splits you want to make and,
 - b) at what value each break/split should occur.
4. Select a **color scheme** (if desired). See "**Using Color Schemes**" below for more information.
5. Define the **Break Method** and **Break Values**. The key to class rendering is setting up meaningful break points for the data. You have the choice of determining the break values in one of five ways:
 - a) The default method is "**By Value**". Dynamic Maps defines even split points based on the minimum and maximum values divided by the number of classes. Look at the **# Features** column to see how many map features will be displayed in each break. You can then adjust the **Break Value** for each break if you want to get an appropriate number of features, or more meaningful break values. The number must be less than the next break value.
 - b) If you choose "**# Records**", the system tries to create the breaks by allocating an equal number of records to each class. Note: this may be misleading or it may appear not to work because some records can have the same value, and these would need to be in the same break. As a result, some breaks could end up with many more or less records than others.
 - c) If you choose "**# Features**", the system tries to create the breaks by allocating an equal number of map layer features to each class. As with the **# Records**, the results may not always appear to be correct, because the values for several map features' records may be the same and therefore the system must classify these map features in the same break. If many map features have the same value as each other, the system will not be able to compensate and will give results that contain more features in some classes and fewer in others.
 - d) If you choose "**By Range**", you set the range of values for the data, and Dynamic Maps ignores the minimum and maximum values in the data. This way, you can create ranges with no features in the lowest or highest breaks. This is particularly useful, for example, when you have data that are percentages and you want to show the whole range from 0-100 even though you have no data in the high or low percentage. Define the range using the **Start Range** and **End Range** fields.
 - e) If you choose "**By Increment**", you are telling the system that to start the breaks at a particular value (the **Start Value**), and then set breaks at regular intervals (as defined by the **Increment** value you set). The number of intervals is determined by the **Number of Classes** value that you set.

After setting the break values and method, the form will show you how many records in the database and how many features on the map layer are going to be associated to each class.

6. Edit the **Symbol Rendering Properties** (if necessary). Depending on whether the map layers are point-type, line-type or polygon-type, their features' rendering properties

can be changed to reflect a wide variety of types and colors. For polygon layers, the default rendering properties have a black outline and a solid fill. To change the rendering properties for any or all of your classes, click on the color swatch or symbol in the **"Symbols"** field for the class you want to change. Use the Class Rendering - Rendering Properties form to set the color of the feature, the style, and the outline color.

Tips:

- Solid fills will prevent other map layer features underneath from appearing. If you want your class rendered features to appear a uniform color and you want the features underneath to show up in the display, choose a "highly transparent fill" or "somewhat transparent fill" as the style for the feature rendering.
- The symbol rendering properties can be edited right from the map layers list once the class rendering is done by right-clicking on the legend entry.

7. Set the **Legend Text** (if necessary). The system creates a default legend. Click on the **Legend Text** field value and type in the new text to change the map legend text.

If you do not like the results you can go back into the Class Rendering form and make appropriate changes. The system remembers all your parameters while the class rendered map is available. To permanently save the class rendered map, save it as a view.

Tip:
To do class rendering on a particular set of records in the spreadsheet create a new data set with only those records by using a query. If you want to save your class rendering in a view, however, you must first save the query results as a user data set and then do the class rendering.

Question:
The Class Field I want to use isn't on the Class Fields list. Why not?

Potential Solution:
The Class Field lists only fields that have numeric values. Sometimes a field with numbers in it will actually be defined in the database as a text field. One way to test if the numbers are actually defined as numbers in the database is to try to do a column sum or average on the field. If you can't, then it's not a numeric field.

If this is the case, one option is to send the table to Excel and change the type and then import it as a user data set.

Clearing a Class Rendering

To clear a class rendering on your map view, turn the data set or map layer off, or go to Tools / Class Rendering / Clear.

Scenario: Using the Class Assignment Parameter

Class assignment only makes a difference to the rendered map when map features have more than one record related to it. In this example, the map has four "features". You want to consider a field that is present in the spreadsheet for all four features, but for two of those features there is more than one record. You render the map in two classes (Dynamic Maps uses at minimum three classes but for this example two is simpler), so that features with an associated value less than 3 are rendered as vertical lines and those with a value of 3 and above are rendered as solid.

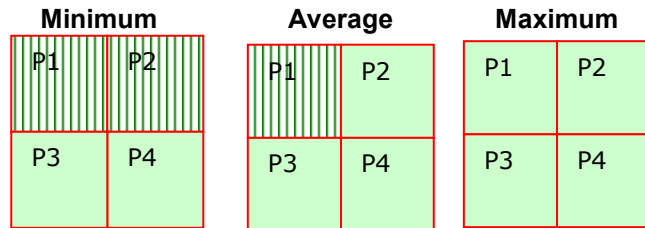
The first three columns represent the data in the spreadsheet and the last three show how the feature would be rendered for each class assignment:

Record	Assoc-iated Feature	Value	Average Value for Feature	Minimum Class render as:	Average Class render as:	Maximum Class render as:
#1	P1	2	2.5	Lines (value=2)	Lines (value=2.5)	Solid (value=3)
#2	P1	3				
#3	P2	2	4.5	Lines	Solid	Solid

Record	Associated Feature	Value	Average Value for Feature	Minimum Class render as:	Average Class render as:	Maximum Class render as:
#4	P2	7		(value=2)	(value=4.5)	(value=7)
#5	P3	5	5	Solid	Solid	Solid
#6	P4	4	4	Solid	Solid	Solid

Looking at the field value in the above table, features P1 and P2 have values that could put them in either class.

With **Minimum Class Assignment**, features P1 and P2 would be rendered with lines -- since they both have a minimum value lower than 3 (record #1 and #3).



With **Average Class Assignment**, the system sums the relevant values associated with each feature and takes an average of these, and then renders the features based on those average values. In this case, features P2, P3, P4 are rendered as solid since their values are greater than 3, while P1 is rendered with vertical lines since it's value is less than 3.

With **Maximum Class Assignment**, all features would be solid, because all four features have an associated database record with a value of 3 or greater.

Using Color Schemes

Dynamic Maps enables you to manage the color schemes for creating class rendered maps.

The color scheme function only sets the **fill color** parameter for the rendering properties of each class. Other rendering properties, such as transparency and outline need to be set manually for each class if you want them changed from their default.

Creating a New Color Scheme

Use **Tools / Color Schemes** in the spreadsheet menu. Give the scheme a name and identify how many colors you want in the scheme. When you do this, the **Scheme Colors** field gets filled with black swatches.

A fast way to create a scheme is to use the **Color Ramp**. By clicking in the **Starting Color** and **Ending Color** fields you can define a ramp's beginning and end colors. Clicking **Apply Color Ramp** populates the other colors in the **Scheme Colors** display list.

If you want to change a color in the **Scheme Colors** display list, click on the color swatch and choose a new one.

When you are satisfied with the colors chosen and your other parameters, click **Add Scheme**.

Managing the Color Scheme

To edit one of your own existing color schemes, use the **Select Existing Color Scheme** dropdown list to select the color scheme. Note: This list will only show the color schemes you have created / updated – it will not include any “system” color schemes. Each color in the scheme can be edited by selecting it in the **Scheme Colors** field. If you need to update the number of colors in the scheme, you must update the number of colors first and then re-select the scheme before you can assign values to those new colors.

If you want to edit a “system” color scheme, export the color scheme using Dynamic Knowledgebase and then import the resulting .clr file as outlined below, and then modify it as desired.

Deleting a Scheme

To delete a scheme from the list of available color schemes, select the scheme and then click **Delete Scheme**.

Importing a Color Scheme

To import a color scheme file, clear the form and click the **Import External Scheme** button. Locate the <scheme name>.clr file on your computer or on the network and click Open. The color scheme must a unique name -- which may mean renaming an existing color scheme before importing if there are two schemes with the same names.

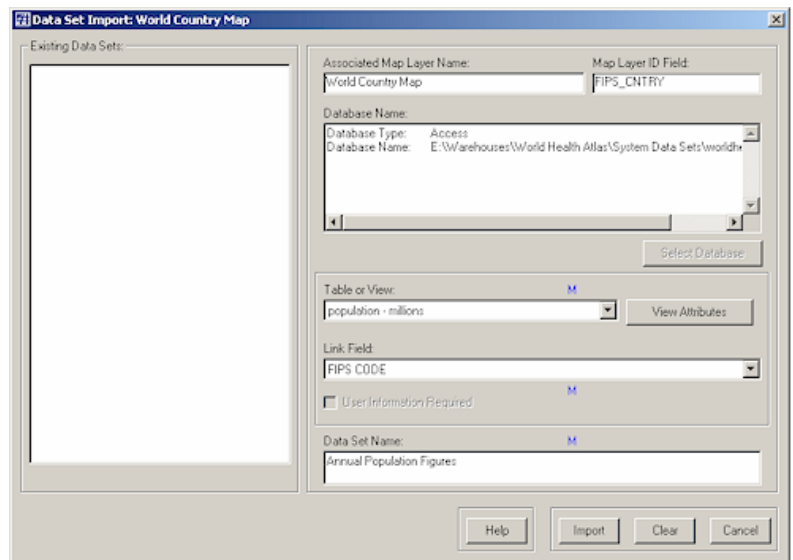
Exporting a Color Scheme

You can share the color schemes you create with your colleagues. To export a color scheme to an external file, select the color scheme you want to export and click "**Export Color Scheme**". Give the theme a file name and location and click **Save**.

The Dynamic Maps color scheme “.clr” file may have the same extension as files used in other systems, but it is not compatible with any other system.

Importing a “User” Data Set

Dynamic Maps enables you to import data as a “User” data set. The data set can be in Access (.mdb) format, Excel (.xls) format, dBase IV (.dbf) format, or stored in an Oracle database, or thorough an Access ODBC link in any other dB. To be imported, the data set must have a field that can be linked to the active map layer’s identifier field. Unlike Related Information, user data sets, once registered, are only available to your computer – not to everyone using the Atlas.



How it's done:

Use **Data Set / Import Data Set** from the map view menu.

Step 1. Select Database

Click **Select Database** to identify the database you are importing.

Access, Excel, dBase Databases:

Select the database type and click **Browse** to locate the database. If the Access database has a password, specify this in the **User Password** field.

Connecting to an Oracle Database:

If you are importing a view on an Oracle database, you will need to input the Oracle **Server (Service) Name**, as well as your **User Name** and **User Password**.

Step 2. Identify the Table or View

The **Table or View** field lists the tables and views in the chosen database. For Excel spreadsheets, the tabs will be listed. Choose the table / view you want to register. The **Link Field** will be populated with all the fields in this table / view that are the same data type as the map layer's link field.

Other Considerations About Importing

Not all the records in the data set's link field have to match a map layer feature ID value. If none of the records in the data set have values that correspond to the map layer feature ID, the data set will not be imported. If only some match, then the system will only work with those records, the others will be ignored.

When importing an Excel spreadsheet, the system will assume that the first row of the spreadsheet contains your field headings, i.e., you cannot have multiple row headings. Any OLE objects in the spreadsheet will not be shown in the grid – such as graphs.

When matching on a non-numeric field, sometimes a record in Excel will look like it's spelled correctly, but in fact there is a blank space before or after the name that you can't see. If so, the link with the map layer won't be successful. Sometimes the words are spelled slightly differently, and sometimes there is different capitalization.

Because of the greater chance for error with Excel, it is often better to first import the spreadsheet into Access as a table and then import the table into Dynamic Maps.

Step 3. Choose the Link Field

Use **View Attributes** to see the contents of the database's fields and the values of the map layer's link field. For the import to work successfully you need to select a link field in the data set that has the same values as the map layer's link field. That is how Dynamic Maps established the link between the spreadsheet and the map.

By right-clicking on the appropriate field, you can Set the Link Field. Right clicking also enables you to sort the values in ascending or descending order.

At this point, you can confirm whether or not you are able to import this particular data set for this active map layer. If say, you are importing a data set for a District map layer, but the appropriate Feature ID values are not in any of the data set's fields, you will not be able to relate the records in this data set to Districts and the import will not work. The field in the database must also be the same data type as the Feature ID field in the map layer i.e., they must both be integer (numeric) or both text.

Step 4. Complete the Import

Complete the import process by giving the data set a name and clicking Import. The data set will now be in the Tabular Data Sets and Queries window for that map layer.

Deleting a User Data Set

Use **Data Set / Delete Data Set** to delete any user data set for the active map layer. You can only delete user data sets that you have imported. System data sets can only be removed by using Dynamic Knowledgebase.

Section 2e. Working with Map Composer

Map Composer Functionality

Building a Map Composition

Use **File / Compose Map** to begin.

Decide on what **paper size** you will be printing the map, or if it will be a PowerPoint slide.

Identify whether the map will be output with a **Portrait** (vertical) or **Landscape** (horizontal) layout in the **Select Page Layout** field. This is disabled for a PowerPoint slide which is a default landscape format.

Specify your printer for hard copy map output. The system displays your current default printer. You can change the **Current Printer** by clicking on the **Select Printer** button at which point a printer selection form will be displayed.

Once you have picked a paper standard, the map's size, its orientation, and the printer, the system will indicate if there are any templates available for that size and orientation. If so, the **Select Template** button will become active. If you use a template, all the map component information on the form will change to reflect the template selected. Unless you want to make changes to these presets, select **OK** on the form and the map composition will be displayed.

Map Composer Explained

Using Map Composer lets you create basic cartographic products that can be printed on standard office printers or integrated with PowerPoint.

Map templates you create enable you to easily produce maps in a "series" or with a consistent layout and style depending on the size and type of map you want.

Maps can have various surround features such as a title, legend, graphics, scale bar and text.

CONCEPT – Map Templates

If you are creating several maps with similar design characteristics and surround features, you may want to create and use a map template. The Map Template is a preset design with the surround features already in place. With the template, all you need to do is change/add the appropriate text in any of the text components you may have included (like the Title) and then double-check the final layout and design before printing. Organizations can use map templates to standardize the map look and format.

The first time you create a map composition, there are no user templates. Templates are user-specific and need to be defined with each install of Dynamic Maps.

If you are not using a Template:

Once you have defined the paper size and orientation, select the various map components that you want to appear on the composition. Each map component is turned "on" or "off" by clicking on and off the check mark beside its name. You can change them in the Map Composition. When you have decided what components to start with, click **OK** and the map composer will be displayed.

CONCEPT – Map Components

Each of the components on the map composer can be resized and several have properties, such as border, text, size and color that can be defined. The map components are accessible in the map composer's **View** menu or a component can be accessed directly by right-clicking on it. Components can be turned on and off using the "visible" switch on their properties form.

Clicking on a map component with the left mouse button enables you to change its size and location. Move the mouse over the corners until little arrows appear and then drag the corner in or out to change the size. Note the resizing is proportional in both directions.

For Text components you can modify the background color by turning off the "transparent" checkbox and selecting a color. The text box can also have a border around it. Turn the border on and off by checking the Border Visible box. Set the width of the border – between 1 and 5 pixels – and provide a new color for the border if you want to change the default black color.

The Map Components

Business Chart/Image

If you have an image in .bmp format that reflects or enhances the information shown on the map – such as a picture of the location, or a business graphic or chart, this component provides an opportunity to incorporate that image on the map composition.

Tip:

Here is a quick way to create a **Key Map** image for your map composition: From the map view, zoom out to the full extent and draw a rectangle with the Draw functions reflecting the area of interest in the map composition. Copy the map view into the Windows clipboard using the **Edit / Copy All** function; launch an image manipulation program and paste the contents of the clipboard. Save the image as a .bmp file. Then when you create the map composition for the area of interest; right click on the default Business Chart/Image object to bring up the properties form and use the **More** button to select the .bmp file which will insert the “key map” image into your composition.

The **Available Graphics** field lists the graphics in Dynamic Maps’ “Business Graphics” directory. You can add any graphic from your system or network using the **More** button. These graphics all must be in .bmp format.

Disclaimer

Disclaimer is a text field. Its default purpose is associated with copyright and other related notifications, although, you could use it for any text.

Use of Fonts:

All the elements that contain text support the use of multiple fonts so that, for example, the component can reflect the language in which it is being used.

Map Background

The Map Background option provides you the opportunity to add a border around the map composition. To access the form, right-click anywhere on the map composition outside of any other elements or select **Background** from the map composer’s **View** menu. To turn the border on, click the **Visible** checkbox. If you want a border, specify its width in pixels and if necessary, change the color by right-clicking the color swatch or using **Select Color**. The output results may vary in effectiveness depending on the printer you use since the border may not match the paper’s edge.

Map Legend

The Map Legend lists the various map layers shown on the map as well as any class rendering results. The legend is generated by the system based on the map layers that are turned on.

The properties form enables you to:

- Edit the font properties (color, font, size) of both the legend’s title and the map layer names.
- Edit the border’s width and color and turn the border off.

If you publish the map composition in PowerPoint, you can edit the legend. By right-clicking on the legend, or by selecting **Map Composer - View / Legend**, you can define a border for it and turn its visibility on and off.

Miscellaneous Text

The Miscellaneous Text box enables you an opportunity to provide, say, a description of the project that the map represents or any other pertinent information.

Map

No matter what, the map will always be present! You can add a border to the map and change its width and color. You can turn on and off the coordinates that will appear on the corners of the map, as well as edit their font name, size and color.

If you publish the map composition to PowerPoint, the map component can be edited by converting the image and ungrouping its features.

North Arrow

The map is always created with its orientation having North at the top of the page. You can choose from several different north arrow styles.

To add a north arrow to the list of available arrows, use the **More** button to navigate to the image file. The graphic must be in .bmp format.

Organization Logo

The Organization Logo component provides the opportunity to include your organization's logo on the map composition. Use **More** to initially add the proper logo and subsequently any additional graphics you may want to add to your **Available Logos** list.

Title

The Title component is a text field in which you can provide a title for the map.

Scale Bar

The scale bar is a graphic that the system automatically generates to indicate the scale at which the map image is drawn. The scale bar is tied to the map. If you enlarge or shrink the map the scale bar will automatically change.

If you publish the map composition to PowerPoint, you can edit the scale bar itself by converting and ungrouping the image.

Using Graphics in a Map Composition

A variety of graphics can be used in your map composition – the Organization Logo, the North Arrow, and the Business Graphic. The various images can be placed anywhere on the map and can be resized to fit the space available. Various files are stored in a series of directories under Program Files / Dynamic Atlas / Dynamic Maps.

The software enables you to easily add a graphic to the list of available graphics, by clicking the **More** button on the form. When you find and select the graphic, the program automatically adds it to the list and makes a copy of the file and puts it in the appropriate directory. This graphic will then be available for subsequent map compositions as well.

In all cases, the graphic needs to be in windows bitmap (.bmp) format.

You may need to experiment with the size of the graphic, since resizing it on the map composition may produce unwanted results.

To remove any graphic from a list, you need to use Windows Explorer to delete or move the file from its directory. However, please be careful when deleting any files from this area.

Manipulating the Map Components

The various map components can be resized and moved to best suit your layout requirements.


Moving a Map Component

Move your mouse cursor over the component until it becomes a four-way arrow symbol

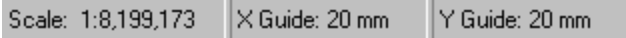


. Click on the component with your left mouse button and drag the component to its new location. You can use the horizontal and vertical guides to help you position the component at a specific location. The guides can be turned on/off from the **View / Guides Visible** menu.

Resizing a Map Component

To resize any of the map components, move the cursor over to a corner of the component until the cursor becomes a two-way arrow . Click the left mouse button and hold to grab the corner and drag to its new size.

Using the Map Guides

 The red-hatched map guides: the vertical X Guide and horizontal Y Guide show the position of the map feature. Their positions are displayed in inches or mm depending on the paper type chosen and reflect the distance from the left hand side of the page for the X Guide, and the top of the page for the Y Guide. To move a guide, move your cursor over top of it until it becomes a two-way arrow, click and hold with the left mouse button, and then drag the guide to position.

Components “snap” to guides automatically. As a result, it is easy to position components in exact locations and to line them up vertically and horizontally. To get a component to “snap” to a position, the X Guide must be near the left or right side of the component, or the Y Guide must be near the top or bottom of the component.

In the **Map Composer – View** menu you can select “**Guides Visible**” to turn the guides off and on.

Using PowerPoint



You can create a PowerPoint slide instead of a paper map by selecting PowerPoint Slide in the Map Composition Definition Form’s “Select Paper Size Standard” field. When you are in Map Composer, selecting **Map Composer – File / PowerPoint** launches PowerPoint and creates a new “presentation” with your map composition on a slide.

When you choose to create a PowerPoint slide, the various map components are transferred as a text box, an editable picture, or as an image. These can have various effects and enhancements applied including shadows, borders, and fills. Text boxes can be rotated and given 3-D effects. Pictures have a variety of formatting tools available through the Picture Toolbar - such as transparency, contrast, and brightness.

Component	Component Characteristics
Business Chart/Image	The Business Chart / Image is transferred as an image.
Disclaimer	The Disclaimer is transferred as a text box.
Map Background	Map Background is not transferred.
Map Legend	The Map Legend is transferred as a picture object and can be ungrouped and edited.
Miscellaneous Text	The Miscellaneous Text component is transferred as a text box.
North Arrow	The North Arrow is transferred as an image.
Organization Logo	The Organization Logo is transferred as an image.
Title	The Title is transferred as a text box.
Scale Bar	The Scale Bar is transferred as a picture object and can be ungrouped and edited.

The map itself is transferred as an editable picture object. To edit the map, select it and click OK when challenged to convert the object and then “Ungroup” from the Draw menu. Because entire features are transferred to PowerPoint, some features may actually lie partially outside your map composition area on the slide. You may want to select and delete these. By editing in PowerPoint this way, you have the opportunity for a great deal of visual effects – such as animating individual features and “exploding” them out from the map to highlight them.

Saving the Map Templates

The placement, type and characteristics of the map composition's elements in the map composer can be saved as a **template** – meaning that all the various surround features, their sizes, fonts, positions, border properties, text descriptions, and their visibility can be saved for use in other map compositions. This is particularly important if, say, you need a consistent look and text descriptions to your map compositions for a project.



Once the map composition is ready and you believe you may need to use the same layout again with a different map, select **Map Composer – File / Save Template As** or the **Save Map Template As** button from the Map Composer's button bar.

If you want make changes to the template, select it when you start creating the map composition and then save it again with the changes.


To **delete a Map Template** that you no longer need, use **Map Composer - File / Delete Template**. The form will list all available templates for that paper size and orientation.

Previewing Your Map Composition (Print Preview)

Before printing, Dynamic Maps gives you a chance to see what the final product will look like.



Use Print Preview button on the map composer button bar, to launch the **Map Composition Viewer** form. From this form, you see exactly how the graphics file will look when it is created and sent to the printer.

Use the **View Full Composition, Zoom In, Zoom Out** and **Pan** buttons  to view the area of the map of interest. You can now save the map composition graphic file or print it.

Saving a Map Composition

When you are satisfied with the result, you may want to save the map composition so that you have it available later as a graphic file. To save a composition, use **File / Print Preview** from the Map Composer form, and then **File / Save** from the Map Print Preview form.

When you save the map composition, all your current map compositions will be listed regardless at what scale they have been produced. Since you might be making similar compositions at varying sizes and with varying layouts, this helps you keep track.

When you save a map composition you have no way of later editing it directly from Dynamic Maps, since it is saved as a graphic file in .bmp format.

Each map file will be about a 4 megabyte .bmp file.

To delete a map composition, you need to use the delete function found in the **File / Delete Map Composition** menu of the Map View (not the Map Composition).

You will need to use a graphics viewer in order to see the view a map composition previously created. There are many excellent freeware graphics viewer programs available, such as "IrfanView" (<http://www.irfanview.com/>).

Printing a Map Composition

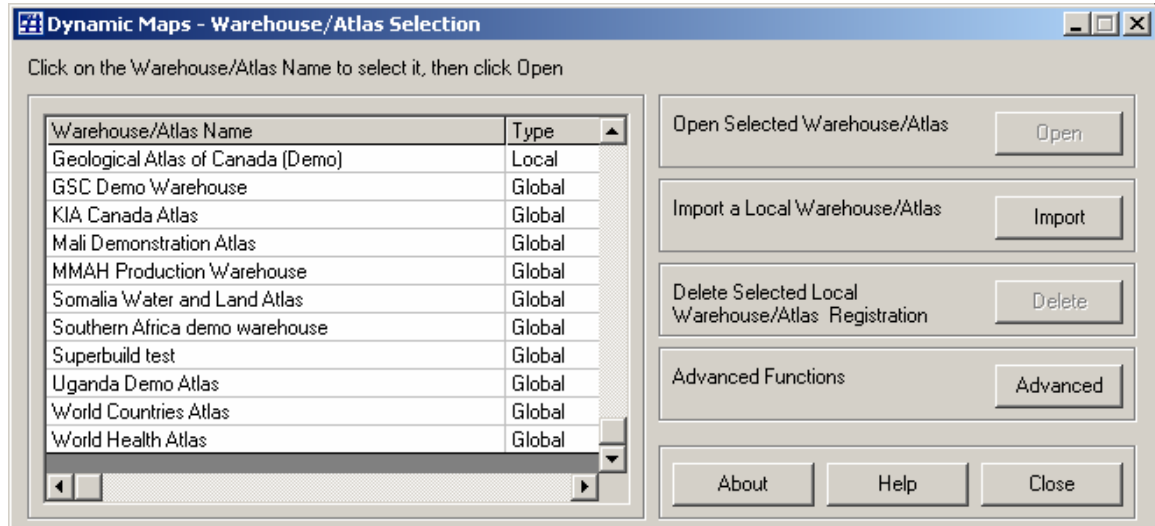


To print the map composition, use the Print button on the Print Preview form.

If you are printing to Adobe Acrobat Distiller, the process may take a few minutes to complete.

Section 2f. Dynamic Maps Administrative Functions

There are various Administrative functions available in Dynamic Maps for managing how you connect to the Atlases you will use.



Advanced Functions: Connecting to the Global Warehouse Manager.

When connecting to an atlas(s) on a network, Dynamic Maps makes the connection through the "Global Warehouse Manager" – a database that keeps track of the warehouses on the network and directs Dynamic Maps where to go to find them. When you run Dynamic Maps for the first time and you are connecting to a shared warehouse(s) on a network, this is the file you need to connect to so that Dynamic Maps can find the warehouses.

Usually when you connect to the Global Warehouse Manager file, you will navigate through the network to find the file on a computer or server.



Warehouse/Atlas Description Information

The **Information** button launches a form that provides information that was used to define the warehouse when it was created with Dynamic Knowledgebase. None of the fields can be changed in Dynamic Maps and all were set by the atlas' creator with Dynamic Knowledgebase.

Warehouse Name

The name of the atlas.

Warehouse Description

A description given to the atlas typically to indicate source and/or purpose.

Warehouse Location

The location of the "warehouse kb.mdb" file. This file maintains the registry information for all the map layers, data sets and metadata in the atlas.

Map Projection

The map projection identifies which map projection the map layers are stored in. There are many possible projections, including: Geographic, Mercator, UTM and several others.

Mapping Coordinate Units

The Mapping Coordinate Units represent the reference system used to measure locations on a map. The choices are Decimal Degrees and Meters.

Reference Ellipsoid

The Reference Ellipsoid is a mathematical representation that describes the approximate surface of the earth and is the basis for a mapping coordinate system. There are several ellipsoids including: GRS 1980, Clarke 1866 (for North America), WGS 84, etc.

Warehouse Password

For warehouses with a password, Dynamic Maps users will need to input the password before they can add related information.

DWMS Server IP Address / Host Name

The "**Server**" is the URL/location of the Internet or Intranet service where Dynamic Web Maps Server (DWMS) is installed and running. Used when the atlas is published on the web.

Web Alias

The "**Web Alias**" is the Virtual Directory that points to the Related Information directory in the warehouse. Used when the atlas is published on the Internet.

Importing a Local Warehouse

Version 3 warehouses / atlases created with Dynamic Knowledgebase can be imported for use locally – i.e. on your computer. This makes Dynamic Maps version 3 a powerful stand-alone data access application because whole organizations and their partners and clients can all be accessing and using the same data even when not connected to a network.

The Import process:

1. Copy the warehouse in its entirety onto a fixed hard drive on your computer and note the location. Make sure you have enough disk space on the computer before you begin copying the files. Some data warehouses can be quite large. The warehouse MUST be copied with all its files and directories in their same relative locations – i.e. DO NOT change the name of any file or directory, and do not move any file or directory. A typical atlas will have a directory structure like the one shown and this must be maintained on your computer when you copy it.
2. When the atlas is in place, click **Import** on the opening form in Dynamic Maps and browse to the location of the warehouse's parent directory (the "World Warehouse" in the accompanying graphic) and click **OK**.
3. The warehouse import process will begin automatically. If you get any errors they may reflect one of three conditions:
 - a. There were one or more files missing. If this is the case, you can usually chose to continue to import the atlas and the references to those files would be removed. Otherwise, chose to not import the atlas and either look for the missing file(s) or ask the warehouse creator for assistance.
 - b. The warehouse won't import at all. This could be because you selected the wrong parent directory for the warehouse. Read the error message carefully and try the import again.
 - c. The warehouse won't import at all. This could be because the warehouse structure has been changed or a warehouse directory has been renamed or some other problem exists. Try copying the original warehouse files again or ask the warehouse creator for assistance.



Although unlikely, there may also be a problem with the version 3 warehouse in that it was created without topics. If no Topics are set up in the warehouse, then Dynamic

Maps will not allow you to open the warehouse after importing it. With local warehouses the system will allow you to delete the registration and with global warehouses it will inform you about the problem. In either case, Dynamic Knowledgebase is needed to add Topics to the warehouse.

Warehouses Created in Version 2.3

Version 2.3 warehouses CANNOT be imported by Dynamic Maps. These warehouses must be upgraded and imported with Dynamic Knowledgebase.



Make sure you DO NOT try to import a version 2.3 warehouse if you are using it with Dynamic Web Maps Server 2.3, Dynamic Knowledgebase 2.3, or Dynamic Maps 2.3. Make a copy of the warehouse first and then import the copy using Dynamic Knowledgebase.

Deleting a Warehouse Registration

To remove the registration for a local warehouse from your computer, select the warehouse you want to remove and then in the Administration form, click the **Delete** button. This process just removes the warehouse from the list, it does not delete any files. If you want to completely delete a local warehouse from your computer, delete the registration first in Dynamic Maps, then delete the files in Windows Explorer. Note, you cannot delete the registration of a Global Warehouse. This can only be done through Dynamic Knowledgebase.

Appendix 1. Installing and Running Dynamic Maps

Dynamic Maps System Architecture

Dynamic Maps can link to warehouses on a network to which many people are attached and it can use local warehouses on your computer. As a result, Dynamic Maps V3 can be used stand-alone with warehouses that either you create with Dynamic Knowledgebase or have been created for you. The diagram below shows how Dynamic Maps can be used in either stand-alone mode with a local warehouse(s), or in client server mode with a link to a shared warehouse(s) through the Global Warehouse Manager. Networked computers can also run local warehouses.



Dynamic Maps is two parts – the software and the data. In order to use Dynamic Maps software, you must have access to a properly structured “warehouse” / “atlas” of data.

Warehouses are built and managed using **Dynamic Knowledgebase**. For information about building warehouses and using Dynamic Knowledgebase, please contact SKE at www.skeinc.com or consult the Dynamic Knowledgebase documentation.

Local Warehouses:

Warehouses can be distributed intact with all their map layers, tabular data sets and related information. Dynamic Maps can import these warehouses and use them locally.

Global Warehouses:

Warehouses can also be stored centrally and accessed by many users over a network. This is particularly useful if, for example, the data are changing frequently, and/or if the tabular or spatial data are too large to distribute on CD, and/or if the data are coming from another corporate system, and/or if restrictions need to be placed on who has access to the information. When global warehouses are used, Dynamic Maps connects to them through the “Global Warehouse Manager” file that keeps track of these warehouses.

Dynamic Maps System Requirements

A computer running Dynamic Maps requires:

- Windows operating system (95 and better). Note: the software has not been tested with Windows ME and XP, although it has worked fine in these environments.
- CD Rom drive.
- Sufficient hard disk space for local warehouses (if necessary)
- At least 64MB RAM and 200MHz processor is recommended for performance.
- Monitor size recommended 17” or better for sufficient viewing area.
- Network / Internet connection recommended although not mandatory for related information object access and software registration.

Installing Dynamic Maps

Uninstall First

If you are installing a new version or re-installing Dynamic Maps, first uninstall the old program from the computer.



*If the uninstall prompts whether you want to delete shared files, pick NO. These files **should not** be deleted since they may affect other applications that depend on their shared components.*

To uninstall, use the Control Panel's "Add / Remove Programs" function. Select Dynamic Maps and follow the prompts. If you are unfamiliar with uninstalling and installing software in the Windows operating system environment, please ask for assistance.

You may get a message when the uninstall is complete that some files could not be removed. This is probably because new or changed files were manually added to the program folder after installation, so they were not "registered" by the install. To remove all of the Dynamic Maps files, use Windows Explorer to delete them from their program directory:

Version 3.x: {root:\Program Files\Dynamic Atlas\Dynamic Maps}

Version 2.x: {root:\Program Files\Dynamic Knowledgeware\Dynamic Maps}.

Please be careful when deleting files from this area of the computer.

Reboot your computer after the uninstall.

The Install Process

Need Administrator Privileges: If your computer is installing from a network or if you have many users registered on this computer, make sure you have logged on to the computer with Administrator privileges before beginning the install.

Getting the Files Ready: Dynamic Maps is installed using the installation program "Dynamic Maps 3.x Install.exe". Dynamic Maps is designed to work under Windows '95, Windows '98, Windows NT Server/Workstation v4 with Service Pack 3+, and Windows 2000. Although not tested in ME and XP, Dynamic Maps has run successfully in those environments as well.

1. If you are going to use Dynamic Maps with a local warehouse(s) / atlas(s), copy the warehouse in its entirety onto your computer. Do not change any directory names or relationships.

If the warehouse has been compressed using a file compression program such as ".zip", when you uncompress the warehouse, make sure you extract all files and use the folder names.

The warehouse will not be able to be imported if the relationship among its files is not maintained.

2. Run the Dynamic Maps Install.exe file and accept all the prompts. As with most Windows programs, other programs should be not be running.



Turn off virus checking applications and any other applications that are running as they can interfere with the proper registration of the system files and settings.

3. Reboot your computer. This is not optional.

During the installation process, a couple of Microsoft upgrades may be installed on the computer as well. If Dynamic Maps is being installed on a Windows 95 machine, both MDAC 2.5 and DCOM will be automatically installed, otherwise only MDAC will be installed.

If your machine already has these components or later versions of these components installed, their re-installation will not adversely affect any current program. NOTE: Under Windows 95, the computer will automatically reboot twice – once after Dynamic Maps is installed and once after the MDAC components are installed.

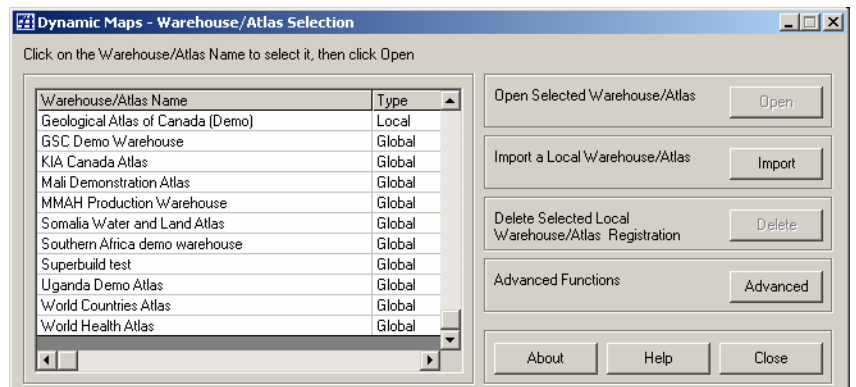
Running Dynamic Maps for the First Time

Before you launch Dynamic Maps for the first time, you need to know where the warehouse(s) / atlas is if you are going to import locally, and/or, where the "Global Warehouse Manager" file is if you are connecting to shared warehouses / atlases on a network.

The Dynamic Maps Icon is located in Start / Programs and likely on your desktop as well.

When you run Dynamic Maps for the first time your Warehouse Selection form will be empty. Either Import your local warehouse, or connect to the Global Warehouse Manager file.

To Import a **local** warehouse, simply click on Import and navigate to the parent directory of where the atlas resides on your computer – e.g. C:\Atlases\World Health Atlas".



When connecting to a warehouse(s) / atlas on a **network**, Dynamic Maps makes the connection through the "Global Warehouse Manager" – a file that keeps track of the warehouses on the network and directs Dynamic Maps where to go to find them. When you run Dynamic Maps for the first time and you are connecting to a global warehouse(s) on a network, this is the file you need to connect to so that Dynamic Maps can find the warehouses.

Usually when you connect to the Global Warehouse Manager file, you will navigate through the network to find the file on a shared computer or server. If you are running Dynamic Maps on a network, the systems/database administrator will provide the location of the Global Warehouse Manager database.



When you have connected to the Global Warehouse Manager and/or have successfully imported a local warehouse close the Warehouse Administration form, click on the warehouse name and click "Open". Dynamic Maps will launch with the warehouse / atlas ready for use.

Appendix 2. The Dynamic Atlas Family of Products - Liberate Your Information!

Introducing Spatial Knowledge Engineering Inc.

Spatial Knowledge Engineering Inc. is an information solutions company with offices in Ontario and Nova Scotia, Canada. Our focus is to help organizations publish and access information. We develop information management solutions that are easy to implement and use. At SKE Inc. we provide both **Consulting Services** and custom software development, as well as our groundbreaking **Dynamic Atlas** information publishing software. Projects of any size from a National Spatial Data Infrastructure to a local mine management application can be quickly, effectively, and confidently implemented based on our experience and "ready-to-go" technologies.

Our Consulting Services: We believe "success breeds success!" We make sure useful results are in place quickly – often through a demonstration project or pilot system. Plus, we put an emphasis on communications. That way our clients see benefits early and stay informed and involved throughout.

As the highlighted map shows, clients from Afghanistan to Zimbabwe are taking advantage of our information management services and rapid implementation approach. We help them develop and implement strategies, systems and structures that ensure their information isn't an expense, but a *valued investment*.



Dynamic Atlas Software: Wherever we go, we encounter organizations struggling to get at their information and to make it readily accessible. We realized that people need a solution that:

- Handles all kinds of information – such as spatial data, tabular data and documents;
- Handles key functions that most people need;
- Is "generic", works anywhere and even complements other technologies;
- Is usable by everyone – not just the few "gurus" who have advanced technology or experience; and,
- Doesn't cost much.

So we built **Dynamic Atlas!**

Dynamic Atlas:
So advanced it's simple.

Introducing Dynamic Atlas

Dynamic Atlas is a suite of information publishing and access tools. These generic technologies enable the publishing of maps, databases, and documents with the click of a button. The diagram below outlines the architecture that is built around the concept of a corporate warehouse(s) of related data. It is easy to grow, add functionality through new systems, and maintain data – even in partnership with other departments or organizations.

1. **Dynamic Knowledgebase** provides the ability to quickly and easily set up and manage data warehouses for publishing to the desktop and the web.
2. **Dynamic Maps** makes it easy for *anyone* to use maps in their everyday work. It quickly enables the integration of tabular data on the map to create key indicator maps as well as offering a "library" for related documents and URLs. Plus it is

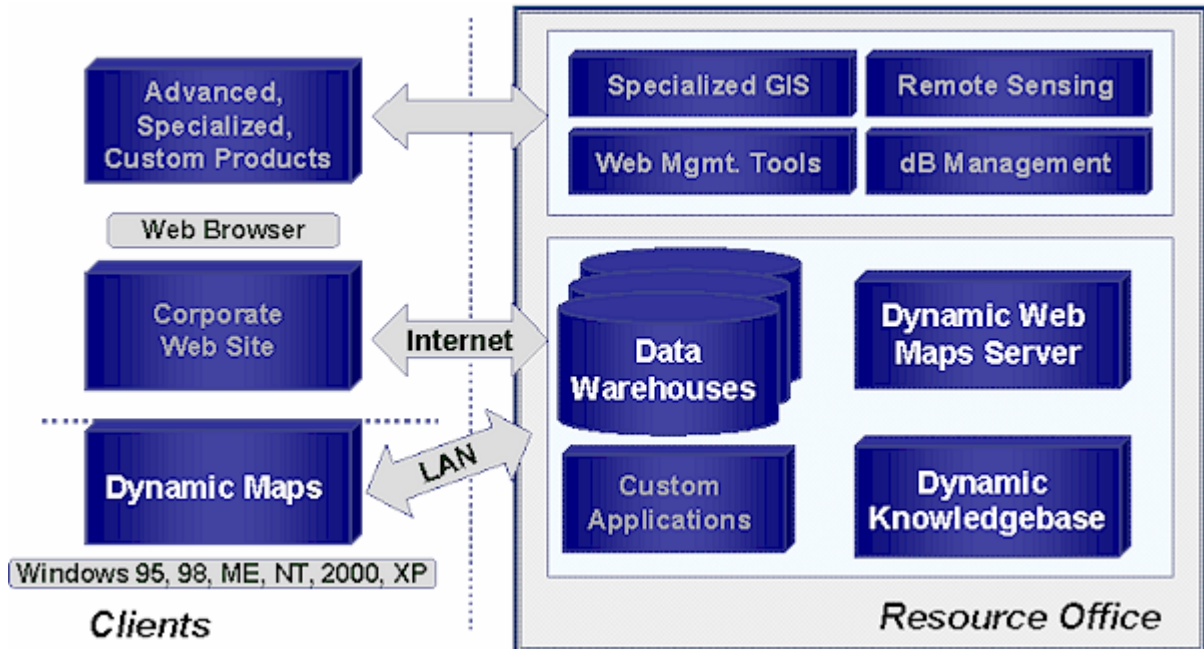
DYNAMIC  MAPS

DYNAMIC 
WEB MAPS SERVER

DYNAMIC 
KNOWLEDGEBASE

integrated with Microsoft Office to provide easy publishing of maps in PowerPoint and related data analysis in Excel.

3. **Dynamic Web Maps Server** enables the publishing of maps as well as data, documents, URLs, etc. related to any map feature(s) on the Internet.



Dynamic Knowledgebase

Our database management tool, **Dynamic Knowledgebase**, is at the heart of the Dynamic Atlas solution. With Dynamic Knowledgebase, we put the construction and management of the atlas "behind the scenes" so that your clients only need Dynamic Maps or a web browser to access and use the data and information.

With **Dynamic Knowledgebase** your organization can maintain virtually all its information in structured corporate data warehouses – thus promoting maintenance, standards and data sharing. Once data are registered in a warehouse, they are *automatically and immediately* available for use on the desktop or over the Internet on the corporate web site.

Specifically, Dynamic Knowledgebase handles:

- **Spatial data (maps)** – even huge map layers can be handled. When spatial data are registered, their rendering characteristics are defined as well as the scale at which they should be rendered. This way, the data appear in a logical color, sequence, and at an appropriate scale when they are accessed on the desktop or on the web. The user chooses what map layers they want to see and use, and there they are! Dynamic Knowledgebase handles spatial data in ESRI's coverage and shape file format and .tiff, .bmp, .bil, and .SID image formats, and many others.
- **Tabular data** from Oracle, dBase, Access, Excel or any ODBC-compliant database system. With Dynamic Knowledgebase it is easy to relate tabular data to features on a map layer so that users can easily "map" their data to identify spatial trends, create thematic maps, and do other spatial analysis.
- **Metadata (Descriptions of the data)**. Dynamic Knowledgebase enables all spatial, tabular and document data to have detailed and standardized descriptions provided for them to support users' needs to understand the data they are using,

Bring the relationship between your data and geography to life!

and to support data standards development and sharing within and among organizations.

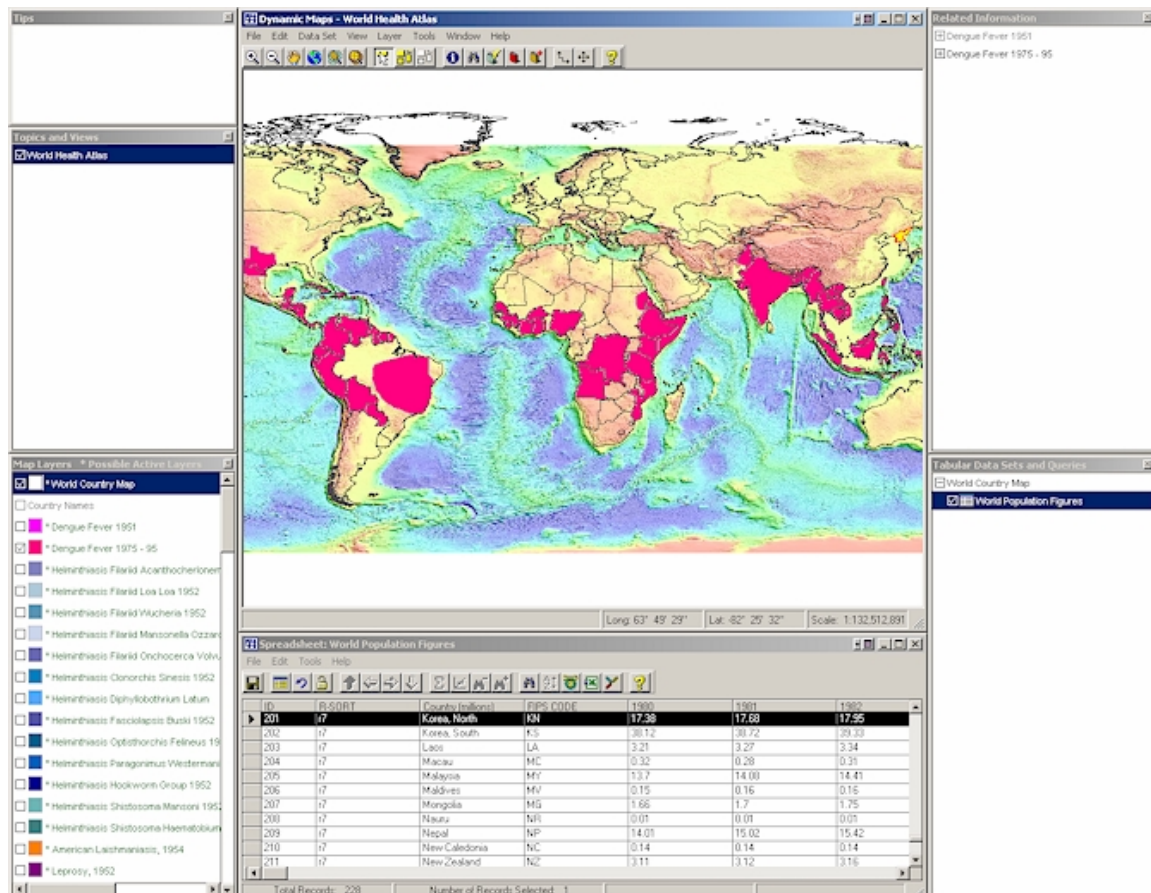
- **Multiple "Warehouses"**. Spatial data can have different projections or they can relate to completely different areas or features. Therefore, Dynamic Knowledgebase enables you to create separate "warehouses" of data as a way of logically and physically organizing keeping "like" data together. You can easily distribute these warehouses on CD so that people without access to the corporate network can use the data.
- **Topics**. Group map layers, data sets, and documents into relevant "topics" that are immediately reflected when a user launches Dynamic Maps or logs onto your web site. Topics enable you to focus the users' attention on an item or area of interest while providing information that is tailored to meet their needs.

Dynamic Maps

Dynamic Maps enables anyone to access and use the data and information in a warehouse by integrating tabular data and digital files with maps and their map features.

Dynamic Maps:

- Is easy to learn and use. Management and staff don't have to know anything about spatial data or the location of corporate databases to use it.
- Provides links from map features to associated information. For example, click on a municipality and get a live report about its finances, a document, some statistics, a URL -- anything.
- Integrates with Microsoft **PowerPoint**. Whatever you see on your screen can become a detailed PowerPoint slide instantly – ready for editing, animating, and annotating.
- Integrates with Microsoft **Excel**. Import Excel spreadsheets and "map" them by linking their records to map features on the fly. Send any or all records in a database to Excel and maintain a link with the map. This way, you're working in Excel and seeing the results of your work on the map.
- Import an Atlas. Atlases can be distributed on CD and imported by anyone using Dynamic Maps.
- Has a powerful query function enabling you to ask questions of tabular data and map the results. E.g. Where is the rate of HIV infection growing? – create a map that shows you from the data.
- Has a powerful class rendering function that enables you to quickly and easily create "trend" and "indicator" maps based on the data. E.g. Create a map showing relative property values, education levels, immigration trends, oil potential, anything your data allows.
- Is "generic", not database or system-specific, and therefore can be used by multiple disciplines in many ways.
- Enables you to access associated tabular information without having to know anything about the database, its structure or how to connect to it.
- Is fully user-definable in its display. Don't like the color of an object or feature? – change it. Want to highlight something – make it a different color. You can even annotate the map with points, lines, polygons, and text.



Plus, **Dynamic Maps V3** is FREE to use, copy and distribute!

Dynamic Web Maps Server

Dynamic Web Maps Server integrates mapping, tabular data and related documents reports and URLs on the Internet thereby significantly enhancing your ability to communicate with clients and share important information.

Map layers and tabular data sets are organized into "topics" so that the Internet client can quickly find the information they need or create a map of particular interest. And before accessing any of them, clients can access descriptions of the data to determine what map layers and tabular data are worthwhile retrieving. As the data change and are updated in the core database, these changes are immediately reflected on the web site.

Click on a map feature and get information about it -- such as links to documents, dynamic reports, a URL, etc. **Any information object** can be registered against **any map feature** providing your Internet clients a fabulously easy and powerful access mechanism for whatever information you want to publish. For example, a river might have several live reports regarding its pollution, flood risk, etc -- click on the river, get its associated reports. Or, a store might want to promote a sale -- click on the store, get its coupons, its URL, a picture.

Dynamic Web Maps provides the integration of maps, tabular data and documents on the Internet. No HTML programming required. No plug-ins either.

Implementing an SKE Solution in Your Organization

Often a two-phase approach is best. The first phase consists of a pilot project that delivers real data and systems but is done quickly and in a focused way. So even if the project ends after Phase I, there are still meaningful results. The second phase defines and implements a more complete solution. A successful pilot project in Phase

1 will go a long way in ensuring the future implementation success of an organization-wide information management initiative.

Phase I should:

- Have a narrowly-defined but meaningful geographic scope – dealing with one, two or a few specific areas;
- Have a clear business objective – dealing with one or two clear and measurable business needs – based on the priorities of the organization;
- Reflect data that are or could quickly be made available;
- Have an aggressive time-frame;
- Have appropriate staff assigned – and appropriate skill-upgrade / training programs put in place; and,
- Have a management structure with clear responsibilities.

Success breeds success, and those not involved in the Phase I project will be anxious to get involved too. Also, through the evaluation of the project, it will become much easier to determine the type of investment required in data maintenance and custom applications development. Therefore, Phase II involves the roll-out of the technologies across the organization as well as any additional database work and custom application development required.

Phase II also involves training programs, the establishment of data sharing partnerships and data maintenance agreements, and the identification of new and better ways of working.

The benefits of this approach include:

- The basic technologies are easy to use and inexpensive.
- The identification, development, and implementation of business-specific applications take place within an environment that already works with the data.
- By starting with basic technologies, the foundation is laid for future growth and use of more complex systems -- easing the learning curve and expense.

Contact SKE

SKE's experience, custom software development capabilities, and Dynamic Atlas software combine to provide any organization with dramatic information publishing and access solutions. Contact us and find out how we can help you "Liberate Your Information!"

President

Darko Poletto
dpoletto@skeinc.com

40 Linelle Street
Toronto ON M2N 2J3
Tel: (416) 221-4363
Fax: (416) 221-3559
Web: www.skeinc.com

Business Manager

Hugh Williams
hwilliams@skeinc.com

Appendix 3. Dynamic Maps Function Descriptions

Working with Forms

When you encounter forms in Dynamic Maps, you can often use the ESC key to clear an individual field. Use **Clear** to clear the entire form. Use **Close** to exit. You can also use the TAB key to move from one field to another.

Map View Functionality

File	Edit	Data Set	View	Layer	Tools
Delete View	Copy Selected	Import Data Set	Pan	Active Layer	Related Information
Save View	Copy All	Delete Data Set	Show Related Information	Rendering Properties	• Add
Save View As	Select Features		Zoom In	Visible Layer	• Update
Compose Map	• Select by Intersecting		Zoom Out	Description	• Delete
Open Map Composition	• Select by Name		Zoom dB Extents		• Related Information Mode
Delete Map Composition	• Select by Pointing		Zoom to Selected		• Show Related Information
Select Printer	• Select by Polygon		Zoom to Active Layer		Measure
Print View	• Select by Rectangle		Label Selected		• Measure Area
Refresh Warehouse	• Select by Circle		Label Found		• Measure Distance
Warehouse Connections	Select All		Render Labels		Draw
Exit	Unselect All		Render Selected		Identify Feature
			Render Find / Identify		Advanced Identify
					Find Feature
					ArcView

Map View File Functions

File / Delete View

File / Delete View brings up a form of available views from which you choose the one to delete. To delete a view, select it from the list and click **Delete**.

File / Save View (Ctrl+S)

File / Save View saves the current Map View and rendering settings with the same name previously specified. If there is no user-specified name, the system uses "Save View As".

File / Save View As

File / Save View As saves your current Map View and rendering settings as a new user view.

File / Compose Map (Ctrl+M)

File / Compose Map invokes the **Map Composition Definition** form. Your input establishes the parameters for the map composition.

File / Open Map Composition (Ctrl+O)

File / Open Map Composition enables you to select a map composition already created and available in the list of map compositions and open it for viewing and printing.

File / Delete Map Composition

File / Delete Map Composition deletes a map composition from the list of available map compositions.

File / Select Printer

File / Select Printer enables you to choose the printer or output services you will use for printing a map composition file or your view.

File / Print View (Ctrl+P)

File / Print View enables you to do a quick print of the current user view – without any of the surround features.

File / Refresh Warehouse

File / Refresh Warehouse re-starts the warehouse at its default view. This is particularly helpful if changes have been made to the atlas while Dynamic Maps is running.

File / Warehouse Connection (Ctrl+W)

File / Warehouse Connection invokes a Warehouse Selection form and enables you to connect to another data warehouse.

File / Exit (Ctrl+X)

File / Exits ends Dynamic Maps.

Map View Edit Functions

Edit / Copy Selected (Ctrl+C)

Edit / Copy Selected enables you to copy just the selected map feature(s) to the Windows clipboard as a graphic image. From there, the features can easily be pasted into any standard Windows software supporting cut and paste functionality.

Edit / Copy All

Edit / Copy All copies all visible features in the map view and places them in the Windows clipboard. This is an easy way to get your view into Word or PowerPoint.

Edit / Select Features

You have the following options for selecting features on the active layer:

- Select by Circle
- Select by Intersecting
- Select by Name
- Select by Pointing
- Select by Polygon
- Select by Rectangle

Edit / Select by Circle

Edit / Select Features / Select by Circle lets you define a circular shape on the map view for which all the intersecting active layer features will be selected.

Edit / Select By Intersecting

Edit / Select Features / Select by Intersecting enables you to select any features on a non-active layer that intersect with features you have already selected on the active layer.

Edit / Select by Name

Edit / Select Features / Select by Name brings up a list of the available features on the active layer. Selecting one or more feature names from the list will automatically select and highlight the feature on the map view. You can list only those features in the active layer that are visible in the current view, or list all features in the active layer.

Edit / Select by Pointing

With "Select By Pointing", you select and unselect features on the active layer by positioning your cursor on them and clicking. You can select multiple features by holding the CTRL key while clicking the mouse.

Edit / Select by Polygon

Edit / Select Features / Select by Polygon lets you define a polygonal shape on the map view for which all the intersecting active layer features will be selected.

Edit / Select by Rectangle

Edit / Select Features / Select by Rectangle lets you define a rectangle on the map view for which all the intersecting active map layer features will be selected.

Edit / Select All

Edit / Select All selects all the features on the active layer.

Edit / UnSelect All

Edit / UnSelect All clears the currently selected set of features on the active layer.

Map View Data Set Functions

Data Set / Import Data Set

Data Set / Import Data Set allows an appropriately structured tabular data set to be imported and linked with the current active map layer. Once the data set has been successfully imported, it is displayed as a user data set in the Tabular Data Sets and Queries window under the associated map layer's name.

Data Set / Delete Data Set

Data Set / Delete Data Set enables you to remove a user data set.

Map View View Functions

View / Pan

View / Pan lets you grab and move the map image in any direction with the mouse.

View / Show Related Information

View / Show Related Information provides you with a list of any related information objects that may have been registered for the selected feature(s). Once the function is invoked, click on the desired map feature to see its linked related objects.

View / Zoom In (Ctrl+Z)

View / Zoom In enables you to increase the scale of the Map View by defining a rectangle for the new area of interest.

View / Zoom Out

View / Zoom Out enables you to zoom out 150% and center on the position of the cursor.

View / Zoom dB Extent (Ctrl+G)

View / Zoom dB Extent zooms to the outer boundaries of the system's database.

View / Zoom to Selected

View / Zoom to Selected zooms to the selected feature(s) and centers it in the map view.

View / Zoom to Active Layer

View / Zoom to Active Layer zooms to the extent of the active layer.

View / Label Selected

View / Label Selected turns on and off labels for selected features.

View / Label Found

View / Label Found turns on and off labels for found features.

View / Render Labels

View / Render Labels enables you to define the size and color of the labels.

View / Render Selected

View / Render Selected enables you to change the rendering properties used for selected features.

View / Render Find - Identify

View / Render Find - Identify enables you to change the rendered properties of features when they are found or identified.

Map View Layer Functions

Layer / Active Layer (CTRL+A)

Layer / Active Layer provides a list of all selectable map layers from which you can set the active layer by clicking on its name in a list.

Layer / Render Properties (Ctrl+R)

Layer / Render Properties enables you to select a map layer and then define its rendering properties (i.e. how it appears on the map view).

Layer / Visible Layer

Layer / Visible Layer enables you to quickly turn the layers on and off in your map view all at once – rather than one at a time.

Layer / Description

Layer / Description enables you to get a report (often called "metadata") in your web browser about a map layer.

Map View Tools Functions

Tools / Related Information - Add

Tools / Related Information – Add enables you to publish a document, URL or description against a selected map feature(s). You may need specific privileges i.e. a warehouse password and operating system privileges depending on your system's security settings (see your system administrator for details).

Tools / Related Information – Update

Tools / Related Information – Update enables you to update the logical name and the description for a linked information object for the selected map feature(s).

Tools / Related Information – Delete

Tools / Related Information – Delete enables you to delete any related information object for the selected map feature(s).

Tools / Related Information – Related Information Mode

Tools / Related Information – Related Information Mode puts you in the related information mode so that whatever feature you click on will become selected and its related information will be highlighted or launched.

Tools / Show Related Information

Tools / Show Related Information launches the related information form containing the related information for selected features.

Tools / Measure - Area

Tools / Measure - Area enables you to define a polygon and find its approximate area in square meters or kilometers.

Tools / Measure - Distance

Tools / Measure - Distance enables you to draw a complex line and find its approximate length in meters or kilometers.

Tools / Draw

Tools / Draw launches the Draw Toolbar with a number of drawing-related functions. These can be used to enhance your map composition with project-specific descriptive lines, shapes, and text.

Draw Point

Draw points of various styles, weight, and color using either default styles or any true-type font on your system.

Draw Line

Draw a complex line of various styles, weight, and color.

Draw Polygon

Draw polygons with various fill patterns, fill color, and line color.

Draw Rectangle

Draw rectangles with various fill patterns, fill color, and line color.

Draw Circle

Draw circles with various fill patterns, fill color, and line color.

Add Text

Add text to create labels for features or add other relevant information on your map.

Delete User Object

Delete User Object deletes drawn objects and text.

Delete All User Objects

Delete All User Objects deletes all drawn objects and text.

Tools / Identify Feature

Tools / Identify Feature enables you to identify a feature on the active layer by clicking on it.

Tools / Advanced Identify

Tools / Advanced Identify enables you to identify a feature and get all the information about that feature that is stored in the map layer primary attribute table.

Tools / Find Feature (Ctrl+F)

Tools / Find Feature enables you to find a particular feature on the active layer – either within the current view or over the entire layer's extent.

Tools / ArcView

Tools / ArcView launches ArcView and passes the currently visible map layers to ArcView.

Spreadsheet Functionality

File	Edit	Tools
M/S Excel - All records	Select All	Query Builder
M/S Excel - selected records	Inverse Selection	Find
Save Selected Records	Unselect	Find Minimum
Exit		Find Maximum
		Sort
		Math Functions - sum
		Math Functions - average
		Class Rendering – Create
		Class Rendering – Clear
		Description
		Color Schemes

The Spreadsheet File Functions

Spreadsheet File / M/S Excel – All Records

Spreadsheet File / M/S Excel – All Records launches M/S Excel, moves all the data from the Spreadsheet into Microsoft Excel, closes the Dynamic Maps spreadsheet and maintains a link between the records now in Excel and the map view.

Spreadsheet File / M/S Excel – Selected Records

Spreadsheet File / M/S Excel – Selected Records launches M/S Excel, moves any selected records in the Spreadsheet into Microsoft Excel, closes the Spreadsheet and maintains a link between the records now in Excel and the map view.

Spreadsheet File / Save Selected Records

Spreadsheet File / Save Selected Records registers all the selected records in the spreadsheet as a new User Data Set.

The Spreadsheet Edit Functions

Spreadsheet Edit / Select All

Spreadsheet Edit / Select All selects all the records in the Spreadsheet. The map will also change to reflect this new selected set.

Spreadsheet Edit / Inverse Selected

Spreadsheet Edit / Inverse Selected lets you reverse the current selection. It makes all unselected records selected, and makes the selected records unselected.

Spreadsheet Edit / Unselect Records

Spreadsheet Edit / Unselect Records releases all the currently selected records.

The Spreadsheet Tools Functions

Spreadsheet Tools / Query Builder

Spreadsheet Tools / Query Builder enables you to create a sub-set of the records in the Spreadsheet that meet specific criteria you define.

Spreadsheet Tools / Find

Spreadsheet Tools / Find lets you find a string of characters in the Spreadsheet.

Spreadsheet Tools / Find Minimum

Spreadsheet Tools / Find Minimum finds and selects the record(s) with the minimum value in a column (field).

Spreadsheet Tools / Find Maximum

Spreadsheet Tools / Find Maximum finds and selects the record(s) with the maximum value in a column (field).

Spreadsheet Tools / Sort

Spreadsheet Tools / Sort sorts the spreadsheet's records in ascending or descending order in a column (field).

Spreadsheet Tools / Math Functions / Sum

Spreadsheet Tools / Math Functions / Sum calculates the total of a column's values.

Spreadsheet Tools / Math Functions / Average

Spreadsheet Tools / Math Functions / Average calculates the average value of a column (field).

Spreadsheet Tools / Class Rendering

Spreadsheet Tools / Class Rendering - Create lets you divide the spreadsheet's records into meaningful value-ranges or partitions ("classes") and then display these on the map in different colors and styles. To clear the class-rendered map, use the **Spreadsheet Tools / Class Rendering - Clear** function.

Spreadsheet Tools / Description

Spreadsheet Tools / Description enables you to get a report describing a data set in your web browser (often called "metadata").

Spreadsheet Tools / Color Scheme

Spreadsheet Tools / Color Scheme enables you to manage the color schemes you use to create class rendered maps – including importing and exporting schemes from elsewhere.

Map Composer Functionality

File	View
Save Map Template	Business Chart / Image
Save Map Template as	Disclaimer
Delete Map Template	Map
Print Preview	Map Background
Microsoft PowerPoint	Map Legend
Exit	Miscellaneous Text
	North Arrow
	Organization Logo
	Scale Bar
	Title
	Guides Visible
	Show Coordinates

Map Composer File Functionality

Map Composer – File / Save Map Template

Map Composer – File / Save Map Template enables you to save your current map parameters for use in subsequent map compositions. If your current map's parameters have not been previously saved and named, then the system invokes the "Save Map Template As" form.

Map Composer – File / Save Map Template As

Map Composer – File / Save Map Template As saves a new map template.

Map Composer – File / Delete Map Template

Map Composer – File / Delete Map Template provides you with a list of the templates you have saved and enables you to select then delete one of those templates.

Map Composer – File / Print Preview

The **Map Composer – File / Print Preview** function creates a preview of the map composition and displays it in its own window. From this form you can:

- Save Map Composition – lets you define the name and the file location for the graphic (.bmp) file that you are about to save; and,
- Print Map Composition.

Map Composer – File / Microsoft PowerPoint

Map Composer – File / Microsoft PowerPoint sends the map composition to PowerPoint.

Map Composer View Functions

Map Composer – View provides you direct access to the various map components' control forms. These enable you to change various parameters of each element. This is particularly helpful if, for example, your template does not include one of the components, but you decide to include the component. By selecting it in the View menu, you can now make it "visible" on the map composition.

Map Composer – View / Guides Visible

Map Composer – View / Guides Visible lets you select whether or not the X and Y (vertical and horizontal) guides are visible on the map composition. The guides can then be used to orient and “snap” composition objects.

Map Composer – View / Show Coordinates

Map Composer – View / Show Coordinates lets you select whether or not the X and Y (vertical and horizontal) coordinates are visible on the map composition corners.



Appendix 4. Glossary of Terms

Active Layer	The Active Layer is the currently selected map layer. Only one layer can be active at a time. An Active Layer can have its features selected and identified and can have related information registered against its features. Only Selectable map layers (the ones with names that appear in green color) can be made active.
Atlas	In Dynamic Maps, an Atlas is a warehouse – a logical integrated grouping of map layers, tabular data sets, related information, and metadata / descriptions.
Available Map Layers	The Available Map Layers lists the map layers registered in the warehouse and visible at the current map view’s scale.
Data Set	A Data Set contains tabular information associated with one of the Selectable Map Layers. There are two types of Data Sets: System Data Sets and User Data Sets . System Data Sets are registered in the system by the creator of the warehouse using Dynamic Knowledgebase and cannot be deleted by the end-user. System data sets are accessible to any one using Dynamic Maps. The warehouse creator can also define views as Data Sets that connect the System dB with other ODBC-compliant databases visible on the local or wide area network, thus allowing a virtual table to be created “on the fly”. The usefulness of this function is that Dynamic Maps can connect to almost any production database. A User Data Set consists of data defined by the user through the Data Set / Import Data Set menu function and is only accessible to the user.
Database	A collection of related information, managed, and stored as a unit. A GIS database includes data about the spatial location and shape of geographic features recorded as points, lines, areas, or pixels as well as their attributes.
Database Table	A Database Table is a collection of data about a specific person, place, thing, object and event. Using a separate table for each topic means the data are stored only once, making the database more efficient and reducing data entry errors. Tables organize data into columns (called fields) and rows (called records).
Database View	A Database View is a subset of fields from a specific table, or a number of fields from different tables that have been joined together through a SQL statement. Views are a powerful way by which specific data can be accessed from a relational database.
Image Data	An image is a graphic representation or description of an object. Some common examples of image data include remotely sensed data, aerial photography, scanned data, and photographs. Image data are a form of raster data where each grid-cell, or pixel, has a certain value depending on how the image was captured and what it represents. For example, if the image is a remotely sensed satellite image, each pixel represents energy reflected from a portion of the Earth's surface. If, however, the image is a scanned document, each pixel represents a grey-scale value associated with a particular point on the document.
Image Layer	An Image Layer is file in .bmp, .bil, .tif or .sid format (raster format) with an associated World file for geo-referencing.

Map Components	The Map Components are objects in a map composition.
Map Composition	A Map Composition is a raster image file in .bmp format that represents the end product map generated through the Map Composer tool. The map image is depicted on one of several possible paper sizes for printing.
Map Coordinates	Map Coordinates describe the location of geographic features in a coordinate system. Dynamic Maps supports two types of coordinates systems: Geographic/Curvilinear and Cartesian coordinates. Geographic / Curvilinear coordinate systems have their coordinates displayed as Degrees, Minutes and Seconds, and Cartesian coordinate systems have their coordinates displayed in rectangular units such as meters. Distance and area calculations are displayed in rectangular units - meters/kilometers and square meters/kilometers. Distances and area are always calculated in a Cartesian coordinate system using a generic map projection when dealing with geographic based warehouses – therefore they are only approximations.
Map Extent	The rectangular limits of the Earth's surface area you want to display. Typically, the extent of the geographic data in the warehouse defines the map's initial extent.
Map Layer	A Map Layer is a collection of geographic features represented as points, lines, polygons or labels and are represented in vector or raster format.
Map Scale	Map scale defines the distance relationship between the map and the Earth's surface. The map scale is expressed as a fraction of distance, such as 1:50,000 where one distance unit on the map represents 50,000 of the same distance units on the Earth. Map scale can also be expressed as equal units; for example, 1 inch = 1 mile or 1 inch = 2,000 feet.
Map Template	Using a Map Template, you can define and save for later use the various Map Components to be displayed in a Map Composition, how they are displayed, and where they are displayed in the Composition. The map template does not include the Map View and the Available Map Layers.
Map View	The Map View is what you see in display area of geographic data visible to the user along with the associated display parameters.
Metadata	Data that describe data. Metadata provide information about the map layer or data set –who created it, the contact person, the type of data, its accuracy, etc.
Overview of Spatial Data	Geographic or "spatial" data are any data that describe any part of the Earth's surface or the features found on it. Along with cartographic and scientific data, they can also include business data, land records, photographs, customer databases, travel guides, real estate listings, legal documents, videos, etc. In fact, over 80% of all data used in business and government can be related directly to geographic features like addresses and locations.
Pan	Pan moves the viewing window in any direction to display parts of the map that, at the current viewing scale, lie outside the current map view.
Pixel	Short form for "picture element". A pixel is the smallest resolvable element in a raster image. A pixel has both a spatial location and a value component.
Raster Data	Raster data organize information in a matrix. Each cell has a number that represents a particular geographic feature, such as soil type, elevation, land use, slope, etc. Raster data are often used to store information about geographic features that vary continuously over a surface. Image data are a form of raster data in which each cell or pixel of the image stores an optical value. The quality/resolution of raster data depends on the grid size in which they are recorded. Since the grid cell size is fixed, as you zoom in on raster data you will eventually see the shape of the cells. See Image Layer.
Related Information	Any type of digital file and URL and text description can be related to a spatial feature or features. This enables geography to be used as an index to non-geographic information objects.
Selectable Map Layer	A Selectable Map Layer is a map layer that can be used for feature selection and query purposes and with which tabular data sets can be associated.

	The warehouse creator designates map layers as “selectable”.
Shapefiles	<p>The shapefile format defines the geometry and attributes of geographically-referenced features in three files with specific file extensions. They are:</p> <ul style="list-style-type: none"> • .shp - the file that stores the feature geometry. • .shx - the file that stores the index of the feature geometry. • .dbf - the dBASE file that stores the attribute information of features. • Plus, often various index files (that help speed up the access and drawing of the data).
SKE Inc.	<p>Thank you for using Dynamic Maps. SKE developed this software to meet a key need for a data access and manipulation tool that was not being met by traditional high-cost, high-overhead, hard-to-learn mapping and GIS systems.</p> <p>Software development is just one of the things we do. Spatial Knowledge Engineering Inc. is a total solutions company – working with clients to identify their business information needs and designing and building the appropriate information and management systems to meet these needs. Please feel free to contact us at www.skeinc.com for more information.</p>
Spatial Data	<p>Spatial data store the location of geographic features, along with attribute information describing what these features represent. Data describing location are stored in a vector or raster data structure, and corresponding attribute data are stored in a set of tables related geographically to the features they describe.</p> <p>Dynamic Maps supports the following spatial data formats:</p> <ul style="list-style-type: none"> • shapefiles and ArcInfo coverages (workstation and PC), and • .sid, .bil, .bmp, .tiff image data with a World file. <p>Spatial data have an explicit relationship between the geometric and attribute information, so that both are always available when you work with the data. Spatial data are geo-referenced to known locations. To ensure that location is accurately recorded, spatial data always use a specific coordinate system, unit of measurement, and map projection. When spatial data are displayed, they have a particular scale just like any paper map.</p> <p>Spatial data are primarily feature-based. They enable specific geographic phenomena to be managed, manipulated, and analyzed easily and flexibly to meet a wide range of needs.</p>
Spreadsheet	<p>Tabular data are displayed and queried by the Spreadsheet. The Spreadsheet displays text, numeric, and memo data types in a table format. When any record is selected in the Spreadsheet, its corresponding geographic feature is automatically selected in the Map View.</p>
Tabular Data	<p>Tabular data (data in a table format) can reflect almost any data set, whether or not it contains geographic data. Dynamic Maps works with data in M/S Access, Excel, dBase, and Oracle formats.</p>
Vector Data	<p>Vector data record spatial information as a set of x,y or Latitude, Longitude coordinates in a rectangular (planar) or curvilinear coordinate system. Point features are recorded as single locations. Line features, including the outlines of polygons, are recorded as an ordered series of coordinates, and polygons as a closed series of coordinates. Vector data are well suited to record the location of discrete geographic features with precise locations like streets, boundaries, streams, villages, etc.</p> <p>Vector data are highly dependent on the number of coordinate points that are chosen to represent features, especially natural features like streams and coastlines. As you zoom in on vector data representing such features, you will eventually see the individual straight-line segments that make up their vector representation. Each data set has an inherent accuracy that is dependent on how it was initially surveyed (located and described) and then how it was represented, i.e., on hard copy maps created at a specific scale or in digital databases.</p>
Warehouse	<p>A warehouse or “atlas” is a grouping of map layers and their associated system data sets and related information objects and descriptions. Map layers in a warehouse will always have the same coordinate system, datum and projection. They may also be grouped for logical reasons – such as local data or data at a national scale.</p>

Appendix 5. Dynamic Maps License Agreement

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