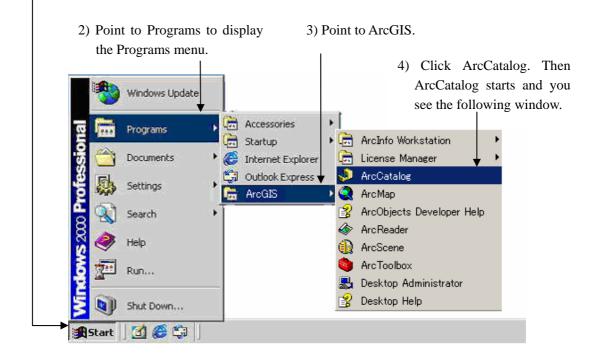
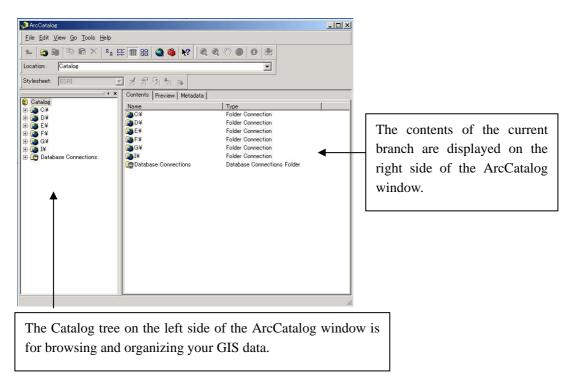
2 Introduction of ArcCatalog

ArcCatalog is the tool such as Microsoft Explorer for browsing, organizing and documenting organization's GIS data holdings.

2.1 Starting and Exiting ArcCatalog 2.1.1 How to Start ArcCatalog

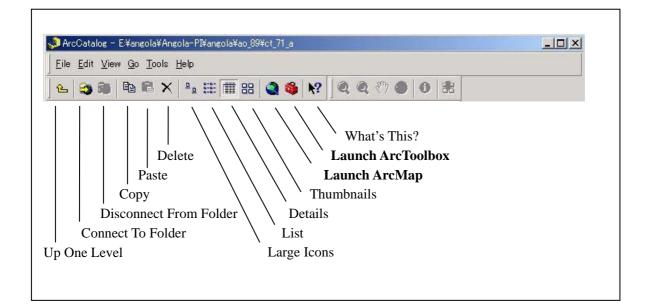
1) Click the Start button on the taskbar.

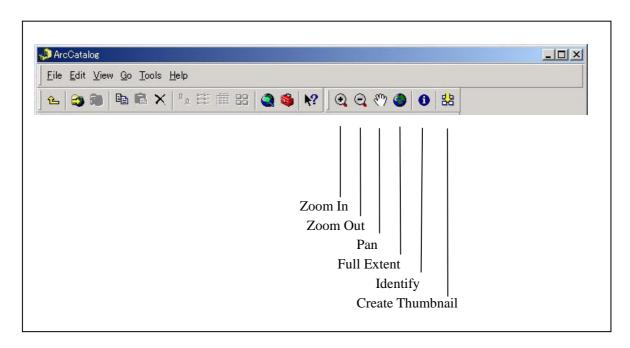




When you start ArcCatalog for the first time, you may see branches for each local hard drive, a branch for database, etc. As you can use ArcCatalog like Microsoft Explorer, you can view the contents of a branch by double-clicking it or by clicking the plus sign beside it.

Functions of Toolbars buttons are the followings:

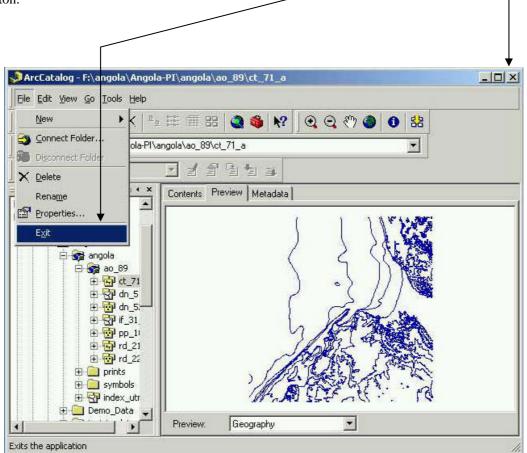




Note: Please see Page 12 for operation examples of Zoom In and Identify.

2.1.2 How to Exit ArcCatalog

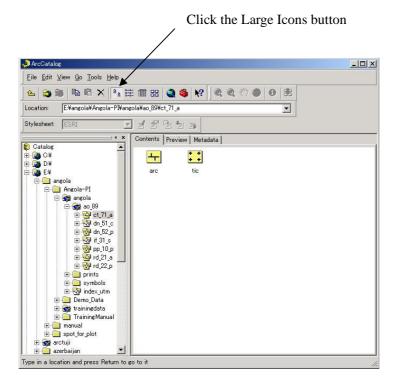
There are two ways for exiting ArcCatalog. Click File and click Exit or only click the Close button.



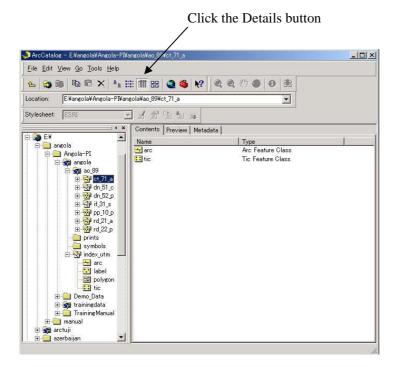
2.2 How to View Data in ArcCatalog

On the right side of the ArcCatalog window you can view a data source in the three ways - Contents, Preview and Metadata.

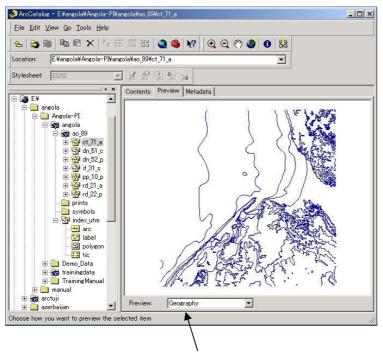
Example 1 of Contents view:



Example 2 of Contents view:

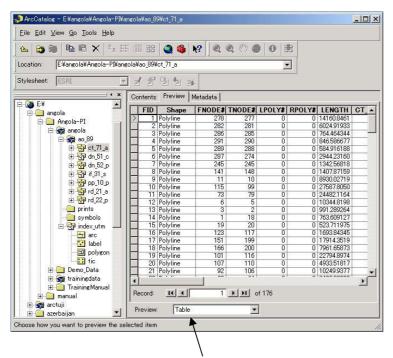


Example 1 of Preview view:



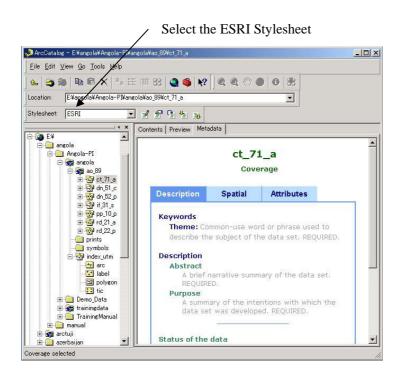
Select the Geography option

Example 2 of Preview view:

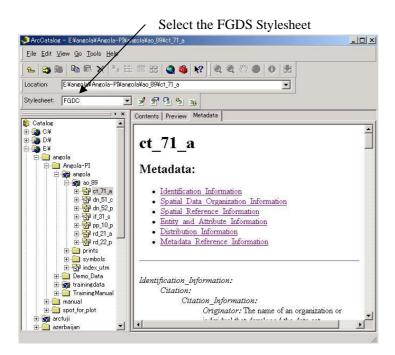


Select the Table option

Example 1 of Metadata view:



Example 2 of Metadata view:

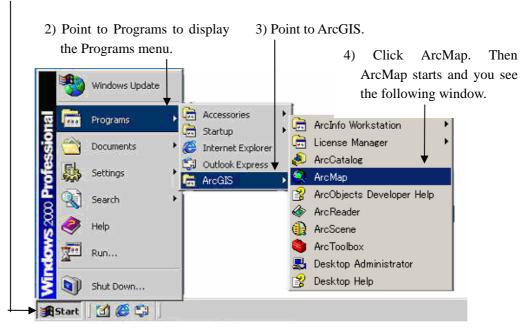


3 Introduction of ArcMap

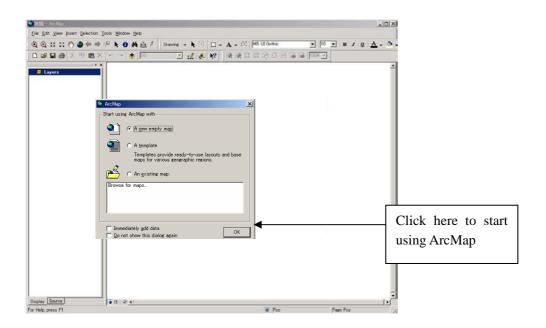
ArcMap is the tool for creating, viewing, querying, editing, composing and publishing maps.

3.1 Starting and Exiting ArcMap 3.1.1 How to Start ArcMap

1) Click the Start button on the taskbar.

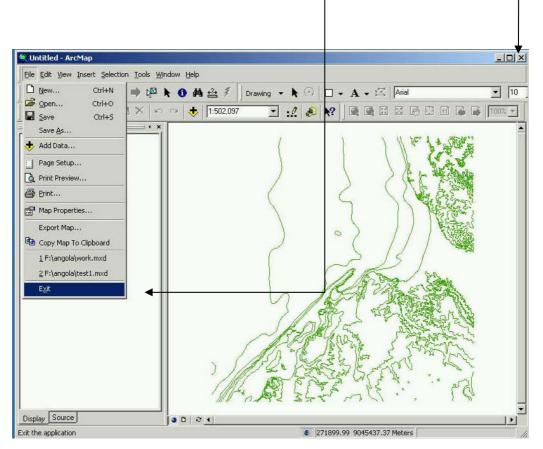


Note: You can also start ArcMap by clicking the Launch ArcMap button in ArcCatalog. Please see Page 3.



3.1.2 How to Exit ArcMap

There are two ways for exiting ArcCatalog. Click File and click Exit or only click the Close button.



Note: As the warning dialog box appears before closing ArcMap, click No if it is not necessary to save a map.



3.2 How to View a Map in ArcMap

3.2.1 How to Connect to Data

File	<u>E</u> di	t⊻	ew	Insert	Sele	ction	Tools	Windo	IW <u>H</u> e	elp														
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D	Ê		8	X		e ×	1	0	+	0:0			Ŧ	0	٢	h ?			3 K	F.	50	1	100%	Ŧ

1) Click the Add Data button. Then the Add Data window appears.

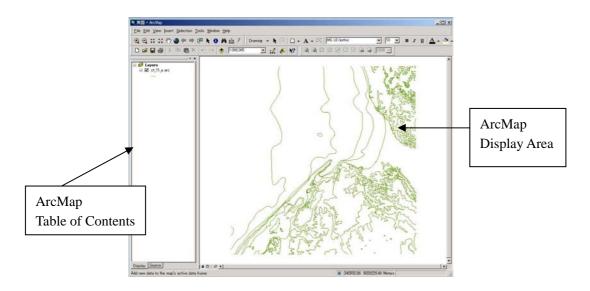
Look in:	🗊 Catalog	<u> </u>	# 88
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G:¥			
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👰 Coordina			
I Object name	e:		 Ac

2) Connect to your data by double-clicking. If you cannot see a drive you want, click the Connect To Folder button.

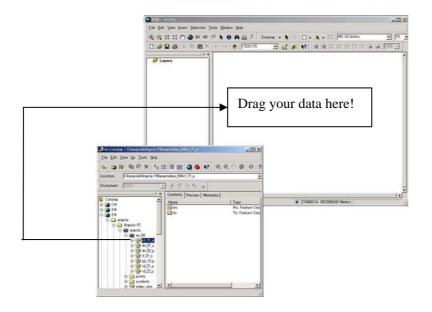
	Look in:	😽 ao_89	-	·		6-6- 6-6-	88
	ਦਾ ct_71_a ਨੀ ¹ dn_51_c						
	🔂 dn_52_p						
	ср if_31_s орр_10_р						
	rd_21_a						
	م rd_22 p						
	Object name	ct_71_a					Add
							Cance
10					/		

4) Click the Add button. Then your data appear in the map display of ArcMap like the figure of the next page.

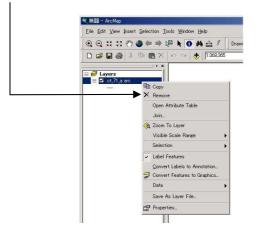
Example of Map Display:



Note: You can add your feature data from ArcCatalog to ArcMap by dragging.

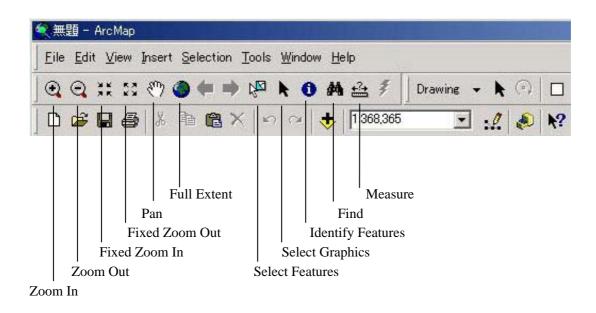


Note: To eliminate a map, right-click the map and click Remove.



3.2.2 How to Explore a Map

You can explore a map in several ways. The browse toolbar contains frequently used tools as the followings:



Operation for Zoom In or Zoon Out:

- 1) Click the Zoom In or Zoom Out button.
- 2) Drag a box on the map where you want to zoom in or zoom out.

Operation for Identify Features:



- 1) Click the Identify Features button.
- 2) Click a feature on the map that you want to know the feature attributes. Then the Identify Results window appears.

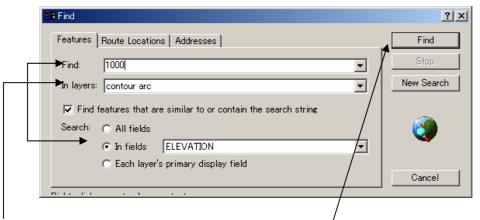
⊡ ct_71_a arc	Location: 234003.30	69634 9051280.208700)
	Property	Value
	FID	67
	Shape FNODE#	271
	TNODE#	17
	LPOLY#	0
	RPOLY#	0
	LENGTH	71516.769007
	CT_71_A# CT_71_A-ID	67 108
	CODE	7106
	SPOT	100
	INTID	71000107
	\$ID	108
	\$FROMNODE	271
	\$TONODE \$LEFTPOLYGON	17
	\$RIGHTPOLYGON	
	UNIGHTFOLIGON	0

#

Operation example for Find:

1) Add contour arc from the sample data.

2) Click the Find button. Then the Find dialog box appears.



3) Full in values like as the above figure.

4) Click the Find button. Then the result appears in the Find dialog box like the following.

📲 Find	ł							? ×
Fea	tures	Route Locations	s Address	es			. [Find
Fir	nd:	1000				•		Stop
In	layers:	contour arc				•		New Search
V	Find f	eatures that are	similar to	or contain th	e search str	ne		_
Se	arch:	○ All fields						
			ELEVATIO			•		-
		C Each layer's	primary di	splay field				Cancel
Right	-click a	a row to show c	ontext men	J.				
Valu	Je			Layer		Field		
1000				contour arc				1
1000				contour arc		Flash feature		
1000				contour arc		Zoom to feature(s))	
1000				contour arc		THE		
1000				contour arc		Identify feature(s)		
1000	j			contour arc		Set Bookmark		
1000				contour arc		Select feature(s)		
1000				contour arc contour arc		Unselect feature(s)	
1000				contour arc			-	1
1000				contour arc		ELEVATION		
1000				contour arc		ELEVATION		
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1000				contour arc		ELEVATION		
1000				contour arc		ELEVATION		
1000)			contour arc		ELEVATION		
18 obje	ets fou	nd.						

5) Right-click one line of the result. Then the context menu appears.

6) Click one in the context menu to function it.

3.2.3 How to Change the Way of Feature Drawing on a Map

You can change the drawing way on a map.

Example of Features/Single symbol:

Image: Selection Image: Selection Selection Image: Selection Label Features Convert Labels to Annotation Convert Features to Graphics Data Data Save As Layer File		🖑 🍘 🛑 🔿 🕼 📐 🦸 👫 🚣 🐔 🗍 Drawin	
Layers Contour arc Copy Remove Open Attribute Table Join Zoom To Layer Visible Scale Range Selection Label Features Convert Labels to Annotation Convert Features to Graphics Data		š 🖻 🛍 Χ ၊ ၊ ၊ · · 🔸 👖 1:368,365	
Copy Remove Open Attribute Table Join Zoom To Layer Visible Scale Range Selection Label Features Convert Labels to Annotation Convert Features to Graphics Data	E 🕖 Lavers	[
Remove Open Attribute Table Join Visible Scale Range Visible Scale Range Selection Label Features Gonvert Labels to Annotation Onvert Features to Graphics Data	🖃 🖻 🗹 contour		
Join	▲		
Coom To Layer Visible Scale Range Selection Label Features Convert Labels to Annotation Convert Features to Graphics Data			
Visible Scale Range Selection Label Features Convert Labels to Annotation Convert Features to Graphics Data			
Label Features Convert Labels to Annotation Convert Features to Graphics Data		가장 옷 옷 옷을 알 안 감 생성이 있다. 그는 그는 그는 그는 것이 같이 많이 없다. 그는 것이 같이 많이 많이 없다. 그는 것이 없는 것이 없다. 그는 것	
Convert Labels to Annotation Convert Features to Graphics Data		Selection	
Convert Features to Graphics		Label Features	
Data			
Save As Layer File			
		Save As Layer File	
Properties		Properties	

- 2) As the pop-up menu appears, click Properties.
- 3) The following Properties dialog box appears.

Layer Properties	<u>? ×</u>
General Source Selection Display Symbology Fields Definition Query Labels Joins & Relates	
Layer Name: contour arc	
Scale Range	
You can specify the range of scales this layer will be shown:	
O Don't show layer when zoomed:	
out beyond 1: 0 (minimum scale)	
in beyond 1: 0 (maximum scale)	
OK #ャンセル 適用 G	ð

4) Click Symbology tab and click the Symbol. If Features/Single symbol is not chosen, click Features and click Single Symbol.

iow: eatures	Draw all features using the same symbol
ategories Juantities Jultiple Attributes	Symbol
	Legend Label appearing next to the symbol in table of contents:
L'E-AL	Description Additional description appearing next to the symbol in your map's legend
()	

5) As the Symbol Selector dialog box appears, you can choose one of predefined symbols.

/

			1	- Preview				
Highway	Highway Ramp	Expressway						
				-Options	.			
Expressway Ramp	Major Road	Arterial Street		<u>W</u> idth:	1.00	」 ⊒ 4 −−−	[You can change
		<u> </u>						a width of the
Collector Street	Residential Street	Railroad						features.
				P	roperties			
				<u>M</u> o	ore Symbol	s •		
River	Boundary, National	Boundary, State		<u>S</u> ave		<u>R</u> eset		
			-	ОК		Cancel		

- 6) Click Color. Then the color selector dialog box appears.
- 7) Click a color that you want.



8) Click Ok in the Symbol Selector dialog box. After that click OK in the Properties dialog box. Then you can see the features with color that you wanted.

Example of Categories/Unique values:

- 1) Open the Properties dialog box and click the Symbology tab by the same way as Features/Single symbol on Page 15.
- 2) Click Categories and click Unique values.

			3) C	lick th	e dow	vn a	rrow	and sel	ect a v	alue	field	d that you	want.
Layer Properties											<u>? ×</u>		
General Source	e Selection	Display	Symbology	Fields D	efinition G	Query	Labels	Joins & Rela	tes				
Show: Features			ategories u	using uniqu	ie values	s of o				Import			
Categories	s	- <u>V</u> alue Fi	əld ———		/	न (Color Scł	eme ——					
Unique value Match to sy	es, many fiel										╝╇┥		1
Quantities Charts		Symbol	Value Kall other va	alues>		Label Call off	er values	>	Count				
Multiple Attri	butes			1000/		an oa							
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100 0	<u></u>										-	color	schemes.
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C Street	X]											
Sec. 1	V 7	Add A <u>l</u> l 1	Values	A <u>d</u> d Value:	s	<u>R</u> em	ove	Remove	АШ				
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							ОК	 キャン	bu	適用(<u>A</u>	。)		
										, <u> </u>			
5) Click A	Add All	Value	es.										
-,													

6) Finally click OK. Then you can see the features with colors that you wanted.

Note: You can choose several show ways as below.

- -Features/Single symbol
- -Categories/ Unique values
- -Categories/ Unique values, many fields
- -Categories/Match to symbols in a style
- -Quantities/Graduated colors
- -Quantities/Graduated symbols
- -Quantities/Proportional symbols
- -Multiple Attributes/Quantity by category

3.2.4 How to Query Data

You can select some features depend on attributes values. In this example, the way of query data is explained using the sample data of hydr_pnt point.

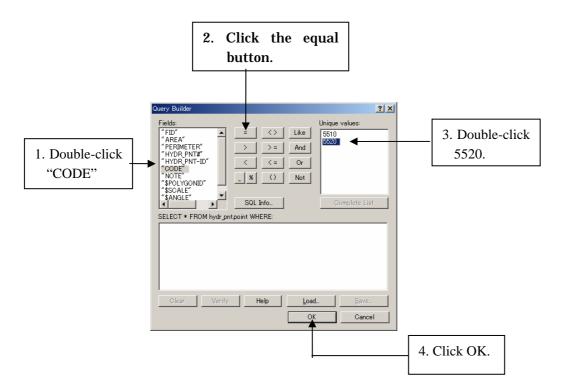
★無題 - ArcMap	
Eile Edit View Insert Selection Tools Window Help	
] @, @, ;;; ;; ;?) @ (= ⇒ (₽) ┣, 0 ┣) @	s 💈 🛛 Drawing 🔹 📐 🗇 🗖 🗸 🗛 🗸 🖾 🕅 MS UI Gothic 💽 📘
D 📽 🖬 🚑 👗 🖻 🎕 × ∽ ⇔ 🔸 📭	118,233 🔄 🕺 🍋 📢 🖳 🚔 🖾 🖻 🖼 🖨 👘 1100% -
Display Source	• • • • • • • • • • • • • • • • • • •

1) Right-click hydr_pnt point in the ArcMap table of contents and click Properties.

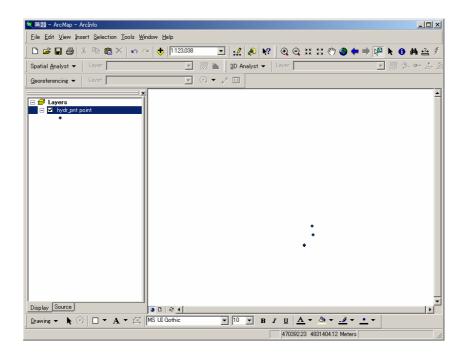
2) As the Properties dialog box appears, click Definition Query tab and click Query Builder.

r ties sral Source Selection Display Sym inition Query:	oology Fields Definition	n Query Labels	<u>? ×</u>	
mor gaay.				
ery Builder				

3) As the Query Expression dialog box appears, fill in values that you want. In this example, select CODE = 5520 like the following figure.



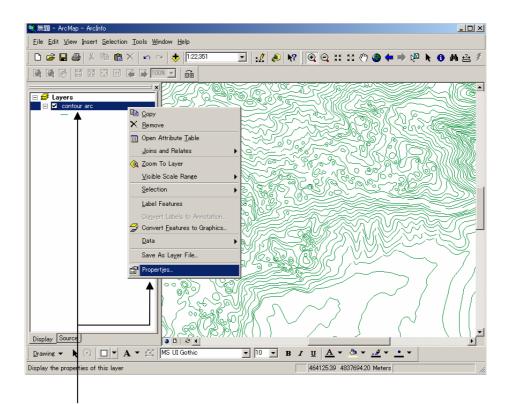
- 4) As the Properties dialog box appears again, click OK.
- 5) The result is viewed. Please compare with the map of Page 17.



Note: To cancel the query result, display the Query Expression dialog box of 3) and click Clear, after that close the box by OK and close the Properties dialog box by OK.

3.2.5 How to Add Labels to a Map

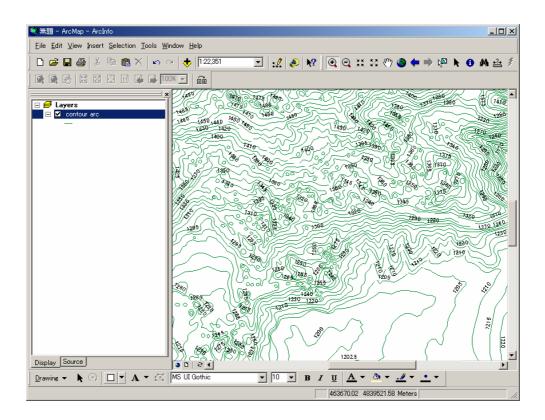
You can add some labels from the attributes data. In this example, the way of adding labels is explained using the sample data of contour arc.



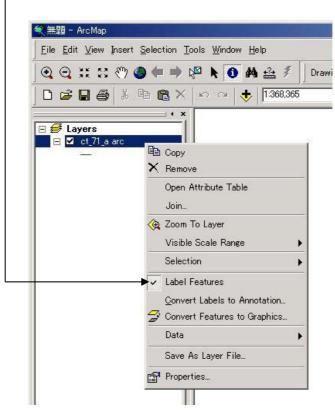
- 1) Right-click contour arc in the ArcMap table of contents and click Properties. (Do "Zoom in" at any place for display.)
- 2) As the Properties dialog box appears, click Labels tab and follow the below instructions.

1. Check Label Features	Layer Properties ? > General Source Selection Display Symbology Fields Definition Query Labels Joins & Relates Image: Comparison of the second seco
2. Click the down arrow and select a label field that you want. Here, select SPOT.	All features will be labeled using the options specified. Text String Label Eield: ELEVATION Text Symbol AaBbYyZz Symbol Other Options Other Options Scale Ragge Pre-defined Label Style Label Placement Options Scale Ragge
	OK キャンセル 適用(金) 3. Click OK. ●

3) The result is viewed. Please compare with the map of Page 19.



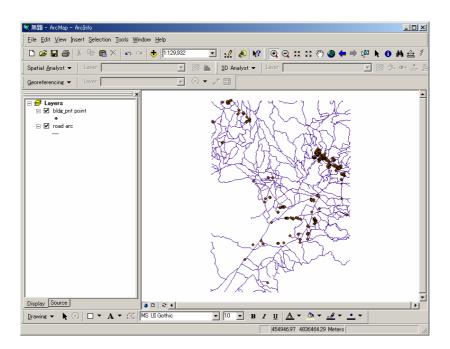
Note: To eliminate the label, right-click contour arc on the ArcMap Table of Contents and click Label Features. If you want to add the label again, right-click contour arc and click Label Features again.



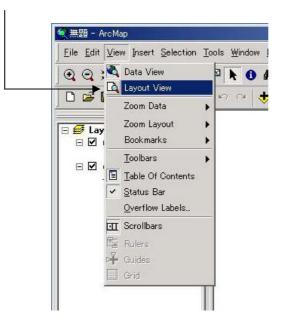
3.3 How to Work with the Map Layout

ArcMap provides two different ways to view a map - Data View and Layout View. Each view lets you look at and interact with the map in a specific way. In Layout View, you see a virtual page upon which you place and arrange map elements. So the Layout View is usually used for making paper printed maps.

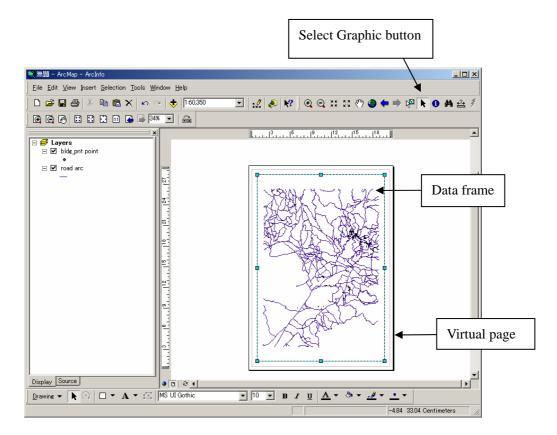
In this section, the sample data of bldg_pnt point and road arc are used for explaining of the Map Layout. The data view of these data is shown below.



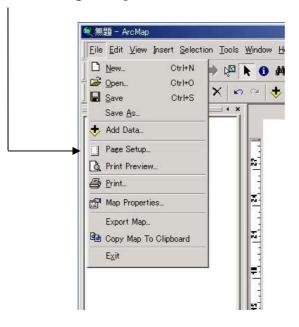
1) Click View and click Layout View.



2) The map appears on a virtual page.



- Note: You can change the data frame size. When the Select Graphic button is active, the data frame is outlined with a dashed line and has selection handles at its corners and edges like the above figure. If you point to one of the selection handles, the cursor becomes a two-pointed resize cursor. So, drag the resize cursor to change the data frame size.
- 3) Click File and click Page Setup.



4) As the Page Setup dialog box appears, select Name, Printer Page Size and Page Orientation. After that click OK.

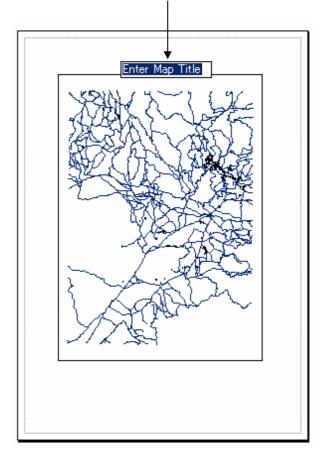
1ap Size	Printer Setup
I▼ Same as Printer	Name:
Standard Page Sizes:	EPSON MJ-8000C
<u>_</u>	Printer Page Size: 🔻
Width: 20.9974 Centimeters 🔻	A4 210 × 297 mm
Height: 29.6969	Page Orientation: 🖌 © Portrait 🔿 Landscape
Page Orientation	Printer Engine:
Portrait C Landscape	Windows Printer
lap Setup	
Output Image Quality: Fast Normal Best	Scale map elements proportionally to changes in page size
	Show printer margins on Layout

In the Layout View, you can add some map elements such as Title, Legend, North Arrow, Scale Bar and so on. The way to add these elements is explain below.

Add a Title:

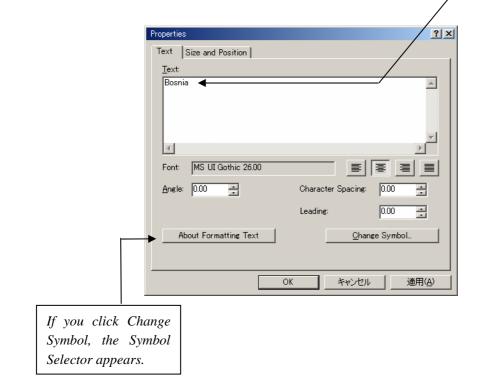
5) Click Insert and click Title.

Image: Second secon	1	The second s	Insert Selection To	ols <u>W</u> indow
E Ct_71_a Scale Bar		🗆 🥩 New Dat	A lext	and and and a
		⊡ ⊻ rd_22 ; ♦ ⊡ ☑ ct_71_; —	🛥 Scale Bar 📼 Scale Text	
			Ficture	-



6) As the title "Enter Map Title" appears, type your title and press Enter.

Note: The Properties dialog box appears by double-click on the title. You can change title text and its size, position and style.

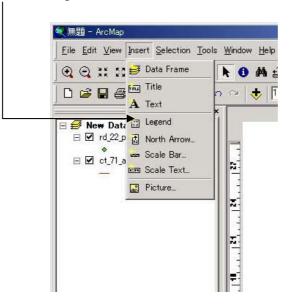


You can change Color, Size, Font, etc. on the Symbol Selector.

ector	
•AaBbYyZz Country 1	Angola Map
A a B b Y y Z z Country 2	Options Qolor:
•AaBbYyZz _{Country} 3	MS UI Gothic B Z U +
	Properties
AaBbYyZz	<u>M</u> ore Symbols
Capital	<u>Save</u> <u>R</u> eset

Add a Legend:

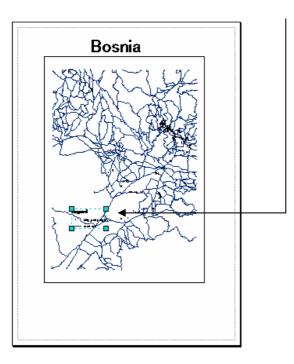
7) Click Insert and click Legend.



As the Legend Wizard appears, operate following the instructions.

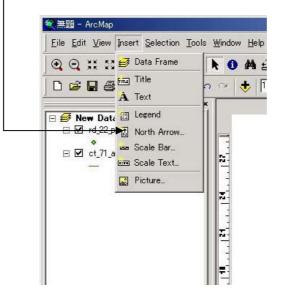
Map Layers: bldg.pnt.point road arc	Legend Items bldg.pnt point road arc	1	
Set the number of columns	n your legend: 1		

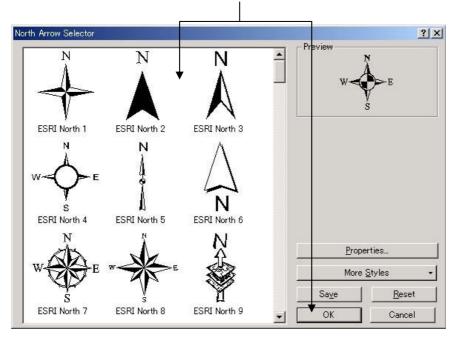
8) As the legend appears, drag the legend to move it to the empty space. You can resize it by dragging the blue selection handles.



Add a North Arrow:

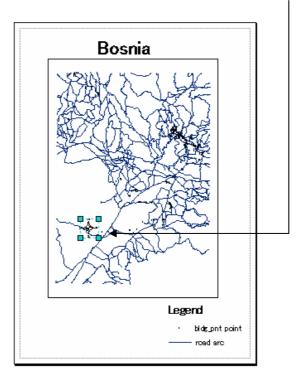
9) Click Insert and click North Arrow. The North Arrow Selector appears.





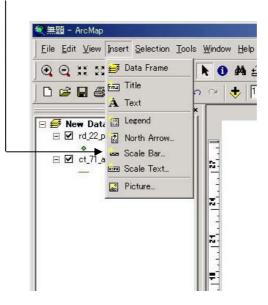
10) Click one of the North arrows and click OK.

11) As the North arrow appears, drag the North Arrow to move it to the empty space. You can resize it by dragging the blue selection handles.

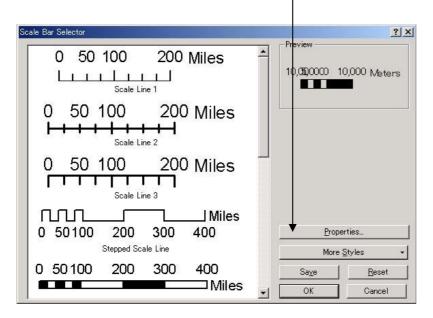


Add a Scale Bar:

12) Click Insert and click Scale Bar. The Scale Bar Selector appears.



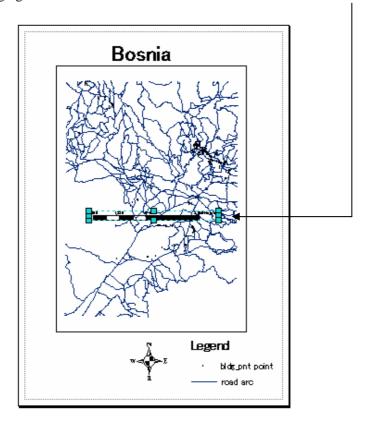
13) Click one of the scale bars and click Properties.



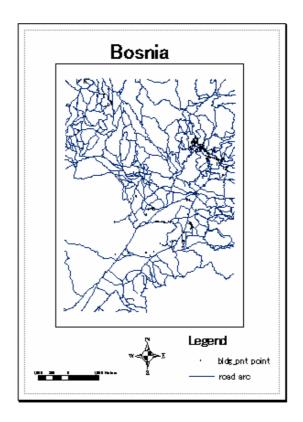
14) As the Alternating Scale Bar appears, fill in the values like the following figure for this example.

le and Units Numbers and Scale		1
Division value:	10	
Number of divisions:	2	
Number of subdivisions:	4	
Show one division before When resizing	e zero	
Preserve division and divisio	ons 💌	
Jnits Division Units:		
Kilometers		
abel Position:		
after labels	_	
abel: Kilometers	Symbol	
Gapt 3 pt 🚔		

15) As the scale bar appears, drag the Scale Bar to move it to the empty space. You can resize it by dragging the blue selection handles.

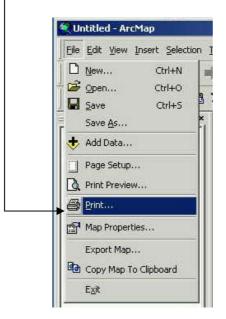


Now you are ready for printing your map like the below figure. Follow the next instructions to print your map.



How to Print a Map:

16) Click File and click Print.



17) As the Print dialog box appears, check the default printer and click OK.

rinter	
lame: EPSON MJ-8000C	Setup
tatus: Ready	
ype: EPSON MJ-8000C	
Where: MJ8000C	
Comment:	Fint to file
C All C Pages from 1 to 1 Scale map to fit printer paper Proceed with printing, some clipping	Vindows Printer Properties Copies
may.occur	Number of copies: 1

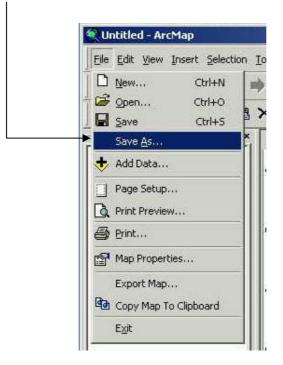
Note: See Pages 22 and 23 about the Page Setup.

3.4 Saving a Map

You can save a map on ArcMap. You save a map as a document and store it on your hard disk. Arc Map automatically appends a file extension (.mxd) to your map document name. The data displayed on a map is not saved with it. Map layers reference the data sources in your GIS database.

After finishing your job on ArcMap, leave the map on the Data View or on the Layout View and follow the next instructions.

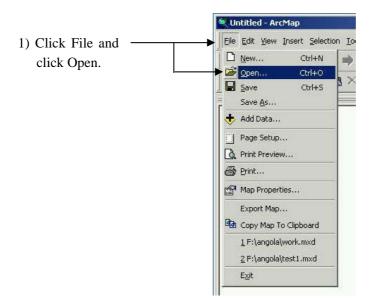
1) Click File and click Save As.



2) Navigate to a folder you want to save a .mxd file.

My Picture	5		
File name:	Untitled		Save
Save as type:	ArcMap Documents (*.mxd)	+	Cance

Note: When you want to open the saved map, only double-click the .mxd file on Microsoft Explorer. Or you can open the map by clicking File/Open and selecting the .mxd file on ArcMap.



2) Navigate to your .mxd file and select the .mxd file.

pen			?
Look in: 🔂	angola	· + E	*
Angola-PI			
imanual Work.mxd	×		
-île name:			Open
File name: Files of type:	ArcMap Documents (*.mxd)		Open Cancel

3) Click Open. Then the saved map is opened on ArcMap.