Pale Edit View Tools Window Help Open Ctrl+O Reload Close	11 12 (?) @ + B 11001 -	
Open Map from Internet	Print	2
Page Setup Page Setup Document Properties Export Map	Plaster Name: Adobe PDF Status: Ready Type: Adobe PDF Converter Where: My Documents Comment:	Properties
1 Dr.J/AYP_PEQMP_GISD0.pm/ 2 Dr.J/SKP_PEQMP_GISD6.pm/ 3 Dr.J/SKP_PEQMP_GISD6.pm/ 4 FrJ/SKP_PEQMP_GISD6.pm/ Exit At+F4	Pterl lange ③ Al ○ Pagers interlight of [] to []	Coner Number of copies 1 2 12 12 12 Control

While printing map in "Data View" window, it will print data display in "Data View" only. Similarly, while printing map in "Layout View" window, it will print full map.

5.3 GIS Database Application Manual for Samut Songkhram Province (for GIS Database Manager)

In the technological world, a digital system is becoming as the supporting tool for decision making system and mapping. At present, the Geographic Information System (GIS) is an effective tool for production, rectification, improvement, gathering, exploration, analysis, and demonstration. It has been applied to various projects because its convenience and fast-and-easy to develop or manage complicated spatial data. The natural resources and environmental problems, in particular, can identify the impact to quality of life both direct and indirect. Consequently, it is properly to use a GIS system for an effective environmental quality management in provincial level.

a. Introduction to ArcGIS

ArcGIS, one of GIS programs developed by ESRI, is high capability to demonstrate, analyze, and manage geographic information. It can apply to a variety of field works and manage a large file with attractive Graphic User Interface (GUI).

ArcGIS 9.2 is latest version which operating under Windows (98/NT2000/XP2002) or higher. ArcGIS's components are ArcView, ArcEditor, and ArcInfo. In case of using any software operation is depended on propose and requirement of each organization. ArcView can view any data running by ArcSDE. In contrast, ArcEditer and ArcInfo can rectify data running under ArcSDE which is Client/Server software for spatial data management in term of DBMS (Database Management Systems). The above three components of ArcGIS are comprises of;

ArcView has ArcCatalog, ArcMap, and ArcToolbox programs which can explore, manage, analyze, and rectify data and create a map.

ArcEditor has all ArcView's functions. It also has additional tool for rectify data as Coverage and Geodatabase.

ArcInfo has all ArcEditor's functions. It also has Geoprocessing and ArcWorkstation (ARC, ArcEdit, ArcPlot, INFO, ARC Macro Language or AML) as an additional tool.

Details of each component are described below.

a.1 ArcView

ArcView has a capability of Data Visualization, Query, Analysis, and Map Creation under Windows operation with a tool for Exploring, Selecting, Displaying, Editing, Analyzing, Symbolizing, Classifying Data, and Metadata.

ArcView's structure is composed of ArcCatalog, ArcMap, and ArcToolbox. It can view data directly to a file or network and web-enabled. ArcView was created from COM (Component Object Model) technology; therefore, the customization and Macros program (Visual Basic for Applications (VBA) or Visual Basic, C++, and Delphi extensions can be applied. Main capabilities of ArcView are;

- Explore, Display, and Query spatial data
- Access and edit Shapefile and Personal geodatabase
- Spatial analysis with Geoprocessing
- Mapping with various tools and Wizards program
- 2D and 3D reporting and graph
- Co-ordinates system projection
- Data annotation
- Map display with the Internet system
- Import/ Export compatible with various data file types

Furthermore, it also have Extensions Program to increase capability of ArcView comprises of Spatial Analyst, ArcView 3D Analyst, ArcPress, Geostatistical Analyst, and StreetMap for instance.

a.2 ArcEditor

ArcEditor is a medium size of ArcGIS composed of all ArcView's function components. It is designed for Enterprise GIS Organization as their name with a capability for data edition in Enterprise GIS. For example, under the core system of ArcInfo and ArcSDE with a Relational Database Management System (RDBMS), one of user can editing data by use ArcEditor and another user can viewing or searching data by use ArcView in the same time.

ArcEditor is comprises of all ArcView's function components and additional component of data editing tools for Shapefile, Coverage, Personal geodatabase, and Enterprise geodatabase.

a.3 ArcInfo

ArcInfo is the most capability of ArcGIS with all function components of Arcview and ArcEditor. It also has completed ArcToolbox and ArcInfo Workstation (ARC, ArcEdit, ArcPlot, AML and all extensions). Hence, ArcInfo is a completed GIS program with various functions such as data creating, editing, querying, mapping, and analyzing.

ArcInfo is usable for data analysis function completely and comply with other application program. Because ArcInfo was created from COM (Component Object Model) technology, it

can distribute Objects by define their principal and behavior. The main capabilities of ArcInfo are;

- Graphical User Interface (GUI) in Windows system
- Client/Server architecture
- High efficiency data processing tools such as creating, managing, querying, overlaying, analyzing, and display.
- Ability to edit one database by various users
- Other high effectiveness tools such as auto change co-ordinates system (On-the-fly projection), data type changing, and data import or export.

a.4 ArcMap, ArcCatalog, and ArcToolbox

All ArcGIS (ArcView, ArcEditor, and ArcInfo) are have 3 mains programs separated by function as ArcCatalog (data management), ArcMap (mapping management), and ArcToolbox (analysis management). Those 3 programs are working simultaneously.

ArcCatalog is usable for source selection, data creation, and metadata.

ArcMap is usable for display, query, edit, and create map document.

ArcToolbox is useable for spatial data analysis, database analysis, and convert and import-export data.

a.5 ArcMap

ArcMap is usable for display, edit spatial data, and create map, graph, and report. ArcMap can provide data viewing as "appear on the map like what seeing on screen" and able to drag-and-drop data from ArcCatalog by open map documents in ArcMap then drag data from ArcCatalog to display area of ArcMap directly.

GIS database that show on the map in ArcMap is called as Layer. Each layer separated each data type and source with Table of Content (TOC) display of ArcMap. The TOC default position at left side but it is able to move to other position.

Layer order in TOC means data showing order in map section. The top order will show on top, thus the background should be located lowest layer in order to not cover an important data.

🔍 Untitled - ArcMap - ArcInf	0	_ 🗆 🔀
Eile Edit View Insert Selection	<u>T</u> ools <u>W</u> indow <u>H</u> elp	
Eayers	X	▲ ● ● ● ③ ③ Ⅱ ∷ ♡ ●
Display Source Selection	3 1 2 1 4 991.304 -1	 ✓ ✓

Figure 98 : ArcMap Program

While map is showing, user can find other interested data by click at their Feature then access to ArcMap database. There is easy to design the map annotation of electronics document and publishing. For some data which appropriate to present as graph or report, ArcMap is also manageable.

a.6 ArcCatalog

ArcCatalog is application program for database connection. The main effectiveness is an applicable to browse and organize data source, spread map document or data. Graphic interface of ArcCatalog is look like the Windows Explorer, but different on that it can browse data, map, and metadata.

The data on disk drive or network system can access by click the button of "Connect to Folder" and select the pathway of data. ArcCatalog is able to connect with various database includes SDE and OLE DB databases.

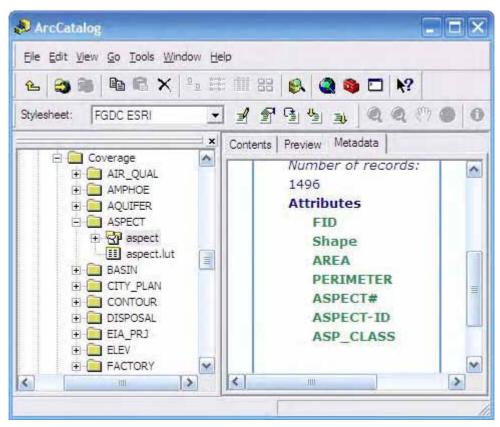


Figure 99 : ArcCatalog Program

The selected group of data is called "Catalog". The "Catalog Tree" is located on left side, while the right side is "Catalog Contents". The right side of ArcCatalog program is composed of 3 components; Content (data lists), Preview (figure or table), and Metadata.

a.7 ArcToolbox

ArcToolbox is a tool for advance analysis GIS data such as co-ordinates system conversion or data type conversion (for example, convert Shapefile to Geodatabase). User can import data with "drag-and-drop" working from ArcCatalog to ArcToolbox.

ArcToolbox D 3D Analyst Tools D 3D Analysis Tools	Feature Class To Shapefile (multiple) Input Features	
 Cartography Tools Conversion Tools From Raster Metadata To CAD To Coverage To dBASE To Geodatabase To Raster To Shapefile Feature Class Data Interoperability Tools 	D:\GisJICA\GisData\Co D:\GisJICA\GisData\Co	
Data Management Too Data Comparison Favorites Index Search	Output Folder D:\GisJICA\GisData	

Figure 100 : Arc Toolbox Program

In addition, user can create own tool as ".exe" or ".dll" file types.

There are more than 140 tools of ArcToolbox in ArcInfo such as Conversion Tools, Map Analysis Tools (Union, Clip, Split, Buffer etc.).

ArcToolbox in ArcInfo also has linkage to ArcInfo Workstation by Open Development Environment (ODE) which allow ArcInfo user to use AML and DLL.

b. Data Handling

b.1 Data Composition and Import

Layer can create by use ArcCatalog program. Normally, when installed ArcGIS program, it will located on Start/All Progams/ArcGIS/ArcCatalog

ArcCatalog - ArcInfo - D:\GisJICA\GisS		 File Geodatabase Personal Geodatabase
⊾ 🎝 🗃 🖻 🛱 🗙 ≞ ☷ 🕅 8		 Layer Group Layer
Coverage	Name Name Name Name Name Copy Ctrl+C Copy Ctrl+C Paste Ctrl+V N Delete Rename F2 Rename F2 Refresh	Address Locator
HOSPITAL HYDRO_STA HYDRO_STA HYDRO_STA HOSAT_1988 HOSAT_1997 HANDSAT_2007 HONICIPA	New Search Properties	XML Document

Figure 101 : Arc Catalog Program

Starting by right click at the "Directory" which need to keep layer and select "New" to create layer such as Shapefile, Coverage, Personal Geodatabase etc. Then the box will appear to fill in the name, type (such as Point, Polyline ,and Polygon ,(and spatial reference edition) click "Edit" button).

Create New Shape	nie	
Name:	New_Shapefile	
Feature Type:	Point	
- Spatial Reference Description: Unknown Coordina	Point Polyline Polygon MultiPoint	k
Show Details		Edit
Show Details	contain M values. Used t contain Z values. Used ti	o store route data.

Figure 102 : Layer Creation

Right click and select Properties to create Field as Attribute of layer by type the name in "Field Name" and select data type in "Data Type" (display as Dropdown Menu).

FID Shape d	Object ID Geometry	
d -		
	Long Integer	
		~
ield Properties	Imp	ort
		53350.6-1-c

Figure 103 : Define Field to Layer

This layer will use for graphic data composition in section of spatial data editing and attribute data editing of ArcMap.

Data import by click	"Add Data" button at File	e > 🔹 Add Data in Main Menu
	<u>File E</u> dit <u>V</u> iew <u>I</u> nsert <u>S</u> election	<u>T</u> ools <u>W</u> indow <u>H</u> elp
	Figure 104 : Main	1 Menu
Otherwise click drag data from	at Data button on standard ArcCatalog to ArcMap.	d menu or open ArcCatalog Program and
🗅 🚅 🖶 🎒 🐰 🗉	🖻 🛍 🗙 🗠 🗠 🔶 📃	🚽 🛃 🔌 🕲 🕅

Figure 105 : Standard Menu

b.2 Data Editing

Data can be edited with ArcMap, a part of ArcGIS program, by Graphic Data Editing and Attribute Data Editing

b.2.1. Graphic Data Editing

It is necessary to open "Editor Toolbar" in ArcMap before start to data editing. If Editor Tool is not show, when right click at Menu Bars or Toolbars it will be appear hidden function and click Editor.

Q Untitled - ArcMap - ArcInfo	Main Menu
Eile Edit View Insert Selection Iools Window Help	3D Analyst Advanced Editing
Eavers X	Advanced Earling Animation Annotation ArcPad ArcScan COGO Data Frame Tools Dimensioning Distributed Geodatabase Draw Editor Effects GPS Geodatabase History Geometric Network Editing Georeferencing
Display Source Selection	Geostatistical Analyst 56 Graphics

Figure 106 : Open Editor

If currently use Standard Tool, the Editing is button will appear on toolbar and click to add Editor Tool. The position of Editor Tool can move as user defined.

Also select the task of Start Editing ,Save Editing, or Stop Editing on Editor Toolbar.

Editor			×
Editor -	Task: Create New Feature	▼ Target: PLAN	🔽 🔀 🗇 🖽 🖂

Figure 107 : Editor Toolbar

In case of Coverage data type, it has to convert by right click and select "Export" in ArcCatalog program to Shapefile or Personal Geodatabase before editing.

Data editing in ArcMap will begin on Start editing. The editing data will temporary store in Edit session until finish or save, then record editing data in original file.

The history of editing data in Edit session will show on map display but still not record in original file until save editing data.

A variety of button such as Dropdown Menu on Editor Toolbar is gray, means "Disabled", because it is still not order to edit. Then click "Start Editing" from Editor Toolbar.

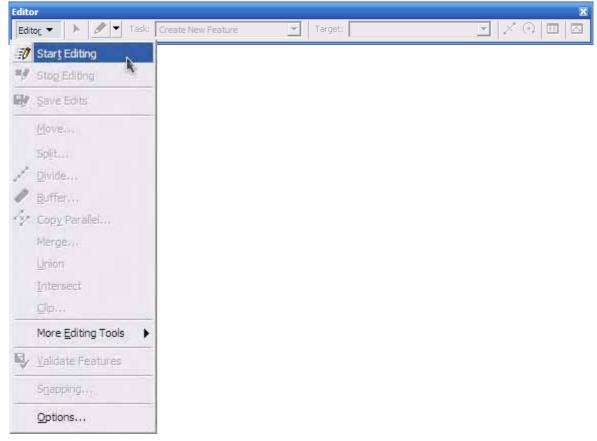


Figure 108 : Start Editing

Object movement; click "Start Editing" buttons will Enabled, the "Edit" is main tool for select and move object. Click at Edit (this tool may activated (on object, it will be Highlighted.

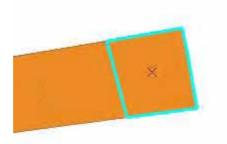


Figure 109 : Object Selection

When point the mouse at object, pointer will be change as 4 directions arrow symbol means ability to move object position. It should be noted that buttons on Editor Toolbar are enabled.

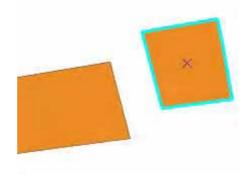


Figure 110 : Object Movement

Object Rotation; click Rotate 🖸 button and move object around Selection Anchor. The Anchor moving will be effect to object rotation.

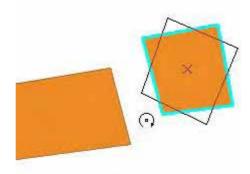


Figure 111 : Object Rotation

It can specify the degree of rotation; positive degree means rotate clockwise and negative degree means anticlockwise.

Sketch sis an outline drawing tool. The sketch is a group of all spots composed to be object)Vertices) and lines) Edge(composed to be object) Segments). The movement of one spot within object called Vertex, Edit tool is usable for move this Vertex position. When click

at Edit **b** and double click at object, their Sketch will be appeared with Vertices and Segments. And when point mouse above the Vertex and drag Vertex in the new position, the figure of Sketch will be changed.

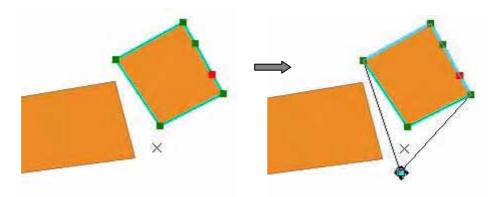


Figure 112 : Vertex Movement

Delete Vertex; use Context menu help to edit object. Right click at Sketch by point mouse above the left below Vertex and right click to show Sketch then select Delete Vertex

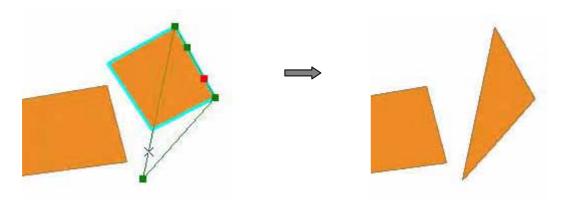


Figure 113 : Delete Vertex

Insert Vertex; as same as delete vertices, add the vertices by point mouse above the Sketch line and right click to open Context menu then select Insert Vertex

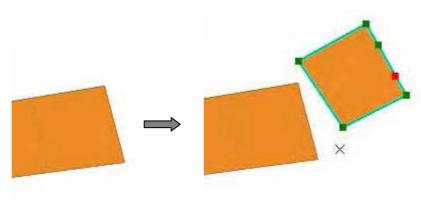


Figure 114 : Insert Vertex

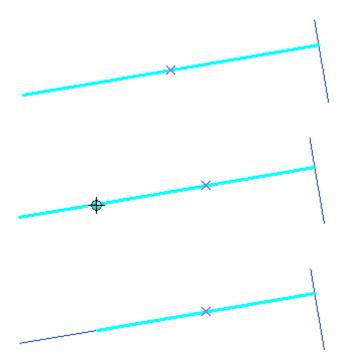


Figure 115 : Split

Delete object; select object or data from Table of Content and click Delete X at Standard toolbar or click Delete at Keyboard.

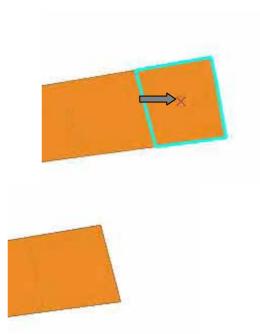


Figure 116 : Delete Object

The editing session as described above is show a variety of tools useful for editing, besides user can use various tool on Standard toolbar such as Cut, Copy, and Paste object between layers and Delete object. User can also use Undo and Redo command, for instance, use Undo to reuse latest working.

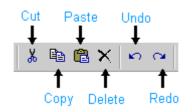


Figure 117 : Standard Toolbar

Save change and leave ArcMap program; Click Stop Editing from Editor Menu and click Yes when dialog box appear to ask save change or not. Or select File from Main Menu and click Exit and click No when dialog box appear to ask save document or not.

b.2.2. Attribute Data Editing

If user wants to edit an attribute data, use editing option by perform Start Editing and view attributes by click attributes button then the attributes window will be appeared.



Figure 118 : Attribute Button

The attributes window is divided into 2 parts; 1) Data view located on left side is object lists and 1) Right side is details of selected object from left side.

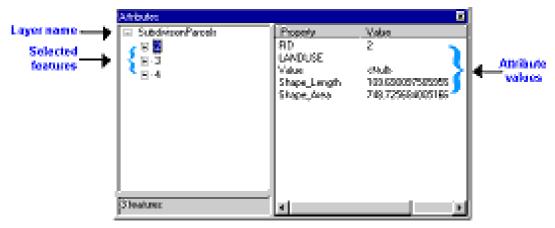


Figure 119 : Attributes Window

If select object more than one layer, each layer composed of selected object in list of data viewing. User can access interested object by click (+)symbol to expand the list.

User can edit attribute data by click Field of each data appeared in right side and edit in Value to change the new one.

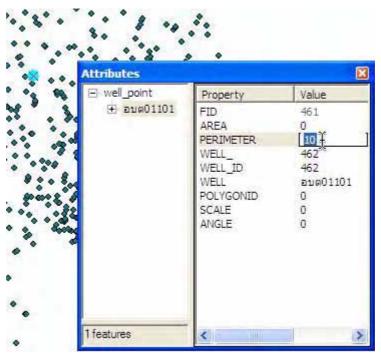


Figure 120 : Data Editing in Attributes Window

If user wants to change value of all objects, it can do by click at the name of layer and type a new value in data field as same. Then below of all selected data field will change to the new one.

Figure 121 : Data Editing in Layer

Value in all PERIMETER field of WELL_POINT layer will change to be 15.

User can copy or cut to each value or all value of attribute data and paste as each object or all selected objects.

Additionally, for calculated option in ArcMap, user can edit attribute data of an object by create a simple calculation of define condition in Field Calculator. The Field Calculator will activate to selected object, if no one it will activate to all object.

To use Field Calculator, start with editing session first and open the table of each layer by right click at their name in Table of Contents and select "Open Attribute Table". When the table appeared, right click at the heading of data which want to edit, select Calculate Values from menu to show Field Calculator Window.

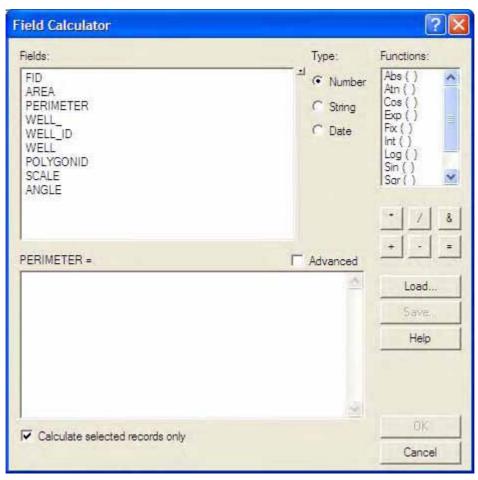


Figure 122 : Field Calculator Windows

To define a condition in Field Calculator, it has a field, function, and operation options support to user. User can click in area of field, the list of field will be appeared in Expression box for define condition. Otherwise user can type a condition directly as below example; the PERIMETER field is edited to be sum with 10 to each perimeter.

Using Field Calculator is useful for advance calculation and can be edit only selected data or edit all data in table.

When user defined a condition in Field Calculator already and click OK, the value in field will change as defined condition or calculation.

Fields:	Type:	Functions:
FID AREA PERIMETER WELL_ WELL_ID WELL POLYGONID SCALE ANGLE	의 ⓒ Number ⓒ String ⓒ Date	Abs() Atn() Cos() Exp() Fix() Int() Log() Sin() Sar()
PERIMETER =	T Advanced	+ - =
[PERIMETER]+10	4	Load
		Save
		Help
	-	ОК
Calculate selected records only		Cancel

Figure 123 : Field Calculator Windows

c. Map Printing

The provided file is comprise of Layout or map printing format, just move the map to the wanted position, specify scale, edit heading and other then able to print out.

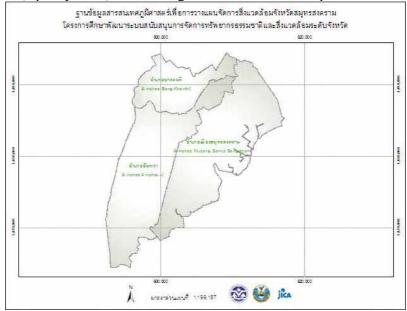


Figure 124 : Mode Layout View

Anyway, it has to change as Mode Layout View (usually working in Map Display) by click Layout View at the left below window or select View > Layout View on Main Menu

<u>F</u> ile	<u>E</u> dit	<u>V</u> ie	w <u>I</u> nsert	t <u>S</u> election	<u>T</u> ools	<u>W</u> indow	<u>H</u> elp			
		۲	Data View							
			Layout Vie	w.	A					
			Zoom Data	9	•				3	
			Zoom Layo	out					200	A and a second
			Bookmarks	ş	•				1	Layout View
			Toolbars							
		~	<u>S</u> tatus Bar	e						
			Overflow .	Annotation						
		ш	Scrollbars							
		包含	Rulers							
		¥	Guides							
			Gri <u>d</u>							
			Data Fram	e Properties	2					
		Consect States		0.000000						

Figure 125 : Layout View Display

To create Map Layout, it is necessary to define size and printing property first; because ArcGIS will change Layout as paper size (default paper size is set as A4). If user wants to print other sizes, they should specify paper size by right click at outer Layout frame.

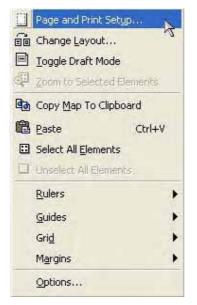


Figure 126 : Printing Preference

If user wants to change other details, they can double click to edit default map composition or add new element by click Insert at Main Menu.

c.1 Adding the Direction) North Arrow)

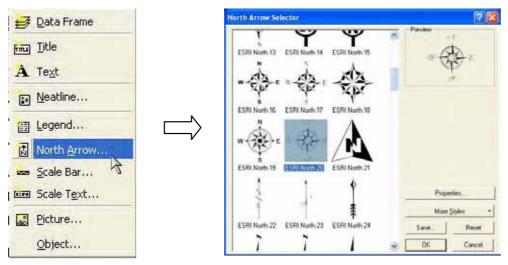


Figure 127 : North Arrow Addition

c.2 Adding the Scale) Scale bar & Scale Unit)

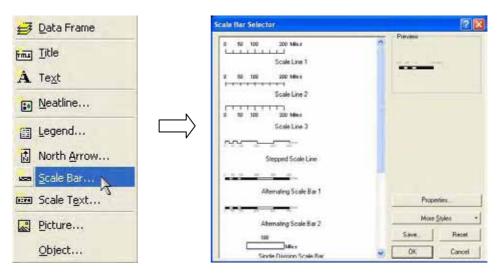


Figure 128 : Scale Addition

Other than to select scale format to display, user has to specify map unit too. When completed Insert Scale Bar, change the unit of measurement by right click at Scale bar and select Properties. Then the alternating Scale bar properties window will be appeared, select "Scale and Unit Tab" to change unit.

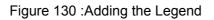
Meters	1	
Label F	osition:	
after b	ar	<u> </u>
Label:	Meters	Symbol
Gap:	2.49813	

Figure 129 : Change the Unit of Measurement

c.3 Adding the Legend

As figure below, the name of layer will be appeared for user to define symbol of layer. The left frame is all names of layer and the right side is layer need to added symbol.

🧾 Data Frame	Legend Wizard
Fina Title	Choose which layers you want to include in your legend Map Layers Legend Items
A Text	AnimaScatter TanimaScatter
🔝 <u>N</u> eatline	amphoe amphoe .
Egend	> <u>*1</u>
North Arrow	<u></u>
🛥 Scale Bar	Set the number of columns in your legend
🚥 Scale T <u>e</u> xt	
Picture	Previou
Object	Each Next Cancel



To edit symbol, Legend has to convert as Graphic by right click at Legend Frame select Convert To Graphic and right click Ungroup again. Then Legend will be separated to single Graphic which can rename, delete, change color, and regroup.

c.4 Adding Map Title

🛃 Data Fi	rame	Properties	2 🔀
File	X	Text Size and Poston	
A Text		12033055	P
🔝 <u>N</u> eatlin	e		
		\rightarrow	
North &	Arrow	Fort CordiaUPC 28.00	
🛥 <u>S</u> cale B	ar	Angle 0.00	Character Spacing: 0.00 +
📼 Scale T	<u>e</u> xt		Leading 0.00 ±
Picture		About Formatting Text	Change Symbol
<u>O</u> bject		0	Cancel Arriv

Figure 131 : Adding Map Title

After completed map editing, click Menu File and select Print Preview to verify before printing that map is outside paper margin or not and select Print.

	<u>N</u> ew	Ctrl+N
Ì	Open	Ctrl+O
	Save	Ctrl+5
	Save <u>A</u> s	
÷	Add Da <u>t</u> a	
	Add Data from Internet	
	Page and Print Setyp	
a	Print Preview	
6	Brint	
P	Map Properties	
	Import from ArcView project	¥.
	Export Map	

Figure 132 : Map Printing

In case of color map printing is not available or want to use as annotation in other programs such as Microsoft Word, PowerPoint, or HTML format, ArcGIS is compatible to convert map file in other file format as follows;

- PDF (Portable Document Format) is an Electronic Paper which can display on web in document format both text and picture.
- SVG (Scaleable Vector Graphic) support to Graphicpresentation which can reduce or expand or move picture without lost details. It can present through WebB rrowseandin SVG Vi-Plug ewer.
- Picture file group such as
 - BMP (Windows Bitmap)
 - JPEG (Joint Photographic Experts Group)
 - TIFF (Tag Image File Format)
 - EMF (Enhanced Windows Metafiles)
 - EPS (Encapsulated Postscript)

c.5 Export Map by click File Menu and select Export Map

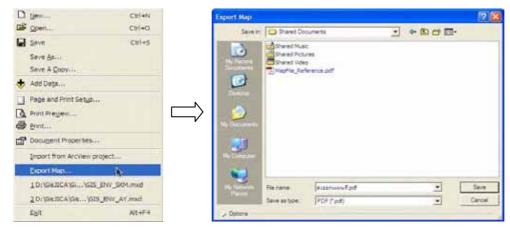


Figure 133 : Export Map

d. Geographic Information Database Program for Environmental Quality Management

The Geographical Information Database for Environmental Quality Management is a development of application program for support to GIS usability and convenient access to database. User who does not have deeply knowledge can use this database with a Graphic User Interface (GUI) that helpful to decrease complexion of procedures and confusing of data access.

This program was developed by Visual Basic for Applications (VBA) based on ArcMap 9.2 in order to benefit of specific work for environmental quality management of Samut Songkhram Province.

Geographic Information System for Environmental Quality Management Installation

Install program by copy folder in CD-ROM to disk drive as required. The folder is GisSamutsongkhram as details described below.

Folder Name	Description
GisSamutsongkhram	Folder of Samut Songkhram Province
Configdata	Folder of configuration program storage
GisData	Folder of data storage
Coverage	Folder of coverage data storage
Satellite	Folder of satellite photo storage
🖵 📁 Торо	Folder of topographic map storage
GIS_ENV_SKM.mxd	Program file (ArcMap Document)

Table 22 : Description of Data Storage Folder

d.1 Open Project File

After completed program installation, open ArcMap program which generally located in Start/All Progams/ArcGIS/ArcMap

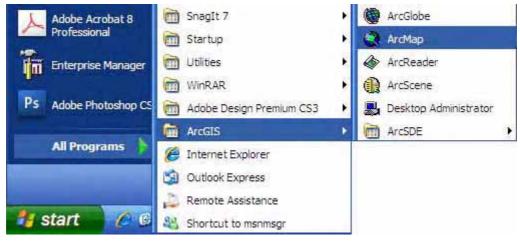


Figure 134 : ArcMap Program

Program file can open by two ways, the first way open with ArcMap program and select project file (An Existing Map) and select file GIS_ENV_SKM.mxd

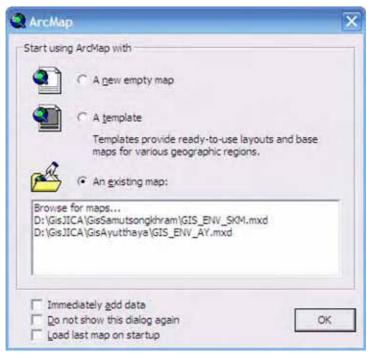


Figure 135 : Open Project File

The second way is select menu File > Open at Main Menu and select file GIS_ENV _SKM.mxd from folder (Browse for maps)



Otherwise double-click file GIS_ENV_SKM.mxd which copy to disk drive.

When open project file, welcome window will be appeared.



Figure 136 : Program Welcome Window

Then, click Login to the page of Geographic Information Database for Environmental Quality Management of Samut Songkhram Province, the Study and Development of Provincial Natural and Environmental Resources Management System Project.

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	In CALL Concernment (In Concernment of Concernme	Tartanii 19 Tarina 19 Tarina 19 Tarina	Summer Rame Rame Summer Rame Rame Summer Rame Rame Summer Rame Rame Summer Rame Rame Summer Rame	•[
way Sere				-

Figure 137 : Geographic Information Database Program

If user edits the default position of GUI and save change in original file, the position of GUI will change as user edited while open it next time.

The GUI of Geographic Information Database for Environmental Quality Management Planning of Samut Songkhram Province is divided as usability as follows;

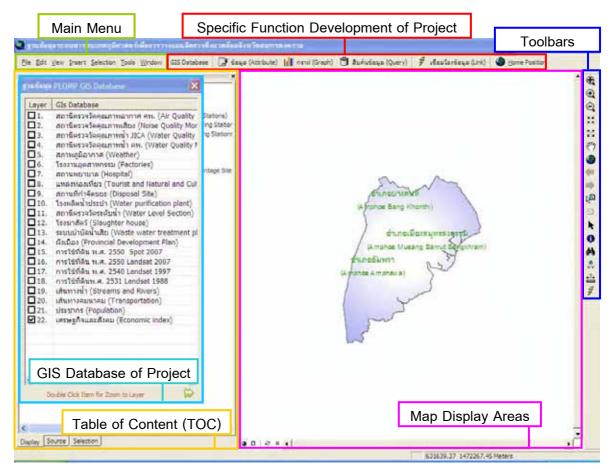


Figure 138 : Graphic User Interface

d.2 Main Menu

This part is defined as default of ArcGIS program and auto run when ArcGIS program is opened always. This main menu is cannot be removed.

<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	<u>I</u> nsert	Selection	<u>T</u> ools	<u>W</u> indow
--------------	--------------	--------------	----------------	-----------	---------------	----------------

Figure 139 : Main Menu

The important commands orders are 1) <u>File</u> has orders to Add Data, Save, Print etc. 2) <u>Edit</u> has orders to Cut, Copy, Paste etc. 3) <u>View</u> has orders to Zoom, Toolbars etc. 4) <u>Insert</u> has orders to input map compositions 5) <u>Selection</u> has orders to Zoom to Selection, Clear Selected Features etc. 6) <u>T</u>ools has orders to Editor, Graph, Report etc. and 7) <u>W</u>indow has orders to Magnifier, Table Of Content (TOC) etc.

d.3 Specific Function Development of Project

This function is specific develop to the Geographic Information Database for Environmental Quality Management Planning of Samut Songkhram Province Project only for convenient to user in order to database access. It is help to reduce complex procedures and confuse data access with function components of GIS Database, Attribute, Graph, Query, Link, and Home Position **"Functions Created within Program"**.

GIS Database 🛛 🖉 ข้อมูล (Attribute) 📊 กราฟ (Graph) 🕤 ลิม	ล้นข้อมูล (Query) 🕴 เชื่อมโยงข้อมูล (Link) 🧔 <u>H</u> ome Position

Figure 140 : Specific Function Development of Project

d.4 Toolbars

A group of tools prepared by ArcGIS for manage to graphic data. The tool sorts from the top to bottom are described as follows;

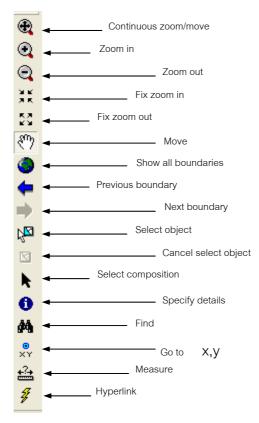


Figure 141 : Toolbars

d.5 GIS Database of Project

The database lists will appear when click GIS Database button on the bar of specific function development of project. It has two databases, which user can select one by one, such as PEQMP GIS Database and DEQP GIS Database. For more details, please see sub-section "GIS Database Windows" in section "Functions Created within Program".

Layer	GIs Database
11.	สถานีตรวจวัดคุณภาพอากาศ คพ. (Air Quality
2.	สถานีตรวจวัดคุณภาพเสียง (Noise Quality Moi
Пз.	สถานีตรวจวัดคุณภาพน้ำ JICA (Water Quality
4.	สถานีตรวจวัดคุณภาพน้ำ คพ. (Water Quality I
5 .	สภาพภูมิอากาศ (Weather)
6.	โรงงานอุตสาหกรรม (Factories)
7.	สถานพยาบาล (Hospital)
8.	แหล่งท่องเที่ยว (Tourist and Natural and Cul
□9,	สถานที่กำจัดขยะ (Disposal Site)
10.	โรงผลิดน้ำประปา (Water purification plant)
1 11.	สถานีตรวจวัดระดับน้ำ (Water Level Section)
112.	โรงฆ่าสัตว์ (Slaughter house)
13.	ระบบบ่าบัดน้ำเสีย (Waste water treatment p
14.	ผังเมือง (Provincial Development Plan)
15.	การใช้ที่ดิน พ.ศ. 2550 Spot 2007
16.	การใช้ที่ดิน พ.ศ. 2550 Landsat 2007
1 17.	การใช้ที่ดิน พ.ศ. 2540 Landsat 1997
18.	การใช้ที่ดินพ.ศ. 2531 Landsat 1988
1 19.	เส้นทางน้ำ (Streams and Rivers)
20.	เส้นทางคมนาคม (Transportation)
21.	ประชากร (Population)
22.	เศรษฐกิจและสังคม (Economic index)
<	

Figure 142 : GIS Database of Project

d.6 Table of Content (TOC)

A list of all data in program which can open/close layer as requires from Check Box in front of the name of layer. Besides, it is able to click to the + symbol at the front to show hidden details or click to the - symbol to hide details.

In addition, it is able to select view format as Display, Source, or Selection by click the bar in the left of below TOC window.

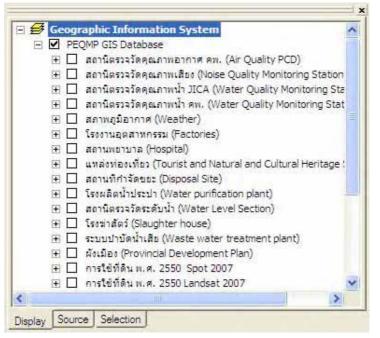


Figure 143 : Table of Content

d.7 Map Display Areas

The area to show Graphic Data and Attribute Data.

The order at left of below window will allow user to select Data View (show data), Layout View (show map printing layout), Refresh (may display adjustment), and Pause Drawing.

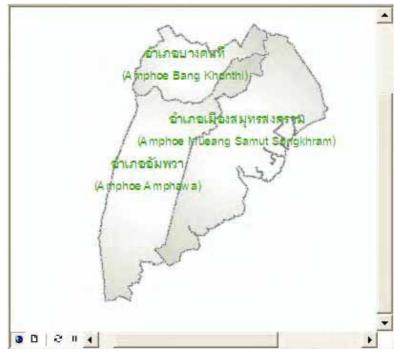


Figure 144 : Map Display Areas

e. Specific Function Development of Project

This program has divided into 6 parts; database window, attribute, graph, query, link, and home position. The functions of each part are the following expressed.

e.1 GIS Database Window

The project database is consists of two parts; PEQMP GIS Database and DEQP GIS Database.

To open-close layer in window by click to mark a check symbol in front of the layer (Check Box)

Besides, when double click to checking layer in window, program will expand to display in those layer field.

Laye	สถานีตรวจวัดคุณภาพอากาศ คพ. (Air Qualit
2.	
	สถานีตรวจวัดคุณภาพเสียง (Noise Quality M
3.	สถานีตรวจวัดคุณภาพน้ำ JICA (Water Quali
4 .	สถานีตรวจวัดคุณภาพน้ำ คพ. (Water Qualit
D 5.	สภาพภูมิอากาศ (Weather)
G 6.	โรงงานอุตสาหกรรม (Factories)
07.	สถานพยาบาล (Hospital)
08.	แหล่งท่องเที่ยว (Tourist and Natural and C
09.	สถานที่กำจัดขยะ (Disposal Site)
110	โรงผลิตน้ำประปา (Water purification plant
11	สถานีตรวจวัดระดับน้ำ (Water Level Section
112	โรงฆ่าสัตว์ (Slaughter house)
13	
14	ผังเมือง (Provincial Development Plan)
115	การใช้ที่ดิน พ.ศ. 2550 Spot 2007
16	การใช้ที่ดิน พ.ศ. 2550 Landsat 2007
17	
18	การใช้ที่ดินพ.ศ. 2531 Landsat 1988
19	The second s
20	
21	
	เศรษฐกิจและสังคม (Economic index)

Figure 145 : GIS Database Windows

e.2 Attribute

Attribute is a tool for show details of selected object corresponding with database window.

When click attribute button, check box in front of layer, and select object on the map, program will show their attribute.

However, the attribute display format will different as program set up to access data in each layer.

แห่งมอ	PEOMP GIS Database	ลารให้ประโทพเที	ni LANDSAT 2007	/Land Lise + LA	NDSAT 2007)		1
Layer	GIs Database		น์ที่ดิน LANDSAT 200				
	สถานีตรวจวัดคณภาพอากาศ คพ.	LU CODE	NAME E	NAME T	AREA 2007	PER 2007	~
2.	สถานีตรวจวัดคณภาพเสียง (Noise	A0000	Agricultural	พื้นที่เกษตรก	223.98	43,63	_
3.	สถานีตรวจวัดคณภาพน้ำ JICA (W	A0900	Aquacultural	สถานที่เพาะเ	100.6	19.6	
4.	สถานีตรวจวัดคุณภาพน้ำ คพ. (W	F0106	Mangrove F	ป่าชายเลน	26.97	5.25	
35.	สภาพภมิอากาศ (Weather)	M0200	Wetland	พื้นที่ล่ม	6.2	1.21	
16.	โรงงานอุตสาหกรรม (Factories)	M0401	Salt flats	นาเกลือ	19.45	3.79	
7.	สถานพยาบาล (Hospital)	M0402	Beaches, Mud	หาดทราย, ห	0	0	
38.	แหล่งท่องเที่ยว (Tourist and Na	U0000	Urban and b	พื้นที่ชมชนแ	22.14	4.31	
39.	สถานที่กำจัดขยะ (Disposal Site)	11/0000	Mistor hadu	A.A.I.	17 64	7 46	~
111.	โรงผลิตน้ำประปา (Water purific สถานีตรวจวัดระดับน้ำ (Water Le	🔳 वंश्व	อกข้อมูล (Export to	Excel)	แสดงกราฟ (Sl	how Graph)	
10. 11. 12. 13.			อกข้อมูล (Export to เงการใช้ที่ดิน (Chang		<mark>แสดงกราฟ</mark> (Sl	how Graph)	
11. 12. 13. 14. 15.	สถานีตรวจวัดระดับน้ำ (Water Le โรงฆ่าสัตว์ (Slaughter house) ระบบบำบัดน้ำเสีย (Waste water ผังเมือง (Provincial Developmer การใช้ที่ดิน พ.ศ. 2550 Spot 20				แสดงกราฟ (Sl	PER_1988	A
111. 12. 13. 14. 15. 16.	สถานีตรวจวัดระดับน้ำ (Water Le โรงฆ่าสัตว์ (Slaughter house) ระบบบำบัดน้ำเสีย (Waste water ผังเมือง (Provincial Developmer การใช้ที่ดิน พ.ศ. 2550 Spot 20 การใช้ที่ดิน พ.ศ. 2550 Landsat 1	การเปลี่ยนแปล	งการใช้ที่ดิน (Chang	ge Of Landuse) -			
111. 12. 13. 14. 15. 16. 17.	สถานีตรวจวัดระดับน้ำ (Water Le โรงฆ่าสัตว์ (Slaughter house) ระบบบำบัดน้ำเสีย (Waste water ผังเมือง (Provincial Developmer การใช้ที่ดิน พ.ศ. 2550 Spot 20 การใช้ที่ดิน พ.ศ. 2550 Landsat 1 การใช้ที่ดิน พ.ศ. 2540 Landsat	การเปลี่ยนแปล 	งการใช้ที่ดิน (Chang NAME_E	ge Of Landuse) -	AREA_1988	PER_1988	2
111. 12. 13. 14. 15. 16. 17. 18.	สถานีตรวจวัดระดับน้ำ (Water Le โรงฆ่าสัตว์ (Slaughter house) ระบบบำบัดน้ำเสีย (Waste water ผังเมือง (Provincial Developmer การใช้ที่ดิน พ.ศ. 2550 Spot 20 การใช้ที่ดิน พ.ศ. 2550 Landsat 1 การใช้ที่ดิน พ.ศ. 2540 Landsat 1	การเปลี่ยนแปล LU_CODE A0000	งการใช้ที่ดิน (Chang NAME_E Agricultural	ge Of Landuse) - NAME_T พื้นที่เกษตรก	AREA_1988 235.08	PER_1988 45.79	2
11. 12. 13. 14. 15. 16. 17. 18. 19.	สถานีตรวจวัดระดับน้ำ (Water Le โรงฆ่าสัตว์ (Slaughter house) ระบบบำบัดน้ำเสีย (Waste water ผังเมือง (Provincial Developmer การใช้ที่ดิน พ.ศ. 2550 Spot 20 การใช้ที่ดิน พ.ศ. 2550 Landsat 1 การใช้ที่ดิน พ.ศ. 2540 Landsat การใช้ที่ดินพ.ศ. 2531 Landsat 1 เส้นทางน้ำ (Streams and Rivers	การเปลี่ยนแปล <u>LU_CODE</u> A0000 A0900	งการใช้ที่ดิน (Chang NAME_E Agricultural Aquacultural	pe Of Landuse) - NAME_T พื้นที่เกษตรก สถานที่เพาะเ	AREA_1988 235.08 95.38	PER_1988 45.79 18.58	23 10 23
11. 12. 13. 14. 15. 16. 17. 18. 19. 20.	สถานีตรวจวัดระดับน้ำ (Water Le โรงฆ่าสัตว์ (Slaughter house) ระบบบำบัดน้ำเสีย (Waste water ผังเมือง (Provincial Developmer การใช้ที่ดิน พ.ศ. 2550 Spot 20 การใช้ที่ดิน พ.ศ. 2550 Landsat 1 การใช้ที่ดิน พ.ศ. 2540 Landsat การใช้ที่ดินพ.ศ. 2531 Landsat 1 เส้นทางน้ำ (Streams and Rivers เส้นทางคมนาคม (Transportatio	การเปลี่ยนแปล <u>LU_CODE</u> A0000 A0900 F0106	งการใช้ที่ดิน (Chang NAME_E Agricultural Aquacultural Mangrove F	pe Of Landuse) - NAME_T พื้นที่เกษตรก สถานที่เพาะเ ป่าชายเลน	AREA_1988 235.08 95.38 34.2	PER_1988 45.79 18.58 6.66	22 10 22 14
11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21.	สถานีตรวจวัดระดับน้ำ (Water Le โรงฆ่าสัตว์ (Slaughter house) ระบบบำบัดน้ำเสีย (Waste water ผังเมือง (Provincial Developmer การใช้ที่ดิน พ.ศ. 2550 Spot 20 การใช้ที่ดิน พ.ศ. 2550 Landsat 1 การใช้ที่ดิน พ.ศ. 2540 Landsat การใช้ที่ดินพ.ศ. 2531 Landsat 1 เส้นทางน้ำ (Streams and Rivers เส้นทางคมนาคม (Transportatio ประชากร (Population)	การเปลี่ยนแปล <u>LU_CODE</u> A0000 A0900 F0106 M0200	งการใช้ที่ดิน (Chang NAME_E Agricultural Aquacultural Mangrove F Wetland	pe Of Landuse) - NAME_T พื้นที่เกษตรก สถานที่เพาะเ ป่าชายเลน พื้นที่สุ่ม	AREA_1988 235.08 95.38 34.2 5.98	PER_1988 45.79 18.58 6.66 1.16	22 10 22 14
11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21.	สถานีตรวจวัดระดับน้ำ (Water Le โรงฆ่าสัตว์ (Slaughter house) ระบบบำบัดน้ำเสีย (Waste water ผังเมือง (Provincial Developmer การใช้ที่ดิน พ.ศ. 2550 Spot 20 การใช้ที่ดิน พ.ศ. 2550 Landsat 1 การใช้ที่ดิน พ.ศ. 2540 Landsat การใช้ที่ดินพ.ศ. 2531 Landsat 1 เส้นทางน้ำ (Streams and Rivers เส้นทางคมนาคม (Transportatio	การเปลี่ยนแปล <u>LU_CODE</u> A0000 A0900 F0106 M0200 M0401	งการใช้ที่ดิน (Chang NAME_E Agricultural Aquacultural Mangrove F Wetland Salt flats	pe Of Landuse) - NAME_T พื้นที่เกษตรก สถานที่เพาะเ ป่าชายเลน พื้นที่ลุ่ม นาเกลือ	AREA_1988 235.08 95.38 34.2 5.98 17.3	PER_1988 45.79 18.58 6.66 1.16 3.37	22 10 22 14 15 0
11. 12. 13.	สถานีตรวจวัดระดับน้ำ (Water Le โรงฆ่าสัตว์ (Slaughter house) ระบบบำบัดน้ำเสีย (Waste water ผังเมือง (Provincial Developmer การใช้ที่ดิน พ.ศ. 2550 Spot 20 การใช้ที่ดิน พ.ศ. 2550 Landsat 1 การใช้ที่ดิน พ.ศ. 2540 Landsat การใช้ที่ดินพ.ศ. 2531 Landsat 1 เส้นทางน้ำ (Streams and Rivers เส้นทางคมนาคม (Transportatio ประชากร (Population)	การเปลี่ยนแปล LU_CODE A0000 A0900 F0106 M0200 M0401 M0402	งการใช้ที่ดิน (Chang NAME_E Agricultural Aquacultural Mangrove F Wetland Salt flats Beaches, Mud	pe Of Landuse) - NAME_T พื้นที่เกษตรก สถานที่เพาะเ ป่าชายเลน พื้นที่ลุ่ม นาเกลือ หาดทราย, ห	AREA_1988 235.08 95.38 34.2 5.98 17.3 2.79	PER_1988 45.79 18.58 6.66 1.16 3.37 .54	22 10 22 14 15 0 22
11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21.	สถานีตรวจวัดระดับน้ำ (Water Le โรงฆ่าสัตว์ (Slaughter house) ระบบบำบัดน้ำเสีย (Waste water ผังเมือง (Provincial Developmer การใช้ที่ดิน พ.ศ. 2550 Spot 20 การใช้ที่ดิน พ.ศ. 2550 Landsat 1 การใช้ที่ดิน พ.ศ. 2540 Landsat การใช้ที่ดินพ.ศ. 2531 Landsat 1 เส้นทางน้ำ (Streams and Rivers เส้นทางคมนาคม (Transportatio ประชากร (Population)	การเปลี่ยนแปล LU_CODE A0000 A0900 F0106 M0200 M0401 M0402 U0000	งการใช้ที่ดิน (Chang Agricultural Aquacultural Mangrove F Wetland Salt flats Beaches, Mud Urban and b	pe Of Landuse) - NAME_T พื้นที่เกษตรก สถานที่เพาะเ ป่าชายเลน พื้นที่ลุ่ม นาเกลือ หาดทราย, ห พื้นที่ชุมชนแ	AREA_1988 235.08 95.38 34.2 5.98 17.3 2.79 12.09	PER_1988 45.79 18.58 6.66 1.16 3.37 .54 2.35	2: 10 2: 14 15 0 2: 9.
11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21.	สถานีตรวจวัดระดับน้ำ (Water Le โรงฆ่าสัตว์ (Slaughter house) ระบบบำบัดน้ำเสีย (Waste water ผังเมือง (Provincial Developmer การใช้ที่ดิน พ.ศ. 2550 Spot 20 การใช้ที่ดิน พ.ศ. 2550 Landsat 1 การใช้ที่ดิน พ.ศ. 2540 Landsat การใช้ที่ดินพ.ศ. 2531 Landsat 1 เส้นทางน้ำ (Streams and Rivers เส้นทางคมนาคม (Transportatio ประชากร (Population)		งการใช้ที่ดิน (Chang NAME_E Agricultural Aquacultural Mangrove F Wetland Salt flats Beaches, Mud Urban and b Water body Sea	pe Of Landuse) - <u>NAME_T</u> พื้นที่เกษตรก สถานที่เพาะเ ป้าชายเลน พื้นที่ลุ่ม นาเกลือ หาดทราย, ห พื้นที่ชุ่มชนแ พื้นที่น้ำ	AREA_1988 235.08 95.38 34.2 5.98 17.3 2.79 12.09 9.84	PER_1988 45.79 18.58 6.66 1.16 3.37 .54 2.35 1.92	2: 9. 1(
11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21.	สถานีตรวจวัดระดับน้ำ (Water Le โรงฆ่าสัตว์ (Slaughter house) ระบบบำบัดน้ำเสีย (Waste water ผังเมือง (Provincial Developmer การใช้ที่ดิน พ.ศ. 2550 Spot 20 การใช้ที่ดิน พ.ศ. 2550 Landsat 1 การใช้ที่ดิน พ.ศ. 2540 Landsat การใช้ที่ดินพ.ศ. 2531 Landsat 1 เส้นทางน้ำ (Streams and Rivers เส้นทางคมนาคม (Transportatio ประชากร (Population)	การเปลี่ยนแปล <u>LU_CODE</u> A0000 A0900 F0106 M0200 M0401 M0402 U0000 W0000	งการใช้ที่ดิน (Chang Agricultural Aquacultural Mangrove F Wetland Salt flats Beaches, Mud Urban and b Water body	pe Of Landuse) - <u>NAME_T</u> พื้นที่เกษตรก สถานที่เพาะเ ป้าชายเลน พื้นที่ลุ่ม นาเกลือ หาดทราย, ห พื้นที่ชุ่มชนแ พื้นที่น้ำ	AREA_1988 235.08 95.38 34.2 5.98 17.3 2.79 12.09 9.84	PER_1988 45.79 18.58 6.66 1.16 3.37 .54 2.35 1.92	22 10 22 14 15 0 21 9,

Figure 146 : Attribute Data Display

The attribute data can export to Excel Spreadsheet (Microsoft Excel Worksheet) by click export button.

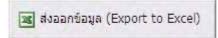


Figure 147 : Export Button (Export to Excel)

When click at export button, the window of Export to Excel will be appeared.

ข้อมูลทั้งหมด] FID] VILL_CODE] VILL_NAM_T	ดอสัมที่ต้องการส่งออก (Export Item) ข้อมูลที่ต้องการส่ง
□ VILL_NAM_E □ TAMBON_ID □ DISTRICT_I □ PROV_CODE	4
<	There Collect

Figure 148 : Exports to Excel Window

The frame "All Fields" at left side will show the name of all fields. User can check box in each field to select an export field, then the selected field will be appeared in the right frame "Export Fields".

ข้อมูลทั้งหมด	คอสัมที่ต้องการส่งออก (Export	Item)
FID	ข้อมูลที่ต้องการส่ง	
VILL_CODE	VILL_CODE	
VILL_NAM_T	VILL_NAM_T	
VILL_NAM_E	VILL_NAM_E	
TAMBON_ID		
DISTRICT_I		î
PROV_CODE		=
		ĥ
		-
< >		
เลือกทั้งหมด (Select All) ยกเลิกทั้งหมด (C	loos Colort	

Figure 149 : Field Selections for Export to Excel

If user wants to export all fields, click Select All button. Otherwise if user wants to cancel all fields, click Clear Select button.

In the frame "Export Fields", user can arrange the order of field export by select the field and click arrow to lift field up or down as requires.

Click OK button when finished for export fields to Excel, then the system will run Excel program for user to save data in Excel file.

Microsoft Excel - Book1						
:2)	Eile Edit View Insert Format Tools Data Window Help Adobe PDF					
in	10 🗃 🖬 🕼 🔄 🕲 🗳 🖏 Ι 🕹 🛍 • 💉 🔊 • P - I 🛞 Σ • ΔΙ 🛣 🛄					
	G29 • fx					
	A	B	C	D		
1		VILL NAM T	VILL NAM E			
2		บ้านเขายี่สาร	Ban Khao Yi San			
3	A.0000000100000000000000000000000000000	บ้านคลองกระทิง	Ban Khlong Kra Ting			
4	58031007	บ้านคลองขด	Ban Khlong Khud			
5	58031207	บ้านคลองคอน	Ban Khlong Khon			
6	58031105	บ้านคลองจมปก	Ban Khlong Chum Puk			
7	58030305	บ้านคลองท่าคา	Ban Khlong Ta Ka			
8	58030603	บ้านคลองบางแค	Ban Khlong Bang Khae			
9	58030404	บ้านคลองบุญนาค	Ban Khlong Bun Nak			
10	58031111	บ้านคลองประชาชิ่น	Ban Khlong Pra Cha Chom Chun			
11	58030806	บ้านคลองผีหลอก	Ban Khlong Pi Lok			
12	58030605	บ้านคลองโพงพาง	Ban Khlong Phong Phang			
13	58030601	บ้านคลองโพธิ์	Ban Khlong Pho			
14	58030501	บ้านคลองลัดตาโชติ	Ban Khlong lat Ta Chot			
15	58031113	บ้านดุ้งจ่าปี	Ban Khung Chom Pi			
16	58030904	บ้า <mark>น</mark> ดอนจั่น	Ban Don Chun			
17	58030903	บ้านดันลำแพน	Ban Ton Lom Pan			
18	58031108	บ้านท้องคุ้ง	Ban Tong Kung			
19	58030703	<u>บ้าน</u> ลัดดาช่วย	Ban Ladda Chuai			
20	58030406	บ้านวัดปรก	Ban Wat Prok			
21		บ้านวัดประชา	Ban Wat Pra Cha			
22		บ้านวัดประดู่	Ban Wat Pra Du			
23	58031115	บ้านสามแยกคลองบางนางลื่	Ban Sam Yeak Khlong Nang Li			
24	58030706	บ้านหน้าวัดนางพิมพ์	Ban Nar Wat Nang Pim			
25	58031209	บ้านหัวหาด	Ban Hua Had			

Figure 150 : Export to Excel

Besides, in order to show attribute details, it can present with a graph by click Show Graph button, then result will show the graph as program set up. For more details, please see in Graph section.

😝 แสดงกราฟ (Show Graph)

Figure 151 : Show Graph Button

e.3 Graph

Use for display data in graph pattern. The usability characterization as same as Attribute buttons that it will show graph of selected object related to database window.

When check box in front of the field, click Graph button and select object on the map, program will show graph data. Graph types of each field will show column, bar, or pie as appropriate with each field.

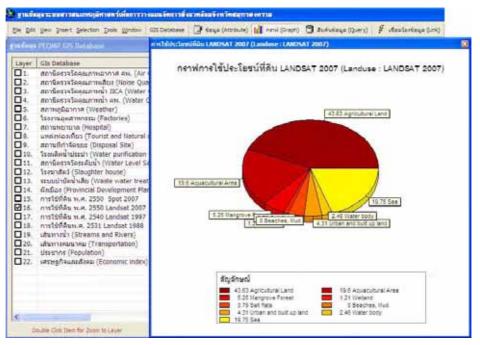


Figure 152 : Graph Display

Some field has to choose parameter, beginning time, and ending time of graph display.

ฟลุมภาพหากาศ Air Qu	rality Graph			
<mark>รหัสสถานี :</mark> (Sta. IDN)	58201			
ชื่อสถานีไทย : (Sta. Name Thai)	หน้าสำนักงานจังหวัดสมุทรสงคราม			
ชื่อสถานีอังกฤษ : (Sta. Name Eng)	In front of Samut	Songkhr	am Provincial O	ffice
พารามิเตอร์ : (Parameter)	502	•		
ช่วงเวลาเก็บข้อมูล :	2006/02/10 🔻	₩ ถึง	2007/10/01	-
(Survey Date)	yyyy/mm/dd	To	yyyy/mm/dd	
	<mark>แส</mark> ดงกราฟ (Show G			

Figure 153 : Graph Condition Windows

If any field is does not have graph display result, dialog box will appear to notice user.

NO Graph Data! 🛛 🛛 🔀			
(į)	ไม่มีข้อมูลกราฟ(No Graph Data)		
	ОК		

Figure 154 : Dialog box "No Graph Data Available"

e.4 Query

Query button is use for search data in Amphoe or all Amphoes in Province. User can define and select field of query from the database.

Click Query button; select one or all Amphoe and field data then click search, details of selected data will be appeared.

		ery by Amphoe			
LASH BAUK K	🦟 กำหนดชื่ออำเภส	อและข้อมูลที่ต้องกา	5	_	
	10 mar 11				
	เลือกชื่ออ่าเ	E PRIETAENE	สมุทรสงคราม-Amph	oe Muear 👻	
	(Select Amp				
@@ <u>&@@</u> @@@@	เลือกชั้นข้	อมูล : หมู่บ้าน (Vil	ages)	-	
	(Select L	ayer)			
			ดันหา (Query)		
araa a					
			15		
		รายการ (86 record	Contraction of the second second		102
	VILL_CODE	VILL_NAM_E	VILL_NAM_T	TAMBON_IDN	
พา	58010307	Ban Khlong	บ้านคลองช่อ	580103	
A conce Musing Samu Songkhra		Ban Preak T	บ้านแพรกทะเล	580103	
	58010305	Ban Khlong	บ้านคลองช่อง	580103	
	58010303	Ban Khlong	บ้านคลองโดน	580103	
	58010302	Ban Khlong	บ้านคลองโคน	580103	
	58011107	Ban Khlong	บ้านดลองสอ	580111	
	58010301	Ban Khlong	บ้านคลองคด	580103	
-	58010306	Ban Pra Cha	บ้านประชาชม	580103	
1	58010804	Ban Chu Chi	บ้านฉู่ฉื	580108	
1	58011108	Ban Pak Khl	บ้านปากคลอ	580111	
- (58010706	Ban Wat Mai	บ้านวัดใหม่	580107	
• {	30010/00		บ้านคลองด่าน	580111	Y
	58011102	Ban Khlong	นานตลองตาม		

Besides, user can export result to Microsoft Excel.

Figure 155 : Query

e.5 Link

The fields of town plan, tourism location, wastewater treatment plant, solid waste disposal site, and water supply plant are able to use Link button.

When click Link button and select object, the window will appear to show linkage data. For example, town plan data will link to Adobe Acrobat program to open town plan data file in ".pdf" format.

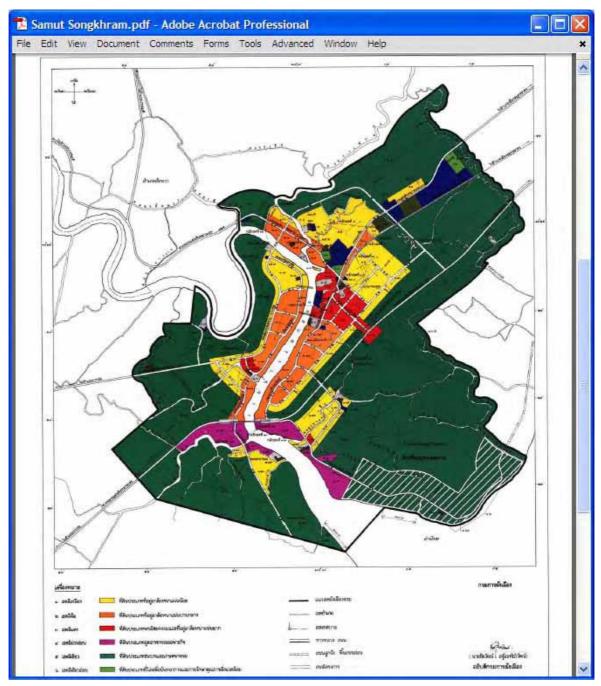


Figure 156 : Link Button Display

e.6 Home Position

Home Position is usable for set the screen back to the original setting at the beginning (show the map cover all area of Samut Songkhram Province).

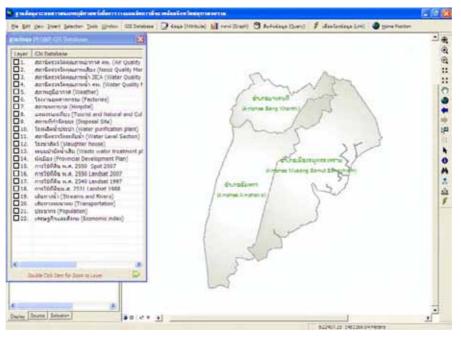


Figure 157 : Home Position Display

Besides, it has many tools and functions without showing in window, but can open and use by right click on area of Menu Bars or Toolbars then hidden functions will be appeared.

Q Untitled - ArcMap - ArcInfo	Main Menu
Elle Edit View Insert Selection Iools Window Help	3D Analyst Advanced Editing Animation
	Annotation ArcPad ArcScan
	COGO Data Frame Tools
	Dimensioning Distributed Geodatabase Draw
	Editor Effects GPS
	GPS Geodatabase History Geometric Network Editing
Display Source Selection	Georeferencing Geostatistical Analyst 5t Graphics

Figure 158 : On-off Tools and Functions Display

f. Usability Description of Each Field

The field is divided into three main parts; PEQMP GIS Database, DEQP GIS Database, and Base Map.

- 🖃 🗲 Geographic Information System
 - 🖃 🗹 PEQMP GIS Database
 - 🛨 🗌 สถานีตรวจวัดคุณภาพอากาศ คพ. (Air Quality PCD)
 - 🛨 🔲 สถานีตรวจวัดคุณภาพเสียง (Noise Quality Monitoring Stations)
 - 표 🔲 สถานีตรวจวัดคุณภาพน้ำ JICA (Water Quality Monitoring Stations JICA)
 - 🗄 🔲 สถานีตรวจวัดคุณภาพน้ำ คพ. (Water Quality Monitoring Stations PCD)
 - 🗄 🗌 สภาพภูมิอากาศ (Weather)
 - 🛨 🗌 โรงงานอุตสาหกรรม (Factories)
 - 🛨 🔲 สถานพยาบาล (Hospital)
 - 🗄 🔲 แหล่งห่องเที่ยว (Tourist and Natural and Cultural Heritage Sites)
 - 🕀 📘 สถานที่กำจัดขยะ (Disposal Site)
 - 🕀 🔲 โรงผลิตน้ำประปา (Water purification plant)
 - 🛨 🗌 สถานีตรวจวัดระดับน้ำ (Water Level Section)
 - 🕀 🗌 โรงฆ่าสัตว์ (Slaughter house)
 - 🛨 🗌 ระบบบำบัดน้ำเสีย (Waste water treatment plant)
 - 🛨 🗌 ผังเมือง (Provincial Development Plan)
 - 🕀 🔲 การใช้ที่ดิน พ.ศ. 2550 Spot 2007
 - 🕀 🔲 การใช้ที่ดิน พ.ศ. 2550 Landsat 2007
 - 🕀 🔲 การใช้ที่ดิน พ.ศ. 2540 Landsat 1997

 - 🛨 🔲 เส้นทางน้ำ (Streams and Rivers)
 - 🕀 🔲 เส้นทางคมนาคม (Transportation)

 - 🕀 🗌 เศรษฐกิจและสังคม (Economic index)
 - 🖃 🗹 DEQP GIS Database
 - 🕀 🗌 ท่าเรือ (Ports)
 - 🕀 🗌 ธรณ์วิทยา (Geology)
 - 🛨 🗌 สถานที่สำคัญ (Places)
 - 🕀 🗌 โรงเรียน (Schools)
 - 🕀 🗌 จุดเกิดอุบัติเหตุ (Accidental Point)
 - 🛨 🔲 บ่อบาดาล (Well)
 - 🕀 🗌 ชุดดิน (Soil Series)
 - 🛨 🗌 ความลาดชั้น (Slope)
 - 🕀 🗌 จุดระดับความสูง (Spot Height)
 - 🛨 🔲 ระดับความสูง (Elevation)
 - 🕀 🗌 ทิศทางความลาดชั้น (Aspect)
 - 🕀 🔲 ขั้นน้ำบาดาล (Aquifer)
 - 🛨 🔲 แหล่งน้ำ (Water Body)
 - 🕀 🔲 ลุ่มน้ำ (Basin)
 - 🕀 🗌 ชั้นคุณภาพลุ่มน้ำ (Watershade)
 - 🛨 🔲 พื้นที่ชุ่มน้ำตามอนุสัญญาแรมชาร์ (Ramsar Wetland Site)
 - 🖃 🗹 แผนที่พื้นฐาน (Base Map)
 - 🕀 🗌 หมู่บ้าน (Villages)
 - 🛨 🗹 อำเภอ (Amphoe)
 - 🛨 🔲 ตำบล (Tambon)
 - 🖃 🗌 เทศบาล (Municipalities)

Figure 159 : List of all GIS Fields of Project

Details of each layer and described below.

f.1 PEQMP GIS Database

f.1.1. Air Quality Monitoring Station of PCD) Air Quality PCD)

When click Attribute and select station, program will show window of air quality monitoring station of PCD) Air Quality PCD). If click Export to Excel, program will show window as addressed in page 39.

รหัสสถ (Sta. ID	100 at				
ชื่อสถานีไ (Sta. Name T ชื่อสถานีอังก (Sta. Name E	hai) ਗੁਸ਼ : In front	างานจังหวัดสมุทรส of Samut Songkh		ffice	
AQ_STA_IDN	DATE	CO (ug/m3)	CH4 (ppm)	NON_CH4 (p	THC
58201	2007/10/01	0	0	0	0
58201	2006/02/10	0	0	0	0
58201	2006/05/25	0	0	0	0
58201	2006/09/21	0	0	0	0
58201	2007/07/20	0	0	0	0
<					>
	1] ส่งออกข้อมูล (Exp	ort to Excel)	ทมายเหตุ 0 คือ ไม่ Remark 0 : No Da	10 10 10 March 10

Figure 160 : Details of Air Quality Monitoring Station of PCD

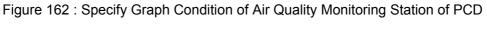
When click Graph and select station, program will show graph window.

กราฟดุณภาพอากาศ Air Qu	ality Graph 🛛 🔀
รทัสสถานี : (Sta. IDN)	58201
ชื่อสถานีไทย : (Sta. Name Thai)	หน้าสำนักงานจังหวัดสมุทรสงคราม
ชื่อสถานีอังกฤษ : (Sta. Name Eng)	In front of Samut Songkhram Provincial Office
พารามิเตอร์ : (Parameter)	[เลือกพารามิเตอร์] 💌
ช่วงเวลาเก็บข้อมูล : (Survey Date)	[เลือกวันที่] ▼
	<mark>ไปไ</mark> แสดงกราฟ (Show Graph)

Figure 161 : Graph of Air Quality Monitoring Station of PCD

User can select parameters and data collecting period by select the beginning time and check the box to select ending time of air quality monitoring of PCD) Air Quality PCD).





Then click show graph.

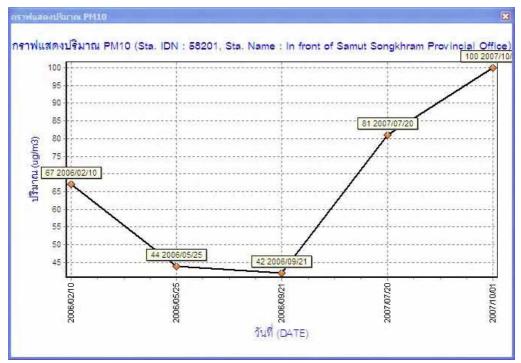


Figure 163 : Example Graph of Air Quality Monitoring Station of PCD

f.1.2. Noise Quality Monitoring Stations

When click Attribute and select station, program will show window of Noise Quality Monitoring Stations.

(Stati ชื่อสถา (Station Name	រែកតុម : In fron		เรสงคราม khram Provincial	Office	
NM_STA_IDN	NM_DATE	NM_TIME	NM_DIST	NM_DBA	
58201	2007/01/10	24 hr	0	68.5	_
58201	2007/07/20	24 hr	0	70	
		ส่งออกข้อมูล		หมายเหตุ 0 คือ ไม่มีข้อม	រ្យូត

Figure 164 : Noise Quality Monitoring Stations

When click Graph and select station, program will show graph window.

รหัสสถานี : (Sta. IDN)	58201
ชื่อสถานีไทย : (Sta. Name Thai)	หน้าสำนักงานจังหวัดสมุทรสงคราม
ชื่อสถานีอังกฤษ : (Sta. Name Eng)	In front of Samut Songkhram Provincial Office
ช่วงเวลาเก็บข้อมูล : (Survey Date)	[เลือกวันที่] ▼ โจ้ง [เลือกวันที่] ▼ yyyy/mm/dd To yyyy/mm/dd
	<mark>แป้</mark> แสดงกราฟ (Show Graph)

Figure 165 : Graph of Noise Quality Monitoring Stations

User can select parameters and data collecting period by select the beginning time and check the box to select ending time of Noise Quality Monitoring Stations.

50001			
58201			
หน้าสำนักงานจัง	เหวัดสมุทรสง	คราม	
In front of San	nut Songkhra	am Provincial O	ffice
PM10	-		
2006/02/10	→ √	2007/10/01	<u> </u>
yyyy/mm/dd		yyyy/mm/dd	
<mark>แไ</mark> สดงกราฟ (Shov	w Graph)		
1	In front of San PM10 2006/02/10 yyyy/mm/dd	In front of Samut Songkhra PM10 🔹 2006/02/10 ្ 🔽 តីរ yyyy/mm/dd	2006/02/10 ▼ 〒 ถึง 2007/10/01 yyyy/mm/dd yyyy/mm/dd

Figure 166 : Define Condition of Noise Quality Monitoring Stations Graph

Then click show graph.

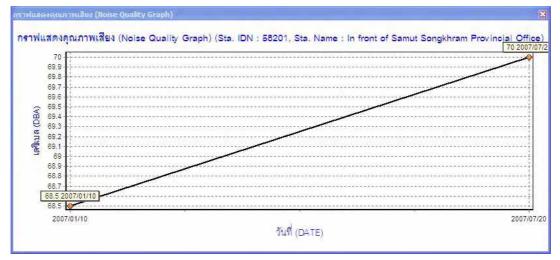


Figure 167 : Example Graph of Noise Quality Monitoring Stations

f.2 Water Quality Monitoring Stations of JICA

When click Attribute and select station, program will show window of Water Quality Monitoring Stations of JICA.

(Statio ชื่อสถา (Station Name	សែកពុម : The mo	น้ำแม่กลอง outh of Mae Klong	River		
WQ_STA_IDN	DATE	AAT (degre	WT (degree	PH	DO (mg/l)
1	2007/08/27	29.5	28	7.8	4.79
<		ส่งออกข้อ			 0 คือ ไม่มีข่อมูส 0 : No Data

Figure 168 : Details of Water Quality Monitoring Stations of JICA

When click Graph and select station, program will show graph window.

U (Water Quality PRJ Graph)	×
1	
ปากแม่น้ำแม่กลอง	
The mouth of Mae Klong River	
[เลือกพารามิเตอร์] 💌	
[เลือกวันที่] ▼	
<mark>ไปไ</mark> แสดงกราฟ (Show Graph)	
	ปากแม่น้ำแม่กลอง The mouth of Mae Klong River [เลือกพารามิเตอร์] ▼ [เลือกวันที่] ▼ โ_ ถึง 2007/08/27 ▼ yyyy/mm/dd To yyyy/mm/dd

Figure 169 : Graph of Water Quality Monitoring Stations of JICA

User can select parameters and data collecting period by select the beginning time and check the box to select ending time of Water Quality Monitoring Stations of JICA



Figure 170 : Define Condition of Water Quality Monitoring Stations of JICA

Then click show graph.

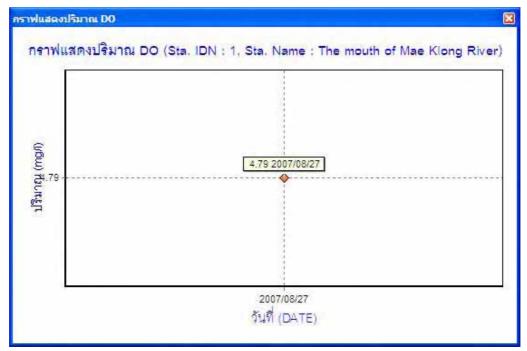


Figure 171 : Example Graph of Water Quality Monitoring Stations of JICA

f.2.1. Water Quality Monitoring Stations of PCD

When click Attribute and select station, program will show window of Water Quality Monitoring Stations of PCD. User can choose to view Raw Data or Summary Data by click selection bar at the top.

รหัส (Statio	สถานี: MK0 on ID)	1				
ชื่อสถา (Station Name		แม่น้ำแม่กลอง อ.เมือง				
(Station Name	Eng)	mouth of Mae Klong 외 (Summary Data)	River, Ampho	e Mueang		
WQ_STA_IDN	COUNT	DATE	AAT	WT (degree	PH	^
MK01	1/1997	1997/01/04	0	30.3	7.8	
MK01	1/1998	1998/03/18	33	30.5	7.4	
MK01	1/1999	1999/01/26	0	27.5	7.7	
MK01	1/2000	2000/07/02	0	24.8	7.43	
MK01	1/2001	2001/02/02	27.27	28.2	7.55	
MK01	1/2002	2002/01/07	0	27	7.7	
MK01	1/2003	2003/01/06	0	27.5	7.9	
MK01	1/2004	2004/02/02	31.6	27.5	7.7	
MK01	1/2005	2004/12/01	28	26.1	7.4	~
<		an and the fact			- >	F
		🕱ส่งออกข้อมูล E	mort to Excel	หมายเหตุ 0 ส Remark 0 :		มูล

Figure 172 : Raw Data of Water Quality Monitoring Stations of PCD

(Static ชื่อสถา (Station Name ชื่อสถานีอั (Station Name	นี้ไทย : ปากแ Thai) งกฤษ : The r Eng)	ม่น้ำแม่กลอง อ.เมี nouth of Mae Klo	ng River, Amphoe	Mueang	
ข้อมูล (Raw Dat WQ_STA_IDN	a) ข้อมูลสรุบ Number	I (Summary Data) DO (mg/l)	BOD (mg/l)	TCB (MI
MK01	1//40	1997	4.34	1.5	28600
MK01	1//41	1998	3.6	.96	7720
MK01	1//42	1999	4.52	1.34	6200
MK01	1//43	2000	4.62	1.24	14400
MK01	1//44	2001	4.26	1.728	4640
MK01	1//45	2002	4.44	1.56	144096(
MK01	1//46	2003	4	2.08	23600
MK01	1//47	2004	4.76	1.02	11600
MK01	1//49	2005	3.62	1.28	13000 🗸
<u><</u>					
			Export to Excel	t	

Figure 173 : Summary Data of Water Quality Monitoring Stations of PCD

When click Graph and select station, program will show graph window.

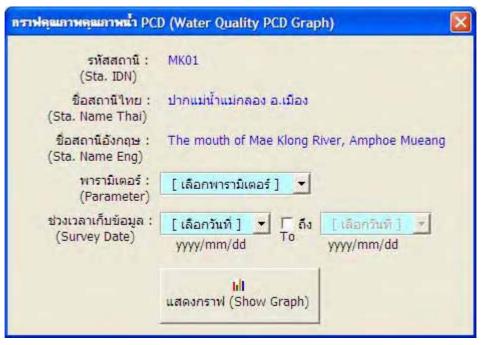


Figure 174 : Graph of Water Quality Monitoring Stations of PCD

User can select parameters and data collecting period by select the beginning time and check the box to select ending time of Water Quality Monitoring Stations of PCD



Figure 175 : Define Condition of Water Quality Monitoring Stations of PCD

Then click show graph.

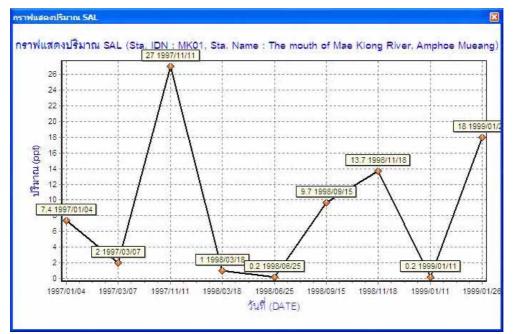


Figure 176 : Example Graph of Water Quality Monitoring Stations of PCD

f.3 Weather

When click Attribute and select station, program will show window of Weather. The data is consists of steam, cloud, humidity, precipitation, wind speed, sunlight, and temperature. User can select data type at left bar.

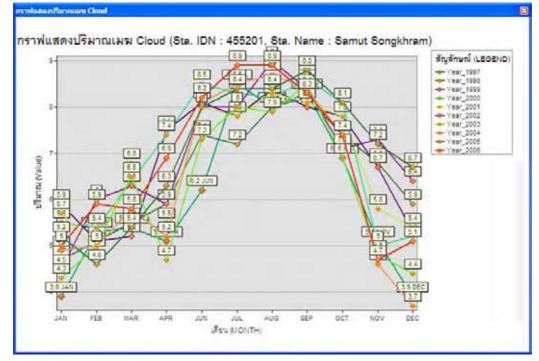
รทัสสถานี : (Sta. IDN)							
ชื่อสถานีไทย : (Sta. Name Thai)		สมุทรสงคราม					
ชื่อสถานีอังกฤษ : (Sta. Name Eng)							
	1		Land the second second				
W_STA_IDN	YEAR	JAN	FEB	MAR			
455201	1997	4.2	4.8	5.4			
455201	1998	4.1	5.2	5.9			
455201	1999	3.7	3.9	5			
455201	2000	4	4.3	5			
455201	2001	3.9	4.3	4			
455201	2002	3.5	4.4	4.7			
455201	2003	3.9	4.5	4.5			
455201	2004	3.7	4.3	4.9			
455201	2005	3.6	4.5	4.9			
455201	2006	3.7	4.2	5.2			
				>			
	(Sta. IDN) ชื่อสถานิไทย : .a. Name Thai) อสถานีอังกฤษ : .a. Name Eng) เชีช์อมูลจา พ_STA_IDN 455201 455201 455201 455201 455201 455201 455201 455201 455201	(Sta. IDN) ชื่อสถานีไทย : สมุทรสงค เอ. Name Thai) อสถานีอังกฤษ : Samut So เชีย์อมูลจากสถานีบางน พ_STA_IDN YEAR 455201 1997 455201 1998 455201 1999 455201 2000 455201 2001 455201 2001 455201 2003 455201 2003	(Sta. IDN) ชื่อสถานีไทย : สมุทรสงคราม เอ. Name Thai) อสถานีอังกฤษ : Samut Songkhram เอ. Name Eng) ใช้ข้อมูลจากสถานีบางนา กรุงเทพฯ (Used W_STA_IDN YEAR JAN 455201 1997 4.2 455201 1998 4.1 455201 1999 3.7 455201 2000 4 455201 2000 4 455201 2001 3.9 455201 2001 3.9 455201 2003 3.9	(Sta. IDN) ชื่อสถานิไทย : สมุทรสงคราม :a. Name Thai) อสถานีอังกฤษ : Samut Songkhram :a. Name Eng) ใช้ข้อมูลจากสถานีบางนา กรุงเทพฯ (Used Data From Bar เป็นข้อมูลจากสถานีบางนา กรุงเทพฯ (Used Data From Bar 1997 4.2 4.8 455201 1997 4.2 4.8 455201 1998 4.1 5.2 455201 1999 3.7 3.9 455201 2000 4 4.3 455201 2001 3.9 4.3 455201 2001 3.9 4.3 455201 2002 3.5 4.4 455201 2003 3.9 4.5 455201 2004 3.7 4.3 455201 2005 3.6 4.5			

Figure 177 : Weather Data

When click Graph and select station, program will show Weather Graph window. User can select to view data of cloud graph, steam graph, humidity graph, precipitation graph, wind speed graph, sunlight graph, and temperature graph.

ราฟสถาพลากาศ (W	'eather)
รหัสสถานี : (Sta. IDN)	455201
ชื่อสถานีไทย : Sta. Name Thai)	สมุทรสงคราม
ชื่อสถานีอังกฤษ : Sta. Name Eng)	Samut Songkhram
กราฟเมฆ	(Cloud Graph)
กราฟไอน้ำ (Evaporate Graph)
กราฟความชื้นใน	อากาศ (humid Graph)
กราฟปริมาณา	น้ำฝน (Rain Graph)
กราฟความเร็ว	າລຸມ (Speed Graph)
กราฟแสงอา	ทิตย์ (Sun Graph)
กราฟอุณหภูมิ (Temperature Graph)

Figure 178 : Window Selection of Weather Graph



When select graph, window will be appeared to show selected graph as example below.

Figure 179 : Windows of Cloud Graph

f.4 Factories

When click Attribute and select factory, program will show window of factory details.

ayers: <top-most layer=""></top-most>		<u> </u>
🗄 โรงงานอุตสาทกรรม (Factories)	Location: (604888.389246 1	473519.639319)
主 1-075(01)-001/35aa	Field	Value
	FID	1
	Shape	Point
	FAC_REG	1-075(01)-001/35aa
	FAC_NAME_T	
	DIW_CODE	075
	TEAM_CODE	G27
	HIW NON	NON
	TSIC_CODE	0
	REG YEAR	1992
	FAC OWNER	
	PRODUCT_T	ต่อเรือและช่อมเรือยนต่
	FAC_CAP	13020000
	FAC_SIZE	1
	FAC_HP	13
	FAC WORKER	0
	factory.dat:OLD_DATA	Yes
	factory.dat:COORDINATE	Yes

Figure 180 : Window of Factory Details

f.5 Hospital

When click Attribute and select hospital, program will show window of hospital details.

f.6 Tourist and Natural and Cultural Heritage Sites

When click Attribute and select tourism location, program will show window of tourism location details.

When click Link and select tourism location, program will show window of tourism location pictures

f.7 Solid Waste Disposal Site

When click Attribute and select solid waste disposal site, program will show window of solid waste disposal site details.

When click Link and select solid waste disposal site, program will show window of solid waste disposal site pictures.

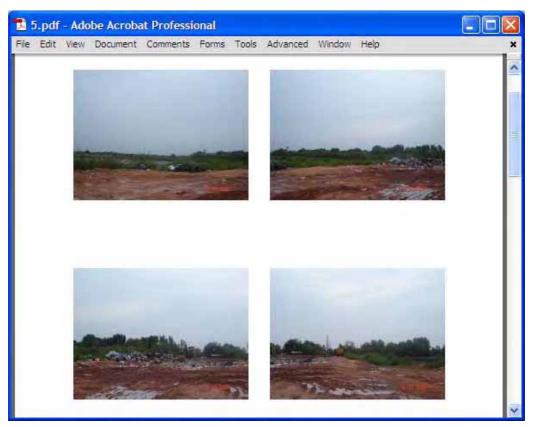


Figure 181 : Link of Solid Waste Disposal Site

f.8 Water Purification Plant

When click Attribute and select water purification plant, program will show window of water purification plant details.

When click Link and select water purification plant, program will show window of water purification plant pictures.

f.9 Water Level Section

When click Attribute and select water level section, program will show window of water level section details.

f.10 Slaughter House)

When click Attribute and select slaughter house, program will show window of slaughter house details.

f.11 Wastewater Treatment Plant

When click Attribute and select wastewater treatment plant, program will show window of wastewater treatment plant details.

When click Link and select wastewater treatment plant, program will show window of wastewater treatment plant pictures.

f.12 Provincial Development Plan

When click Attribute and select provincial development plan, program will show window of provincial development plan details.

When click Link and select provincial development plan, program will open Adobe Acrobat to show provincial development plan file (.pdf).

f.13 Land Use in 2007 (B.E. 2550) Spot 2007

When click Attribute and select any position on the map of land use in 2007 (B.E. 2550) Spot 2007, program will show details.

LU_CODE	NAME_E	NAME_T	SUM_AREA	PERCENT	1
A0100	Paddy Field	นาข้าว	1.45	.28	The
A0300	Mixed Peren	ไม้ยืนดัน, ไม้	213.94	41.68	
A0500	Horticultural	พืชสวน	5.45	1.06	
A0900	Aquacultural	สถานที่เพาะเ	107.64	20.97	
F0106	Mangrove F	ป้าชายเลน	26.3	5.12	
M0100	Rangeland	ทุ่งหญ้าธรรม	2.72	.53	
M0200	Wetland	พื้นที่ลุ่ม	6.02	1.17	
M0401	Salt flats	นาเกลือ	17.87	3.48	
M0403	n 14d		2.05	77	2.00

Figure 182 : Land Use Data in 2007 (B.E. 2550) Spot 2007

When click Graph and select any position on the map of land use in 2007 (B.E. 2550) Spot 2007, program will show graph.

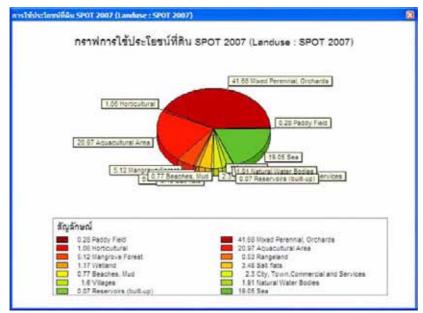


Figure 183 : Land Use Graph in 2007 (B.E. 2550) Spot 2007

f.14 Land Use in 2007 (B.E. 2550) Landsat 2007

When click Attribute and select any position on the map of land use in 2007 (B.E. 2550) Landsat 2007, program will show details.

LU_CODE	NAME_E	NAME_T	AREA_2007	PER_2007	^
A0000	Agricultural	พื้นที่เกษตรก	223.98	43.63	
A0900	Aquacultural	สถานที่เพาะเ	100.6	19.6	
F0106	Mangrove F	ปาชายเลน	26.97	5.25	
M0200	Wetland	พื้นที่ลุ่ม	6.2	1.21	
M0401	Salt flats	นาเกลือ	19.45	3.79	
M0402	Beaches, Mud	หาดทราย, ห	0	0	
U0000		พื้นที่ชุมชนแ		4.31	~
14/0000	Mistor hade	A.d.s.	17 64	7.46	
an and the second		of Landures)			
V. W. S. M. L. S. M. L	งงการใช้ที่ดิน (Chang		ADEA 1099	DED 1099	
LU_CODE	NAME_E	NAME_T	AREA_1988	PER_1988	1.00
LU_CODE A0000	NAME_E Agricultural	NAME_T พื้นที่เกษตรก	235.08	45.79	2
LU_CODE A0000 A0900	Agricultural Aquacultural	NAME_T พื้นที่เกษตรก สถานที่เพาะเ	235.08 95.38	45.79 18.58	2
LU_CODE A0000 A0900 F0106	NAME_E Agricultural Aquacultural Mangrove F	NAME_T พื้นที่เกษตรก สถานที่เพาะเ ป่าชายเลน	235.08 95.38 34.2	45.79 18.58 6.66	2 1 2
LU_CODE A0000 A0900	Agricultural Aquacultural	NAME_T พื้นที่เกษตรก สถานที่เพาะเ	235.08 95.38	45.79 18.58	2 1 2 1
LU_CODE A0000 A0900 F0106 M0200	Agricultural Aquacultural Mangrove F Wetland Salt flats	NAME_T พื้นที่เกษตรก สถานที่เพาะเ ป้าชายเลน พื้นที่ลุ่ม นาเกลือ	235.08 95.38 34.2 5.98 17.3	45.79 18.58 6.66 1.16	2 1 2 1- 1-
LU_CODE A0000 A0900 F0106 M0200 M0401	NAME_E Agricultural Aquacultural Mangrove F Wetland Salt flats Beaches, Mud	NAME_T พื้นที่เกษตรก สถานที่เพาะเ ป่าชายเลน พื้นที่ลุ่ม	235.08 95.38 34.2 5.98 17.3	45.79 18.58 6.66 1.16 3.37	2 1 2 1 1 1 0
LU_CODE A0000 A0900 F0106 M0200 M0401 M0402	NAME_E Agricultural Aquacultural Mangrove F Wetland Salt flats Beaches, Mud	NAME_T พื้นที่เกษตรก สถานที่เพาะเ ป่าชายเลน พื้นที่ลุ่ม นาเกล็อ หาดทราย, ห	235.08 95.38 34.2 5.98 17.3 2.79	45.79 18.58 6.66 1.16 3.37 .54	2 1 2 1 1 1 0 2
LU_CODE A0000 A0900 F0106 M0200 M0401 M0402 U0000	NAME_E Agricultural Aquacultural Mangrove F Wetland Salt flats Beaches, Mud Urban and b	NAME_T พื้นที่เกษตรก สถานที่เพาะเ ป่าชายเลน พื้นที่ลุ่ม นาเกลือ หาดทราย, ห พื้นที่ชุมชนแ	235.08 95.38 34.2 5.98 17.3 2.79 12.09	45.79 18.58 6.66 1.16 3.37 .54 2.35	A 2: 10 2: 14 13 0 2: 9, 10
LU_CODE A0000 A0900 F0106 M0200 M0401 M0402 U0000 W0000	NAME_E Agricultural Aquacultural Mangrove F Wetland Salt flats Beaches, Mud Urban and b Water body	NAME_T พื้นที่เกษตรก สถานที่เพาะเ ป่าชายเลน พื้นที่สุ่ม นาเกลือ นาเกลือ หาดทราย, ห พื้นที่ชุมชนแ พื้นที่ชุมชนแ	235.08 95.38 34.2 5.98 17.3 2.79 12.09 9.84	45.79 18.58 6.66 1.16 3.37 .54 2.35 1.92	2 1 2 1 1 0 2 9

Figure 184 : Land Use Data in 2007 (B.E. 2550) Landsat 2007

When click Graph and select any position on the map of land use in 2007 (B.E. 2550) Landsat 2007, program will show graph.

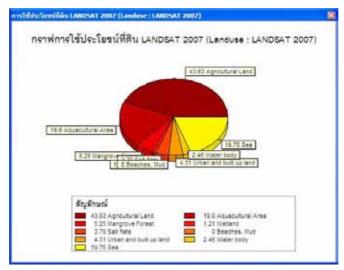


Figure 185 : Land Use Graph in 2007 (B.E.2550) Landsat 2007

f.15 Land Use in 1997 (B.E. 2540) Landsat 1997

When click Attribute and select any position on the map of land use in 1997 (B.E. 2540) Landsat 1997, program will show details.

A0900 Aquacultural สถานที่เพาะเ 104.32 F0106 Mangrove F ปาชายเลน 23.15	42.95 20.32	
F0106 Mangrove F ป่าชายเลน 23.15	and the second sec	
M0200 Wetland พื้นที่ล่ม 14.93	4.51	
	2.91	
M0401 Salt flats นาเกลือ 15.61	3.04	
M0402 Beaches, Mud หาดทราย, ห 0	0	
	4.26	-
W0000 Water body พื้นที่น้ำ 9.87	1.92	
100000 C+- 400.1C		-

Figure 186 : Land Use Data in 1997 (B.E. 2540) Landsat 1997

When click Graph and select any position on the map of land use in 1997 (B.E. 2540) Landsat 1997, program will show graph.

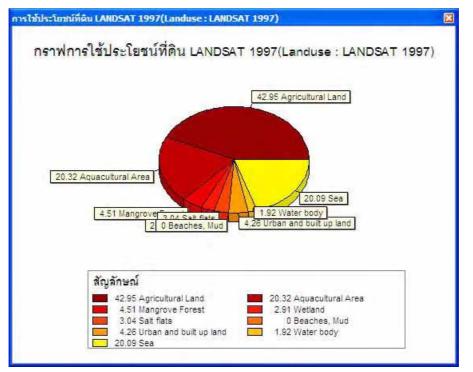


Figure 187 : Land Use Graph in 1997 (B.E. 2540) Landsat 1997

f.16 Land Use in 1988 (B.E. 2531) Landsat 1988

When click Attribute and select any position on the map of land use in 1988 (B.E. 2531) Landsat 1988, program will show details.

LU_CODE	NAME_E	NAME_T	AREA_1988	PER_1988
A0000	Agricultural	พื้นที่เกษตรก	2195.36	86.13
A0300	Mixed Peren	ไม้ยืนต้น, ไม้	97.23	3.81
A0900	Aquacultural	สถานที่เพาะเ	6.95	.27
F0300	Forest Plant	สวนป่า	6.07	.24
M0100	Rangeland,			3.85
00000	Urban and b	พื้นที่ชุมชนแ	99.55	3.91
W0000	Water Bodies	พื้นที่น้ำ	45.65	1.79
	1 1 1 1 1	ภกข้อมูล (Export to	Evcel)	

Figure 188 : Land Use Data in 1998 (B.E. 2531) Landsat 1988

When click Graph and select any position on the map of land use in 1988 (B.E. 2531) Landsat 1988, program will show graph.

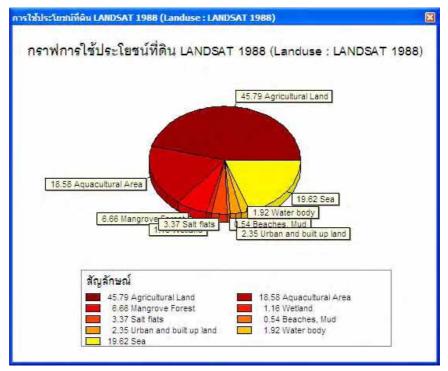


Figure 189 : Land Use Graph in 1988 (B.E. 2531) Landsat 1988

f.17 Streams and Rivers

When click Attribute and select stream and river, program will show window of stream and river details.

f.18 Transportation Route

When click Attribute and select transportation route, program will show window of transportation route details.

f.19 Population

When click Attribute and select population, program will show window of population details.

When click Graph and select the position of population data, program will show graph of population numbers of Samut Songkhram Province.

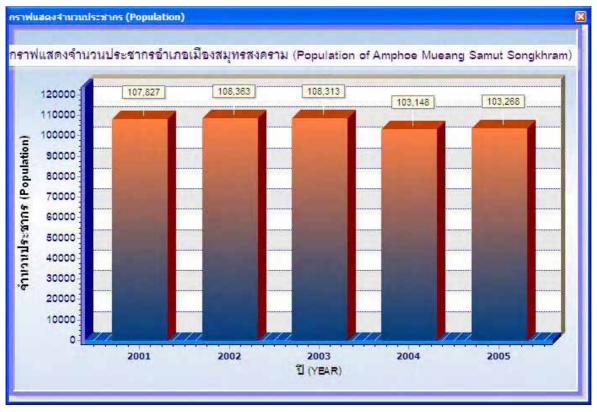


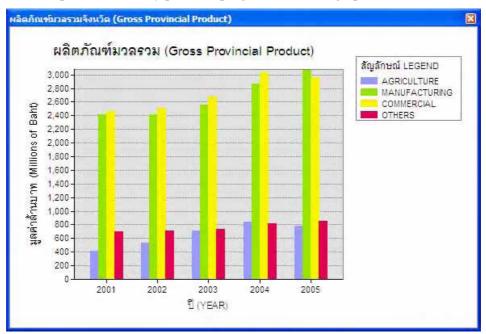
Figure 190 : Population Graph

f.20 Socio-economic) Economic Index)

When click Attribute and select any position of socio-economic data, program will show window of socio-economic details of the province.

2001	AGRICULTU	MANUFACT	COMMERCIAL	OTHERS	FISHING	T
2001	415	2,420	2,463	696	658	1,
2002	535	2,411	2,509	709	367	1,
2003	708	2,556	2,671	730	334	1,
2004	840	2,860	3,035	820	259	1,
2005	779	3,079	2,965	855	241	1,
<						>
สังคม (Numl	ber of Employed pers		a (Export to Exce	the f	Init : Millions of E	, and a
	ber of Employed pers	ons)	ລ (Export to Exce	the f		
YEAR	and the second second second second	ons)	ລ (Export to Exce	el)		
YEAR 2004	OCUPATION_E	ons)	a (Export to Exce	el)		
YEAR 2004 2004	OCUPATION_E Agriculture	ons) OCUPATION_T เกษตรกรรม	a (Export to Exce EMPLOYED 16940	el) RATIO 16.81		
สังคม (Numl YEAR 2004 2004 2004 2004	OCUPATION_E Agriculture Maufacturing	ons) OCUPATION_T เกษตรกรรม อุตสาหกรรม	a (Export to Exce EMPLOYED 16940 41134	RATIO 16.81 40.82		
YEAR 2004 2004 2004 2004	OCUPATION_E Agriculture Maufacturing Commercial	ons) OCUPATION_T เกษตรกรรม อุตสาหกรรม พาณิชยกรรม	a (Export to Exce EMPLOYED 16940 41134 19029	RATIO 16.81 40.82 18.88		

Figure 191 : Socio-economic Data



When click Graph and select any position, program will show graph of socio-economic data.

Figure 192 : Socio-economic Graph

f.21 DEQP GIS Database

When click Attribute and select the position in each field under DEQP GIS Database, program will show details window to explain the selected object as below example.

Layer	GIs Database			
1.	ห่าเรือ (Ports)			
2.	ธรณีวิทยา (Geology)			
☑ 3.				
4.	โรงเรียน (Schools)			
D 5.	จดเกิดอบัติเหต (Accider	ntal Point)		
entify R	lesults			1
	-			
ayers:	<top-most layer=""></top-most>			
= สถาน	ที่สำคัญ (Places)	Location: (610069.089547 14	87705.391607)	
E Ta	ambon Lat Yai Police Station	Field	Value	1
		point:PL_NAME_E point:PL_NAME_T point:IMAGE	Tambon Lat Yai Police Station สถานีตำรวจภูธรตำบลลาดใหญ่	
		point: SPOLYGONID	0	
		point: \$SCALE	0	
		point: \$ANGLE	0	
		places.pl_type:Rowid	24	
		places.pl_type:PL_TYPE		
		places.pl_type:TYP_NAM_E places.pl_type:TYP_NAM_T		
				107

Figure 193 : Data Example

- Ports
- Geology
- Places
- Schools
- Accidental Point
- Well
- Soil Series
- Slope
- Spot Height
- Elevation
- Aspect
- Aquifer
- Water Body
- Basin
- Watershade
- Ramsar Wetland Site

f.22 Base Map

Base Map is usable to specify object position by administration boundary area divided into 4 levels as follows;

- Villages
- Amphoe
- Tambon
- Municipalities

Appendix

	PEQMP GIS Database	Attribute	Graph	Link
		Attribute		LIIIK
1.	Air Quality PCD			
2.	Noise Quality Monitoring Stations	V	V	
3.	Water Quality Monitoring Stations JICA	~	~	
4.	Water Quality Monitoring Stations PCD	\checkmark	~	
5.	Weather	\checkmark	\checkmark	
6.	Factories	~		
7.	Ports	\checkmark		
8.	Hospital	\checkmark		
9.	Tourist and Natural and Cultural Heritage Sites	~		\checkmark
10.	Disposal Site	~		\checkmark
11.	Water purification plant	✓		\checkmark
12.	Water Level Section	\checkmark		
13.	Slaughter house	\checkmark		
14.	Waste water treatment plant	\checkmark		\checkmark
15.	Provincial Development Plan	~		\checkmark
16.	Landuse year 2007 (Spot-5)	~	\checkmark	
17.	Landuse year 2007 (Landsat-5)	\checkmark	\checkmark	
18.	Landuse year 1997 (Landsat-5)	\checkmark	\checkmark	
19.	Landuse year 1988 (Landsat-5)	\checkmark	\checkmark	
20.	Streams and Rivers	~		
21.	Transportation	\checkmark		
22.	Population	✓	\checkmark	
23.	Economic index	\checkmark	\checkmark	

Related Table for Program Function with Samut Songkhram Province GIS Database

Related Table for Program Function with Samut Songkhram Province GIS Database (Cont.)

	(Cont.)			
	DEQP GIS Database	Attribute	Graph	Link
1.	Geology	\checkmark		
2.	Places	\checkmark		
3.	Schools	\checkmark		
4.	Accidental Point	\checkmark		
5.	Well	\checkmark		
6.	Soil Series	\checkmark		
7.	Slope	\checkmark		
8.	Spot Height	\checkmark		
9.	Elevation	\checkmark		
10.	Aspect	\checkmark		
11.	Aquifer	\checkmark		
12.	Water Body	\checkmark		
13.	Basin	\checkmark		
14.	Watershade	\checkmark		
15.	Ramsar Wetland Site	\checkmark		
	Base Map			
1.	Villages	\checkmark		
2.	Amphoe	\checkmark		
3.	Tambon	\checkmark		
4.	Municipalities	\checkmark		

5.4 ArcReader Manual for Samut Songkhram Province (for GIS Database User)

ArcReader is an application program for map display, attribute data viewing, and published map document (*.pmf) printing. This program is based on ArcGIS with ArcPublisher using, and is also available for free to download.

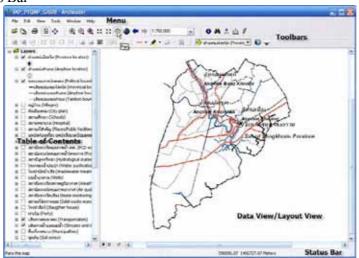
a. Open ArcReader

Click "Start" at Windows taskbar and go to ArcGIS > ArcReader, then click to open program



b. ArcReader Components

- 1) Menu
- 2) Toolbars
- 3) Table of Contents
- 4) Data View
- 5) Layout View
- 6) Status Bar



c. ArcReader Instructions

ArcReader instructions can access from "Menu" or "Toolbars". The Menu options are provided below.

File Edit View Tools Window Help

Frequently used instruction in Menu can access from Toolbars. When point the mouse to each tool, it will have balloon pop-up to show their name and explanation at "Status Bar". All features are described below.

c.1 File Toolbars



Tool	Name	Function
2	Open	Open "Published Map Documents" file (*.pmf)
₽ D	Recent Files	Open used file
a	Print	Map printing
	Toggle Table of Contents	Show/hide "Table of Contents"
¢	Toggle Application Into Full Screen Mode	Switch to normal and full screen

c.2 Navigation Toolbars



Tool	Name	Function	
•	Zoom In	Expand the map by click desired area or drag mouse as square area	
Q	Zoom Out	Compress the map by click desired area or drag mouse as square area	
æ	Continuous Zoom/Pan	Continuous expand/compress the map by hanging mouse then move down to expand or move up to compress	
ж Ж	Fixed Zoom In	Expand the map in center area	
53	Fixed Zoom Out	Compress the map in center area	
EM)	Pan	Move the map by hanging mouse then move to desired direction	
٢	Full Extent	Show the coverage map	
4	Go Back To	Back to previous screen before	
-	Previous Extent	expand/compress or move the map	
-	Go Back To	Back to next screen before expand/compress	
-	Next Extent	or move the map	
1:100,000	Zoom To Scale	Show the map in specified scale	

c.3 **Data Toolbars**



Tool	Name	Function	
0	Identify	Look up attribute data by click to the tool of desired data	
#4	Find	Explore data by click to fill in the term condition	
×Y	Go To XY	Go to XY position by click to fill in the co-ordinates	
± ? →	Measure	Distance measure by click to estimate distance of the map	
4	Hyperlinks	Linkage to hyperlinks data	

c.4 Layout Toolbars

🎯 🖨 🛤 🖾 🖬 🛱 🛶 🗟 100% 🔤

Tool	Name	Function
\odot	Zoom In	Expand the map in "Layout View" by click desired
-		area or drag mouse as square area
\Box	Zoom Out	Compress the map in "Layout View" by click desired
•		area or drag mouse as square area
Ð	Pan	Move the map in "Layout View" by hanging mouse
\sim		then move to desired direction
	Fixed Zoom In	Expanding center area of the map in "Layout View"
2	Fixed Zoom Out	Compressing center area of the map in "Layout View"
	Zoom Whole Page	Show the coverage "Layout View"
11	Zoom To 100%	Show 100% scale of "Layout View"
	Go Back To	Back to previous screen before expand/compress or
	Previous Extent	move the map in "Layout View"
	Go Back To	Back to next screen before expand/compress or move
	Next Extent	the map in "Layout View"
6	Change Title	Rename map in "Layout View"
100% 🔽	Zoom To Percent	Show "Layout View" in specified scale

Layer Effects Toolbars c.5

	🧇 ตำแหน่งจังหวัด (Provinc 💌 🕕 🛶					
Tool	Name	Function				
🧇 ตำแหน่งจังหวัด (Provinc 💌	Layer List	Select desired layer				
Ð	Transparency	Modify transparency of the selected layer				
T	Swipe Layer	Modify hidden layer				
c.6 Markup Tool	bars					



Tool	Name	Function
	Pen	Graphic drawing on the map
<u>e</u> -	Highlighter	Graphic highlighting on the map
01 -	Eraser	Delete graphic on the map

d. Open Published Map Documents

Click to 🖆 "Open" or click to menu "File > Open" then select "Published Map

Documents" file (*.pmf) and click to "Open"

elect Publishe	d Map Docum	nent	_		2.2
Look in:	C SKP_PEO	MP_GISD8	~	1 1 0	œ∙
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My Computer	File name:	SKP_PEQMP_GISD8		×	Open
My Network	Files of type:	Published Map Documents		~	Cancel

In addition, user can open used files by click to "Recent Files" D or go to "Windows Explorer" then double-click at "Published Map Documents" file (*.pmf) to open and access program directly.

e. Table of Contents Usage

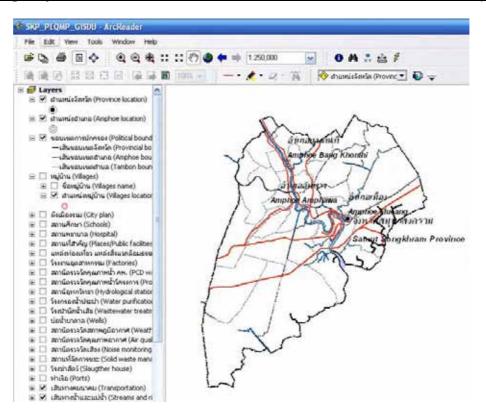
"Table of Contents" is a space to show data list and symbol. User can access step-by-step as shown below.

e.1 Open/close data layer

User can open/close layers to display in "Data View" and "Layout View" from "Table of Contents" by select \blacksquare in front of wanted layer to display or select \square in front of wanted layer to not display. The open/close selected layer is comprised of data label and layer.

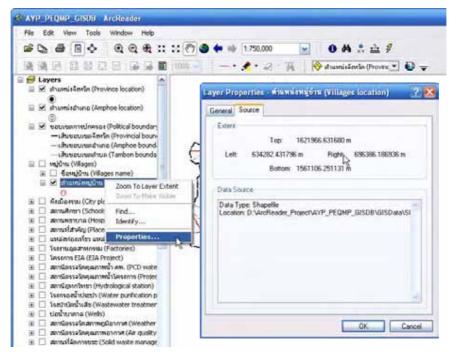
e.2 View hidden layer

User can view hidden layer and their symbol by click \pm to show details of layer or click \equiv to hide details of layer.



e.3 View layer properties

User can view layer properties such as general data and data source by right-click to layer and choose "Properties".

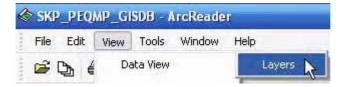


f. Data View Usage

"Data View" is a map display window which user can display selected layer of the map from "Table of Contents". User allowed applying various tools for mapping from "Navigation Toolbars". When point the mouse at "Data View", the geographical co-ordinates will appear in status bar also.

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If current status is "Layout View", it can back to "Data View" by click to menu "View > Data View".



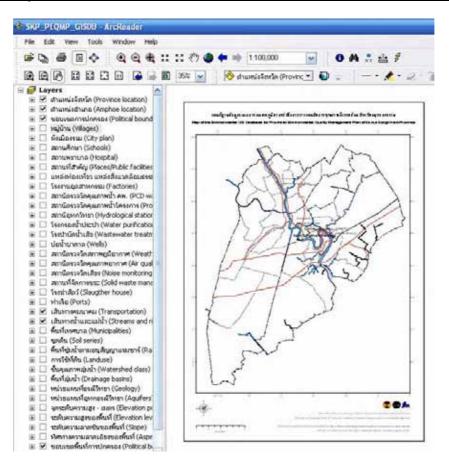
g. Layout View Usage

"Layout View" is a map printing window which user can display selected layer of the map from "Table of Contents". User allowed applying various tools for mapping from "Navigation Toolbars" to defined scale and boundary for display mapping in "Layout View". For display a printing map, user can apply various tools in "Layout Toolbars". When point the mouse at "Data View", the geographical co-ordinates will appear in status bar also.



User can go to "Layout View" by click to menu "View > Layout View".

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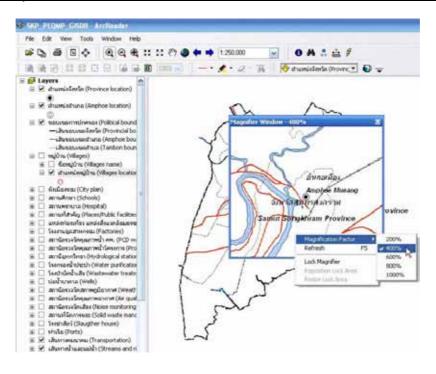


h. Magnifier Window Usage

"Magnifier Window" is a tool for details map showing without mapping adjustment in "Data View". User can access to this function by click to menu "Window > Magnifier".

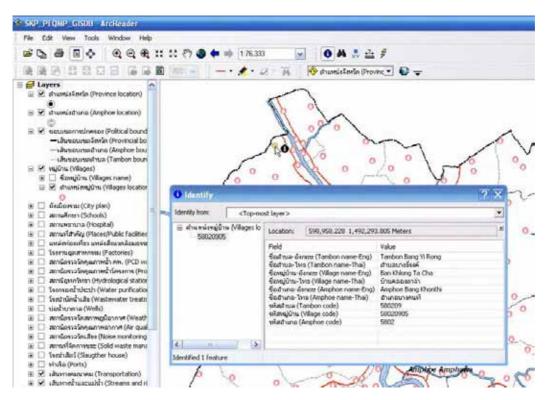


In this regard, user can move "Magnifier Window" to the position that wants to expand. Then choose the wanted size to be enlarged by right-click at "Magnifier Window" and select "Magnifier Factor".

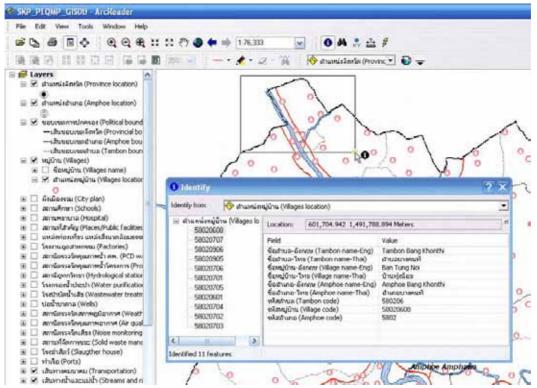


i. Attribute Data Viewing

User can use "Identify" tool to view an attribute data by click to "Identify" at the position that want to view their attribute data in "Data View" or "Layout View".



User can also use "Identify" tool to drag frame in "Data View" or "Layout View" for display a group of selected data.



The "Identify" command will use the top layer as default; therefore, it can not select wanted layer in sometime. User can specify a condition to "Identify" by using "Identify from".

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Furthermore, the "Identify" view is allowed user to apply other commands by right-click to activate selected layer as follows.

- Flash Flash to layer
- Zoom To Expand to layer
- 🖤 Pan To Move to layer

Sort Ascending – Data sort from less to more

Remove from Tree - Delete layer from "Identify" window

Copy Record – Copy attribute data

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The "Identify" window also shows geographical co-ordinates of active layer in "Location". User can change the co-ordinates system to display by click to "Choose Units" Z.

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j. Data Searching

"Find" is a tool for data searching. User can explore by click to "Find" and fill the condition in "Find" window, then click to Find button. Finding results will appear at below window.



From "Find" window in search results, user can apply other commands by right-click to activate a search results as follows.

- 🗱 Flash Flash to layer
- 😟 Zoom To Expand to layer
- 🖑 Pan To Move to layer
- **1** Identify View attribute data of layer
- Add to My Places Create "My Places" position
- Manage My Places Manage "My Places" position

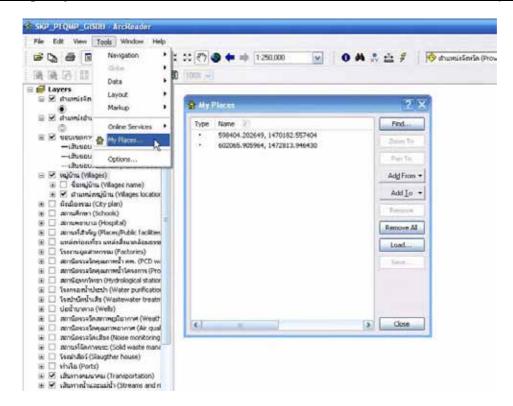
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		Add to My Places	
		Find Nearby Places	

k. My Place Usage

"My Places" is a data making to identify the position or place which user want to use again without searching. From "Find" window in search results, user can bookmark any results in "My Places" by right-click to wanted data and select "Add to My Places".

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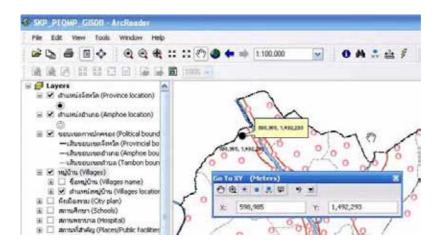
User can manage "My Places" by click to menu "Tools > My Places".



I. Go to XY Position

User can use "Go To XY" **x** tool to go to XY position by fill co-ordinates in "XY" gap and apply below commands.

- Pan To Move to co-ordinates position
- Zoom To Expand to co-ordinates position
- Flash To Flash to co-ordinates position
- Mark XY Show co-ordinates point on the map
- Text XY Show co-ordinates value on the map
- Label XY Show co-ordinates label on the map
- Undo Select previous co-ordinates
- Choose Units Change co-ordinates input system

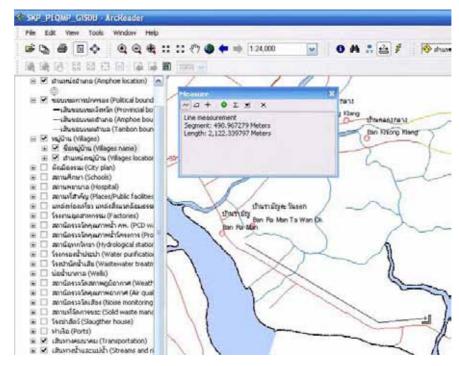


m. Distance Measurement

User can use "Measure" tool to measure a distance by click "Measure" tool to measure a distance by click "Measure" to hen "Measure" to show below commands.

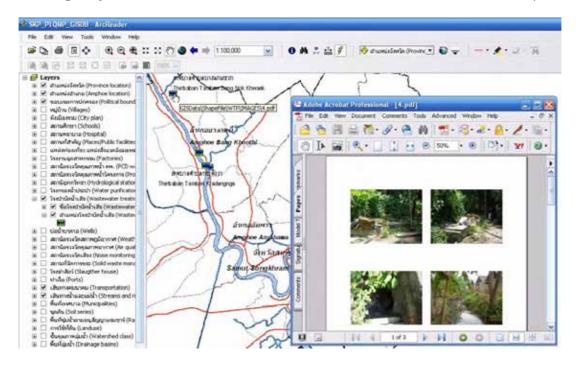
- Measure Line Length measurement
- Measure An Area Area measurement
- + Measure A Feature Position measurement
- Snap to Features (on/off) On/off move the measured position to data
- Σ Show Total (on/off) On/off show total distance measurement
- Choose Units Change unit of measurement
- ➤ Clear and Reset Results Clear "Measure" window

In order to measure, user can click to the beginning position and click to the next position until to the last position for distance or area measurement. Results will show in "Measure" window.



n. Linkage to External Data

Some layer of "Published Map Documents" is link to external data such as picture, document, website etc. User can view those linkages in "Table of Contents" and click to "Hyperlinks" fool. The linkage data will show • symbol, user can click to view details.

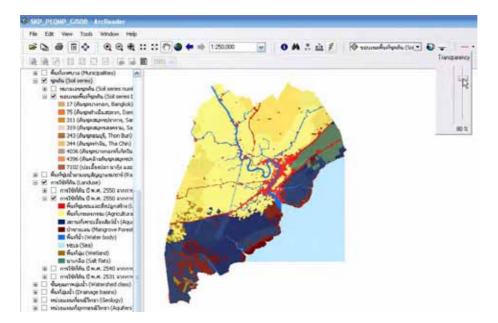


o. Display Layer Modification

Display layer can modify by 2 methods of "Layer Effects Toolbars" as follows.

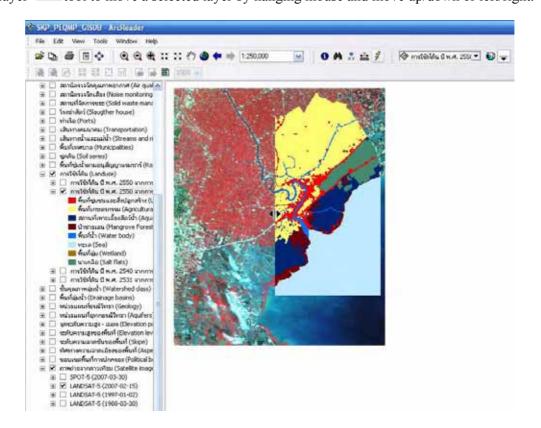
o.1 Layer List – Layer transparency adjustment

Select layer by click to "Layer List" from "Layer Effects Toolbars", then click "Transparency" tool to adjust by hanging mouse at transparency bar and move up to increase or move down to decrease layer transparency.



o.2 Swipe Layer – Manage hidden layer

Select layer by click to "Layer List" from "Layer Effects Toolbars", then click "Swipe Layer" $\overline{}$ tool to move a selected layer by hanging mouse and move up/down or left/right.



p. Graphic Drawing on the Map

User can draw a graphic to highlight an interested data on the map to use for another propose such as report or presentation. In order to labeling on the map, click "Markup Toolbars" to mark any figure by following tools.

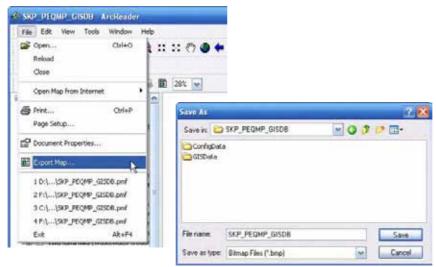
- Pen Graphic drawing on the map
- Highlighter Graphic highlighting on the map
- Eraser Delete graphic on the map

After used "Markup Toolbars", a pmfink file will be created to keep the created graphic file. It has a same file name with "Published Map Documents". Next time to open "Published Map Documents", program will run dialog box to ask user that want to use "Markup" with "Published Map Documents" or not? User can determine on this option.



q. Map Exportation

User can export mapping data to picture as Bitmap Files (*.bmp) to use for report or presentation by click to menu "File > Export Map". Then browse and save file location, put the file name, and click Save to save data.



While exporting map in "Data View" window, it will export data display in "Data View" only. Similarly, while exporting map in "Layout View" window, it will export full map.

r. Map Printing

User can print out map by click menu "File > Page Setup" to define paper size and click

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		OK Cancel Portes

After that, click menu "File > Print" to define printer properties and click

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While printing map in "Data View" window, it will print data display in "Data View" only. Similarly, while printing map in "Layout View" window, it will print full map.