Database Operational Manual

THE PROJECT ON CAPACITY DEVELOPMENT FOR MINING ADMINISTRATION IN THE KINGDOM OF CAMBODIA

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Japan International Cooperation Agency (JICA)

Significant changes

- Inspection Folder, inspection report are added.
- Geological map of whole country, Legend is updated.
- National_data, River.shp is corrected fitting to WGS1984
- Template_Concession.xls, new input field of datum is added.
  - Zones for Multiple zones of single license.
  - Datum for different datum of XY coordinates, Recent concessions are given on WGS1984, instead of previous datum of Indian1960.
- Dept_Construction, Line concession is added, and merged.
- Commodity code is updated, with 2 additional commodities.
- Template_License.xls, new input field of commodity2 is added. Construction licenses permit two commodities in cases.
- License data and Concession data are joined through Code_N.
- Revenue data and License data are joined through License_ID.

Table of contents

Database Operational Manual (GDMR) JICA Project

1. General information

This is a manual for creating GDMR database. The main purpose of the database is to share data over department of GDMR to improve management of mining activity. This database is based on GIS because most data consist of spatial data such as a concession map, a province map, a geological map etc... Chapter 1 shows;

- The structure of the database, and the list of data (ch1-1),
- Responsibility to data (ch1-2),
- Required softwares to create the database (ch1-3),
- Applied coordinate system (ch1-4)
- Workflow of this manual (ch1-5).

Abbreviate the name of Departments of GDMR, as below;

Department of Geology	Dept. Geology
Department of Mineral Resources Development and Promotion	Dept. Promotion
Department of Mineral Exploration Management	Dept. Exploration
Department of Construction Materials	Dept. Construction
Department of Mining	Dept. Mining

1-1 List of data and the storage structure

Data to be shared in GDMR are listed in table below.

List of data

Category	Content	File name
License Certificate (of 3 Departments)	Concession coordinates	Concession_***.xls
	License information	License_***.xls
	Company list	Company ID/code_***.xls
Revenue data	Payment record	Revenue.xls
Operation data	Mines data	Mines_***.xls
Company report	Report, Data	Information only uploaded
ASM information		Information only uploaded
Remote Sensing data	Airphoto dataset	Printed (No digital file)
	ASTER dataset	GeoTIFF images for 18 areas
National data	Admin map	Province_boundary.shp District_boundary.shp Commune_boundary.shp

Category	Content	File name
	Topographic map	River_system.shp Elevation_contour.shp
	Transportation map	Code_Road.xls Road.shp Airport.shp Port.shp
	Protected area map	Protected_area.shp
	CMAC¥Bombing	b52.shp b52dot.shp
	CMAC¥Mine_Field	ordnance_kh.shp Completion_Minefield.shp Confirmed_Minefield.shp Residual_Minefield.shp Suspected_Minefield.shp
Geological data	Geological_map_750k	Geological_map_750k.shp Fault.shp
	Geological_map_200k (14sheets)	Kampong_kngeo.shp KamponSom_ksgeo.shp Kampot_kpgeo.shp KohKong_kkgeo.shp KrochChhma_krgeo.shp Mondulkiri_mrgeo.shp PhnomPenh_ppgeo.shp Pursat_psgeo.shp Ratanikiri_rrgeo.shp Siemreap_srgeo.shp Sisophon_sisgeo.shp StrungTreng_stgeo.shp SvayRieng_svgeo.shp TbengMeanchey_tbgeo.shp
	Mineral resource map	Cambodia_minerals.shp
Inspection data		Inspection_P.shp
	InspectionReport	REPORT.pdf

*** : short name of managing department (Geology, Promotion, Exploration, Construction, Mining)

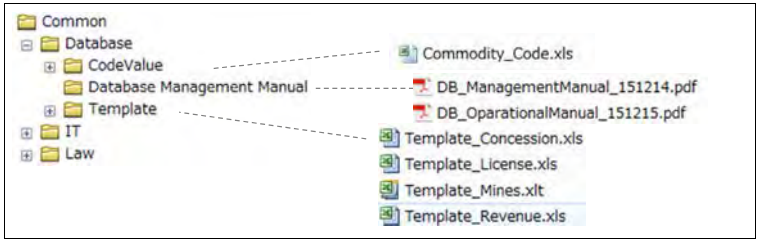
1-1-1 Structure of this database

Since including spatial data like concession map, this database based on GIS. The map is shown by ArcMap of ArcGIS, one of GIS softwares. The ArcMap file, "GDMR_Database.mxd", is stored at the top of main folders. Individual data are stored in the folders of each department. ArcMap file itself has never contain the actual data, just has connecting paths of data and map setting. So when backup, you have to copy the all files and sub-folders which compose a map.

Folder structure

"Common" folder

Common folder contains this manual document and a diagram of folder structure, commodity code which is input in license.xls, and template files for starting to input data.



"National_data" folder

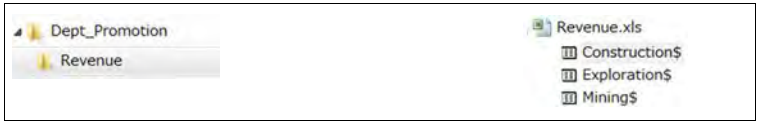
ArcMap file "GDMR_Database.mxd" connects toporaphic data such as "Elevation_contour.shp", "River_system.shp", and transportation data of "Road.shp", "Port.shp", "Airport.shp" and admin boundaries such as "Province_boundary.shp".

"Dept_Geology" folder

ArcMap file "GDMR_Database.mxd" connects geological data of "Geological_map_750k", 14sheets of local geological maps of 200k (1:200,000), and mineral resource map of "Cambodia_minerals.shp". .

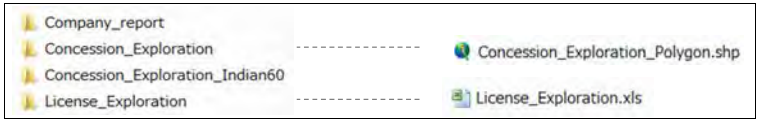
"Dept_Promotion" folder

ArcMap file "GDMR_Database.mxd" connects table data of "Revenue.xls", which consists of three sheets .



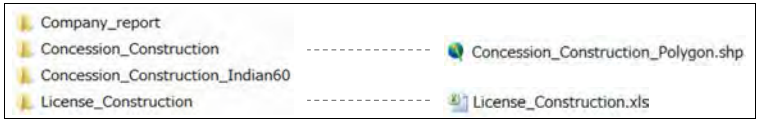
"Dept_Exploration" folder

ArcMap file "GDMR_Database.mxd" connects spatial data of "Concession_Exploration_Polygon.shp", and table data of "License_Exploration.xls". The folder "*_Indian60" is an intermediate work-folder for create a concession polygon shapefile.



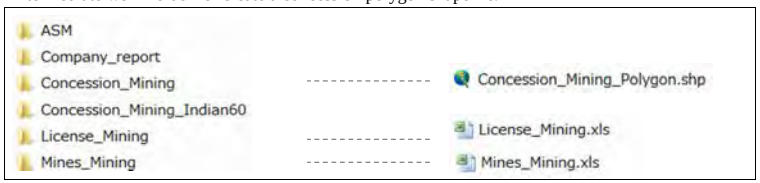
"Dept_Construction" folder

ArcMap file "GDMR_Database.mxd" connects spatial data of "Concession_Construction_Polygon.shp", and table data of "License_Construction.xls". The folder "*_Indian60" is an intermediate work-folder for create a concession polygon shapefile.



"Dept_Mining" folder

ArcMap file "GDMR_Database.mxd" connects spatial data of "Concession_Mining_Polygon.shp", and table data of "License_Mining.xls" and "Mines_Mining.xls". The folder "*_Indian60" is an intermediate work-folder for create a concession polygon shapefile.

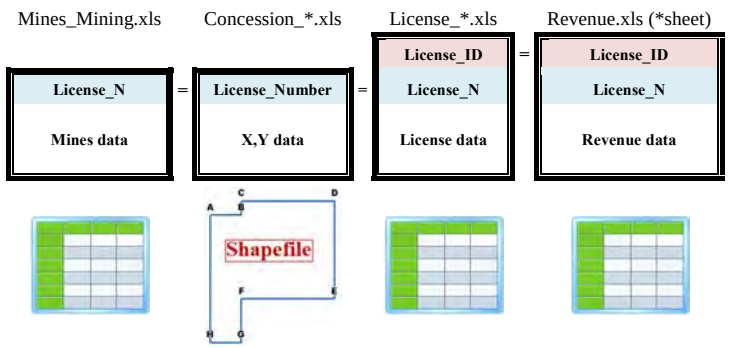


"Inspection" folder

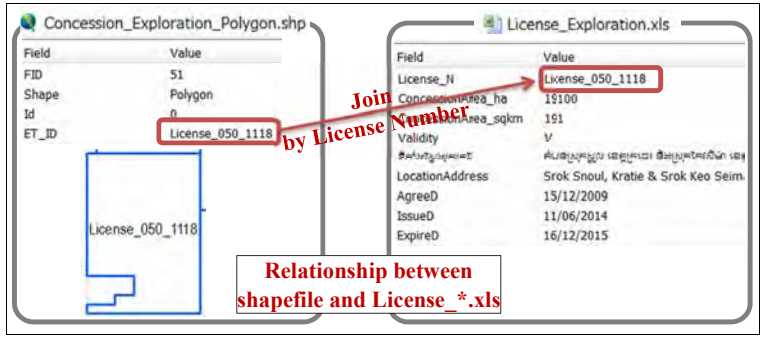
Mine safty inspection data should be stored here. Inspection site is shown on map by point shapefile. When you click the point of inspection site after hyperlink is active, jump to the PDF-format report.

Relationship between data

License data and concession, mines data are joined by License number, within each department. However, revenue data, which cover licenses of all departments, are joined by License ID. License ID is assigned by Department of Promotion.



*: Name of department in charge of license

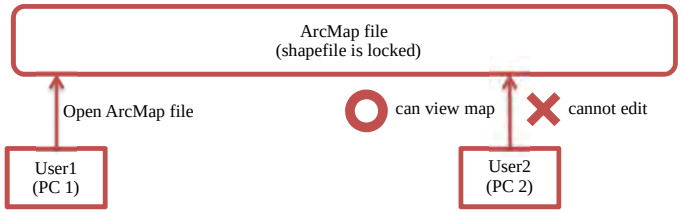


1-1-2 Accessibility to the database

The accessibility of this database is limited within GDMR.

Limitation of sharing an ArcMap file

When one user is using the ArcMap file (GDMR_Database.mxd), other users can open the same ArcMap file and view the map. However, to edit the shapefile, or to save (not as another filename) is impossible, during someone open the ArcMap file. One solution enable to edit by users at same time, is to create geodatabase (file geodatabase) from shapefiles, raster images and table data of Excel.



1-1-3 File type in this database

This database is composed of spatial data, table data, and document files, as listed below.

	Kind of data	File type
Spatial data (GIS data)	Vector data	Shapefile (shp) GoogleEarth file (kmz, kml) GPS file (gpx)
	Raster data	GeoTIFF file (tif)
Non-spatial data	Tabular (Table) data	Microsoft Excel file (xls, xlsx)
	Document	PDF file (pdf) Microsoft Word file (doc, docx)
	Image/scanned document	PDF file (pdf) Image file (jpg, tif, gif, png,…)
	Information (list of data) Memo/log for update	Microsoft Excel file (xls, xlsx) Text file (txt)

About shapefile

One shapefile consists of several files, as listed below. Do NOT delete one of them.

SHP	The main file that stores the feature geometry (required)
DBF	The dBASE table that stores the attribute information of features (required)
SHX	The index file that stores the index of the feature geometry (required)
PRJ	The file that stores the coordinate system information

Shapefiles shall be separated by feature type.

Point	Mineral occurrence location, Mining site location
Polyline (Line)	Road, River
Polygon (Area)	Concession area, Provinces

1-2 Responsibility to data

1-2-1 Responsible department

Data are stored in 7 main folders. Responsibility to data, including update and backup is assigned as below.

Folder name	Responsible office for the containing data
Common	Database administrators
National_data	Any officer to obtain latest data
Dept_Geology	Officers of Department of Geology
Dept_Promotion	Officers of Department of Promotion
Dept_Exploration	Officers of Department of Exploration
Dept_Construction	Officers of Department of Construction
Dept_Mining	Officers of Department of Mining

1-2-2 Backup

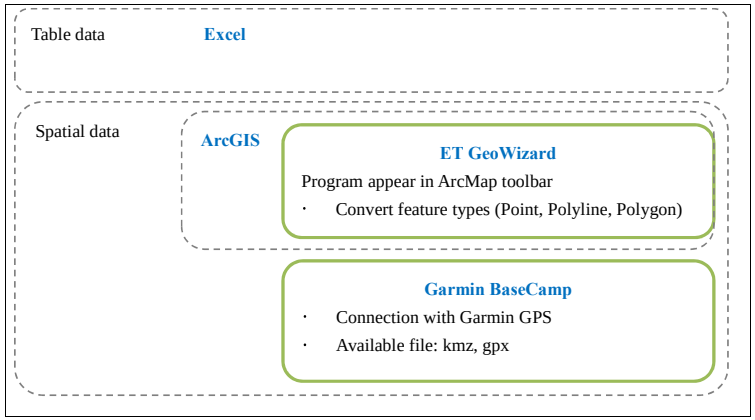
Hard disk of Server or PC has a risk to be broken unexpectedly. Data should be back up in other computers or hard disks. Copy each department data (under each department folder) to another

storage. The schedule of backup is shown below.

Data for backup	Time to backup	Responsible person
Whole database (except National_data)	End of month	Database administrators
National_data (80GB of data size)	End of Year (& Time to be updated)	Database administrators
Folders of each department	Decided by each department	Each department officers

1-3 Software required

This database is build based on the policy to use common software to GDMR. Such a GIS software is ArcGIS. For software handling tabular/table data, Microsoft Excel is chosen because of availability to many PC. Other required softwares are free downloadable and trusted ones.



1-3-1 Microsoft office (Excel)

For Table data, Microsoft Excel is one of common softwares already installed in many PC. That's why we use Excel at the starting database system. Other softwares for table data are usable to ArcGIS-based database system, such as Microsoft Access, database software like SQL Server.

1-3-2 ArcGIS 10.0

ArcGIS has three kinds of products; ArcView, ArcEditor, and ArcInfo. This manual is described based on ArcView, the basic type. ArcGIS Desktop 10.0, for stand alone PC, is composed of ArcCatalog and ArcMap, with a tool, namely ArcToolbox which is accessible from both programs.
Version 10.0 of ArcMap can open the older version (Ver.9) of MXD file. But it can NOT open the

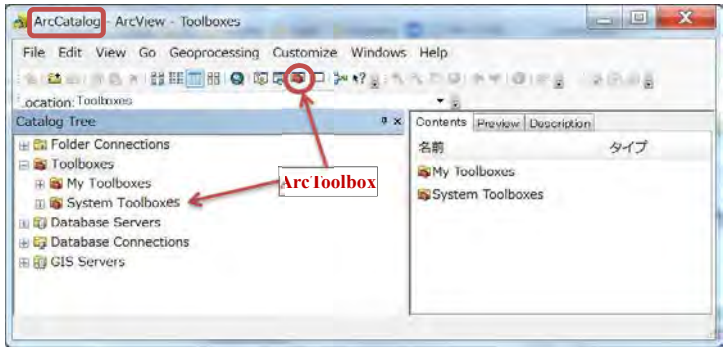
later version (Ver.10.1, Ver.10.2, Ver.10.3). Check your software version, in help menu of either ArcCatalog or ArcMap.

ArcMap File version	Available Software version
Version 9 (mxd file)	ArcGIS 9 ArcGIS 10.0 ArcGIS 10.1 ArcGIS 10.2 ArcGIS 10.3
Version 10.0 (mxd file)	ArcGIS 10.0 ArcGIS 10.1 ArcGIS 10.2 ArcGIS 10.3
Version 10.1 (mxd file)	ArcGIS 10.1 ArcGIS 10.2 ArcGIS 10.3
Version 10.2 (mxd file)	ArcGIS 10.2 ArcGIS 10.3
Version 10.3 (mxd file)	ArcGIS 10.3

	Typical function
ArcCatalog 	File managing (copy & paste) Create a new shapefile View Vector & Raster data, Table data Convert vector file to shapefile (with ArcToolbox)
ArcMap 	Edit a shapefile, Calculate geometry of objects Georeference of raster image, create GeoTIFF file Convert vector file to shapefile (with ArcToolbox) Create & Layout a map Search and Spatial analysis of objects Print out a map

1-3-2-1 ArcCatalog

ArcCatalog is used for file managing like copy and paste, move, and to create new shapefile. Shapefile is composed of several types of file in a windows folder. In ArcCatalog a series of these files appear as one shapefile so easily to handle. ArcCatalog is a useful viewer for shapefile and other vector files like DXF file, image file, table data like Excel file, and some relational databases like Access,SQL Server. With ArcToolbox, ArcCatalog can run various functions such as a conversion between different file type or different coordinate system.

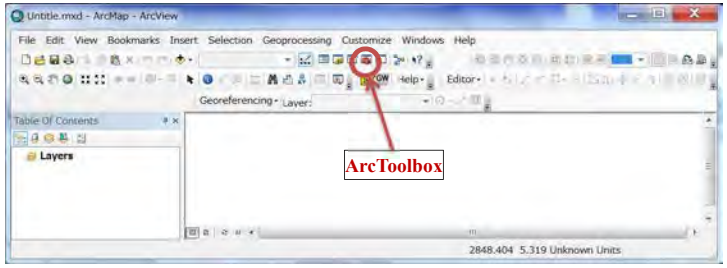


Check your software Version

Help > about ArcCatalogue…

1-3-2-2 ArcMap

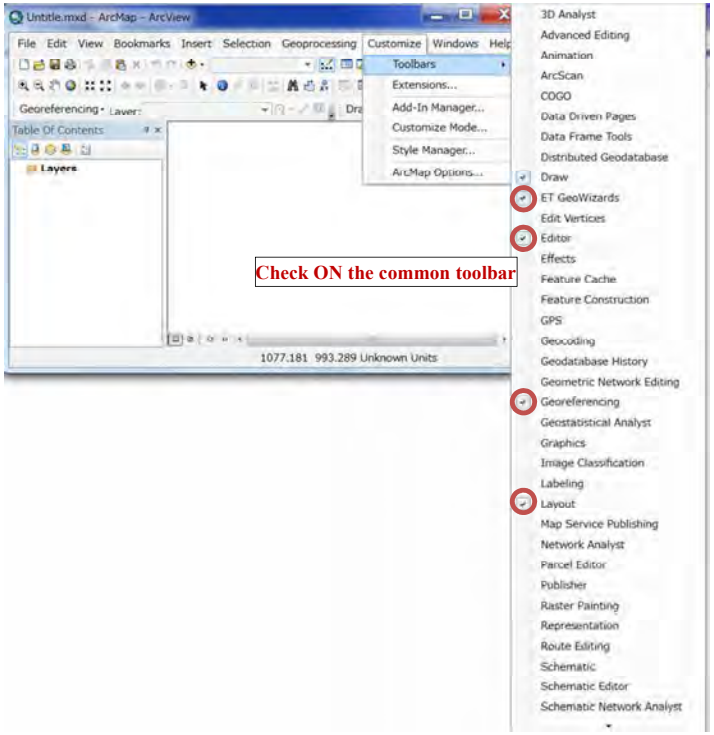
ArcMap is used for creating a map, by overlay of layers of vector and raster files. Another function is to edit of shapefiles, create GeoTIFF file from raster image by georeferenced, spatial search or calculation for objects in map. With ArcToolbox, ArcMap can run various functions such as a conversion between different file type or different coordinate system.



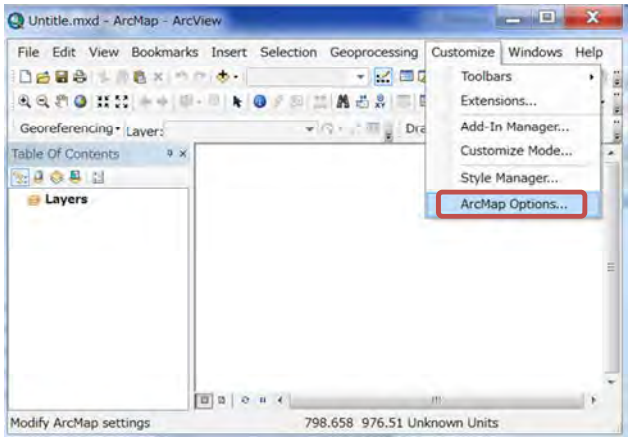
Help > about ArcMap

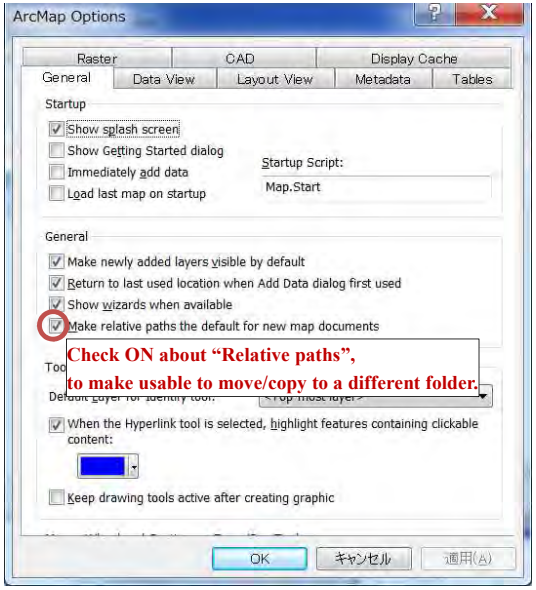
1-3-2-3 Setup your ArcMap

Setup toolbars shown on window.



Setup Relative paths, for creating new ArcMap file.

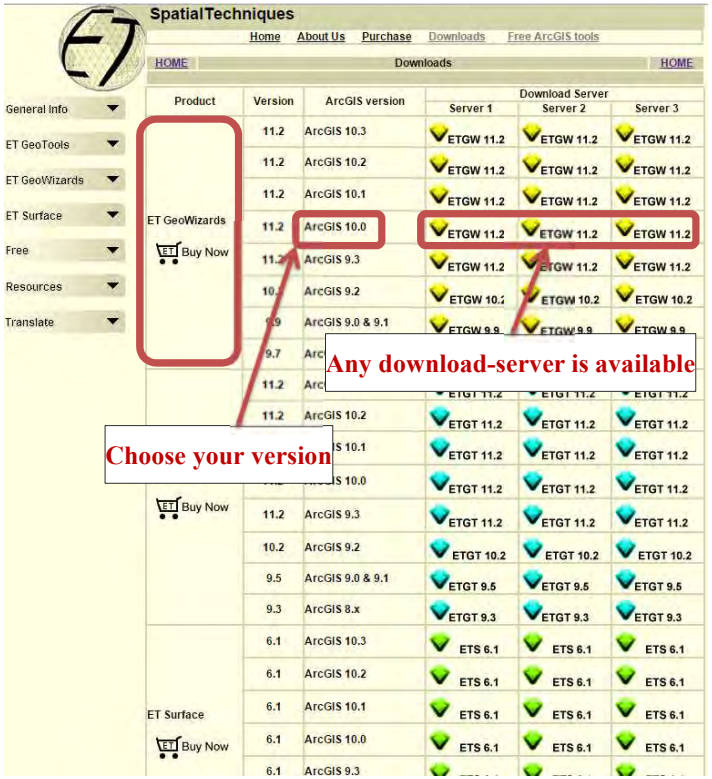




1-3-3 ET GeoWizard (Add-in of ArcMap)

ET GeoWizard is an add-in tool of ArcMap. This appear on ArcMap toolbar. This is a free software with limited function such as conversion of a shapefile between point, line, and polygon.

http://www.ian-ko.com/



Download a zip file in your PC, then unzip it, run “setup.exe”.

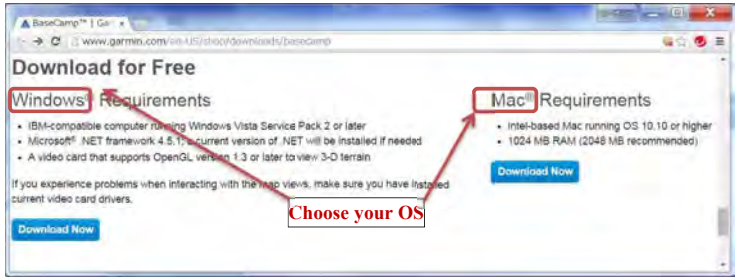
One of free unzip softwares is available from the website http://www.7-zip.org/download.html

1-3-4 Garmin BaseCamp

This software is used for GPS data exchange, described in chapter 9-2. Garmin BaseCamp can export spatial data to GPS, or to import data from GPS. This is a free software of Garmin product. The download site is

http://www.garmin.com/en-US/shop/downloads/basecamp

Choose either one download file as of your OS

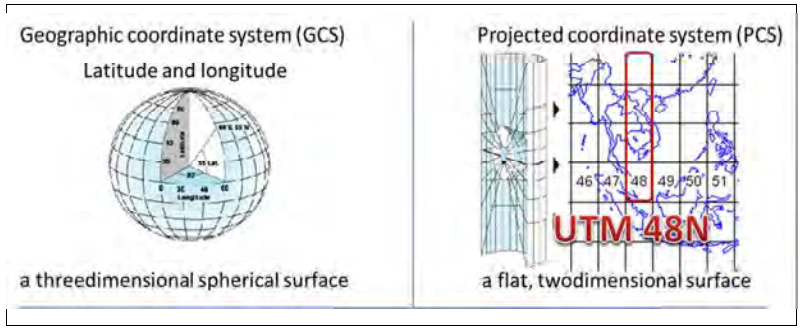


1-4 Applied coordinate system to this database

The coordinate system is composed of map projection and datum.

1-4-1 Map projection

Most common in worldwide is a geographic coordinate system (GCS), shown by latitude and longitude. Other common is a projected coordinate system (PCS), shown by X and Y value on 2-dimensinal grid. UTM is the typical one used over the world. Cambodian country is located in 48N zone of UTM.



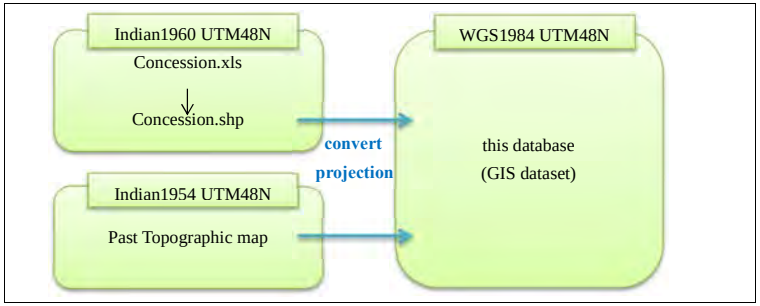
1-4-2 Map datum

In Cambodian land, two kinds of datum are commonly used;
Indian 1954 is used commonly in past topographic maps.
Indian 1960 is officially used in license certificate of GDMR.

1-4-3 Coordinate system in this database

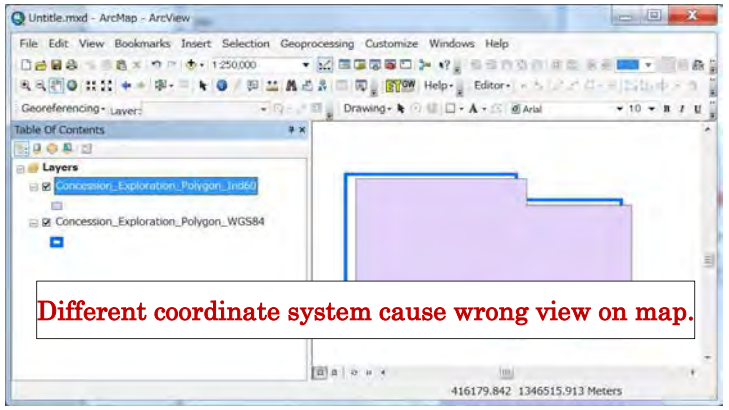
When applying the coordinate system to spatial data in ArcGIS, follow the step to choose ;
1) Map projection ---> 2) Region ---> 3) Name of coordination system

Map projection	Region	Name of coordinate system	Example
Geographic Coordinate Systems (Latitude,Longitude)	World	GCS_WGS_1984	GoogleEarth file
	Asia	GCS_Indian_1954	Past topographic map
		GCS_Indian_1960	
Projected Coordinate Systems (UTM)	Asia	Indian_1954_UTM_Zone_48N	Past topographic map
		Indian_1960_UTM_Zone_48N	Coordinates on License
	WGS 1984	**WGS_1984_UTM_Zone_48N**	**In this database**



1-4-4 Alert about coordinate system in ArcMap

Do NOT mix the layers of different coordinate system in the same map (same data frame).
Otherwise ArcMap shows wrong location, or wrong special analysis.



1-5 Workflow of this manual

This manual consists of nine chapters.

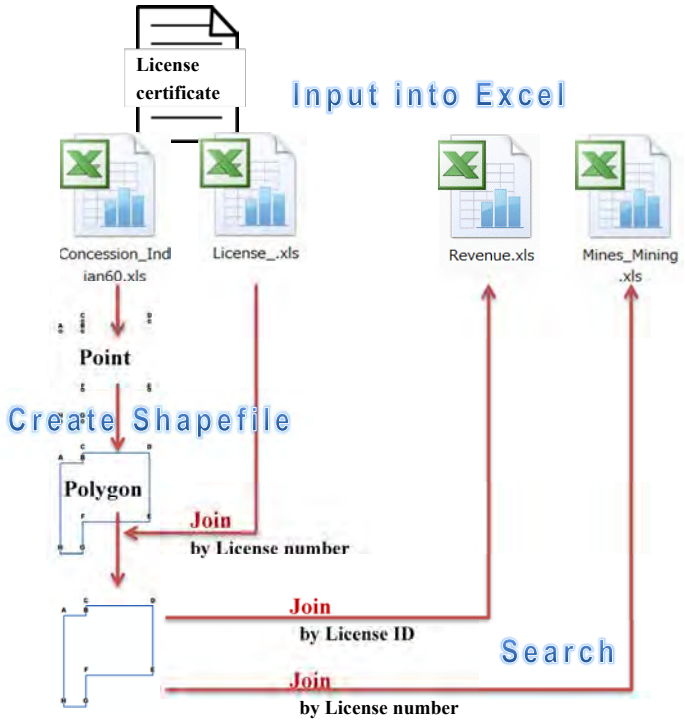
	For Editors (to create database)	For Users in GDMR
Ch1	General (Architecture of database) Install additional tools	General (Architecture of database) Install additional tools
Ch2	Input into Excel	
Ch3	Create concession shapefile (from Excel) Convert Coordinate system Convert from Point to Polygon Edit/draw shapefile	
Ch4	Convert DXF/ KML to shapefile Convert JPG to GeoTIFF (Georeference)	
Ch5	ArcMap (Layer control, Symbology, Save)	
Ch6	Update data	
Ch7		ArcMap (View map, Join table data, Search concessions)
Ch8		ArcMap (Layout, print)
Ch9		GoogleEarth data GPS data

Chapter 1 is about database architecture and software setup information. Chapter 2 to chapter 6 is

for editors of this database. For data input, see chapter 2. For creating a shapefile, see chapter 3. For use existing data of other file format, see chapter 4. For creating a map, see chapter 5. For updating data, see chapter 6.

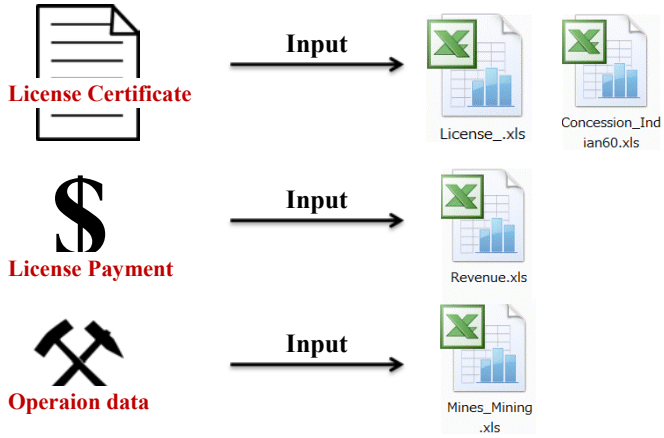
For all users to view a map and to search related data, see chapter 7. To print out including layout, see chapter 8. For exchange data with GoogleEarth or GPS, see chapter 9.

Workflow to create database is shown in below chart.



2. Input new data

The work to building database is initiated with inputting into Excel file. Chapter 2 shows the list of new data to be input. Also the relationship between data is shown. Note some rules when inputting into Excel.



2-1 List of data to be input

The fundamental data for management of mining are of license. They consist of ;

(1) License data	Data about license condition
(2) Concession data	X,Y data for concession shapefile
(3) Mines data	Operation data at mining site, which will be updated by provincial officers, inspector, company reporting
(4) Revenue data	Payment records for licenses of Exploration, Construction matirial, Mining. Data shall be stored in the separated sheet by department, in order to join with concessions of each department.

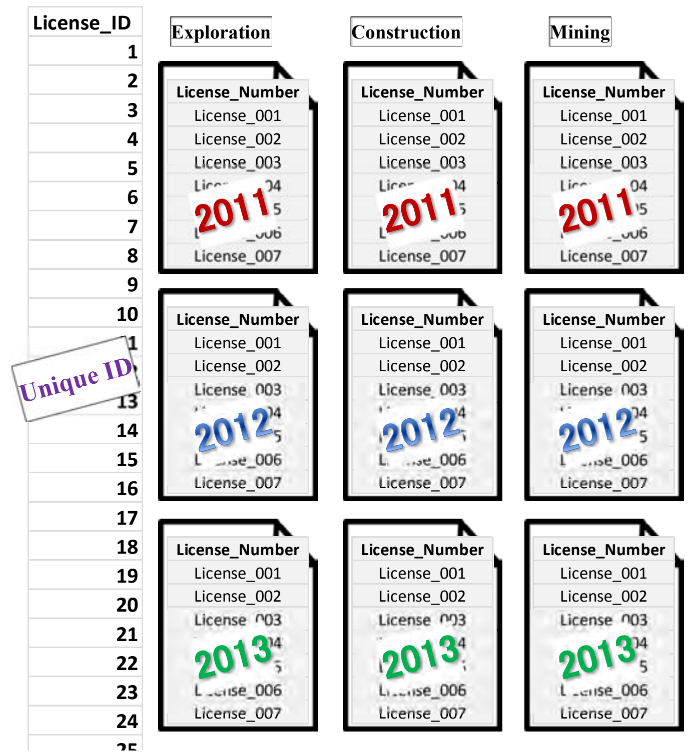
2-1-1 License data

The content of license data is listed below.

Field name	Description	Data Type
License_ID	Unique ID over department	TEXT(Primary Key)
License_N	License number in department	TEXT(Foreign Key)
Issuer	Ministry to issue	TEXT
ConcessionArea_ha	Area(ha) on document	TEXT
ConcessionArea_sqkm	Area(ha) on document	TEXT
Validity	Validity of license	TEXT(Code)
ទីតាំងស្វែងរុករករ៉ែ	Address at site	TEXT
LocationAddress	Address of license area	TEXT
AgreeD	Date of agreement	DATE(dd/MM/yyyy)
IssueD	Date of issue	DATE(dd/MM/yyyy)
ExpireD	Date of expire	DATE(dd/MM/yyyy)
SuspendedD	Date of temporary stop of operation	DATE(dd/MM/yyyy)
ReturnD	Date of returning license by owner	DATE(dd/MM/yyyy)
RevokeD	Date of revoking license by government	DATE(dd/MM/yyyy)
Cancel_Reason	Reason above three events	TEXT
Relinquishment_sqkm	Decrease area of exploration concession	TEXT
Commodity_Code	Commodity code	TEXT(Code)
Company_Code_DptXX	Company code in department	TEXT
Company_Name	Company name	TEXT
Representative_Name	Representative person name	TEXT
Nationality	Nationality	TEXT
JV_structure	Joint venture	TEXT
អាសយដ្ឋានក្រុមហ៊ុន (ភ្នំពេញ)	Address at office (PhnomPenh)	TEXT
Address_Office	Address of company office	TEXT
Email	Email address	TEXT
Phone	Phone number	TEXT
Website	Website	TEXT
Contact	Contact person	TEXT

About "License_ID"

License ID is unique number for connecting License data with Revenue data. License ID is provided by Department of Promotion, every year.



2-1-2 Concession (X,Y) data

In license certificate, the coordinates (X,Y) of permitted concession are described. At first input into Excel file, in order to create shapefiles of concession in chapter 3.

Field name	Description	Data Type
License_Number	License number in department	TEXT(Foreign Key)
Ref_Mark	Connecting order of point	TEXT
Easting	Indian1960 UTM 48N	NUMBER (Integer)
Northing	Indian1960 UTM 48N	NUMBER (Integer)

2-1-3 Mines data

These data are operation data of mining site. This kind of data may be brought by Department of Mining, and Department of Construction, and Provincial offices. The content of data is listed in below. The data shall stored in database, so that all GDMR officers can share these information.

Field name	Description	Data Type
License_N	License number in department	TEXT(Primary Key)
Issuer	Ministry to issue	TEXT
Name_Mines	Name of mine	TEXT
Operator	Name of company	TEXT
Stage	Stage for mining	TEXT
MineLocation	Location of mine	TEXT
MiningArea_sqkm	Area of mining	TEXT
StartMineD	Start date of operation	DATE(dd/MM/yyyy)
CloseMineD	Close date of operation	DATE(dd/MM/yyyy)
Female_Worker	Number of female workers	NUMBER (Integer)
Male_Worker	Number of male workers	NUMBER (Integer)
Commodity_Code	Commodity	TEXT(Code)
Monthly_Production	Monthly production	TEXT
Annual_Production	Annual production	TEXT
Sales	Quantity of sales	TEXT
MineLife_years	Mine life time	NUMBER (Integer)
Ore_Resource_ton	Volume of Ore resources	NUMBER (Double)
Ore_Reserve_ton	Volume of Ore reserves	NUMBER (Double)

2-1-4 Revenue data

Department of Promotion has a management of payment of all licenses over department. The data to be sotred in the database is listed below.

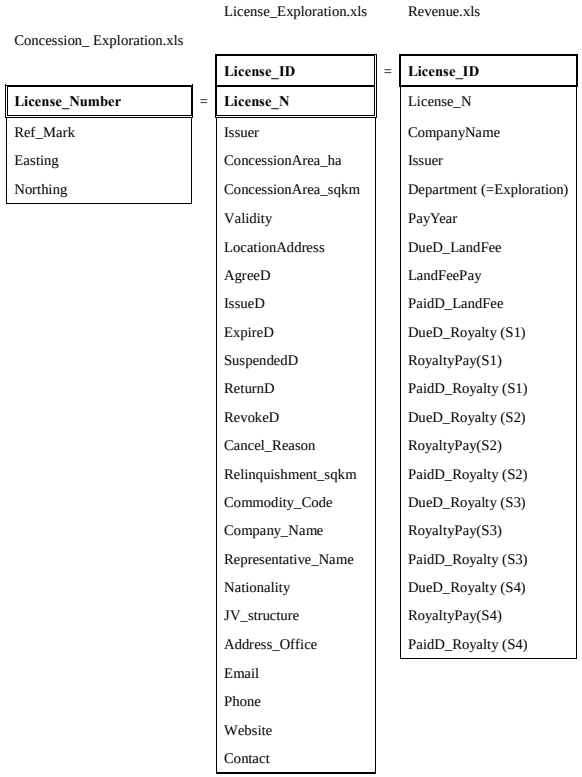
Field name	Description	Data Type
License_ID	Unique ID over department	TEXT(Primary Key)
CompanyName	Company name	TEXT
License_N	License number in department	TEXT(Foreign Key)
Issuer	Ministry to issue	TEXT
Department	Department to manage license	TEXT
PayYear	Year of paying	NUMBER (Integer)
DueD_LandFee	Due date for land fee	DATE(dd/MM/yyyy)
LandFeePay	Status of payment for Land fee	TEXT("non")
PaidD_LandFee	Paid date for land fee	DATE(dd/MM/yyyy)
DueD_Royalty (S1)	Due date for royalty (1st Semester)	DATE(dd/MM/yyyy)
RoyaltyPay(S1)	Status of payment for Royalty (1st Semester)	TEXT("non")
PaidD_Royalty (S1)	Paid date for royalty (1st Semester)	DATE(dd/MM/yyyy)
DueD_Royalty (S2)	Due date for royalty (2nd Semester)	DATE(dd/MM/yyyy)
RoyaltyPay(S2)	Status of payment for Royalty (2nd Semester)	TEXT("non")
PaidD_Royalty (S2)	Paid date for royalty (2nd Semester)	DATE(dd/MM/yyyy)
DueD_Royalty (S3)	Due date for royalty (3rd Semester)	DATE(dd/MM/yyyy)
RoyaltyPay(S3)	Status of payment for Royalty (3rd Semester)	TEXT("non")
PaidD_Royalty (S3)	Paid date for royalty (3rd Semester)	DATE(dd/MM/yyyy)
DueD_Royalty (S4)	Due date for royalty (4th Semester)	DATE(dd/MM/yyyy)
RoyaltyPay(S4)	Status of payment for Royalty (4th Semester)	TEXT("non")
PaidD_Royalty (S4)	Paid date for royalty (4th Semester)	DATE(dd/MM/yyyy)

If payment is outstanding, fill in "non" in "LandFeePay" field or in each "RoyaltyPay" field.

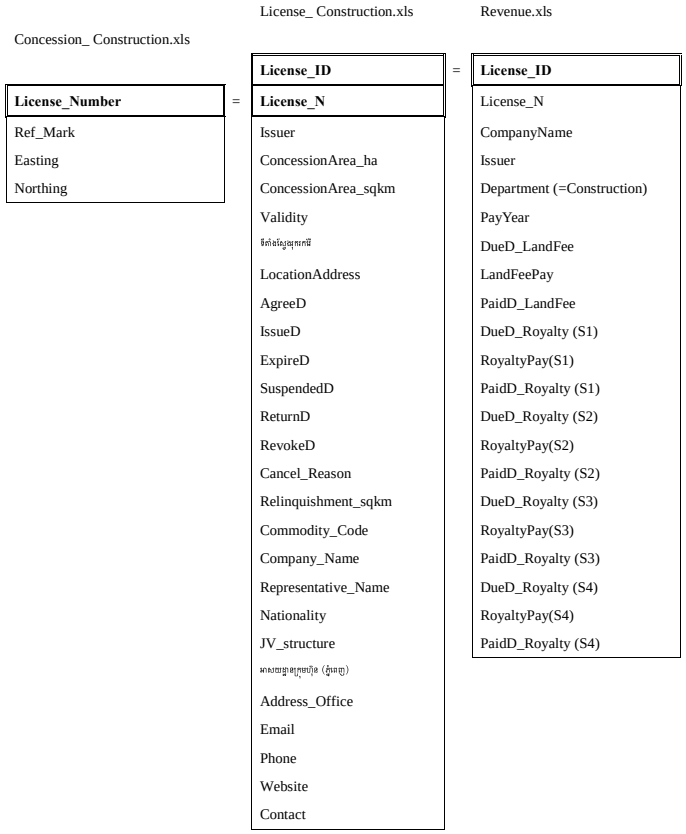
2-2 Relationship between the data

This database has table data which are stored into Excel files. These data can be connected each other with concession map. The relationship between table data is shown below, by each department. Key fields for connecting are the two; License ID, and License number.

2-2-1 Data related to license of Exploration



2-2-2 Data related to license of Construction materials



2-2-3 Data related to license of Mining

Mines_Mining.xls	Concession_ Mining.xls	License_ Mining.xls	Revenue.xls
License_N	**License_Number**	**License_ID**	**License_ID**
		License_N	License_N
Name_Mines	Ref_Mark	Issuer	CompanyName
Operator	Easting	ConcessionArea_ha	Issuer
Stage	Northing	ConcessionArea_sqkm	Department (=Mining)
MineLocation		Validity	PayYear
Location_ID_DoG		LocationAddress	DueD_LandFee
MiningArea_sqkm		AgreeD	LandFeePay
StartMineD		IssueD	PaidD_LandFee
CloseMineD		ExpireD	DueD_Royalty (S1)
Female_Worker		SuspendedD	RoyaltyPay(S1)
Male_Worker		ReturnD	PaidD_Royalty (S1)
Commodity_Code		RevokeD	DueD_Royalty (S2)
Monthly_Production		Cancel_Reason	RoyaltyPay(S2)
Annual_Production		Relinquishment_sqkm	PaidD_Royalty (S2)
Sales		Commodity_Code	DueD_Royalty (S3)
MineLife_years		Company_Name	RoyaltyPay(S3)
Ore_Resource_ton		Representative_Name	PaidD_Royalty (S3)
Ore_Reserve_ton		Nationality	DueD_Royalty (S4)
		JV_structure	RoyaltyPay(S4)
		Address_Office	PaidD_Royalty (S4)
		Email	
		Phone	
		Website	
		Contact	

2-3 File list to be created

All data about the management of licenses and activites, are stored into Excel files. Only concession data are converted into shapefiles, to view map. The file lists of each department is shown below.

2-3-1 Files in "Dept_Exploration" folder

Input	Concession_Exploration_Indian60.xls License_Exploration.xls
Convert	Concession_Exploration_Point_Indian60.shp Concession_Exploration_Point.shp Concession_Exploration_Polygon.shp
Output	Concession_Exploration_Joined.shp

2-3-2 Files in "Dept_Construction" folder

Input	Concession_Construction_Indian60.xls License_Construction.xls
Convert	Concession_Construction_Point_Indian60.shp Concession_Construction_Point.shp Concession_Construction_Polygon.shp
Output	Concession_Construction_Joined.shp

Input/ Output	Mines_Construction.xls

2-3-3 Files in "Dept_Mining" folder

Input	Concession_Mining_Indian60.xls License_Mining.xls
Convert	Concession_Mining_Point_Indian60.shp Concession_Mining_Point.shp Concession_Mining_Polygon.shp
Output	Concession_Mining_Joined.shp

Input/ Output	Mines_Mining.xls

2-3-4 Files in “Dept_Promotion” folder

Department of Promotion has revenue data of all licenses of three departments. They are stored into separate sheets by department.

Input/ Output	Revenue.xls Sheet “Exploration” Sheet ”Construction” Sheet ”Mining”

2-4 Prepare the work-files in your PC

According to the flow chart below, prepare work-folder in your PC. The template files to be input is available in “Common” folder of the database.

Open Excel template file. — from Database (in common folder)

↓

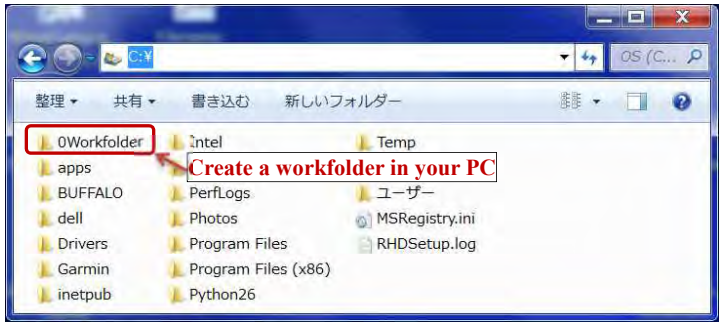
Input data.
Save the Excel file.
Convert/create shapefiles (chapter 3) — work-folder in your PC

↓

Copy the Excel files and shapefiles. — to Database (to the assigned folder)

2-4-1 Work-folder

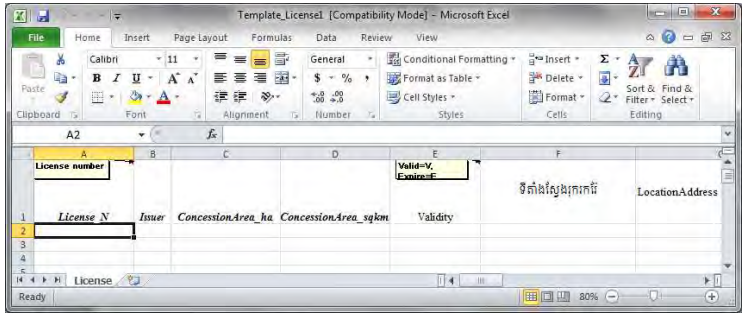
Create a work folder in your PC. For example, C:¥0Workfolder

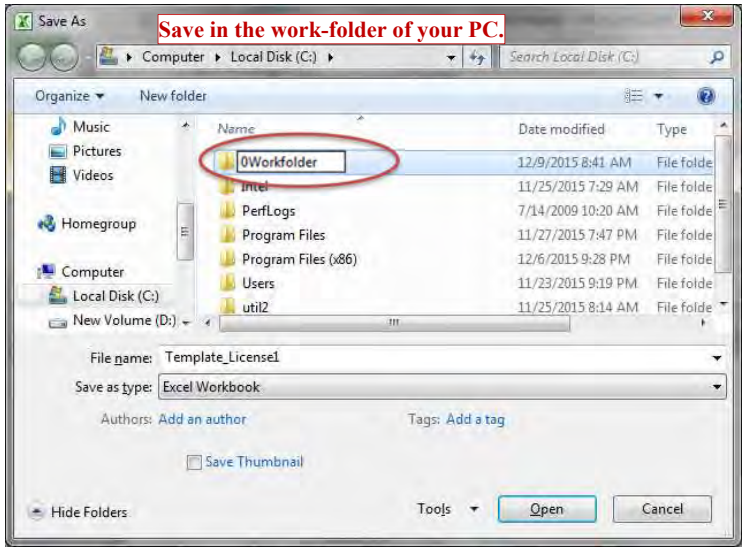


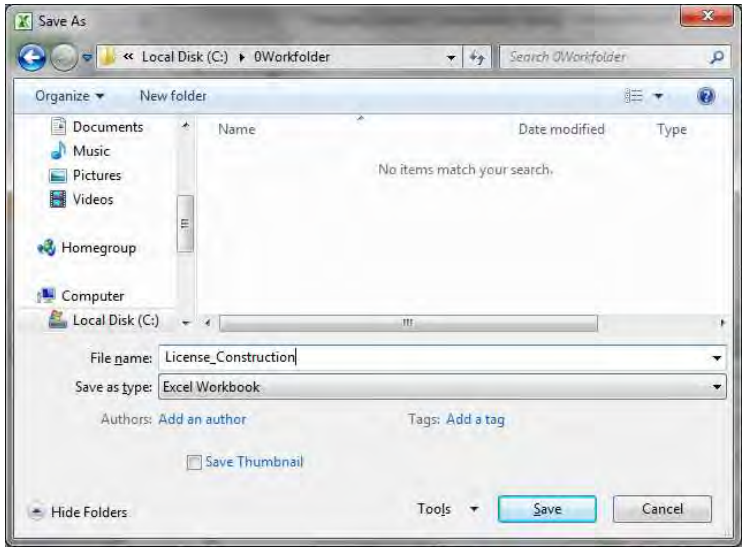
2-4-2 Template files

Template files are stored in “Common” folder of the database.

Open the folder; GDMR_Database¥Common¥Database¥Template







2-5 Input into the Excel files

Before starting to input, remember some rules in Excel.

2-5-1 Rules for input in Excel files

To use as table data in ArcGIS, some rules in Excel are shown below.

Otherwise ArcGIS cannot show the table data.

Number of header line

the first line (only 1 row) in Excel sheet.

Column name (Field name)

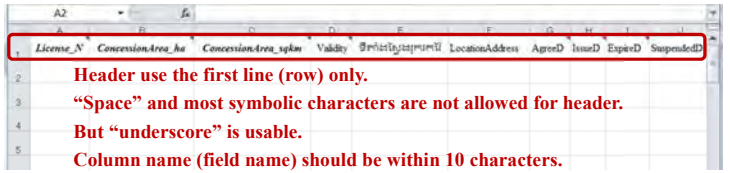
Number of characters

Within 10 characters

Permitted characters

The header line does not accept space and most of symbols. So please use underscore _ with alphabet and numbers.

Alphabets _ (under score) Numbers OK	/*-+=~^¥|?><;:#$%&¥~',. “ ” : (space key) No



Data type of a column (except a header row of Excel sheet)

In this database which is based on ArcGIS, 3 kinds of data type are used. When table data are brought into ArcGIS, data types of Excel are assigned into 3 categories.

(1) Text (254 characters of text)

(2) Double

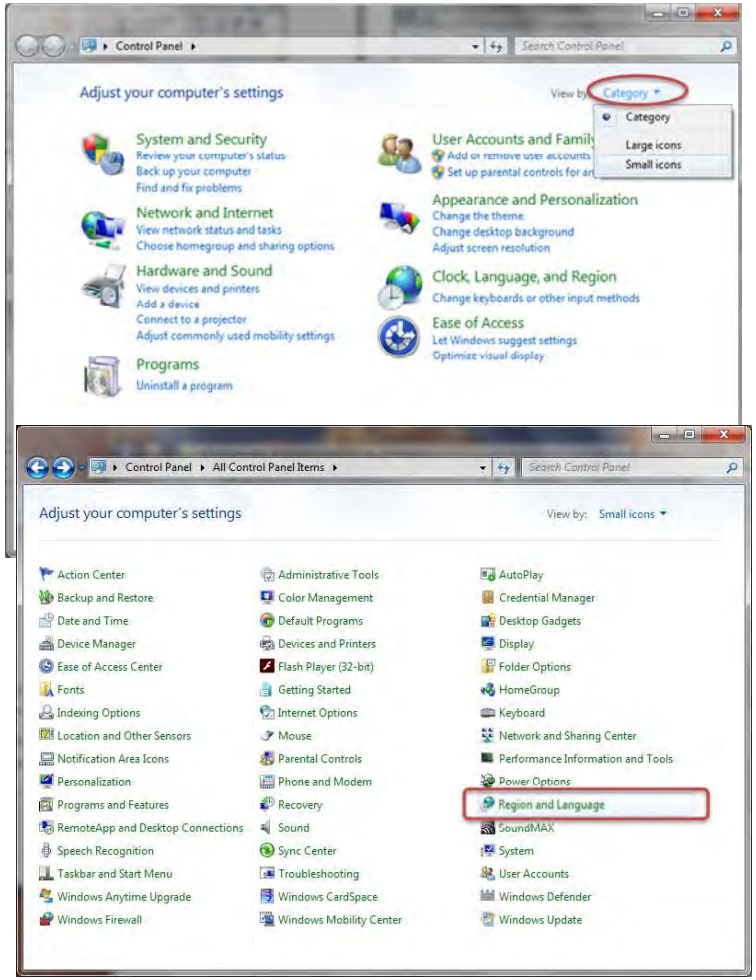
(3) Date

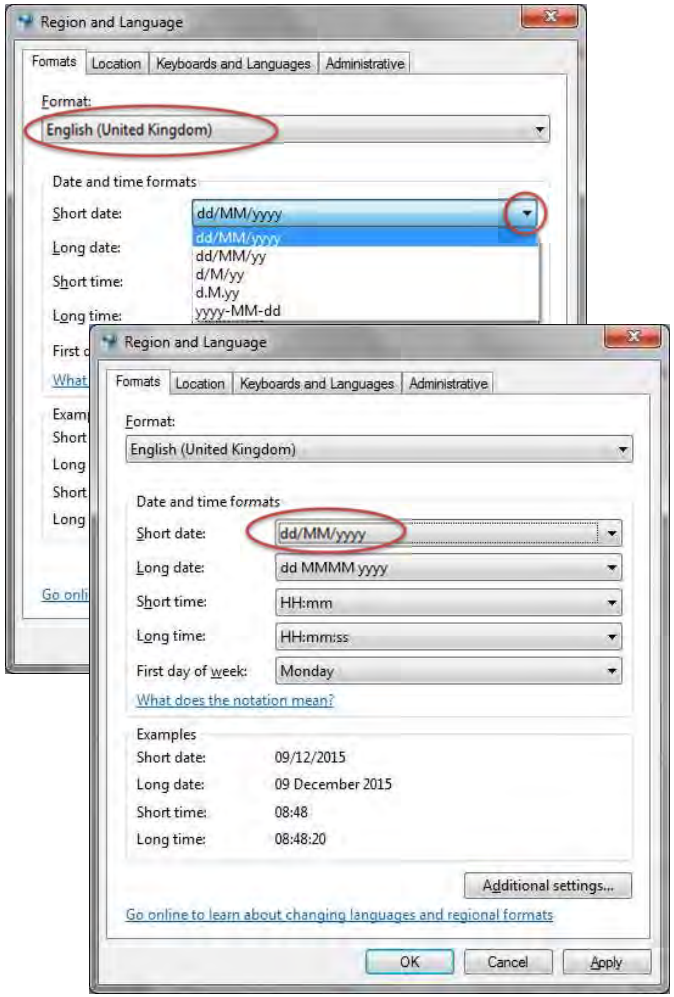
Excel		ArcGIS
- General - Text	--->	Text (254 characters)
- Number - General (if number data only)	--->	Double
- Date	--->	Date

About DATE format

At first check the default setting of your PC, about the order of day (dd), month (MM), year (yyyy). ArcGIS follows your PC setting, regarding the order of dd/MM/yyyy.

Open control panel, then select “locale and language”





How to identify wrong data-type in Excel.

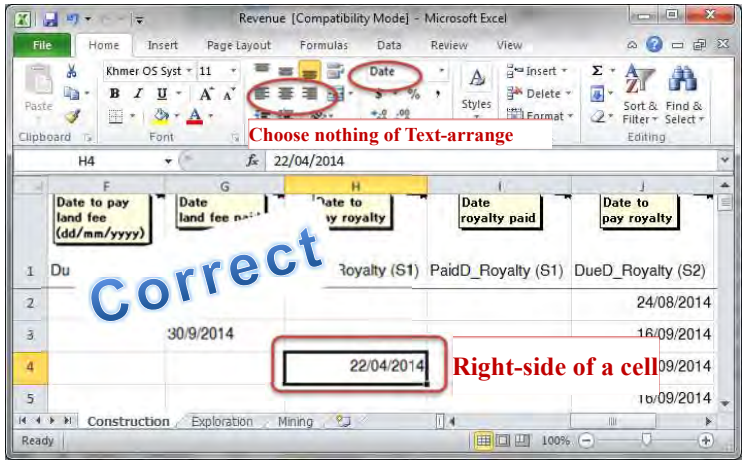
Wrong data-type about DATE (or NUMBER) always appears at left-side of a cell, with no option o indent (text-arrangement).

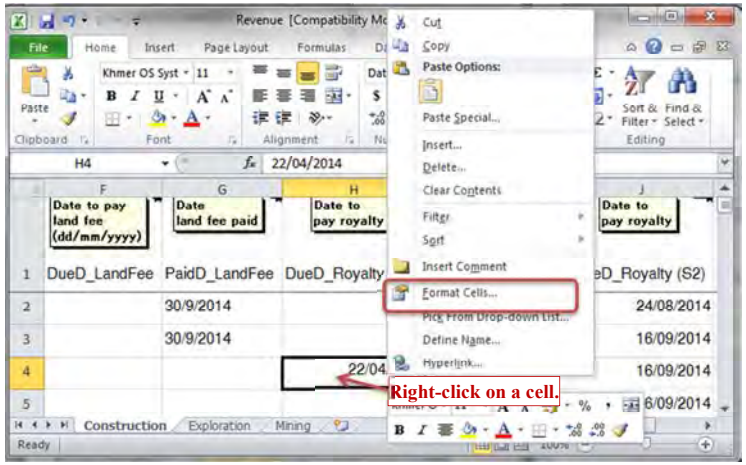
Another solution to correct to DATE format is;

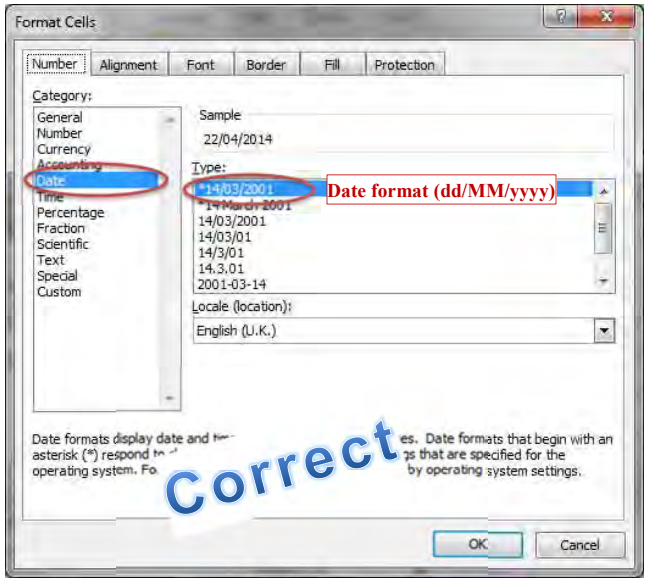
(1) Once save as CSV file.

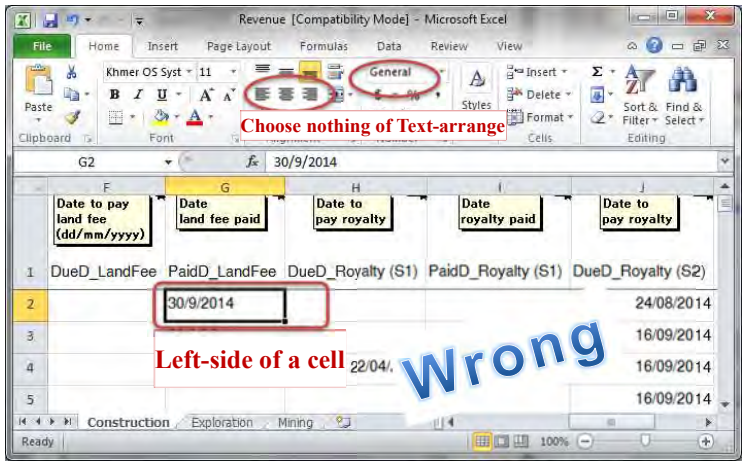
(2) Open the CSV file on Excel (Just drag it into Excel window)

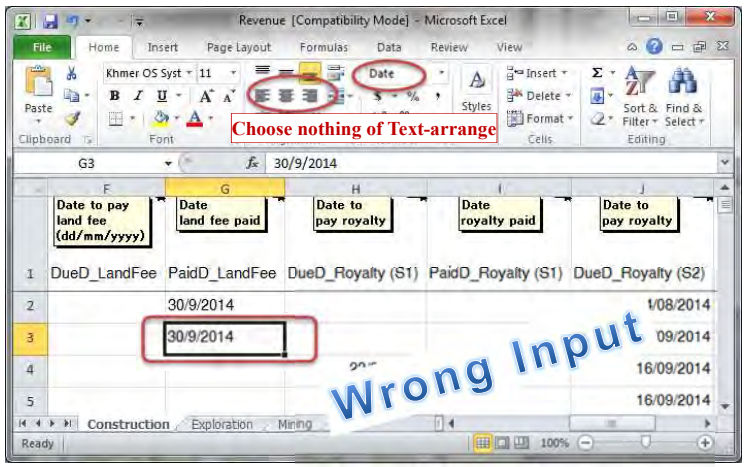
(3) Excel automatically identify as DATE.




Cut
Copy
Paste Options:
Paste Special...
Insert...
Delete...
Clear Contents
Filter
Sort
Insert Comment
Format Cells...
Pick From Drop-down List...
Define Name...
Hyperlink...
Right-click on a cell.
Date to pay land fee (dd/mm/yyyy)
Date land fee paid
Date to pay royalty
DueD_LandFee
PaidD_LandFee
DueD_Royalty
30/9/2014
Construction
Exploration
Mining


Format Cells
Number
Alignment
Font
Border
Fill
Protection
Category:
General
Number
Currency
Date
Time
Percentage
Fraction
Scientific
Text
Special
Custom
Sample
22/04/2014
Type:
14/03/2001
Date format (dd/MM/yyyy)
Locale (location):
English (U.K.)
Correct
OK
Cancel


Revenue [Compatibility Mode] - Microsoft Excel
Choose nothing of Text-arrange
Left-side of a cell
Wrong
Date to pay land fee (dd/mm/yyyy)
Date land fee paid
Date to pay royalty
Date royalty paid
DueD_LandFee
PaidD_LandFee
DueD_Royalty (S1)
PaidD_Royalty (S1)
DueD_Royalty (S2)
30/9/2014
Construction
Exploration
Mining

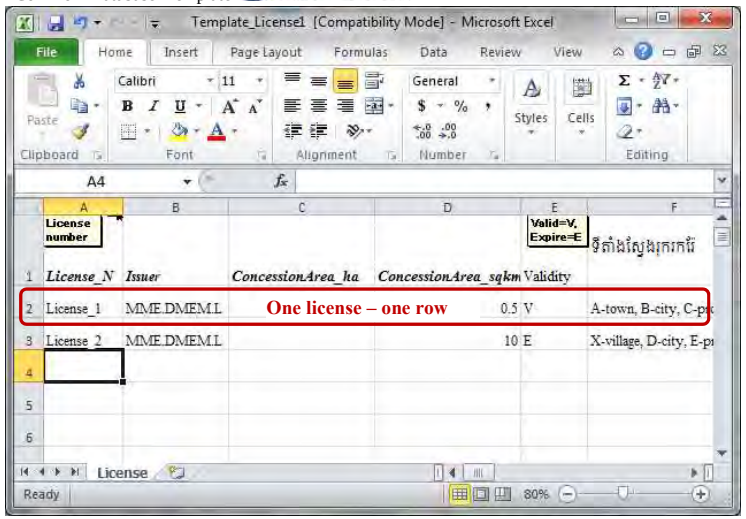

Revenue [Compatibility Mode] - Microsoft Excel
Choose nothing of Text-arrange
Wrong Input
Date to pay land fee (dd/mm/yyyy)
Date land fee paid
Date to pay royalty
Date royalty paid
DueD_LandFee
PaidD_LandFee
DueD_Royalty (S1)
PaidD_Royalty (S1)
DueD_Royalty (S2)
30/9/2014
Construction
Exploration
Mining

2-5-2 Input license data

Prepare a license certificate.

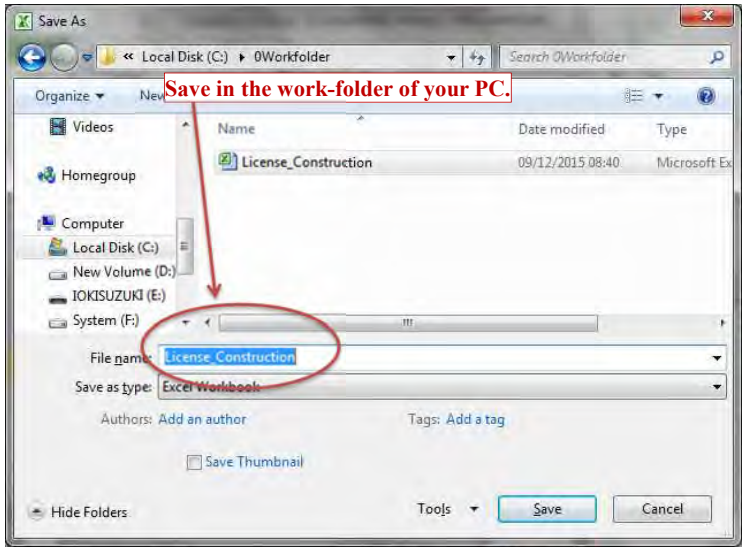
Open template file (Template_License.xlt) from “Common” folder ;

¥Common¥Database¥Template¥ Template_License.xlt

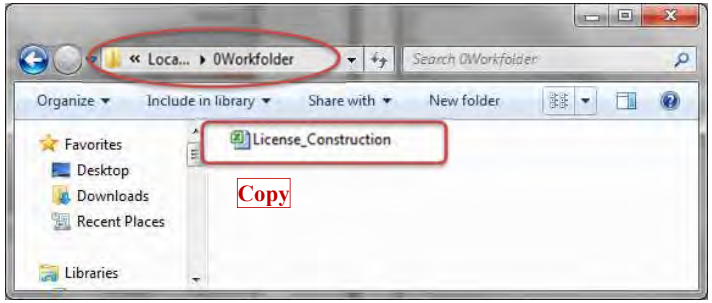


Iput one license data to one row of Excel sheet.

Save in a work-folder of your PC. Give to the filename the department name in suffix.



Upload the file to the database

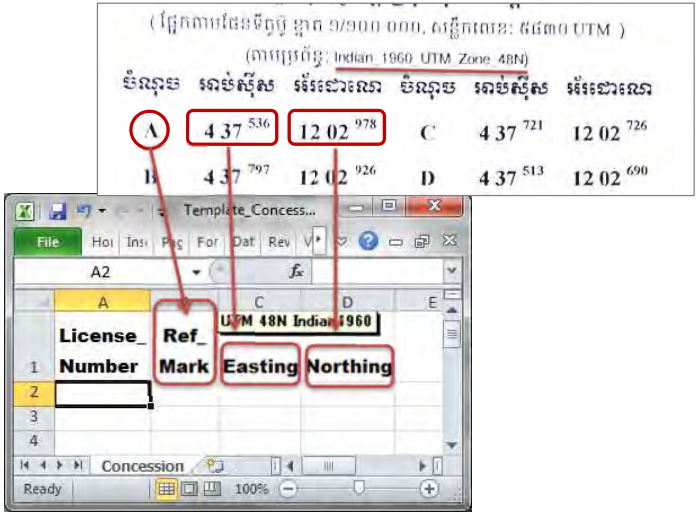


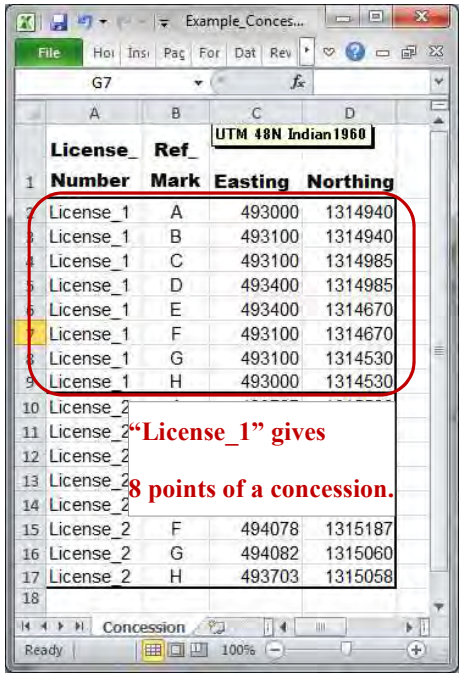
2-5-3 Input Concession coordinates

Prepare the license certificate. Note the coordinates are based on Indian1960 UTM48N.

Open template file (Template_Concession.xlt) from “Common” folder ;

¥Common¥Database¥Template¥Template_Concession.xlt



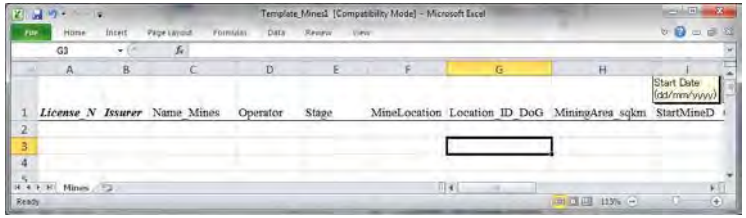


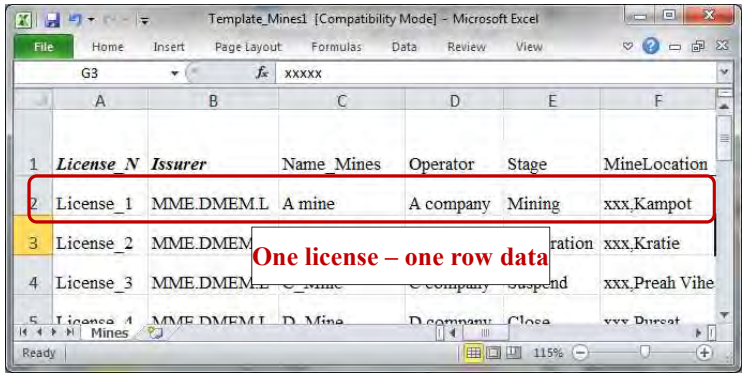
2-5-4 Input Mines data

Input mines data (operation data).

Open template file (Template_Mines.xlt) from “Common” folder ;

¥Common¥Database¥Template¥ Template_Mines.xlt



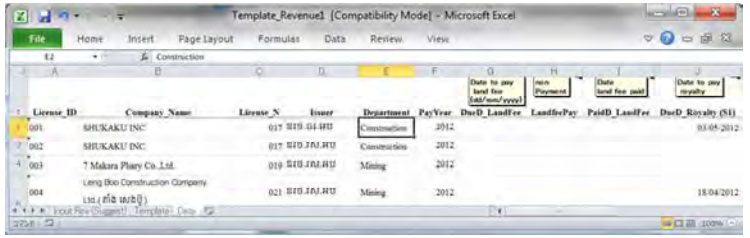


2-5-5 Input Revenue data

Open template file (Template_Revenue.xlt) from “Common” folder ;

¥Common¥Database¥Template¥ Template_Revenue.xlt

Input data as below.



2-6 Code list and data validation

The code data and available range of number are shown for some fields (column name) in excel files.

2-6-1 Commodity Code (in License_*.xls)

Code	Description	Department
11	Sand for construction	Construction
111	River sand	
112	Inland sand mining	
113	Sea sand mining	
12	Sand for filling materials	
121	River sand	
122	Sea sand mining	
13	Gravel	
14	Crushed stone mining	
15	Dimension stone mining	
151	Sandstone	
152	Laterite	
153	Granite	
154	Stone Calcite	
155	Diorite	
156	Andesite	
157	Marble	
16	Ornamental stone	
161	Pagodite	
162	Chalcedony	
17	Soil	
18	Red soil(Laterite)	
21	Metalic material	Exploration/Mining
211	Iron	
212	Gold	
213	Copper	
22	Industrial mineral	
221	Limestone	
222	White sand	
23	Gem	Mining
231	Corundum	
24	Fuel minerals	Exploration/Mining
241	Coal	
99	ASM	Provincial
991	Gem	
992	Gold	
993	Crush stone	
994	Gravel	
995	Sand	
996	Soil	

2-6-2 Validity (in License_*.xls)

Code	Description
V	License is Valid
E	License is Expired

2-6-3 Stage (in Mines_Mining.xls)

Datalist	Description
Mining	Mining
EIA	Environmental Imapct Assesment
Developing	Under construction before production
Revoke	Stop by government
TemporaryStop	Stop for short time (by seasonal or sales reason)

*Other stage can be added to the Datalist, when needed.

2-6-4 Coordinates values (in Concession_*.xls)

Easting (UTM48N)	Northing (UTM48N)
200,000 (minimum)	1100,000 (minimum)
800,000 (maximum)	1700,000 (maximum)

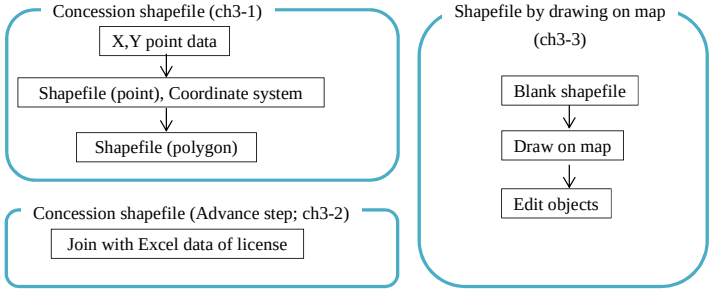
* Range of value should be located within or around Cambodian land

3. Create a shapefile

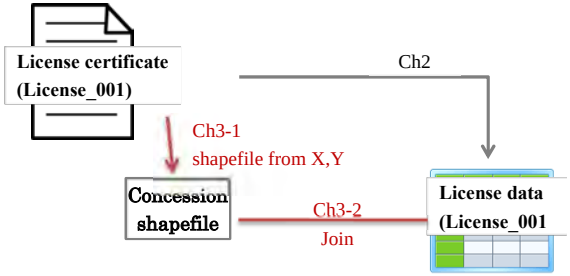
Chapter 3 shows two methods to create a shapefile.

1) For concession polygon shapefile, from X,Y data (ch3-1. ch3-2)

2) Direct drawing into a blank shapefile (ch3-3)



As advance step ch3-2, to join Concession polygon with license data, one by one.



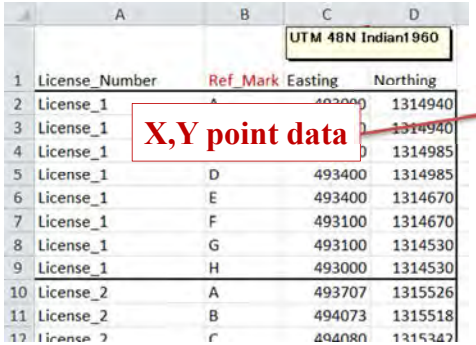
3-1 Create a Concession shapefile from X,Y data

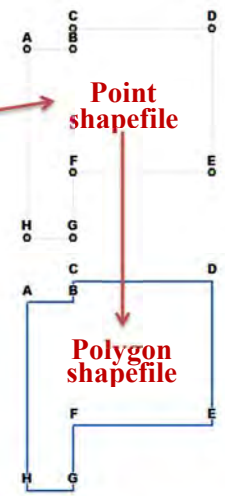
There are 3 steps for concession polygon shapefile.

1) To create a Point shapefile from X,Y data.

2) To convert coordinate system of the shapefile, to WGS1984 UTM.

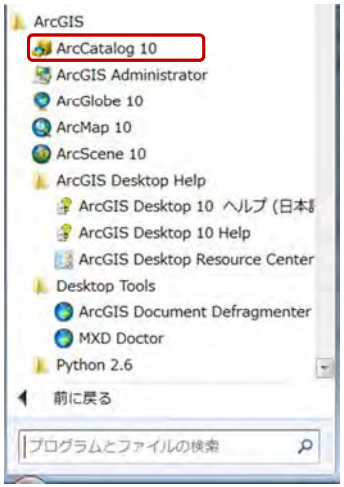
3) To convert the feature type of shapefile, from Point to Polygon.

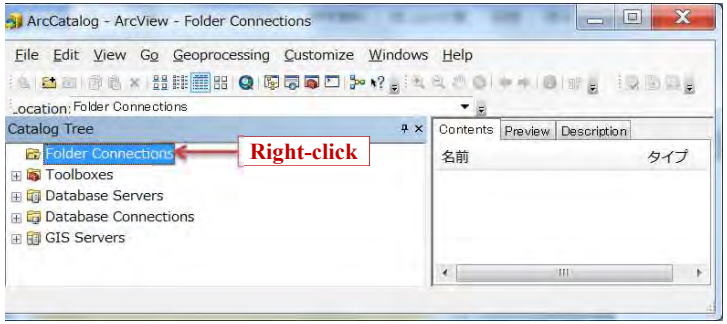




3-1-1 Create shapefile from X,Y data

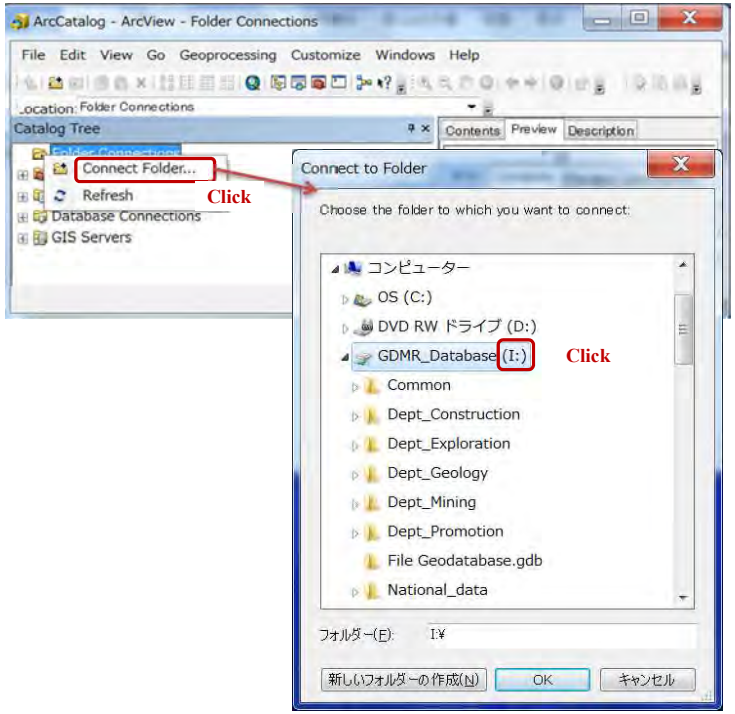
Start ArcCatalog

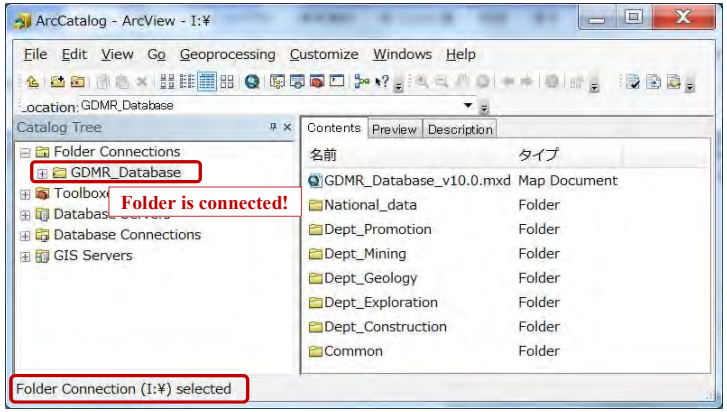




Connect to Concession.xls

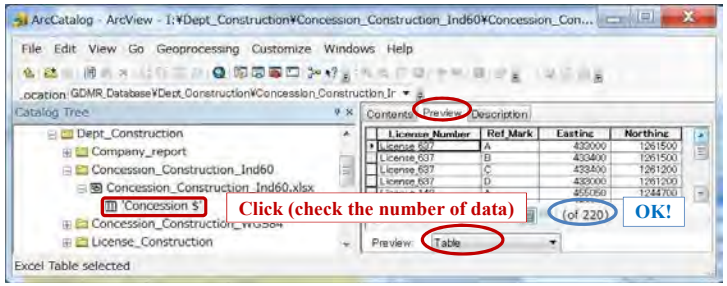
Click “Folder Connections”, select “Connect Folder…”.





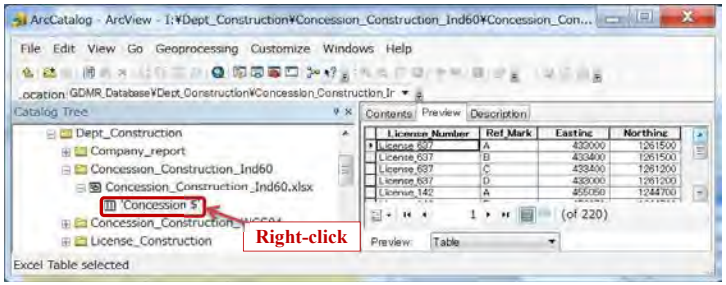
Find a concession excel sheet, containing the coordinates of concessions.

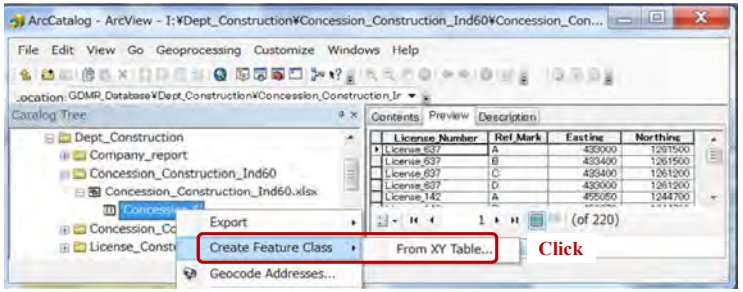
Click the sheet (not the excel file), the coordinates data appear in Preview tab.



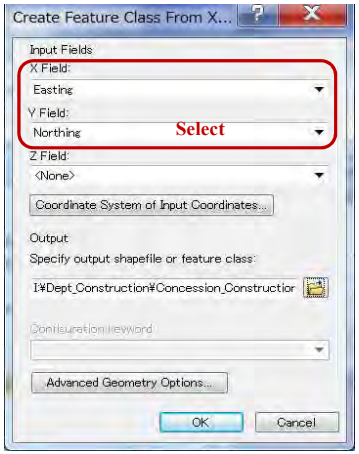
If wrong (too many) number of data is shown, close ArcCatalog and open this excel file. Try to delete the blank rows/columns of Excel sheet.

Right-click on the sheet, select “Create Feature Class”, “From XY Table…”





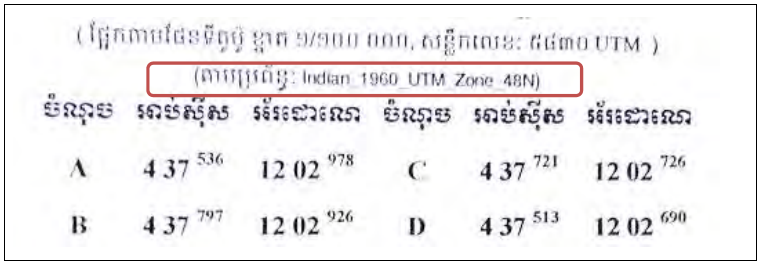
Assign coordinates to X,Y of a new shapefile

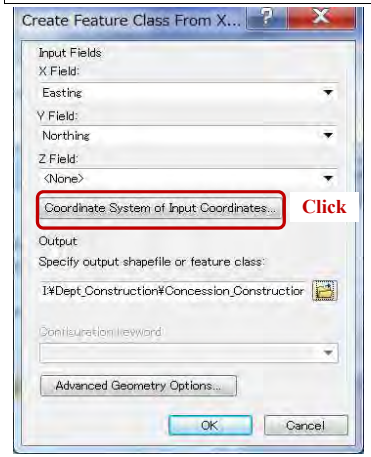


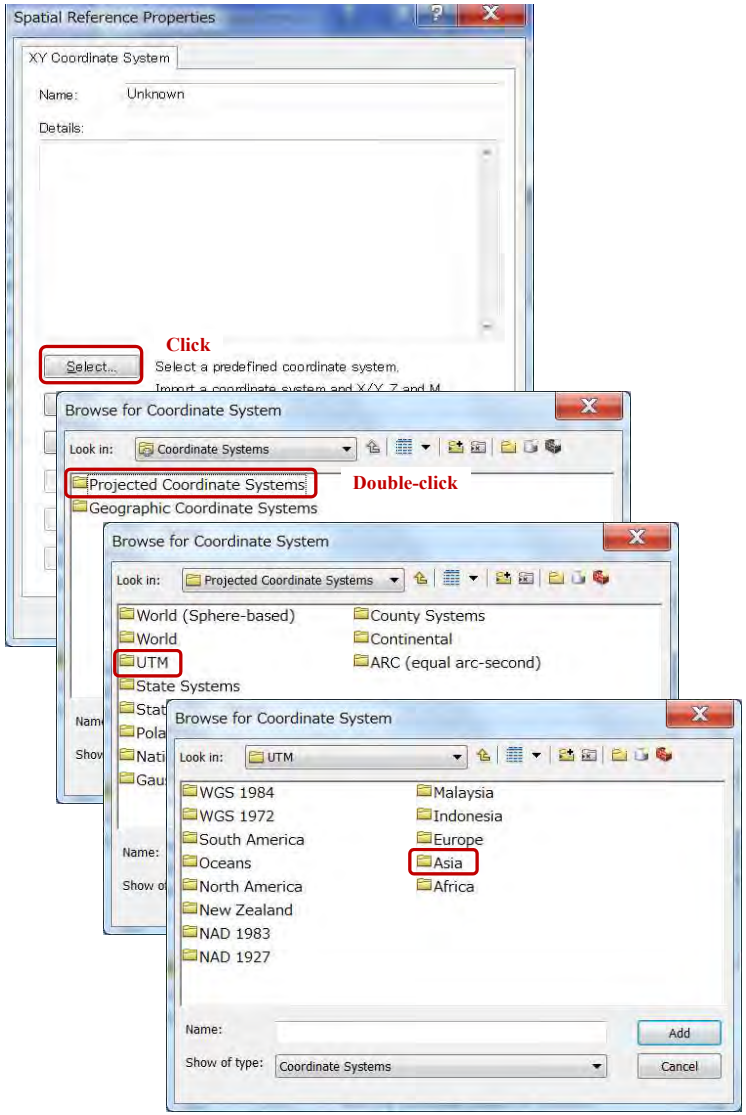
Give coordinate system of Indian1960 UTM

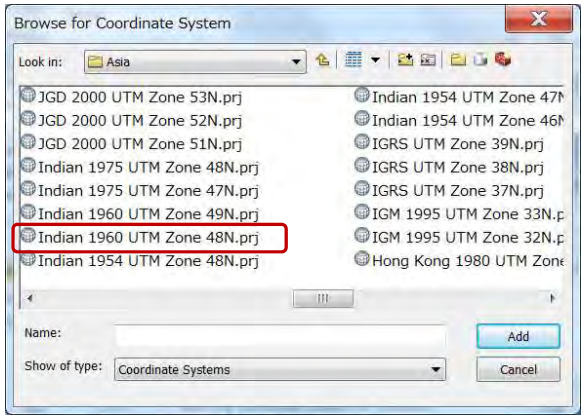
Give the coordinate system of X,Y data from license certificate.

It is based on “Indian1960 UTM 48N”. So later we need to convert to WGS1984 UTM 48N, as instructed in chapter 3-1-2.






Spatial Reference Properties
XY Coordinate System
Name: Unknown
Details:
Select...
Click
Select a predefined coordinate system.
Browse for Coordinate System
Look in: Coordinate Systems
Projected Coordinate Systems
Geographic Coordinate Systems
Double-click
Look in: Projected Coordinate Systems
World (Sphere-based)
World
UTM
State Systems
County Systems
Continental
ARC (equal arc-second)
Look in: UTM
WGS 1984
WGS 1972
South America
Oceans
North America
New Zealand
NAD 1983
NAD 1927
Malaysia
Indonesia
Europe
Asia
Africa
Name:
Show of type: Coordinate Systems
Add
Cancel


Browse for Coordinate System
Look in: Asia
JGD 2000 UTM Zone 53N.prj
JGD 2000 UTM Zone 52N.prj
JGD 2000 UTM Zone 51N.prj
Indian 1975 UTM Zone 48N.prj
Indian 1975 UTM Zone 47N.prj
Indian 1960 UTM Zone 49N.prj
Indian 1960 UTM Zone 48N.prj
Indian 1954 UTM Zone 48N.prj
Indian 1954 UTM Zone 47N
Indian 1954 UTM Zone 46N
IGRS UTM Zone 39N.prj
IGRS UTM Zone 38N.prj
IGRS UTM Zone 37N.prj
IGM 1995 UTM Zone 33N.p
IGM 1995 UTM Zone 32N.p
Hong Kong 1980 UTM Zone
Name:
Show of type: Coordinate Systems
Add
Cancel

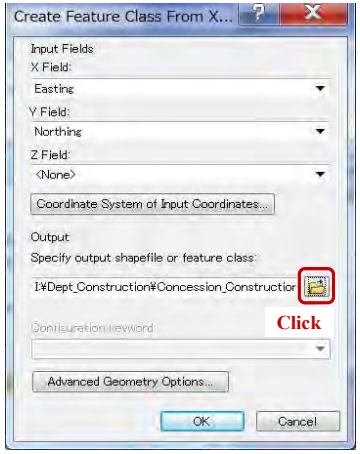

Spatial Reference Properties
XY Coordinate System
Name: Indian_1960_UTM_Zone_48N
Details:
Projection: Transverse_Mercator
False_Easting: 500000.000000
False_Northing: 0.000000
Central_Meridian: 105.000000
Scale_Factor: 0.999600
Latitude_Of_Origin: 0.000000
Linear Unit: Meter (1.000000)
Geographic Coordinate System: GCS_Indian_1960
Angular Unit: Degree (0.0174532925199433299)
Prime Meridian: Greenwich (0.000000000000000000)
Datum: D_Indian_1960
Spheroid: Everest_Adjustment_1937
Select...
Select a predefined coordinate system.
Import...
Import a coordinate system and X/Y, Z and M domains from an existing geodataset (e.g., feature dataset, feature class, raster).
New
Create a new coordinate system.
Modify...
Edit the properties of the currently selected coordinate system.
Clear
Sets the coordinate system to Unknown.
Save As...
Save the coordinate system to a file.
OK
キャンセル
適用(A)

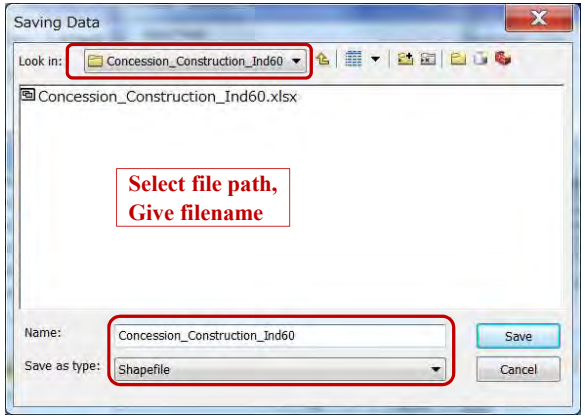
Give filename and output folder to new shapefile

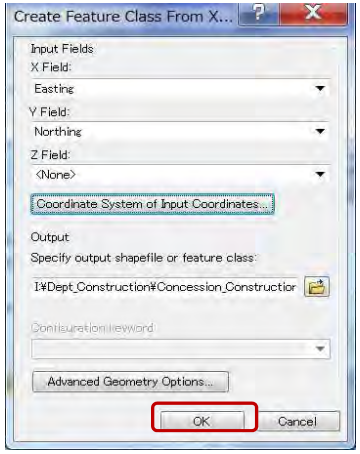
Output filename shall include also the name of applied coordinate system such as Ind60.

The location of output shall be the same folder as an original excel file.

Click “Coordinate System of Input Coordinates…”.button



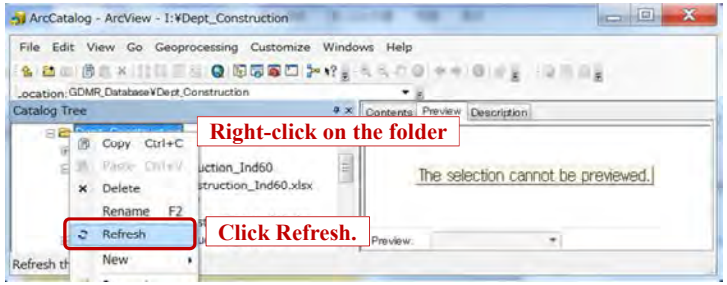


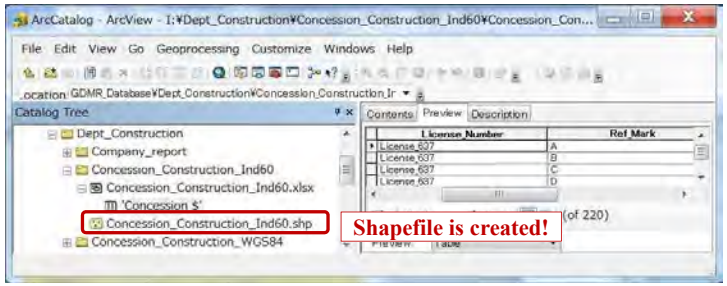


Click “OK”. Shortly a shapefile will be created.

Preview the new created shapefile

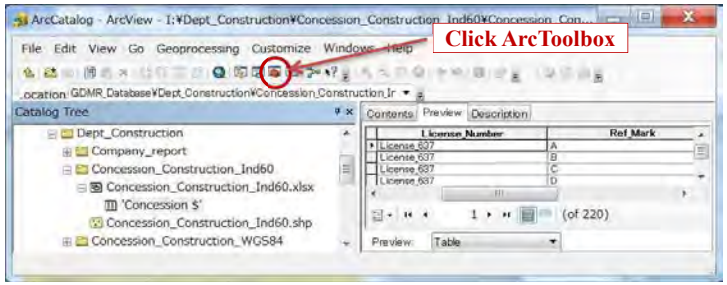
Right-click on the folder, select “Refresh”, then the created file appear.

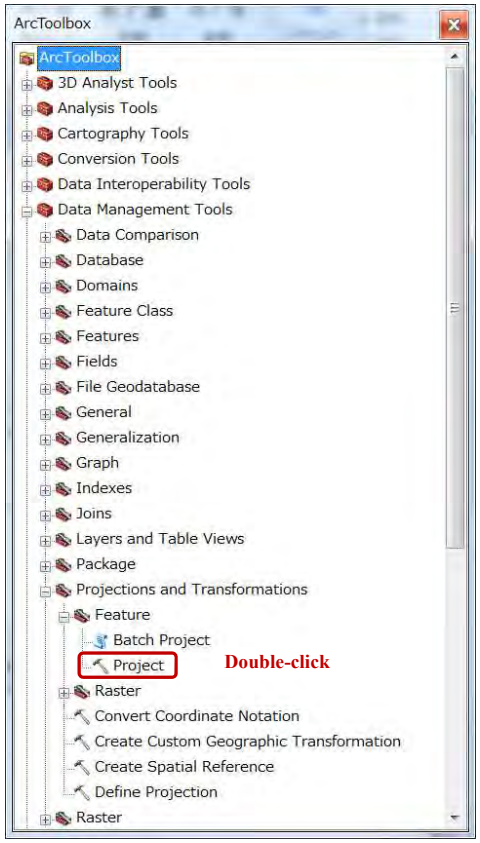


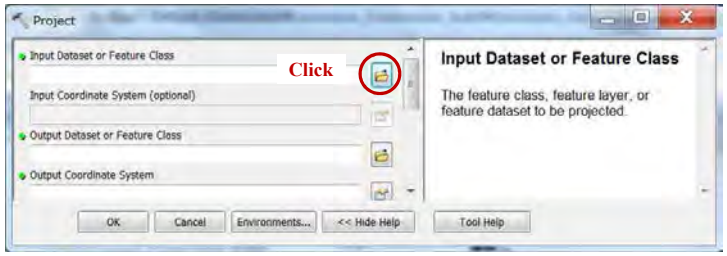


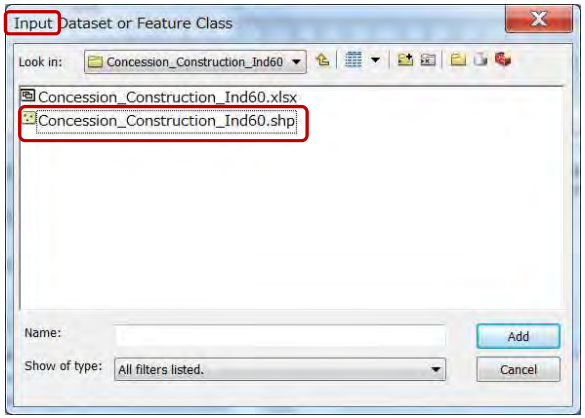
3-1-2 Convert coordinate system

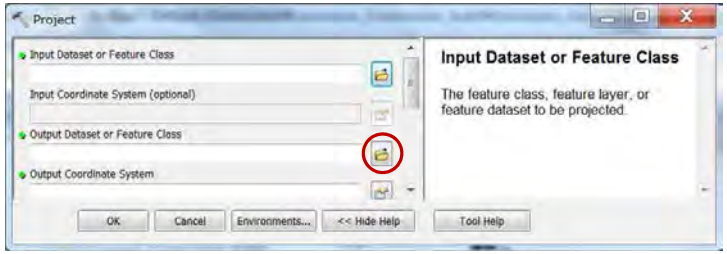
Using a "Project" tool from ArcToolbox, convert coordinate system from Indian1960 UTM to WGS1984 UTM.

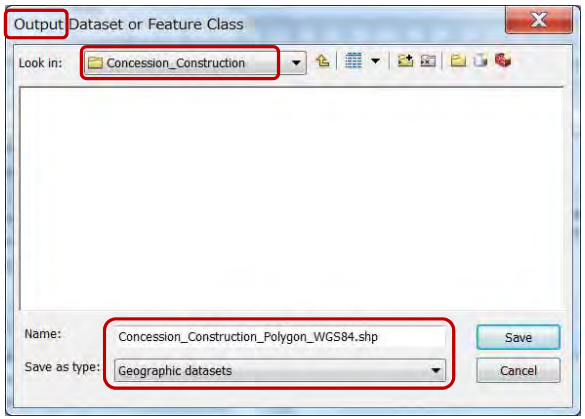


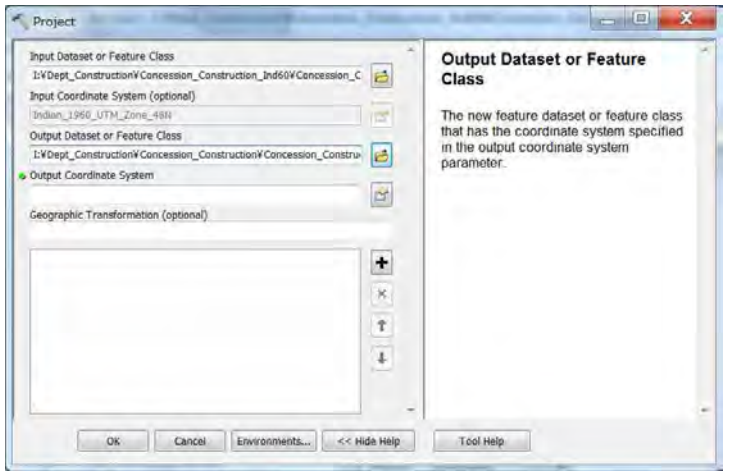




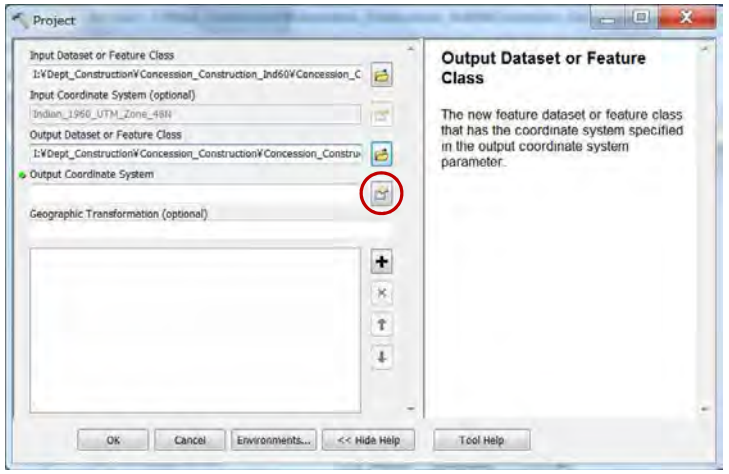


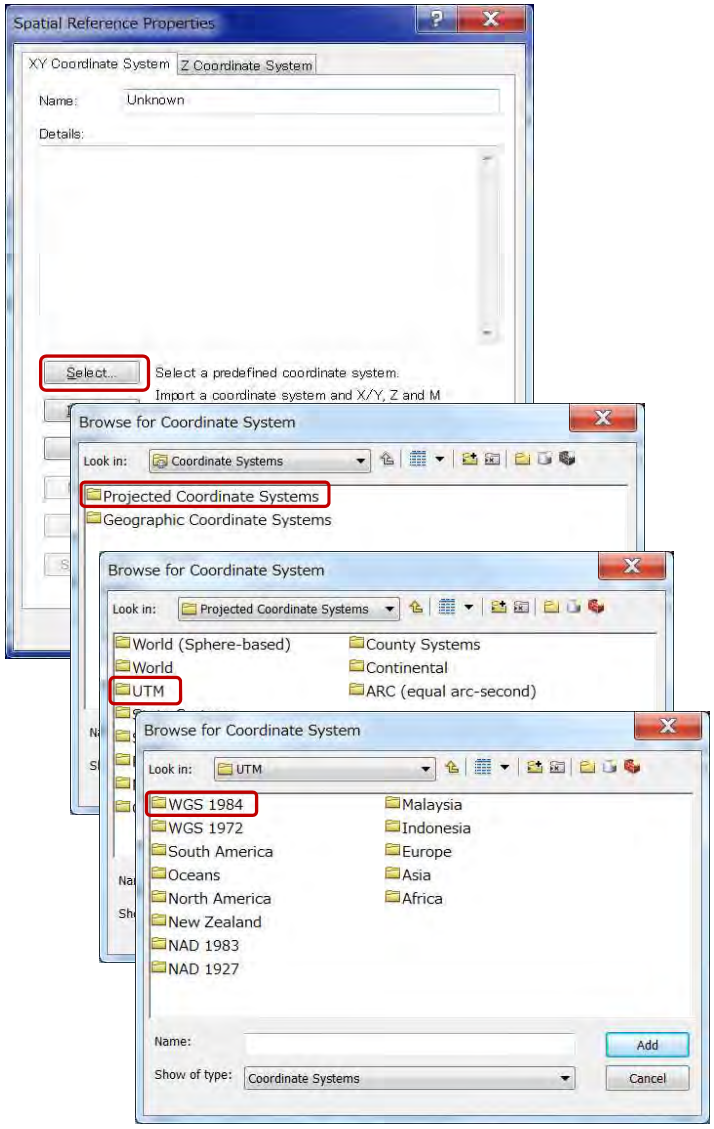


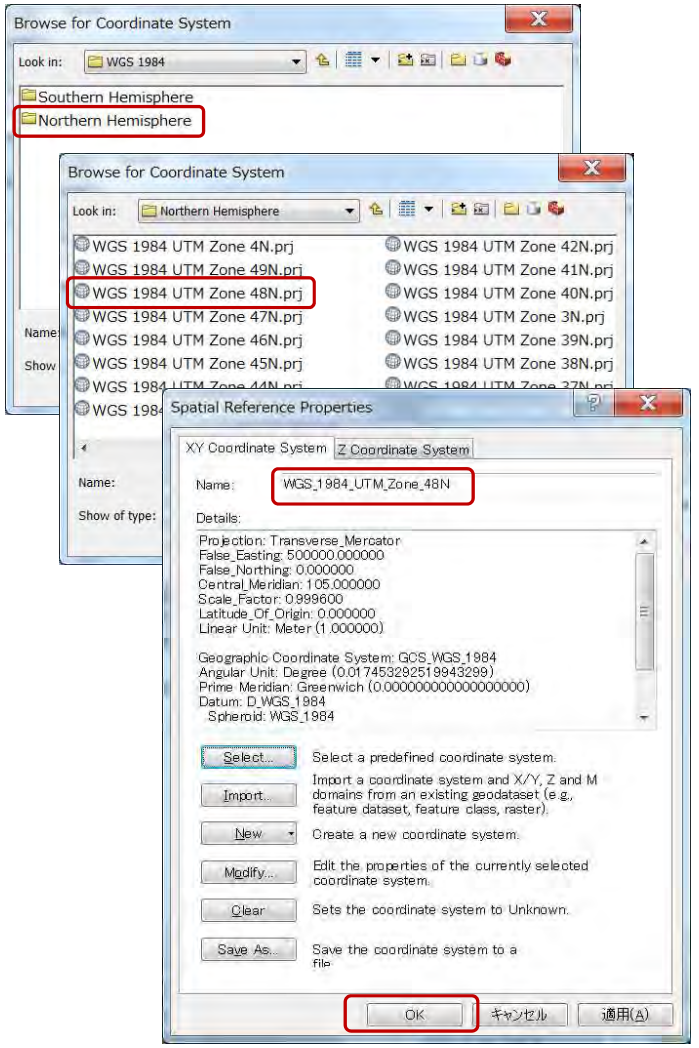


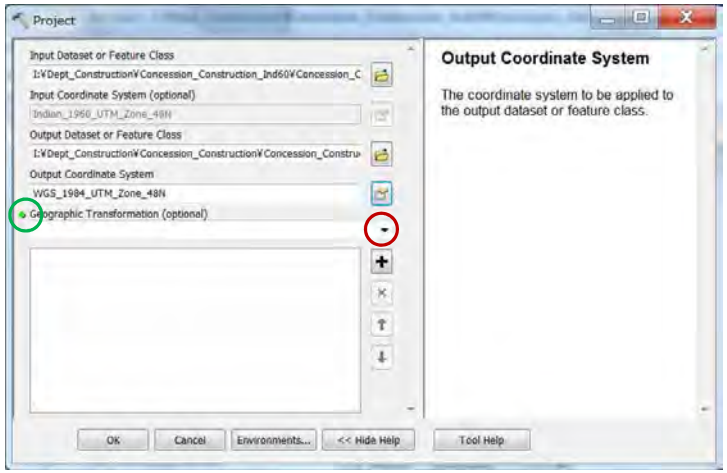


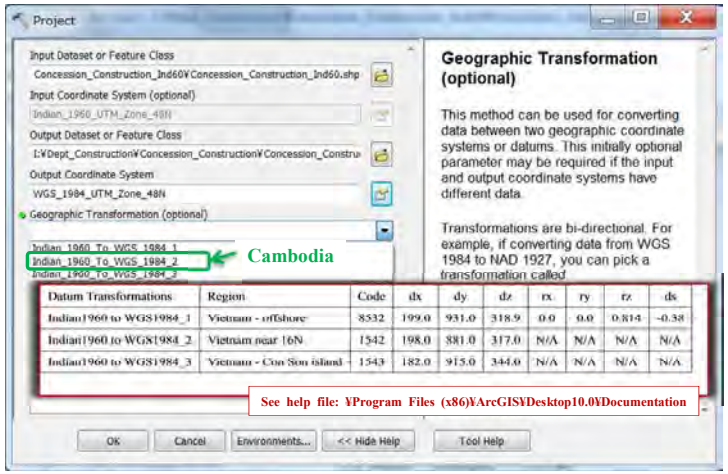
Give coordinate system of WGS1984 UTM

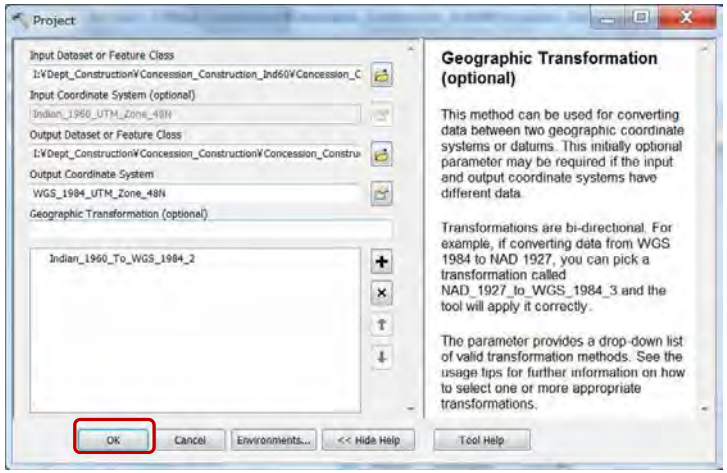


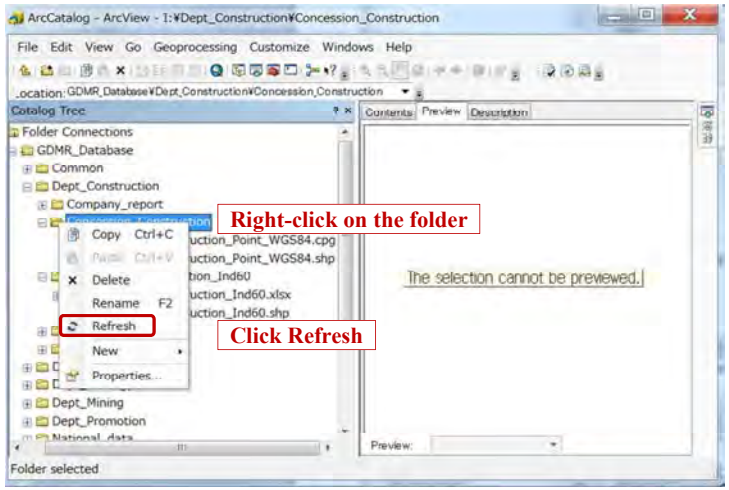

Spatial Reference Properties
XY Coordinate System
Z Coordinate System
Name:
Unknown
Details:
Select...
Select a predefined coordinate system.
Import a coordinate system and X/Y, Z and M
Browse for Coordinate System
Look in:
Coordinate Systems
Projected Coordinate Systems
Geographic Coordinate Systems
Browse for Coordinate System
Look in:
Projected Coordinate Systems
World (Sphere-based)
World
UTM
County Systems
Continental
ARC (equal arc-second)
Browse for Coordinate System
Look in:
UTM
WGS 1984
WGS 1972
South America
Oceans
North America
New Zealand
NAD 1983
NAD 1927
Malaysia
Indonesia
Europe
Asia
Africa
Name:
Add
Show of type:
Coordinate Systems
Cancel

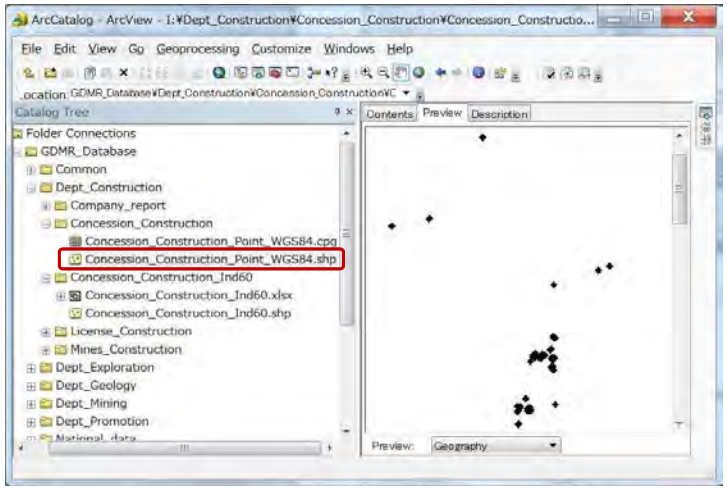

Browse for Coordinate System
Look in:
WGS 1984
Southern Hemisphere
Northern Hemisphere
Browse for Coordinate System
Look in:
Northern Hemisphere
WGS 1984 UTM Zone 4N.prj
WGS 1984 UTM Zone 49N.prj
WGS 1984 UTM Zone 48N.prj
WGS 1984 UTM Zone 47N.prj
WGS 1984 UTM Zone 46N.prj
WGS 1984 UTM Zone 45N.prj
WGS 1984 UTM Zone 42N.prj
WGS 1984 UTM Zone 41N.prj
WGS 1984 UTM Zone 40N.prj
WGS 1984 UTM Zone 3N.prj
WGS 1984 UTM Zone 39N.prj
WGS 1984 UTM Zone 38N.prj
Name:
Show of type:
Spatial Reference Properties
XY Coordinate System
Z Coordinate System
Name:
WGS_1984_UTM_Zone_48N
Details:
Projection: Transverse_Mercator
False_Easting: 500000.000000
False_Northing: 0.000000
Central_Meridian: 105.000000
Scale_Factor: 0.999600
Latitude_Of_Origin: 0.000000
Linear Unit: Meter (1.000000)
Geographic Coordinate System: GCS_WGS_1984
Angular Unit: Degree (0.0174532925199433299)
Prime Meridian: Greenwich (0.000000000000000000)
Datum: D_WGS_1984
Spheroid: WGS_1984
Select...
Select a predefined coordinate system.
Import...
Import a coordinate system and X/Y, Z and M domains from an existing geodataset (e.g., feature dataset, feature class, raster).
New
Create a new coordinate system.
Modify...
Edit the properties of the currently selected coordinate system.
Clear
Sets the coordinate system to Unknown.
Save As...
Save the coordinate system to a file.
OK
キャンセル
適用(A)


Project
Input Dataset or Feature Class
Input Coordinate System (optional)
Output Dataset or Feature Class
Output Coordinate System
WGS_1984_UTM_Zone_48N
Geographic Transformation (optional)
Output Coordinate System
The coordinate system to be applied to the output dataset or feature class.
OK
Cancel
Environments...
<< Hide Help
Tool Help


Project
Input Dataset or Feature Class
Input Coordinate System (optional)
Output Dataset or Feature Class
Output Coordinate System
WGS_1984_UTM_Zone_48N
Geographic Transformation (optional)
Indian_1960_To_WGS_1984_1
Indian_1960_To_WGS_1984_2
Indian_1960_To_WGS_1984_3
Cambodia
Geographic Transformation (optional)
This method can be used for converting data between two geographic coordinate systems or datums. This initially optional parameter may be required if the input and output coordinate systems have different data.
Transformations are bi-directional. For example, if converting data from WGS 1984 to NAD 1927, you can pick a transformation called
Datum Transformations | Region | Code | dx | dy | dz | rx | ry | rz | ds
Indian1960 to WGS1984_1 | Vietnam - offshore | 8532 | 199.0 | 931.0 | 318.9 | 0.0 | 0.0 | 0.814 | -0.38
Indian1960 to WGS1984_2 | Vietnam near 16N | 1542 | 198.0 | 881.0 | 317.0 | N/A | N/A | N/A | N/A
Indian1960 to WGS1984_3 | Vietnam - Con Son island | 1543 | 182.0 | 915.0 | 344.0 | N/A | N/A | N/A | N/A
See help file: ¥Program Files (x86)¥ArcGIS¥Desktop10.0¥Documentation
OK
Cancel
Environments...
<< Hide Help
Tool Help

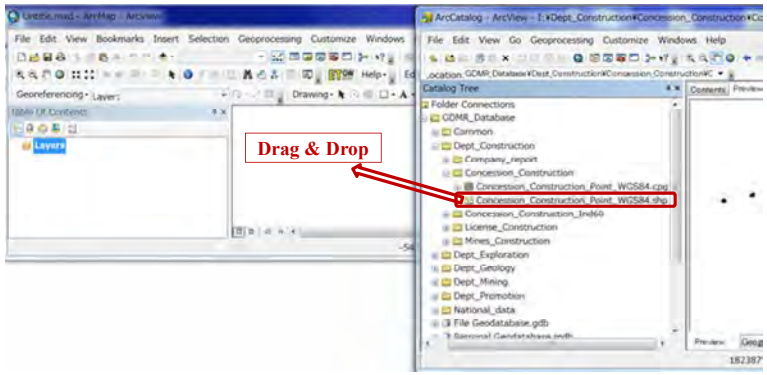

Project
Input Dataset or Feature Class
Input Coordinate System (optional)
Output Dataset or Feature Class
Output Coordinate System
WGS_1984_UTM_Zone_48N
Geographic Transformation (optional)
Indian_1960_To_WGS_1984_2
Geographic Transformation (optional)
This method can be used for converting data between two geographic coordinate systems or datums. This initially optional parameter may be required if the input and output coordinate systems have different data.
Transformations are bi-directional. For example, if converting data from WGS 1984 to NAD 1927, you can pick a transformation called NAD_1927_to_WGS_1984_3 and the tool will apply it correctly.
The parameter provides a drop-down list of valid transformation methods. See the usage tips for further information on how to select one or more appropriate transformations.
OK
Cancel
Environments...
<< Hide Help
Tool Help

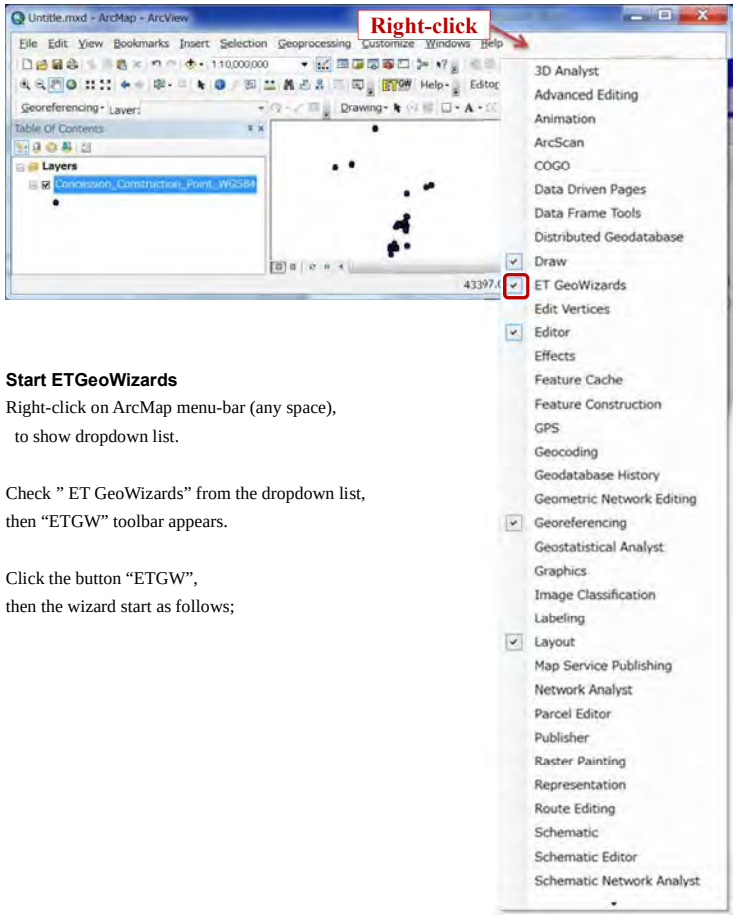

ArcCatalog - ArcView - I:¥Dept_Construction¥Concession_Construction
File Edit View Go Geoprocessing Customize Windows Help
Location: GDMR_Database¥Dept_Construction¥Concession_Construction
Catalog Tree
Contents Preview Description
Folder Connections
GDMR_Database
Common
Dept_Construction
Company_report
Right-click on the folder
Copy Ctrl+C
Delete
Rename F2
Refresh
New
Properties...
Click Refresh
The selection cannot be previewed.
Dept_Mining
Dept_Promotion
Preview:
Folder selected



3-1-3 Convert a shapefile from point to polygon

Add a point shapefile into ArcMap



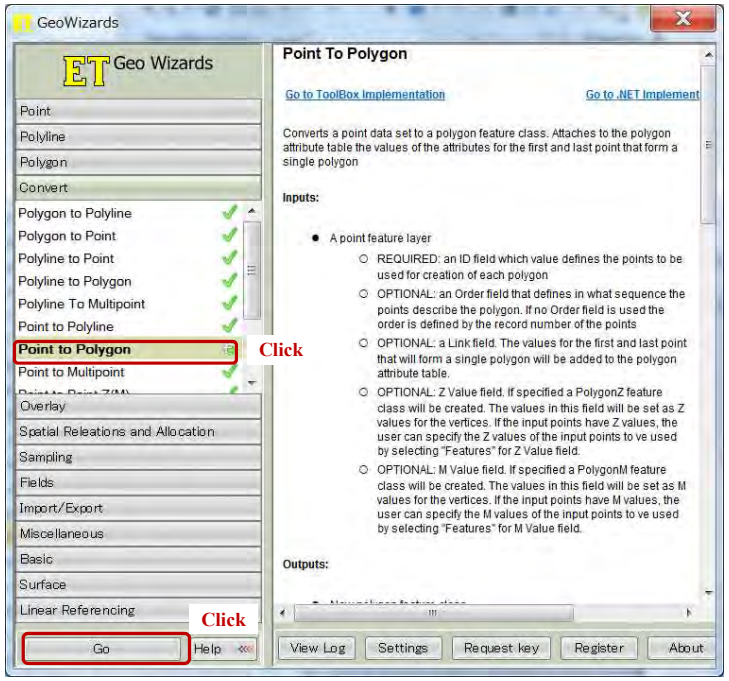


Start ETGeoWizards

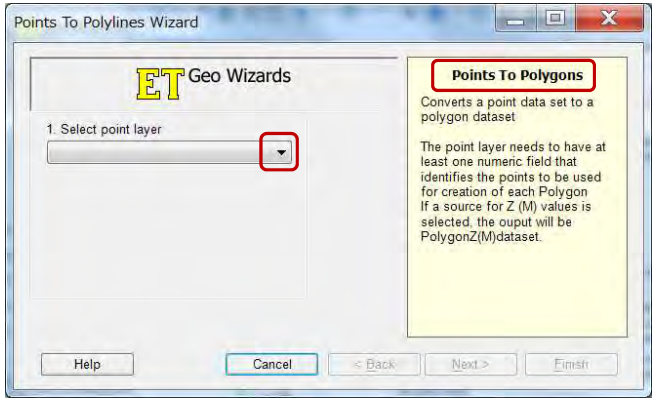
Right-click on ArcMap menu-bar (any space),
to show dropdown list.

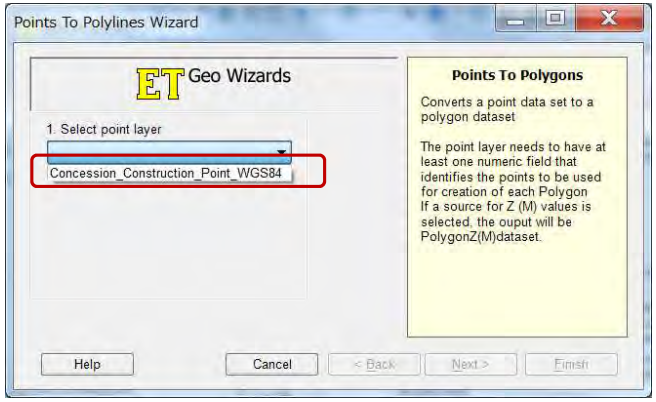
Check ” ET GeoWizards” from the dropdown list,
then “ETGW” toolbar appears.

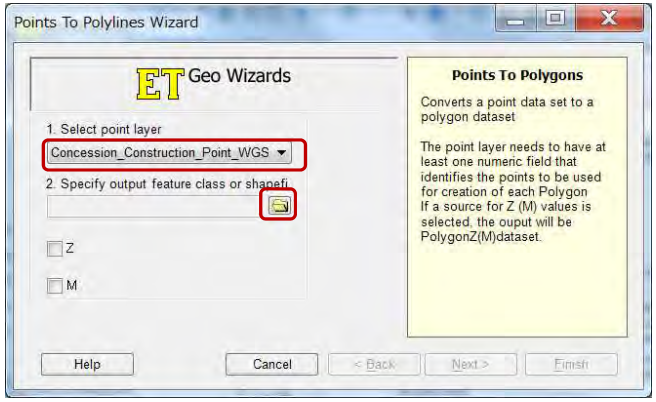
Click the button “ETGW”,
then the wizard start as follows;

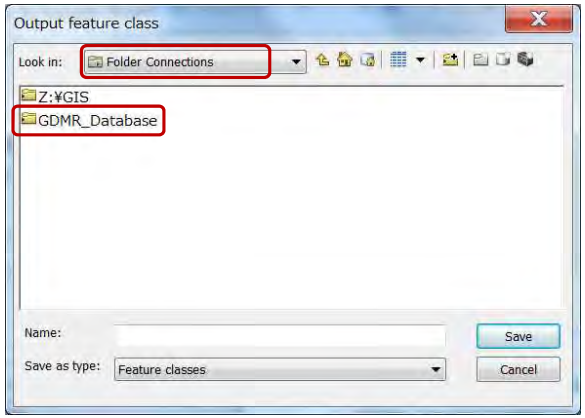


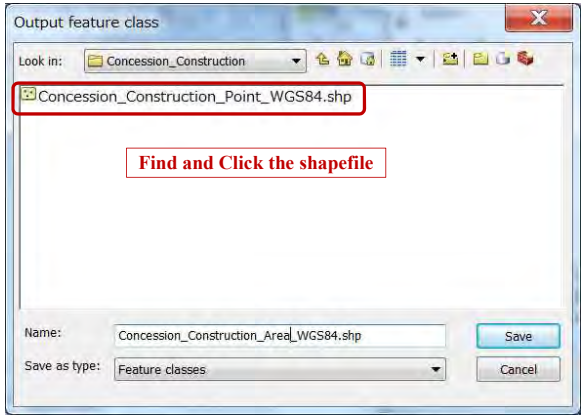
Choose “Point to Polygon”, then click “Go”.

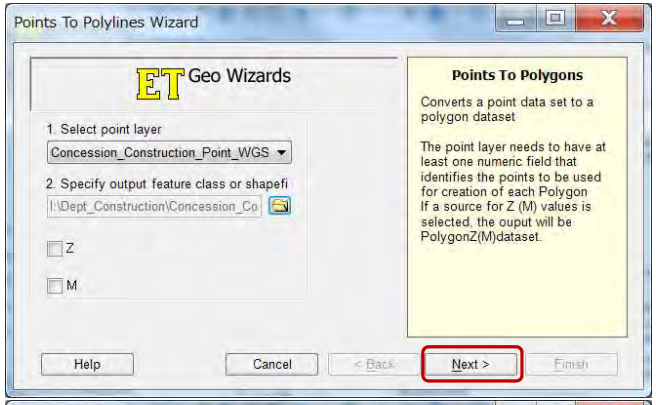


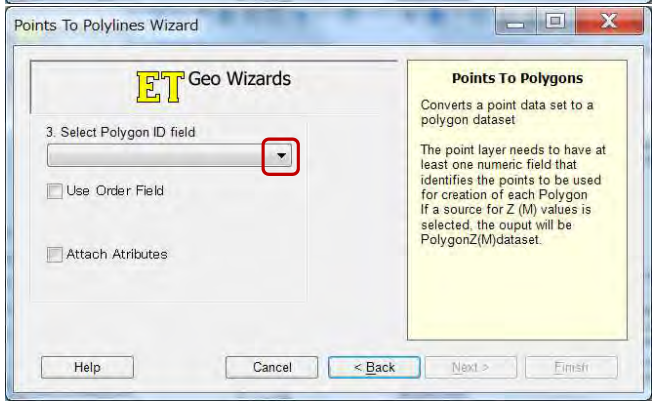


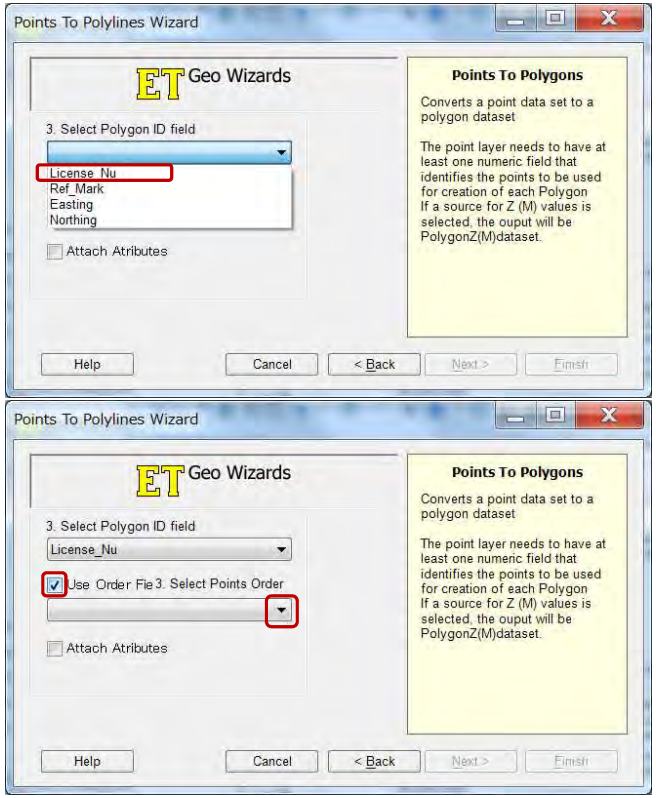


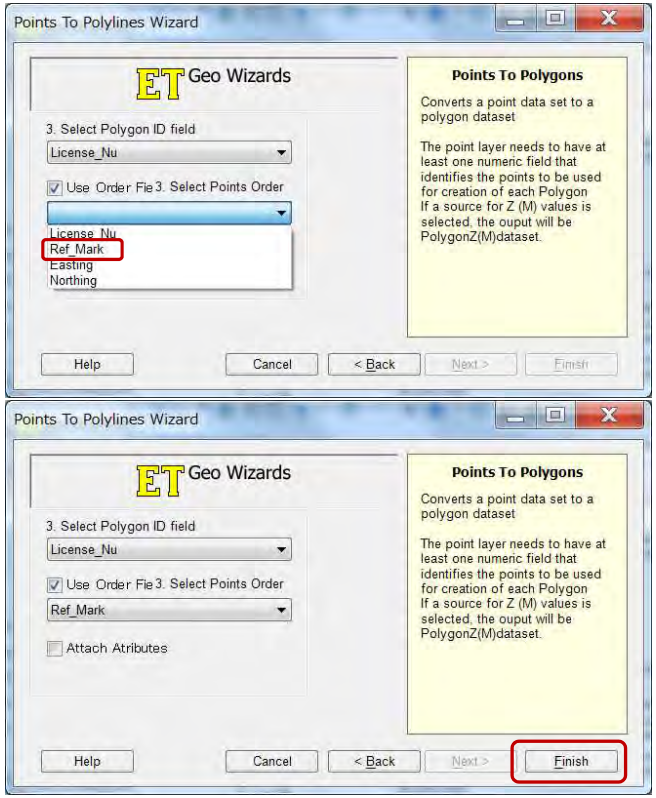

Output feature class
Look in:
Folder Connections
Z:¥GIS
GDMR_Database
Name:
Save as type:
Feature classes
Save
Cancel


Output feature class
Look in:
Concession_Construction
Concession_Construction_Point_WGS84.shp
Find and Click the shapefile
Name:
Concession_Construction_Area_WGS84.shp
Save as type:
Feature classes
Save
Cancel

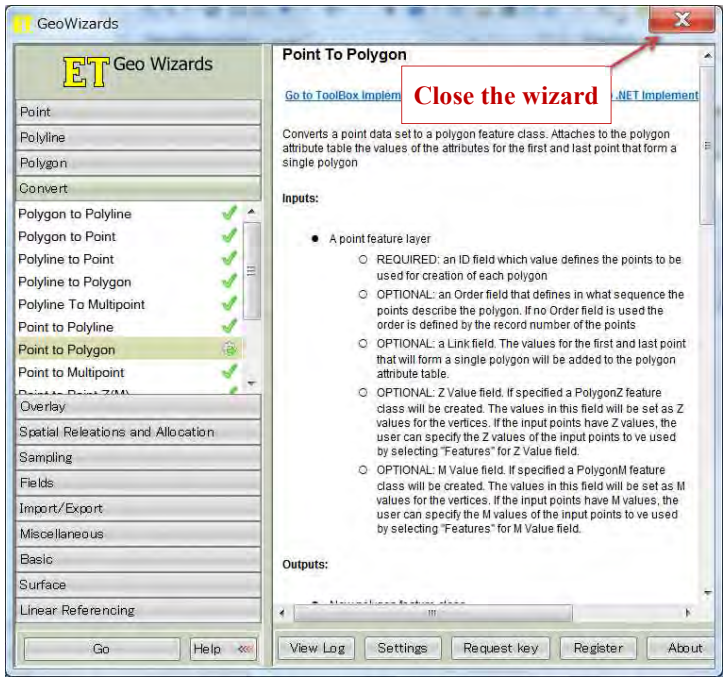

Points To Polylines Wizard
ET Geo Wizards
1. Select point layer
Concession_Construction_Point_WGS
2. Specify output feature class or shapefi
I:\Dept_Construction\Concession_Co
Z
M
Points To Polygons
Converts a point data set to a polygon dataset
The point layer needs to have at least one numeric field that identifies the points to be used for creation of each Polygon
If a source for Z (M) values is selected, the ouput will be PolygonZ(M)dataset.
Help
Cancel
< Back
Next >
Finish

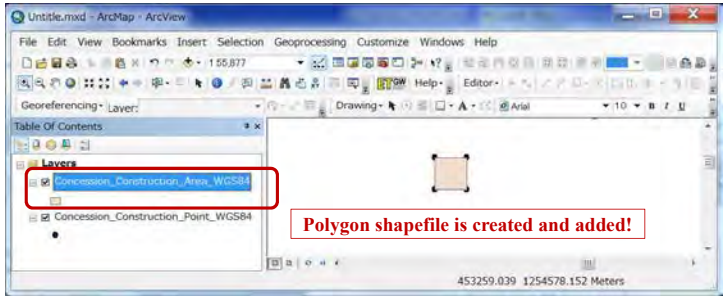

Points To Polylines Wizard
ET Geo Wizards
3. Select Polygon ID field
Use Order Field
Attach Atributes
Points To Polygons
Converts a point data set to a polygon dataset
The point layer needs to have at least one numeric field that identifies the points to be used for creation of each Polygon
If a source for Z (M) values is selected, the ouput will be PolygonZ(M)dataset.
Help
Cancel
< Back
Next >
Finish



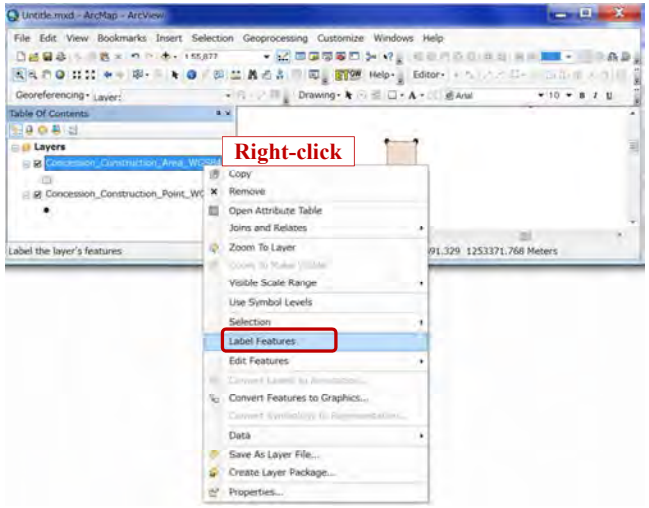


Click “Finish”, polygon shape is created in the output folder, then automatically added to layers.

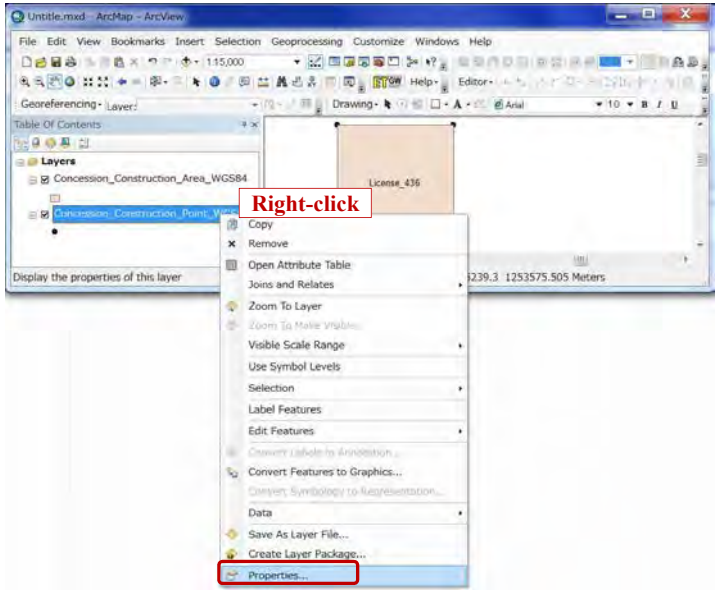


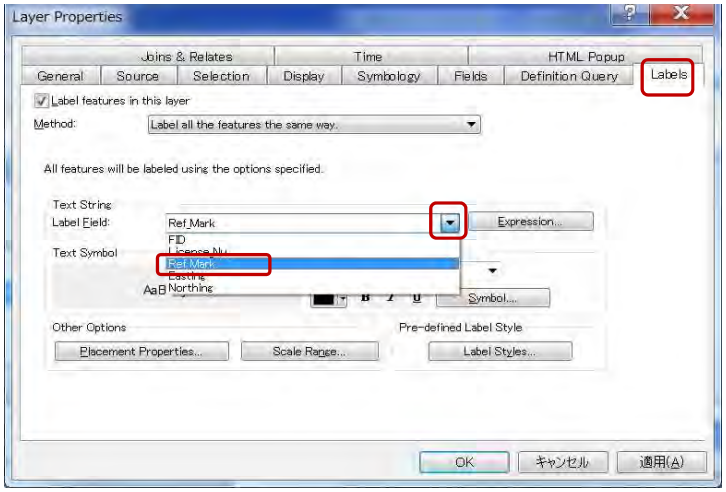


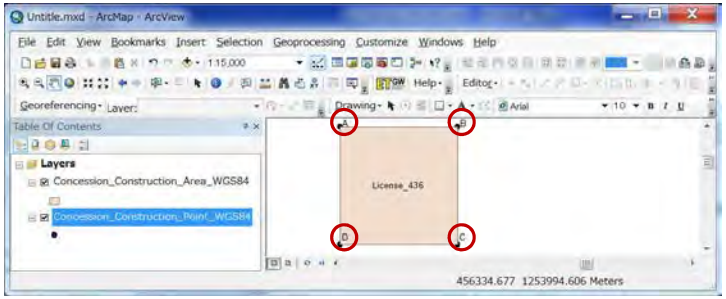
Show labels of concessions




Untitle.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Table Of Contents
Layers
Concession_Construction_Area_WGS84
Concession_Construction_Point_WGS84
License_436
456185.452 1253658.055 Meters


Untitle.mxd - ArcMap - ArcView
Right-click
Copy
Remove
Open Attribute Table
Joins and Relates
Zoom To Layer
Visible Scale Range
Use Symbol Levels
Selection
Label Features
Edit Features
Convert Features to Graphics...
Data
Save As Layer File...
Create Layer Package...
Properties...
Display the properties of this layer

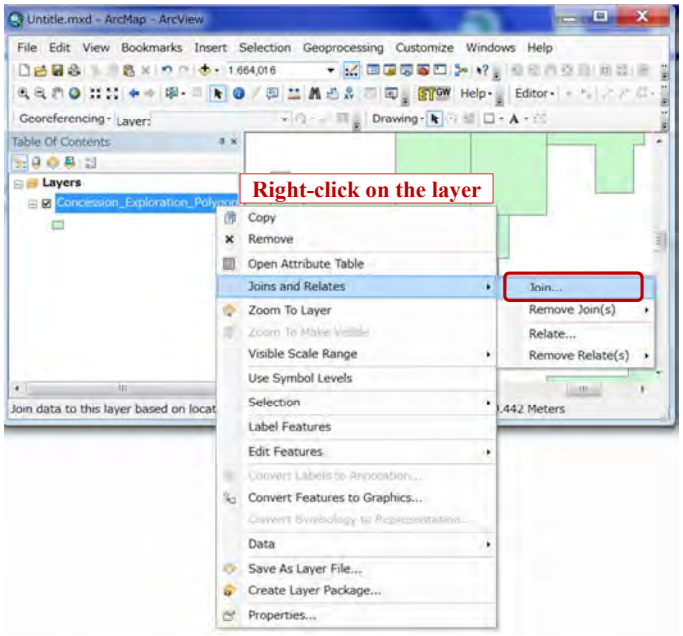

Layer Properties
Joins & Relates
Time
HTML Popup
General
Source
Selection
Display
Symbology
Fields
Definition Query
Labels
Label features in this layer
Method:
Label all the features the same way
All features will be labeled using the options specified.
Text String
Label Field:
Ref_Mark
Expression...
Text Symbol
Symbol...
Other Options
Placement Properties...
Scale Range...
Pre-defined Label Style
Label Styles...
OK
キャンセル
適用(A)

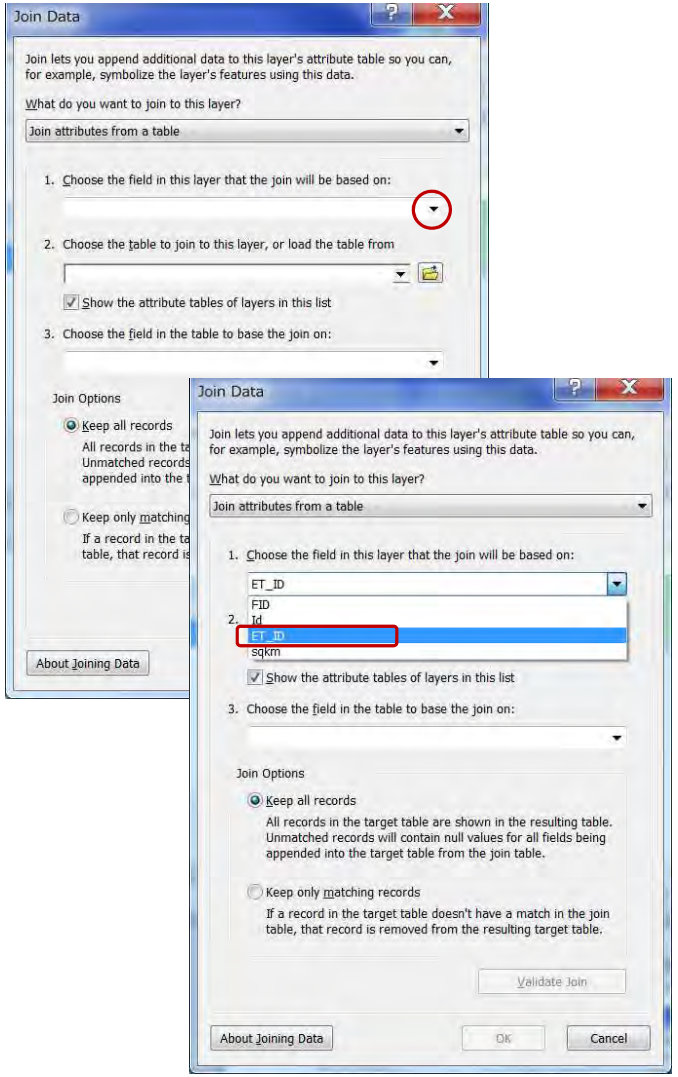

Untitle.mxd - ArcMap - ArcView
Layers
Concession_Construction_Area_WGS84
Concession_Construction_Point_WGS84
License_436
456334.677 1253994.606 Meters

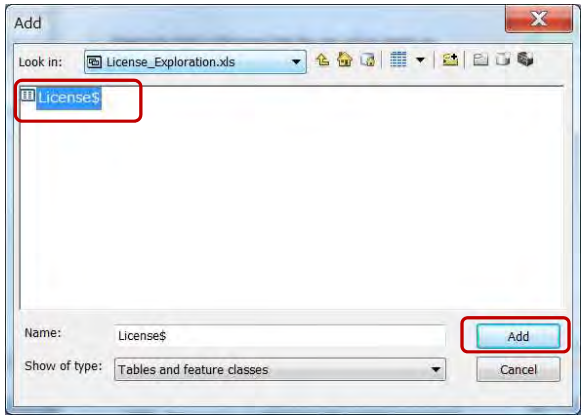
3-2 Advance step to complete a concession shapefile

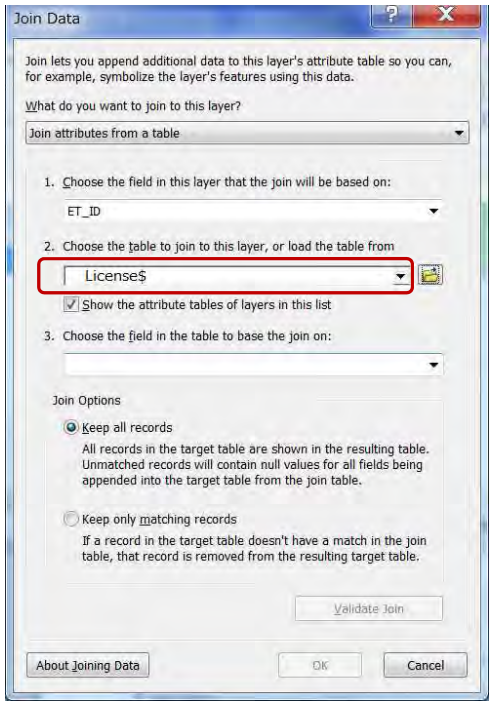
Join concession polygon shapefile with license data by license number.

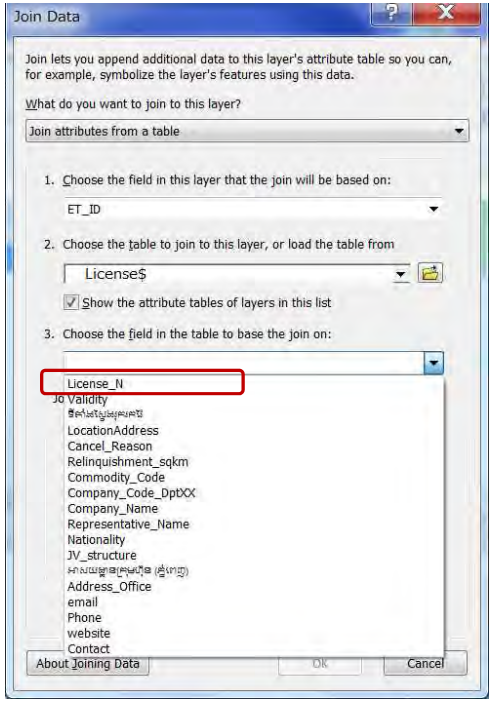
3-2-1 Join with the license data of Excel file by license number

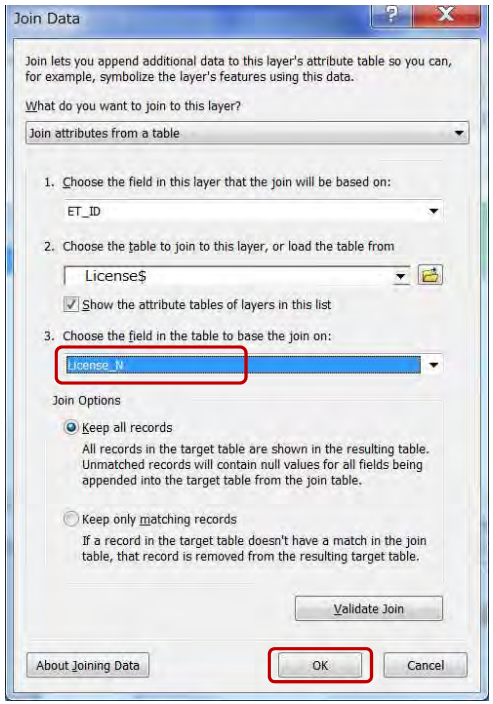


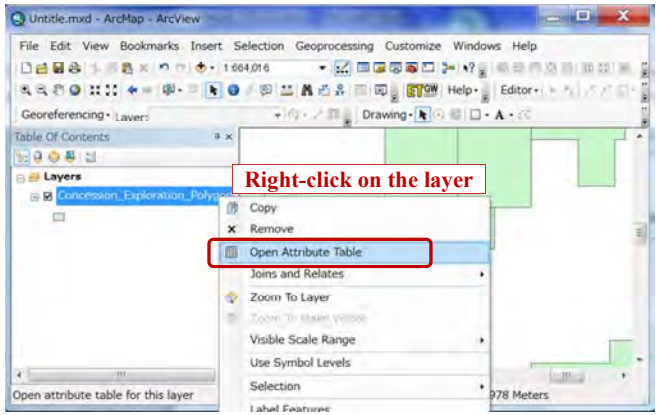


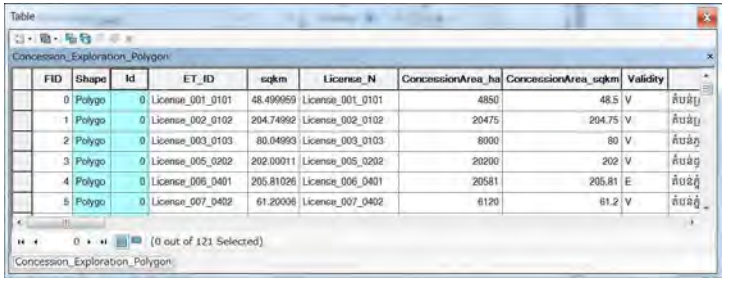

Add
Look in:
License_Exploration.xls
License$
Name:
License$
Add
Show of type:
Tables and feature classes
Cancel


Join Data
Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data.
What do you want to join to this layer?
Join attributes from a table
1. Choose the field in this layer that the join will be based on:
ET_ID
2. Choose the table to join to this layer, or load the table from
License$
Show the attribute tables of layers in this list
3. Choose the field in the table to base the join on:
Join Options
Keep all records
All records in the target table are shown in the resulting table. Unmatched records will contain null values for all fields being appended into the target table from the join table.
Keep only matching records
If a record in the target table doesn't have a match in the join table, that record is removed from the resulting target table.
Validate Join
About Joining Data
OK
Cancel


Join Data
Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data.
What do you want to join to this layer?
Join attributes from a table
1. Choose the field in this layer that the join will be based on:
ET_ID
2. Choose the table to join to this layer, or load the table from
License$
Show the attribute tables of layers in this list
3. Choose the field in the table to base the join on:
License_N
Jo Validity
LocationAddress
Cancel_Reason
Relinquishment_sqkm
Commodity_Code
Company_Code_DptXX
Company_Name
Representative_Name
Nationality
JV_structure
Address_Office
email
Phone
website
Contact
About Joining Data
OK
Cancel

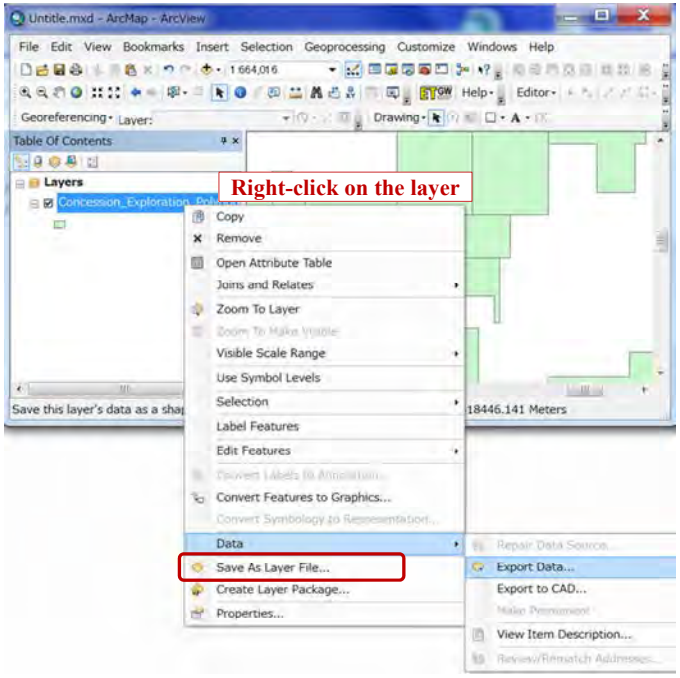






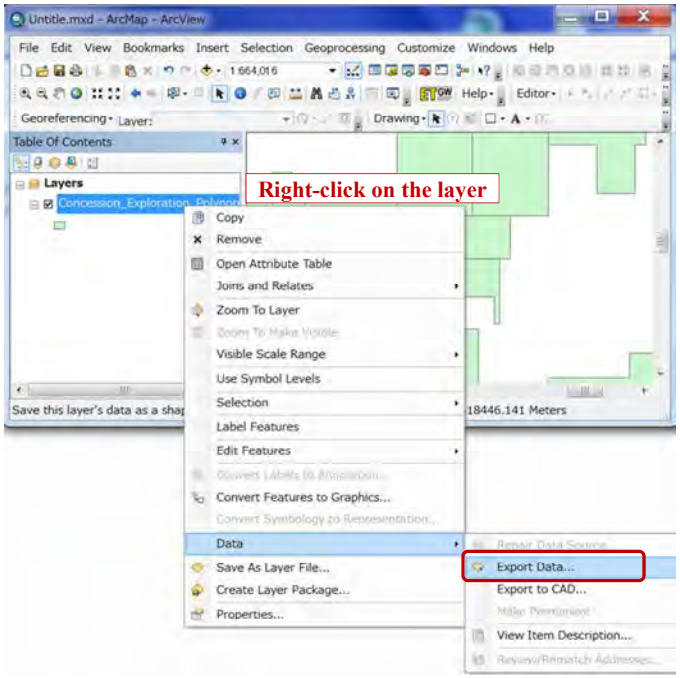
3-2-2 Save the joined result as a layer file

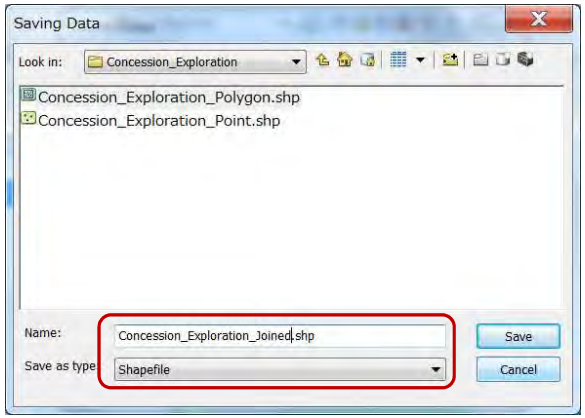
The layer which has joined data can save as a layer file. In this case the original shapefile has still no joined data. Only joining path and layer setting only shall be saved into a layer file.

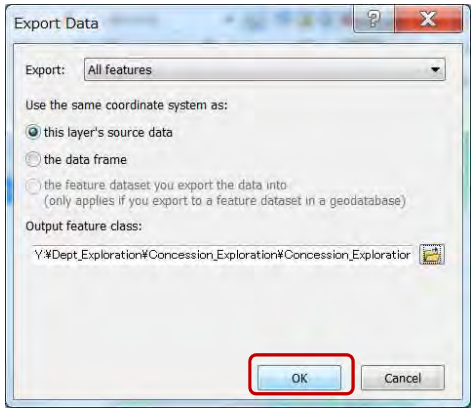


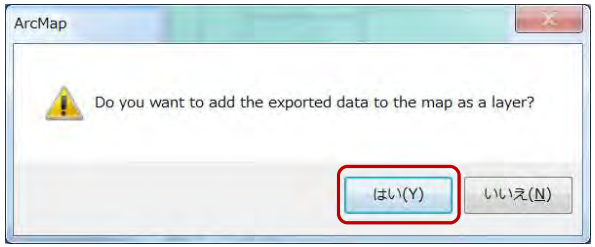
3-2-3 Save the joined result as another shapefile

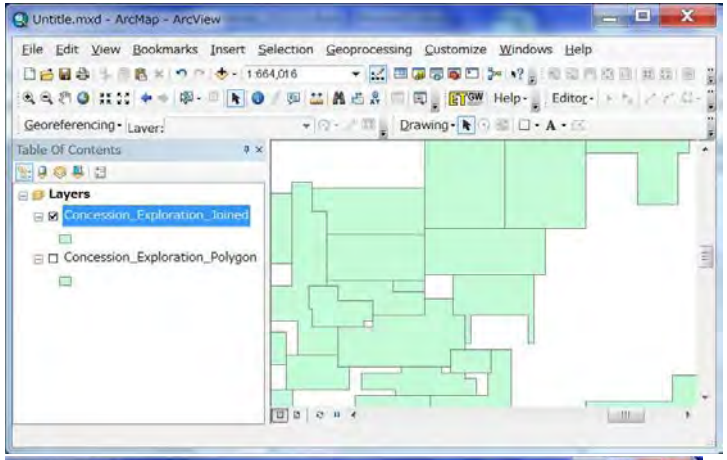
Joined data can stored into a new shapefile. But note it may lose the part of data of Khmer Unicode character, which depends on the default setting of operating PC.

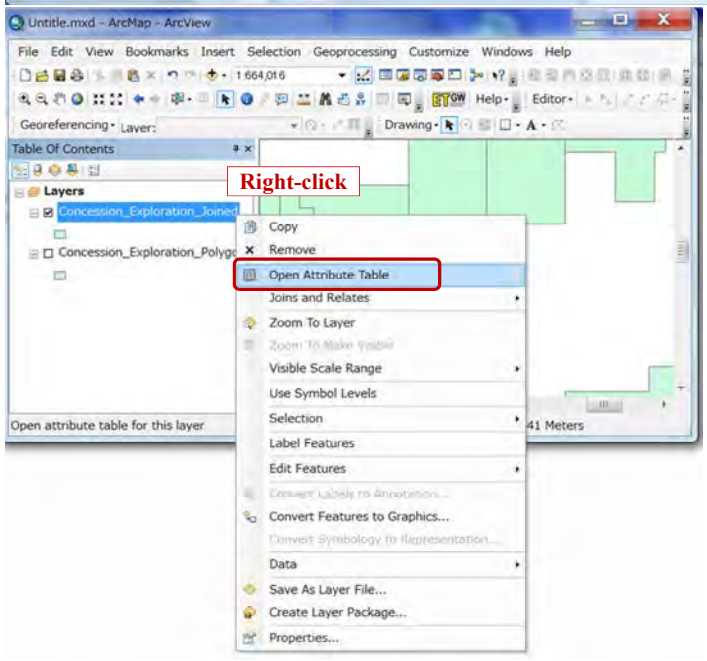


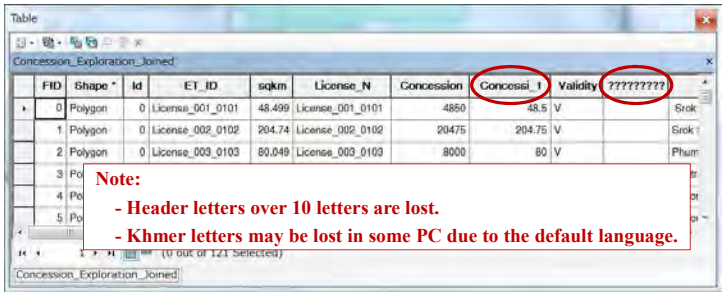












3-3 Create a blank shapefile and draw on map

How to draw object and edit in ArcMap, is instructed. At first add layer of a shapefile to draw in.

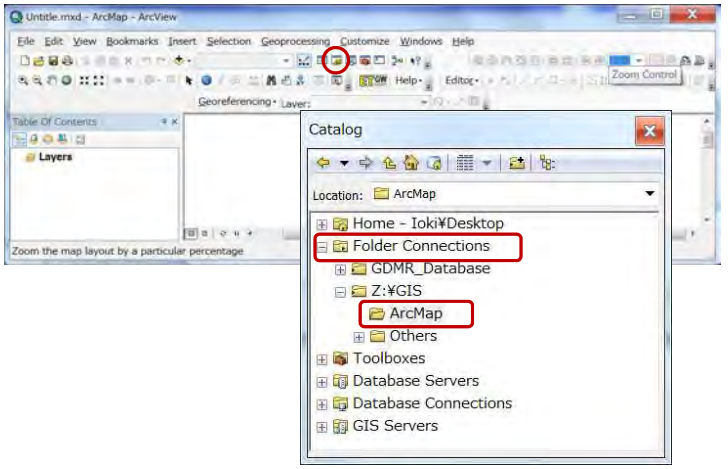
If you want to draw POLYLINE objects, add a POLYLINE shapefile to layer.

For POLYGON objects, add a POLYGON shapefile.

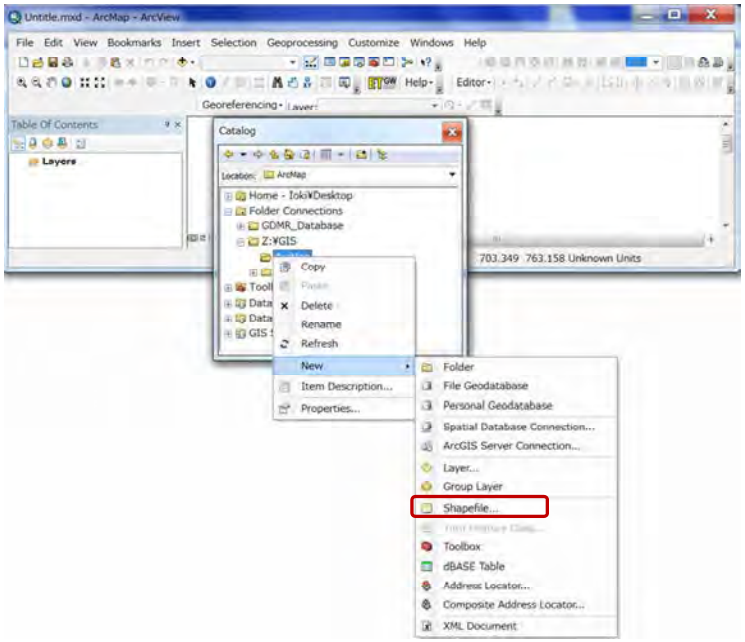
For POINT object, add a POINT shapefile.

3-3-1 Create a blank shapefile

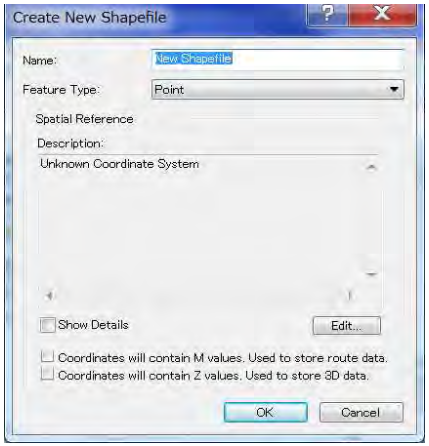
Start ArcMap and connect the folder.



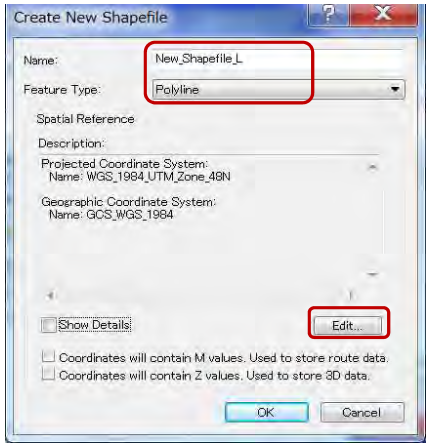
Right-click on the folder of path of a new shapefile, from Folder Connections (See ch___)



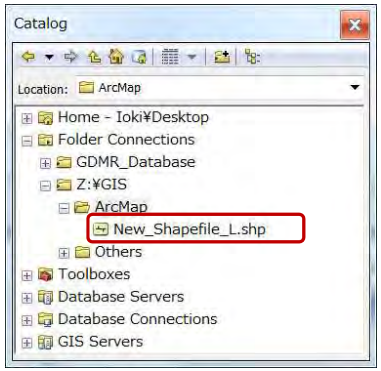
Select from the pulldown list, click “New”, “Shapefile…”.



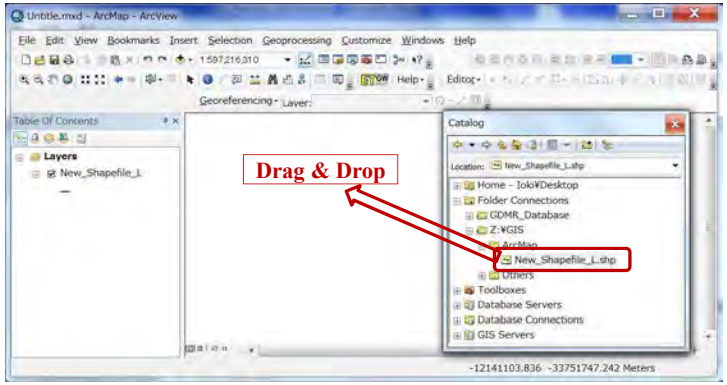
Give filename. Choose feature type (For example; Polyline).



Select special reference (such as WGS1984 UTM 48N) by click “Edit” button.
Click OK, then shortly a new shapefile is created in Catalog window.



At the same time the created shapefile is uploaded on ArcMap Layers window.
If not, drag the shapefile of Catalog window to ArcMap window.

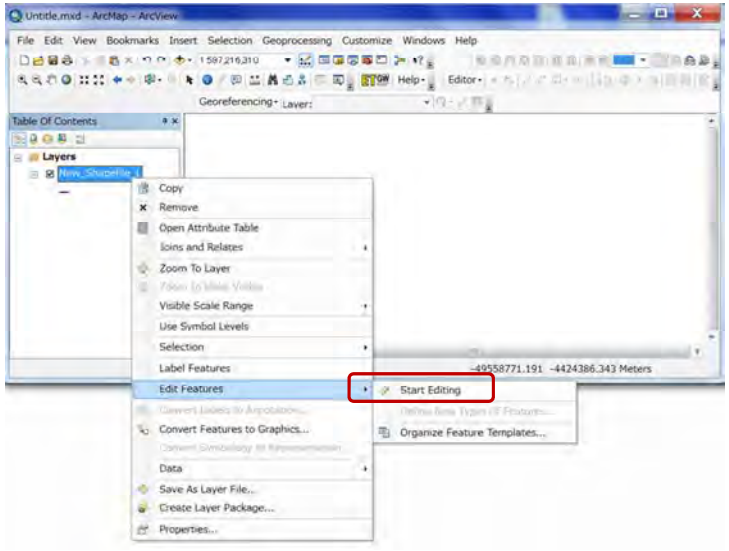


3-3-2 Draw new objects

Start editing

Right-click on the layer.

Select “Edit Features”, “Start Editing”.

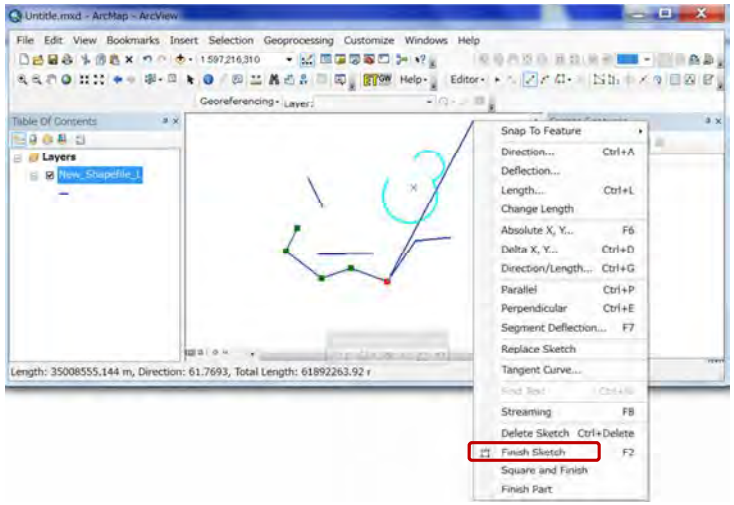


Draw objects

Click the line appearing in “Create Feature” window.

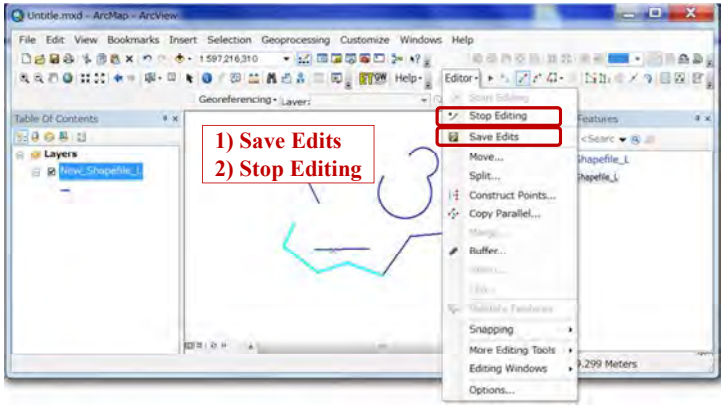
Draw a polyline.

Finish a drawing by right-click to select “Finish Sketch” from the pulldown list.

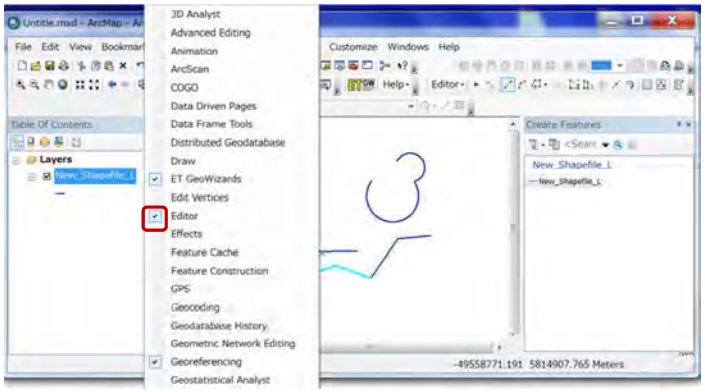


Save and stop editing

Click”Editor” in toolbar, select “Save Edits”, then select “Stop Editing”.



For Editor tool to appear, right-click any free space for toolbar, then check ON “Editor”.

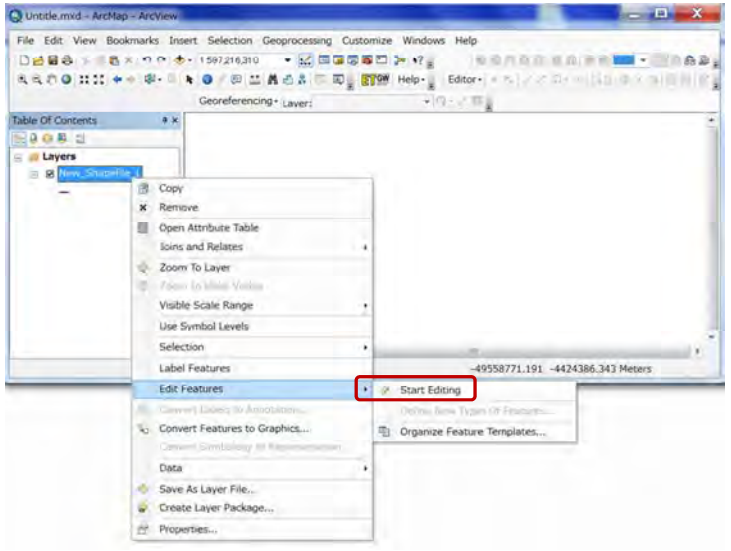


3-3-3 Edit objects

Start editing

Right-click on the layer.

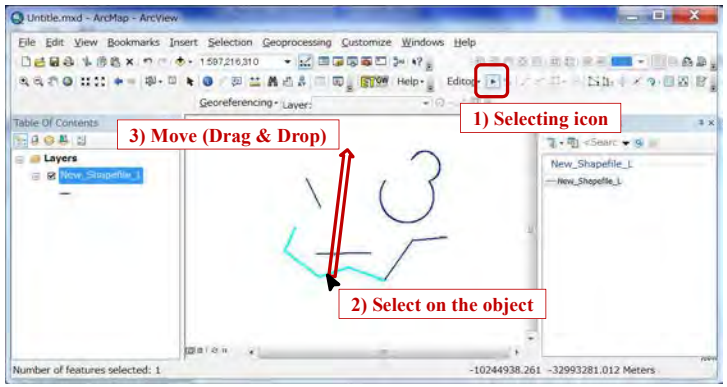
Select “Edit Features”, “Start Editing”.

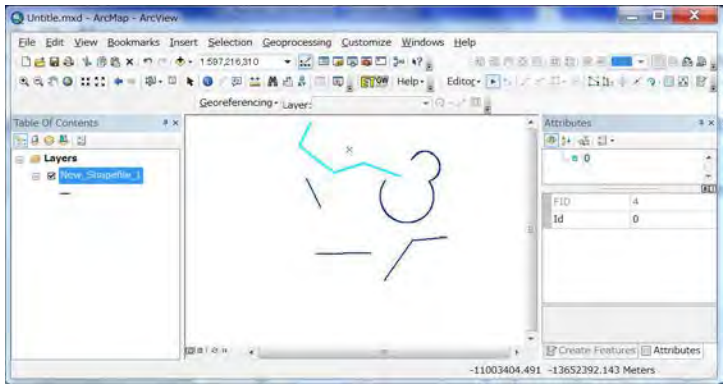


Edit objects

Select the arrow mark in Editor toolbar.

Click the object to be edited, then color of object is changed to the defined color of selection.

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File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
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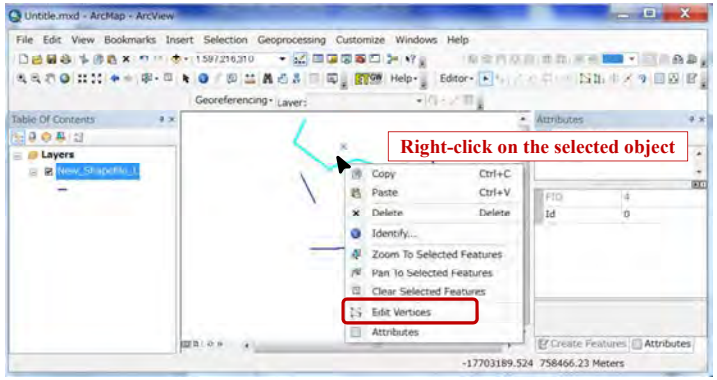
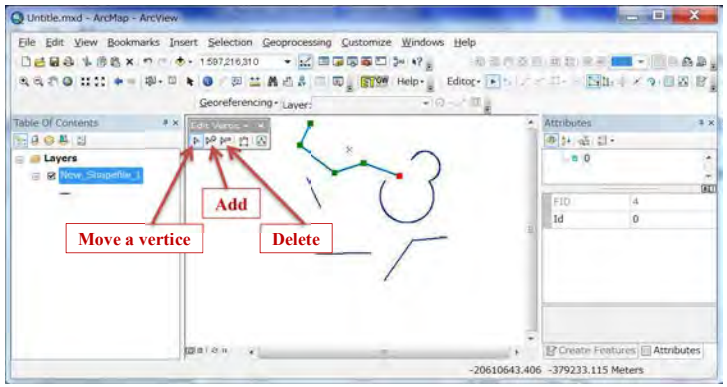
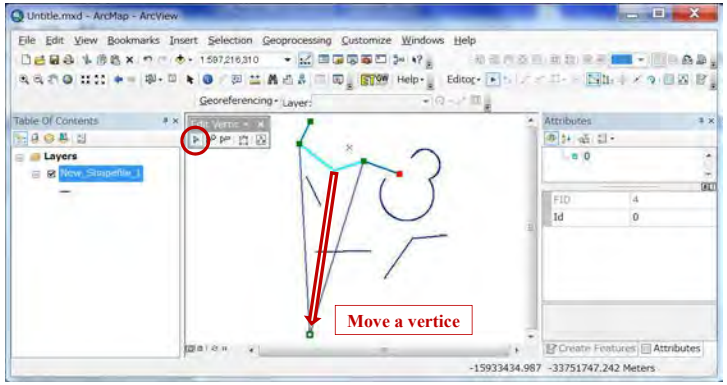
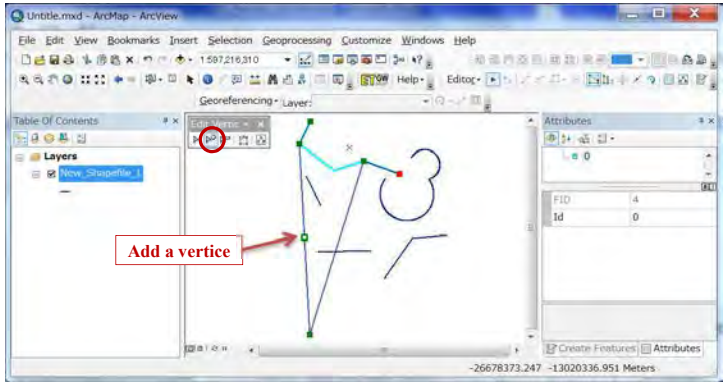
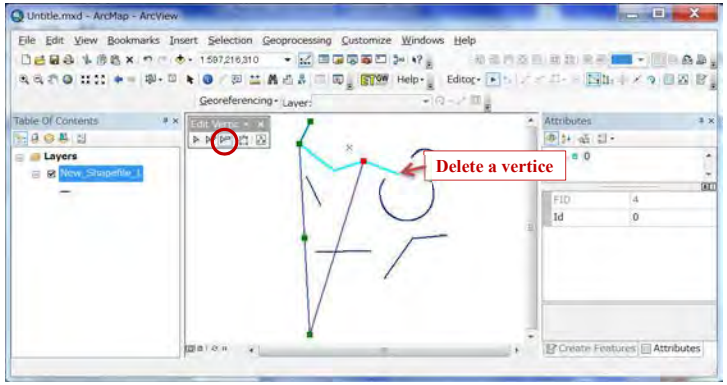
Layers
New_Shapefile_1
Attributes
Create Features
Attributes
-11003404.491 -13652392.143 Meters


Untitle.mxd - ArcMap - ArcView
Right-click on the selected object
Copy Ctrl+C
Paste Ctrl+V
Delete Delete
Identify...
Zoom To Selected Features
Pan To Selected Features
Clear Selected Features
Edit Vertices
Attributes
-17703189.524 758466.23 Meters


Untitle.mxd - ArcMap - ArcView
Add
Move a vertice
Delete
-20610643.406 -379233.115 Meters

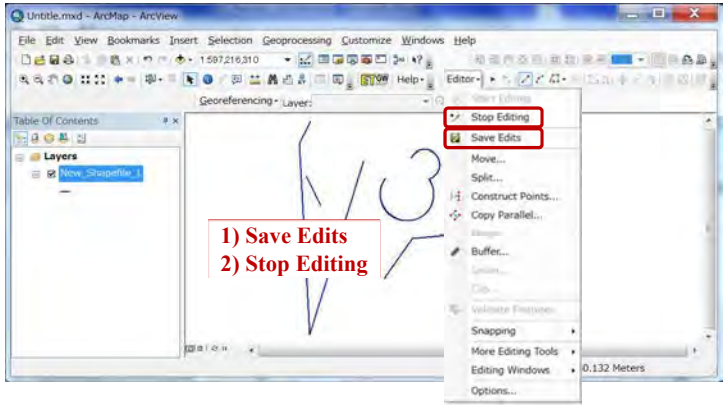

Untitle.mxd - ArcMap - ArcView
Move a vertice
-15933434.987 -33751747.242 Meters





Save and stop editing

Click"Editor" in toolbar, select "Save Edits", then select "Stop Editing".



4. Using existing data

Chapter 4 treats how to use other file-types, some of which may have different coordinate system or no spatial information. Raster images can be added to a map by georeference.

Example of existing data of other file-type

Kind of data	File type	Example	Conversion software
Vector data	DXF file	Transport data (Road, port,...)	ArcCatalog
	KML/KMZ file	GoogleEarth data	ArcToolbox
	GPX file	GPS data	BaseCamp
Raster data	JPG file PDF file TIFF file	Scanned map	ArcMap (georeference)

Note: ArcCatalog cannot show some file-types, such as KML/KMZ file, GPX file.

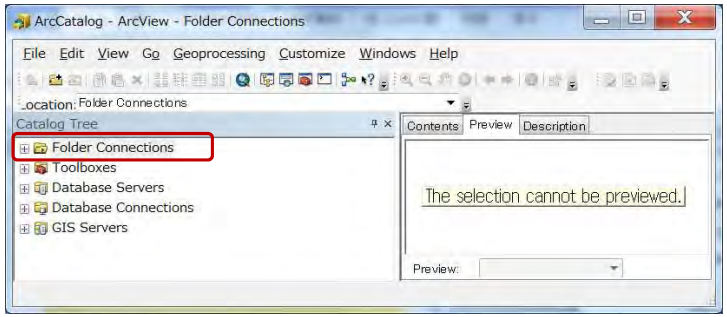
4-1 Vector data

Examples of vector file type are shapefile, DXF file, KML file and so on. These can be converted to shapefiles. Some files may have different coordinate systems, or no spatial information. We need to convert to or give the coordinate system based on WGS1984 datum.

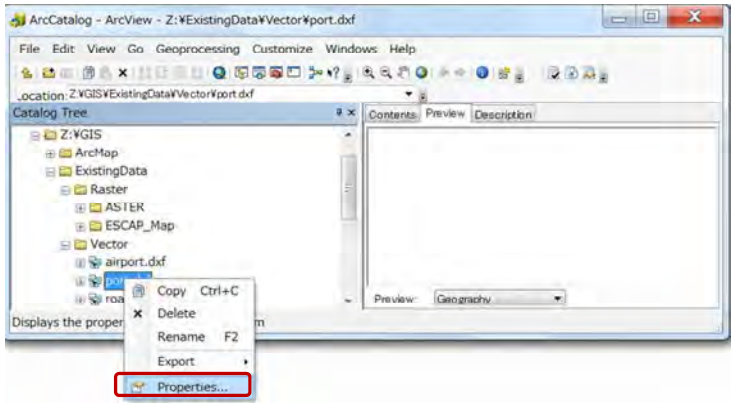
4-1-1 Check the coordinate system of vector data

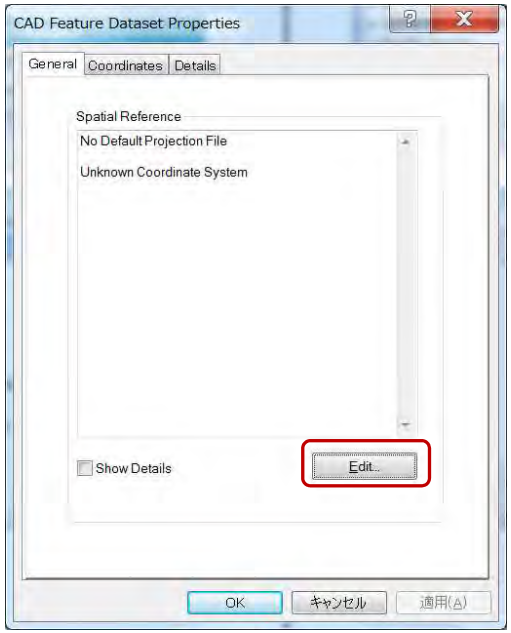
Spatial data of this database are designed based on WGS1984 UTM48N coordination system. So you have to check whether that is WGS1984 datum or not. If not, you have to convert the coordinate system.

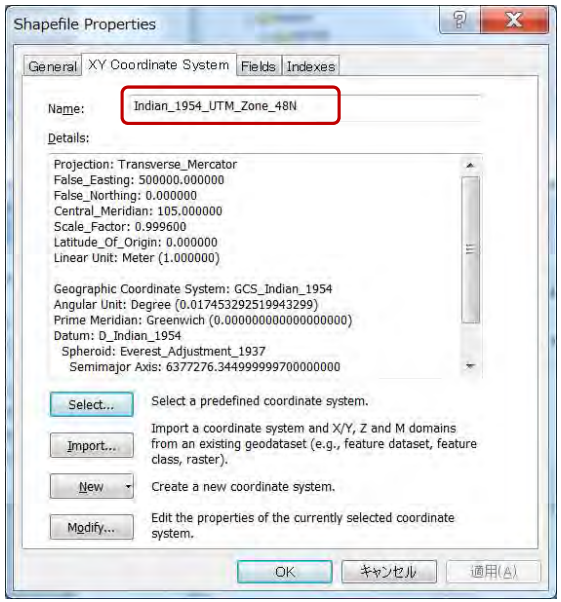
Open ArcCatalog



Right-click on “Folder Connections”, to connect folders.







4-1-2 Convert coordinate system of vector data

Use “Project” tools of ArcToolbox (See Chapter 3-1-8).

4-1-3 Convert DXF file to shapefile

airport.dxf port.dxf road.dxf	Make sure the coordination system applied in DXF file. These objects (road, airport,..) in DSF files are drawn on Indian1954 UTM48N system.

DXF file	Point object	Convert	Shapefile (Point)
	Polyline object	------->	Shapefile (Polyline)
	Polygon object		Shapefile (Polygon)

Open ArcCatalog.

Click the DXF file, which shows a set of several feature types.

Select one type of feature to be converted to a shapefile.

Give original coordinate system where object is drawn in DXF.

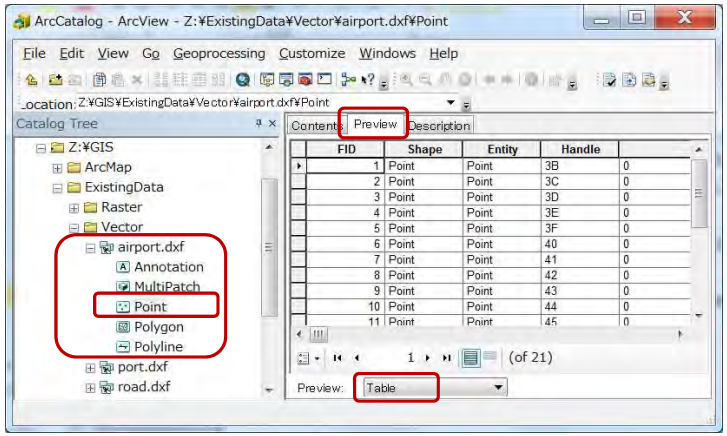
Right-click on the selected feature.

From the pulldown menu, select property to give coordinate system.

Right-click on the selected feature again.

From the pulldown menu, select Export to create a shapefile.

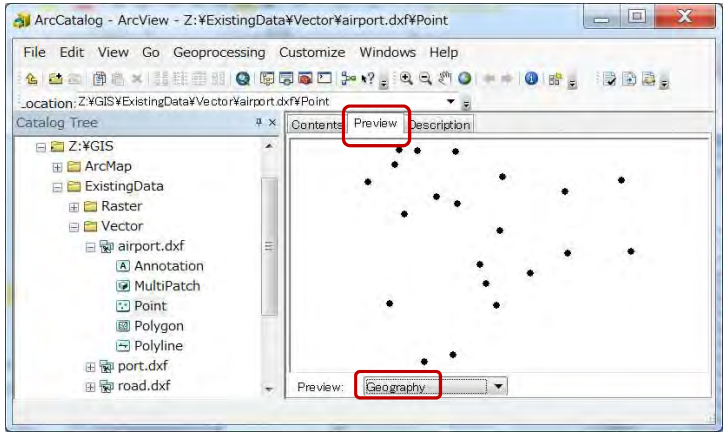
Convert point objects of DXF file in ArcCatalog



In Catalog Tree window, find the DXF file.

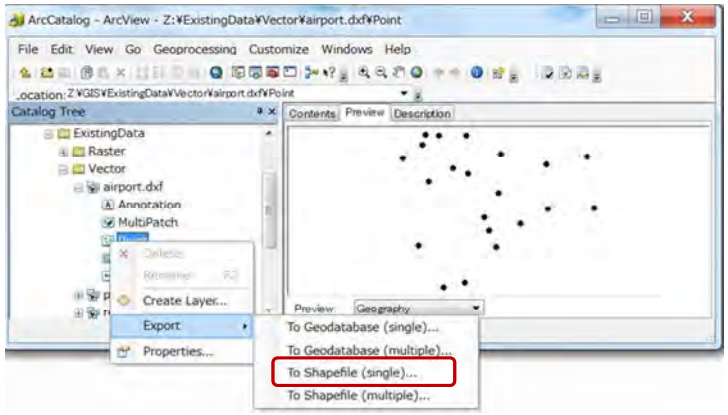
Click each segment inside the DXF file.

Click Preview tab, and choose “Geography” at the bottom.

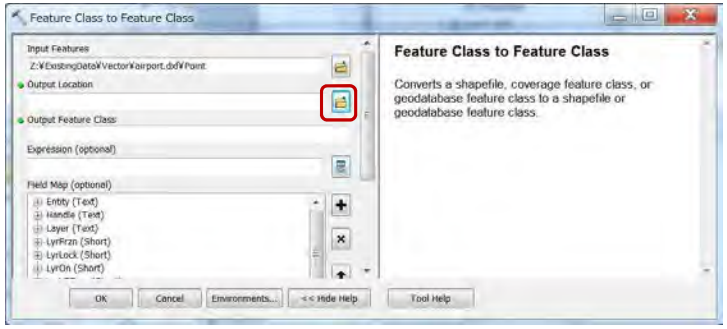


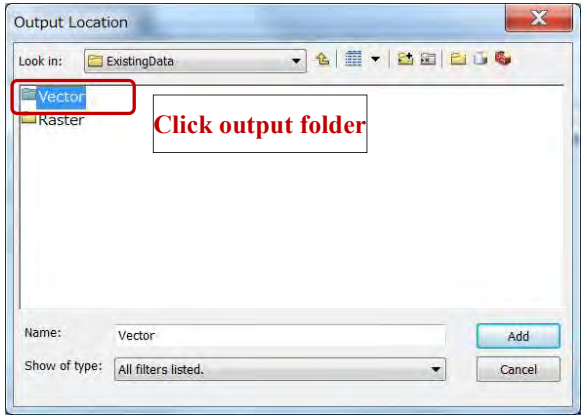
See the content of data, then right-click on the segment “Point” of airport.DXF

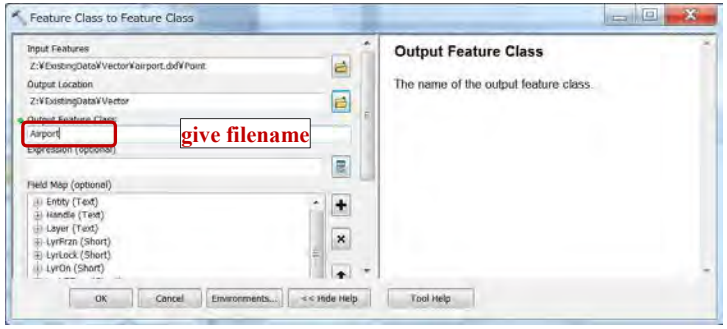
Right-click on “Point” segment.



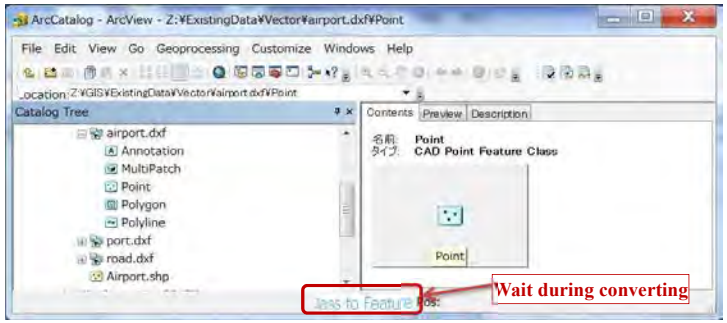
Select “Export”, “To Shapefile(single)...”

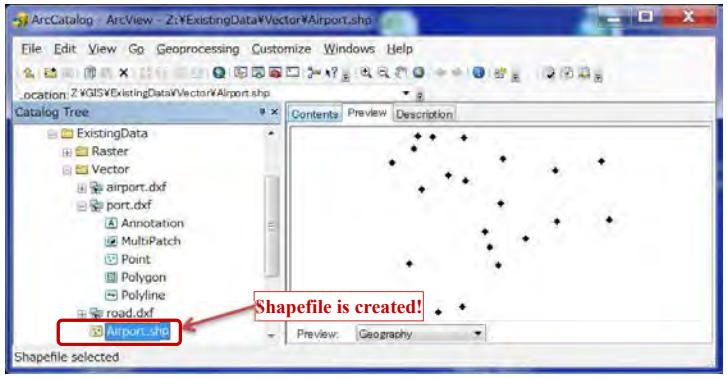




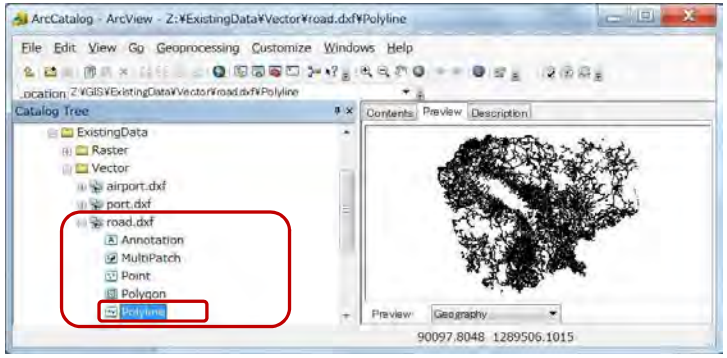


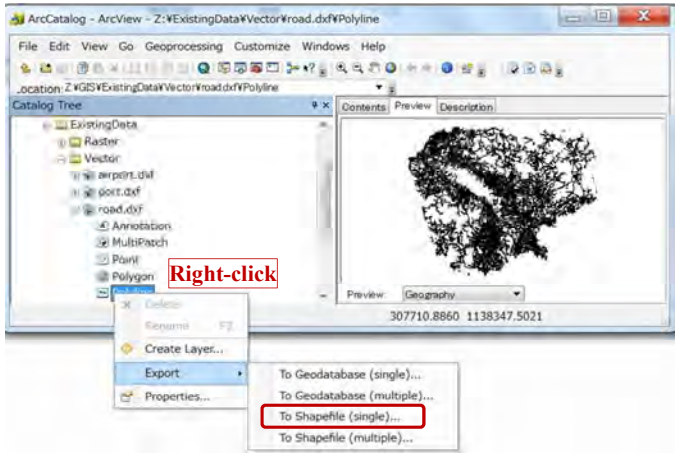
Click “OK”, then it start to create the new shapefile (Wait until creating message dissapear).

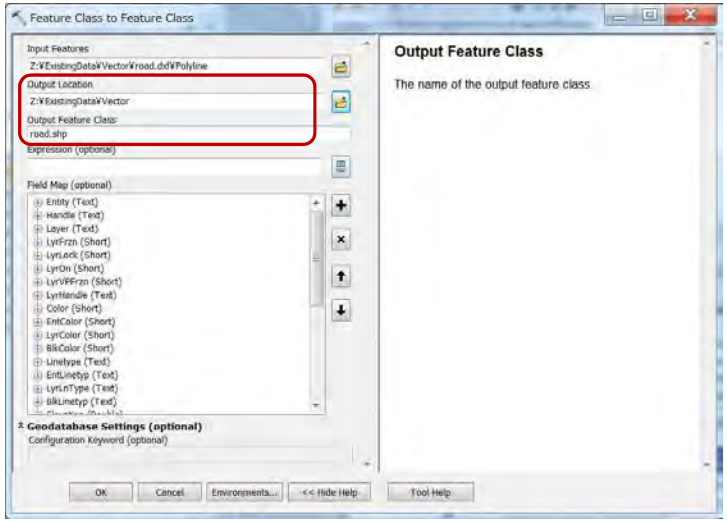


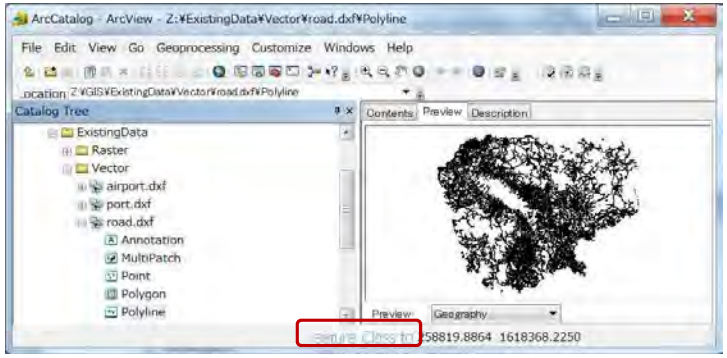


Convert polyline objects of DXF file in ArcCatalog





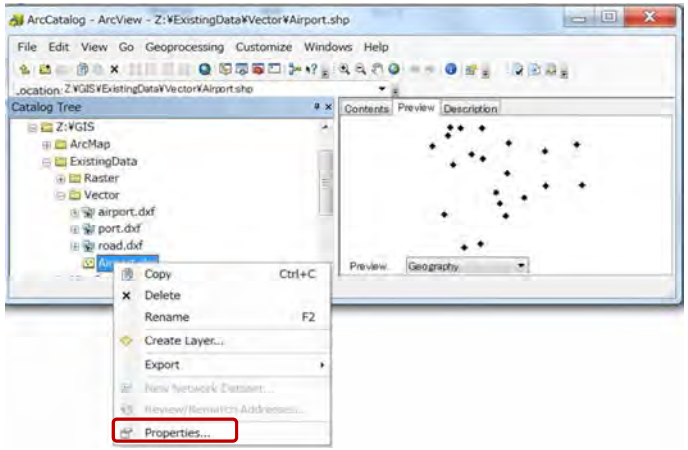


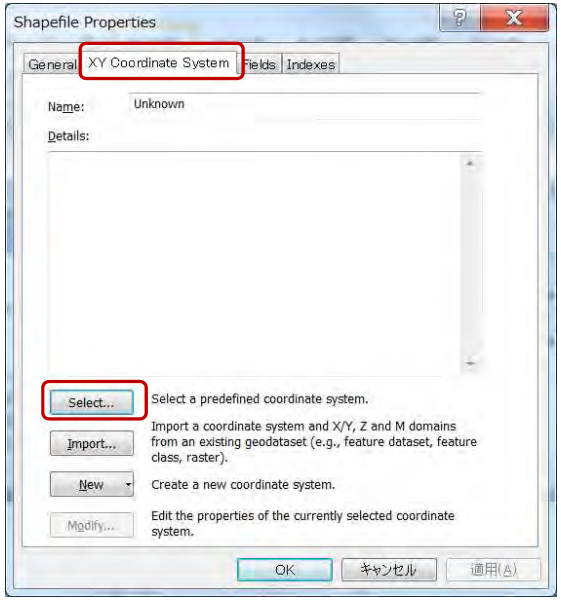


Right-click on the folder of new files, then select “Refresh” for new files to appear,

Give the coordinate system to new shapefile.

Right-click on new file “Airport.shp”.





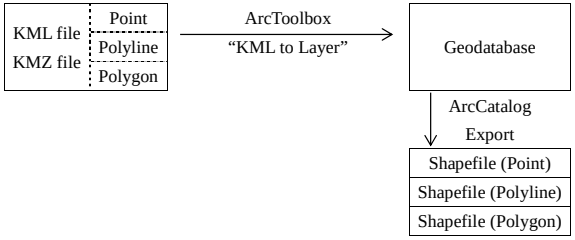
Click “Select...” button, to give WGS84 UTM48N (See Ch_____).

4-1-4 Convert KML/KMZ file to shapefile

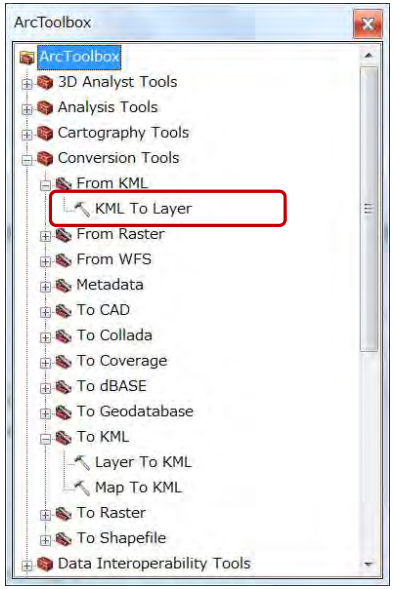
KMZ is a compressed file containing KML file. You can create KML file anytime from KMZ file.

KMZ file	Unzip ---------->	KML file

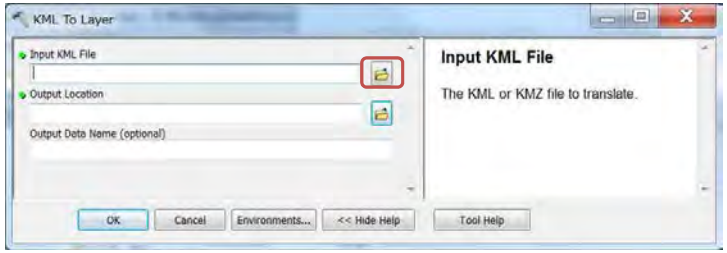
If you do not have any unzip software, free download from 7z website ;
www.7-zip.org/download.html

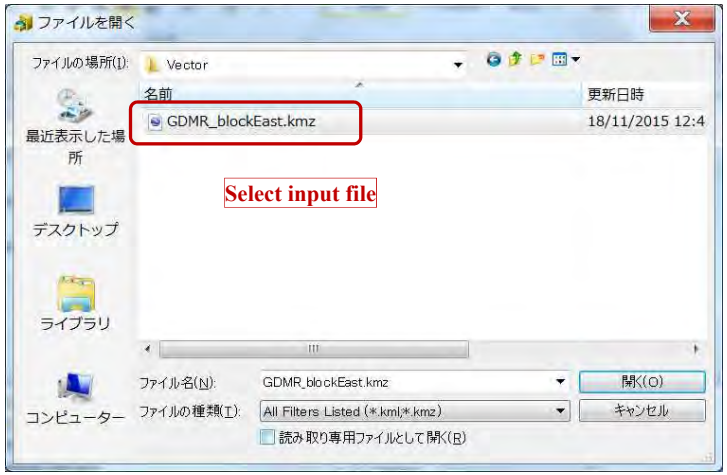


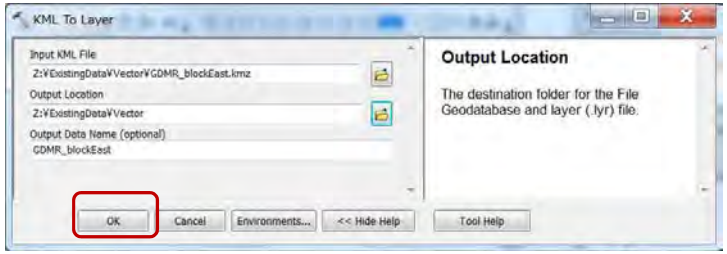
Start ArcMap or ArcCatalog
Open ArcToolbox

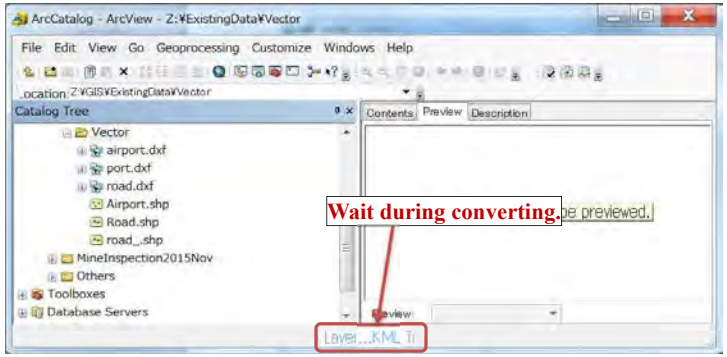


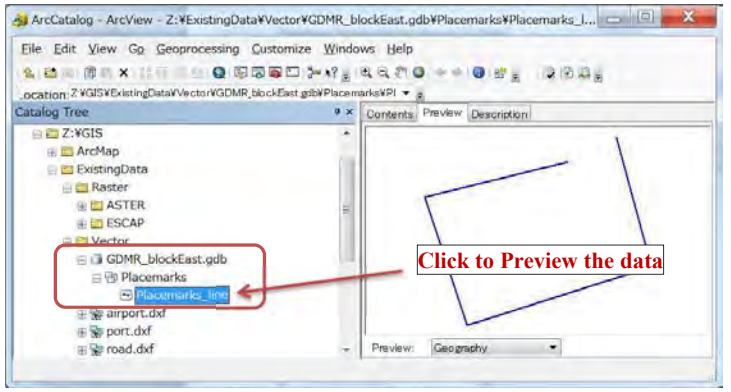
Double-click "KML To Layer", in Conversion Tools

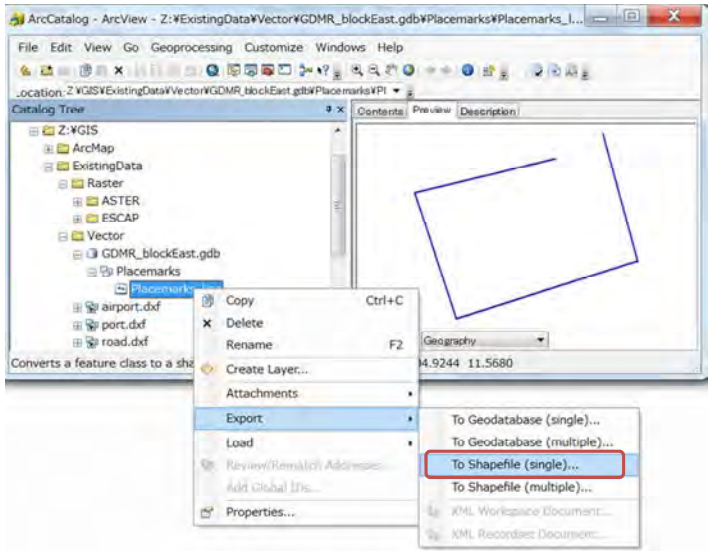


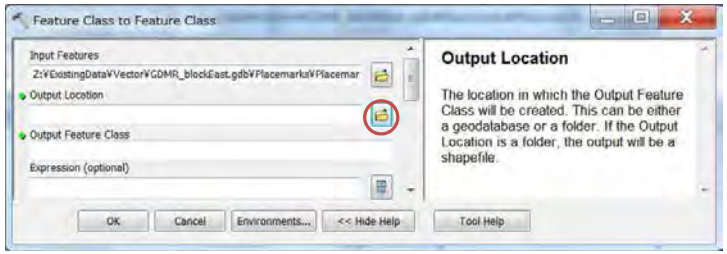

ファイルを開く
ファイルの場所(I):
Vector
名前
更新日時
GDMR_blockEast.kmz
18/11/2015 12:4
最近表示した場所
デスクトップ
ライブラリ
コンピューター
Select input file
ファイル名(N):
GDMR_blockEast.kmz
開く(O)
ファイルの種類(T):
All Filters Listed (*.kml;*.kmz)
キャンセル
読み取り専用ファイルとして開く(R)

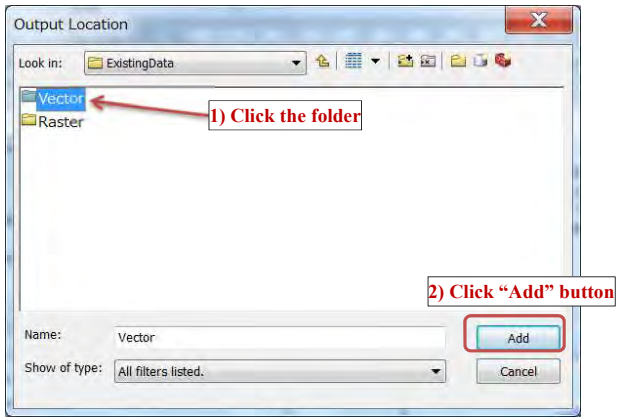

KML To Layer
Input KML File
Z:¥ExistingData¥Vector¥GDMR_blockEast.kmz
Output Location
Z:¥ExistingData¥Vector
Output Data Name (optional)
GDMR_blockEast
OK
Cancel
Environments...
<< Hide Help
Tool Help
Output Location
The destination folder for the File Geodatabase and layer (.lyr) file.

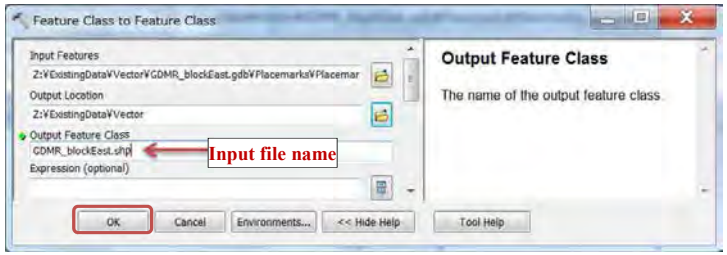

ArcCatalog - ArcView - Z:¥ExistingData¥Vector
File Edit View Go Geoprocessing Customize Windows Help
Catalog Tree
Contents Preview Description
Vector
airport.dxf
port.dxf
road.dxf
Airport.shp
Road.shp
road_.shp
MineInspection2015Nov
Others
Toolboxes
Database Servers
Wait during converting.
be previewed.

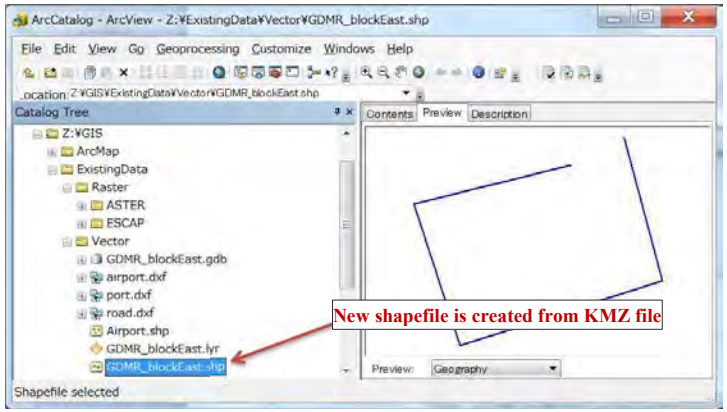

ArcCatalog - ArcView - Z:¥ExistingData¥Vector¥GDMR_blockEast.gdb¥Placemarks¥Placemarks_l...
File Edit View Go Geoprocessing Customize Windows Help
Catalog Tree
Contents Preview Description
Z:¥GIS
ArcMap
ExistingData
Raster
ASTER
ESCAP
Vector
GDMR_blockEast.gdb
Placemarks
Placemarks_line
airport.dxf
port.dxf
road.dxf
Click to Preview the data
Preview:
Geography


ArcCatalog - ArcView - Z:¥ExistingData¥Vector¥GDMR_blockEast.gdb¥Placemarks¥Placemarks_l...
File Edit View Go Geoprocessing Customize Windows Help
Catalog Tree
Contents Preview Description
Z:¥GIS
ArcMap
ExistingData
Raster
ASTER
ESCAP
Vector
GDMR_blockEast.gdb
Placemarks
airport.dxf
port.dxf
road.dxf
Copy Ctrl+C
Delete
Rename F2
Create Layer...
Attachments
Export
Load
Properties...
To Geodatabase (single)...
To Geodatabase (multiple)...
To Shapefile (single)...
To Shapefile (multiple)...
Geography

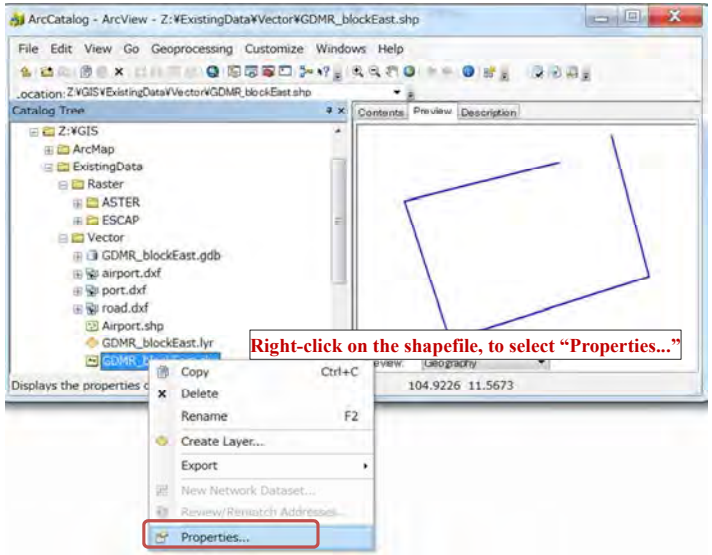


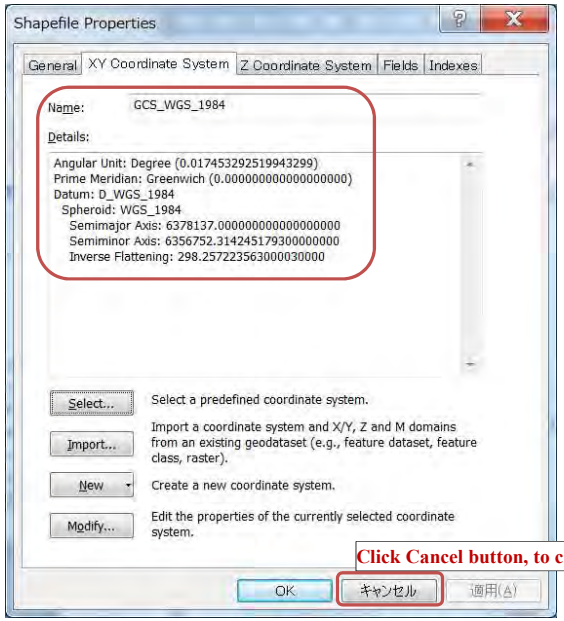






Check the coordinate system of new shapefile.



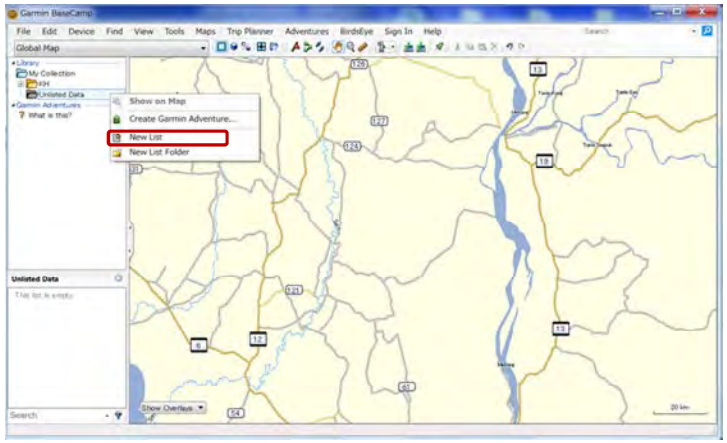


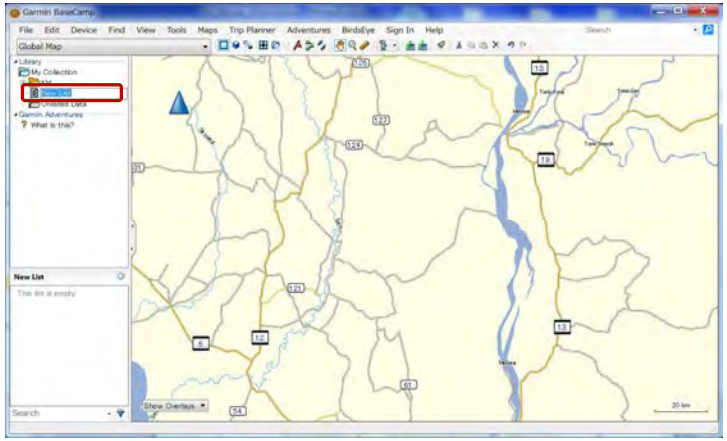
Click Cancel button, to close window.

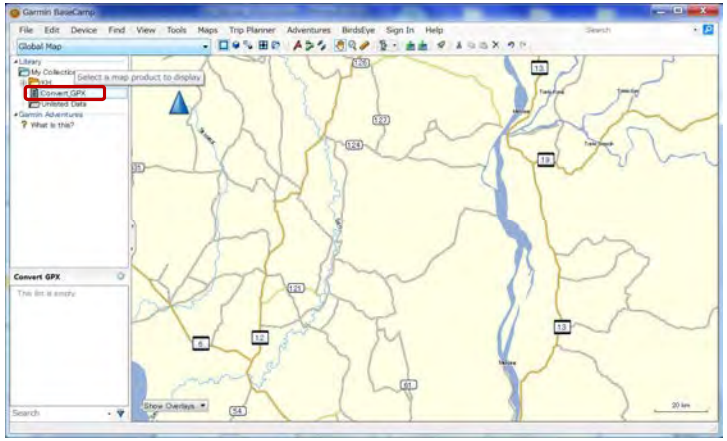
4-1-5 Convert GPX file to shapefile

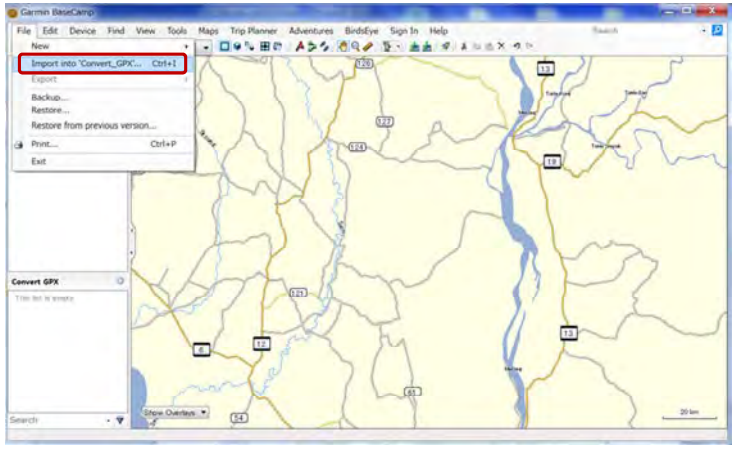
Convert GPX file to KML file in BaseCamp

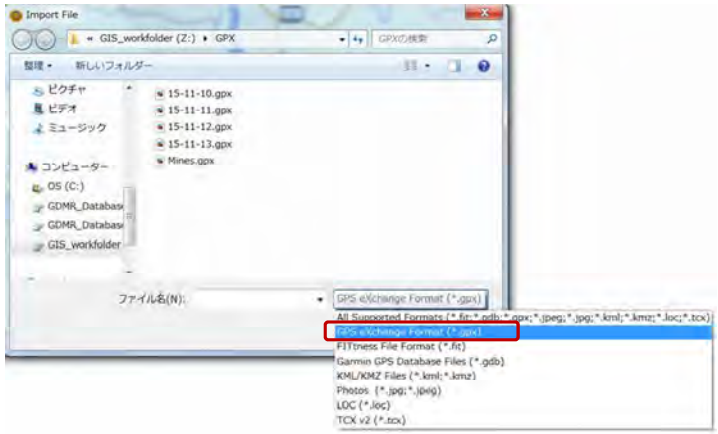
Start BaseCamp software

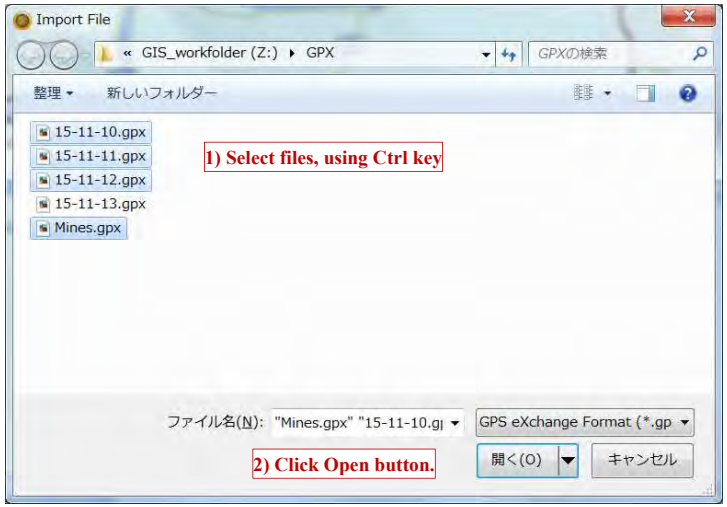


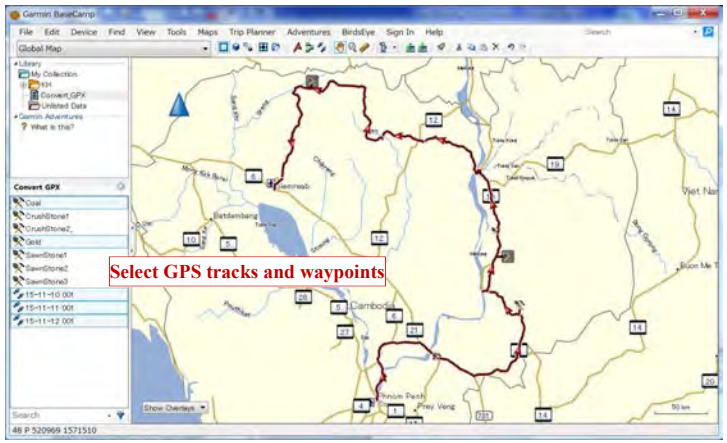


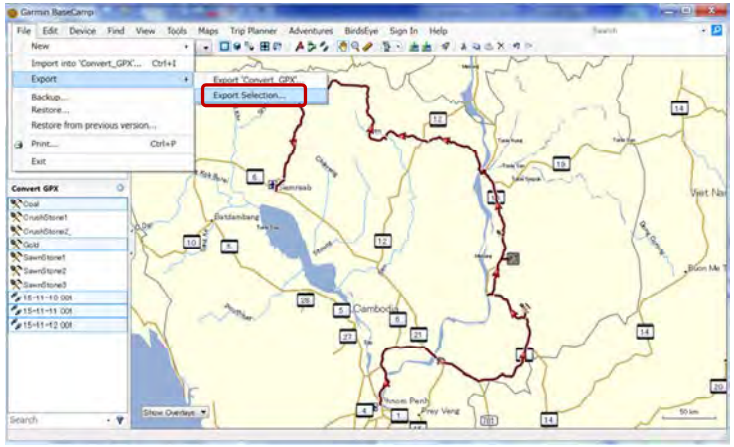

Garmin BaseCamp
File Edit Device Find View Tools Maps Trip Planner Adventures BirdsEye Sign In Help
Global Map
Convert GPX

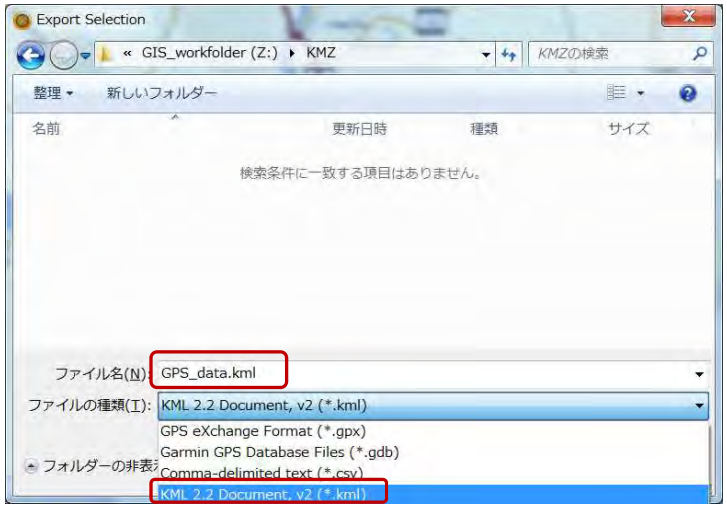

Garmin BaseCamp
File Edit Device Find View Tools Maps Trip Planner Adventures BirdsEye Sign In Help
New
Import into 'Convert_GPX'... Ctrl+I
Export
Backup...
Restore...
Restore from previous version...
Print... Ctrl+P
Exit
Convert GPX


Import File
GIS_workfolder (Z:) ▸ GPX
GPXの検索
整理
新しいフォルダー
ピクチャ
ビデオ
ミュージック
コンピューター
OS (C:)
GDMR_Database
GDMR_Database
GIS_workfolder
15-11-10.gpx
15-11-11.gpx
15-11-12.gpx
15-11-13.gpx
Mines.gpx
ファイル名(N):
GPS eXchange Format (*.gpx)
All Supported Formats (*.fit;*.gdb;*.gpx;*.jpeg;*.jpg;*.kml;*.kmz;*.loc;*.tcx)
GPS eXchange Format (*.gpx)
FITness File Format (*.fit)
Garmin GPS Database Files (*.gdb)
KML/KMZ Files (*.kml;*.kmz)
Photos (*.jpg;*.jpeg)
LOC (*.loc)
TCX v2 (*.tcx)


Import File
GIS_workfolder (Z:) ▸ GPX
GPXの検索
整理
新しいフォルダー
15-11-10.gpx
15-11-11.gpx
15-11-12.gpx
15-11-13.gpx
Mines.gpx
1) Select files, using Ctrl key
ファイル名(N): "Mines.gpx" "15-11-10.gp
GPS eXchange Format (*.gp
2) Click Open button.
開く(O)
キャンセル

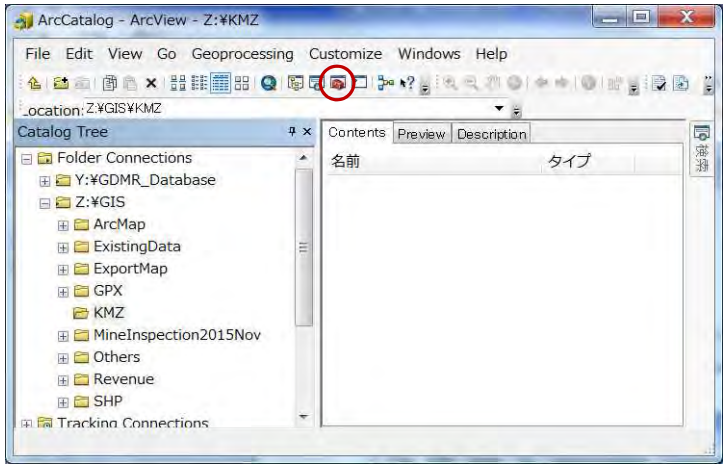


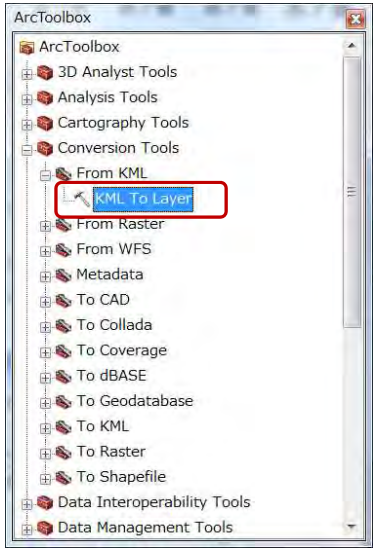




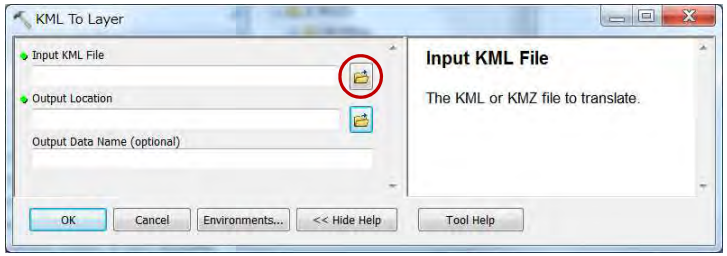
Convert KML file to geodatabase by ArcToolbox

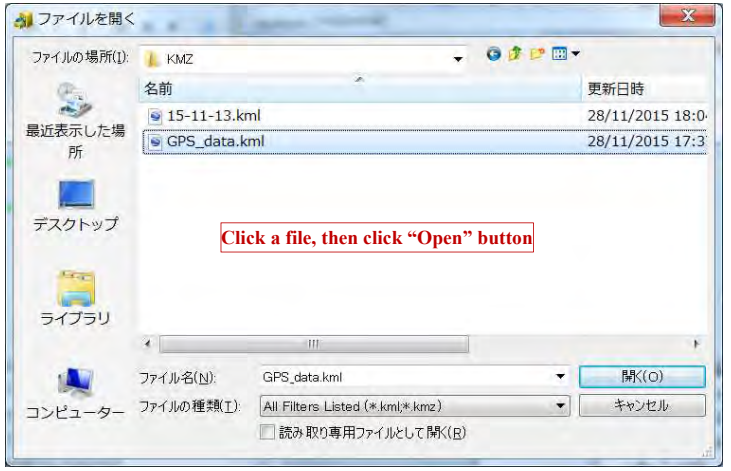
Start ArcCatalog, and open ArcToolbox

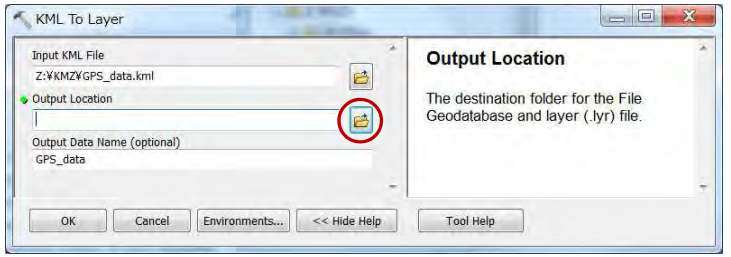


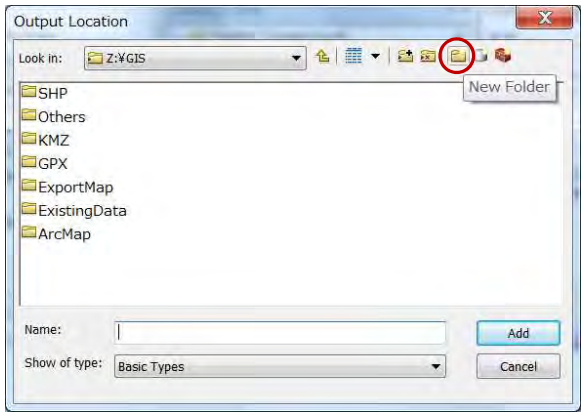


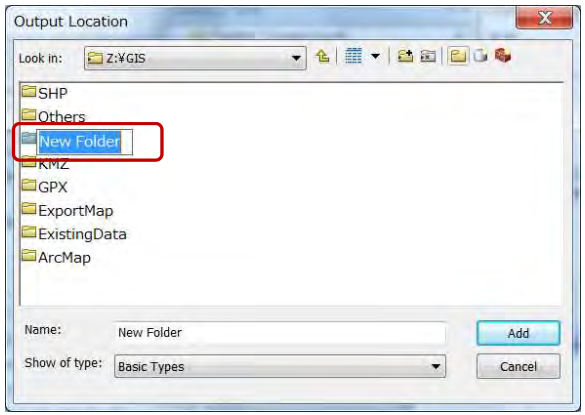
Run "KML To Layer" tool

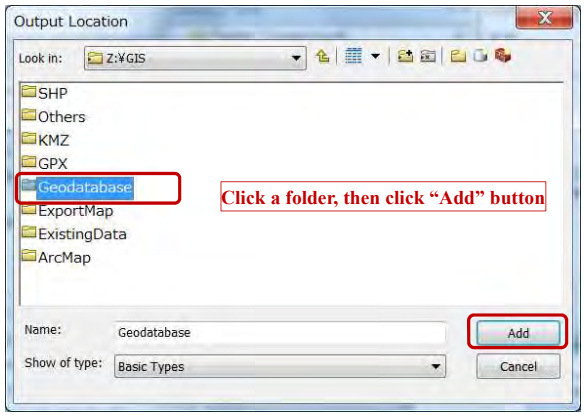


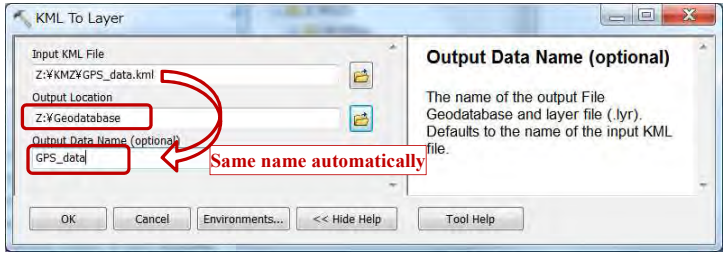


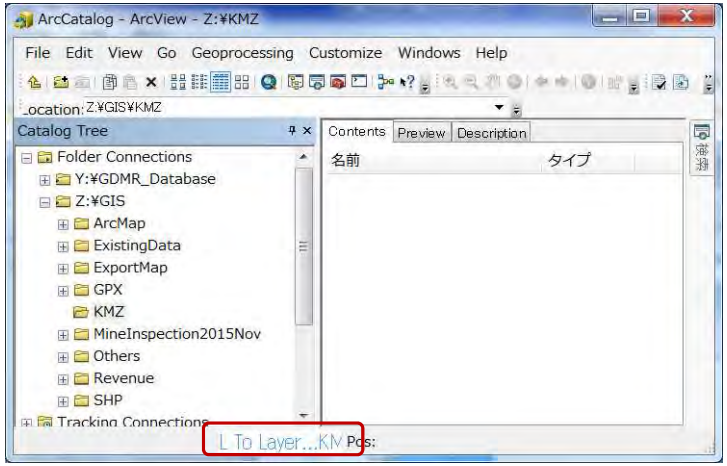


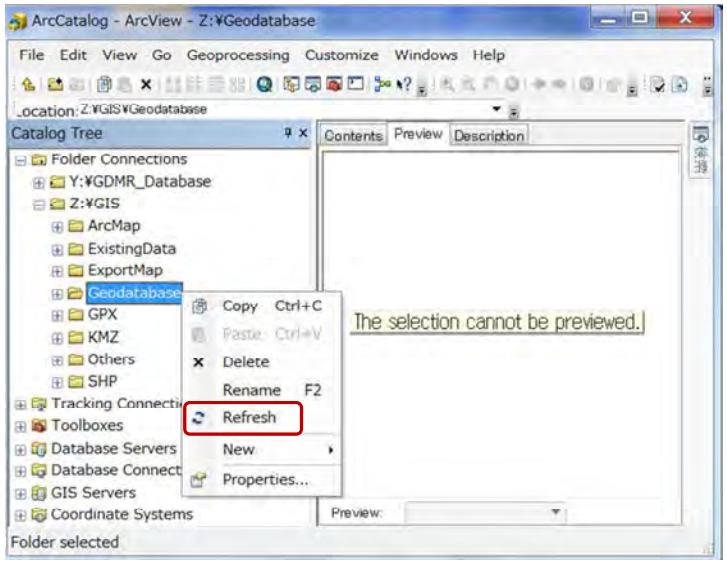

Output Location
Look in: Z:¥GIS
New Folder
SHP
Others
KMZ
GPX
ExportMap
ExistingData
ArcMap
Name:
Add
Show of type: Basic Types
Cancel


Output Location
Look in: Z:¥GIS
SHP
Others
New Folder
KMZ
GPX
ExportMap
ExistingData
ArcMap
Name: New Folder
Add
Show of type: Basic Types
Cancel

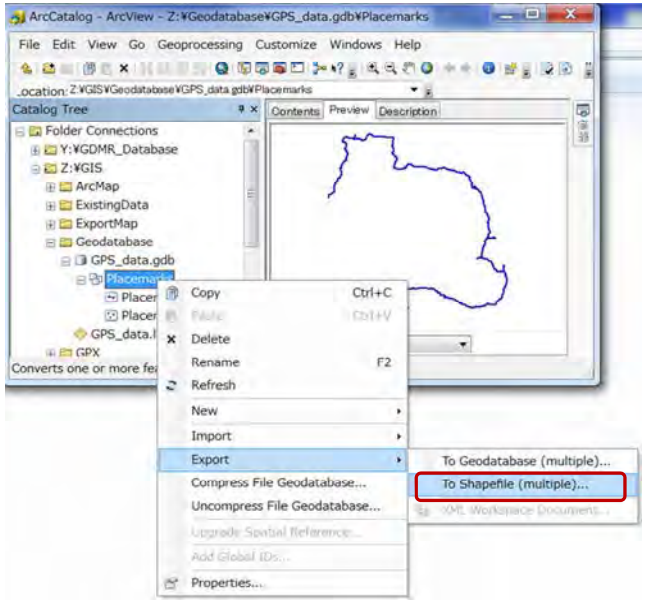

Output Location
Look in: Z:¥GIS
SHP
Others
KMZ
GPX
Geodatabase
ExportMap
ExistingData
ArcMap
Click a folder, then click "Add" button
Name: Geodatabase
Add
Show of type: Basic Types
Cancel

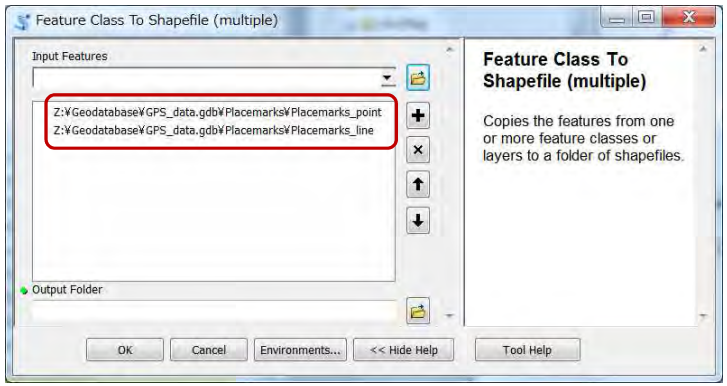

KML To Layer
Input KML File
Z:¥KMZ¥GPS_data.kml
Output Location
Z:¥Geodatabase
Output Data Name (optional)
GPS_data
Same name automatically
Output Data Name (optional)
The name of the output File Geodatabase and layer file (.lyr). Defaults to the name of the input KML file.
OK
Cancel
Environments...
<< Hide Help
Tool Help

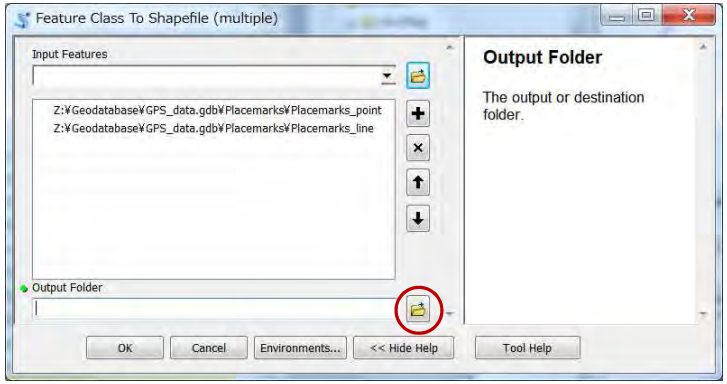


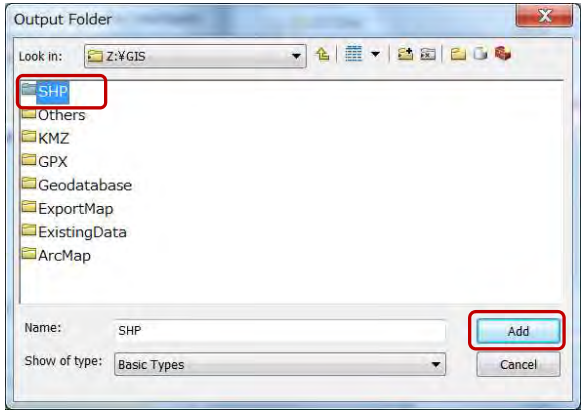


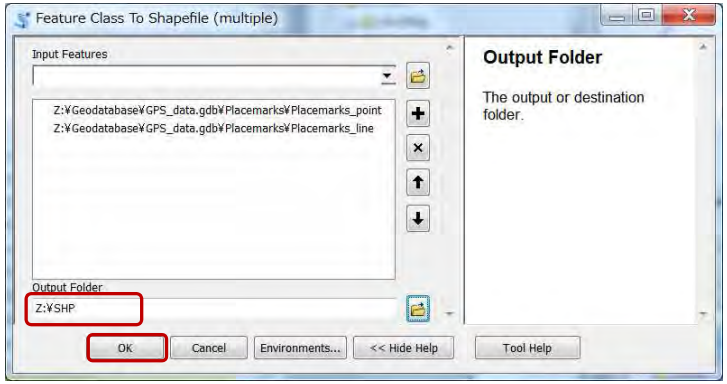
Convert geodatabase to shapefile in ArcCatalog

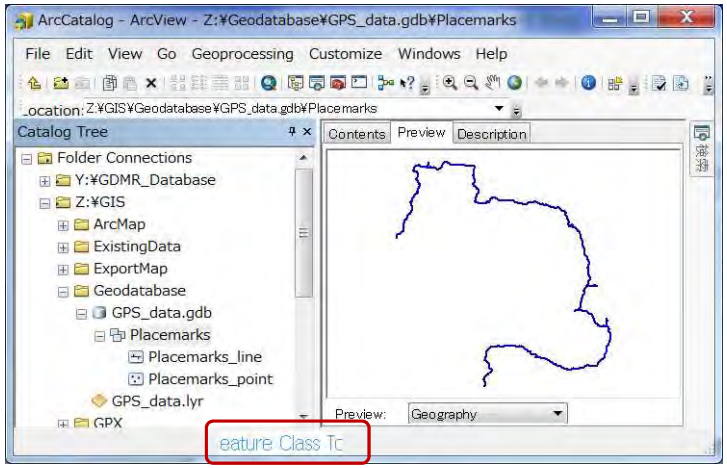


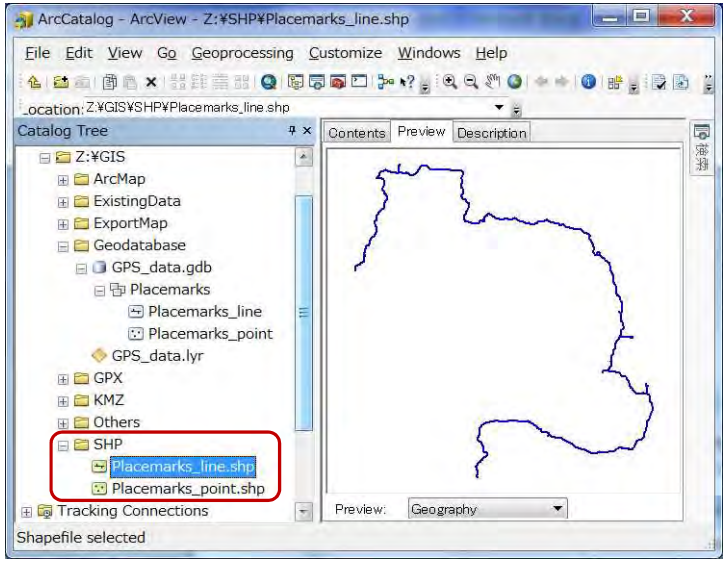



Feature Class To Shapefile (multiple)
Input Features
Z:¥Geodatabase¥GPS_data.gdb¥Placemarks¥Placemarks_point
Z:¥Geodatabase¥GPS_data.gdb¥Placemarks¥Placemarks_line
Output Folder
OK
Cancel
Environments...
<< Hide Help
Tool Help
Output Folder
The output or destination folder.


Output Folder
Look in:
Z:¥GIS
SHP
Others
KMZ
GPX
Geodatabase
ExportMap
ExistingData
ArcMap
Name:
SHP
Show of type:
Basic Types
Add
Cancel


Feature Class To Shapefile (multiple)
Input Features
Z:¥Geodatabase¥GPS_data.gdb¥Placemarks¥Placemarks_point
Z:¥Geodatabase¥GPS_data.gdb¥Placemarks¥Placemarks_line
Output Folder
Z:¥SHP
OK
Cancel
Environments...
<< Hide Help
Tool Help
Output Folder
The output or destination folder.

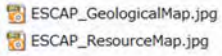

ArcCatalog - ArcView - Z:¥Geodatabase¥GPS_data.gdb¥Placemarks
File Edit View Go Geoprocessing Customize Windows Help
Location: Z:¥GIS¥Geodatabase¥GPS_data.gdb¥Placemarks
Catalog Tree
Folder Connections
Y:¥GDMR_Database
Z:¥GIS
ArcMap
ExistingData
ExportMap
Geodatabase
GPS_data.gdb
Placemarks
Placemarks_line
Placemarks_point
GPS_data.lyr
GPX
Contents
Preview
Description
Preview:
Geography
eature Class To

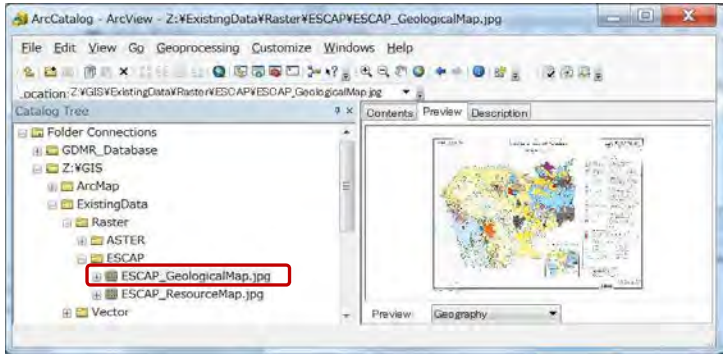


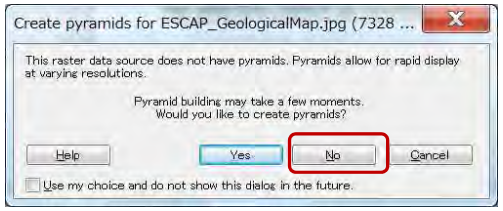
4-2 Raster image data

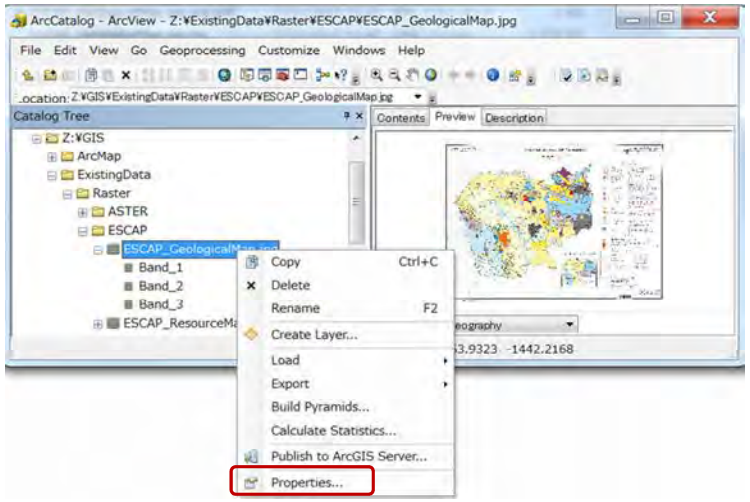
Except GeoTIFF file, raster images have no coordinate system in most case. One example is scanned map. How to make GeoTIFF file of spatial information from raster images such as a scanned map

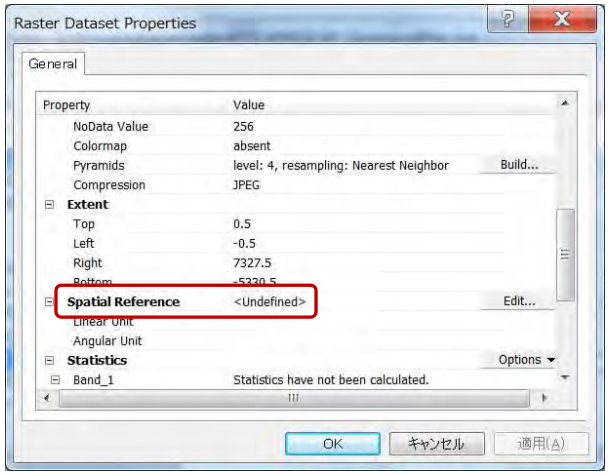
4-2-1 Check the coordinate system of raster data

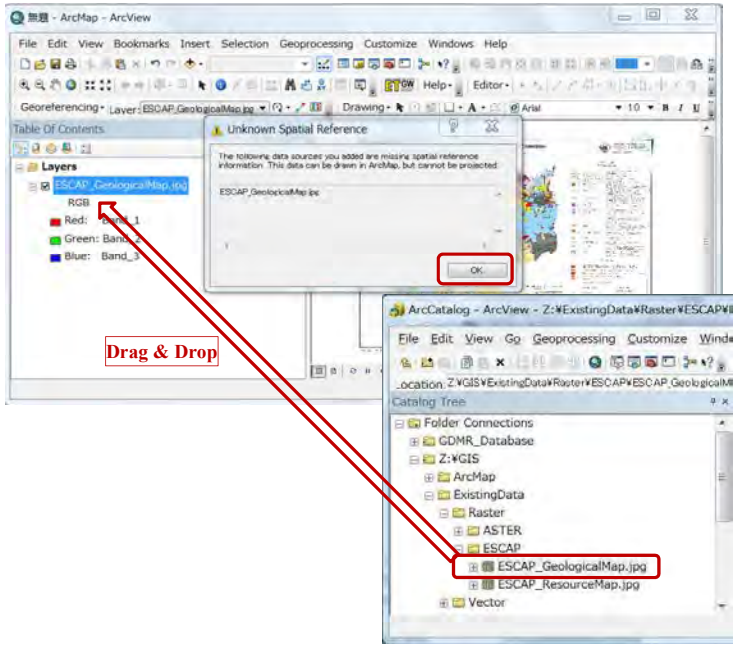






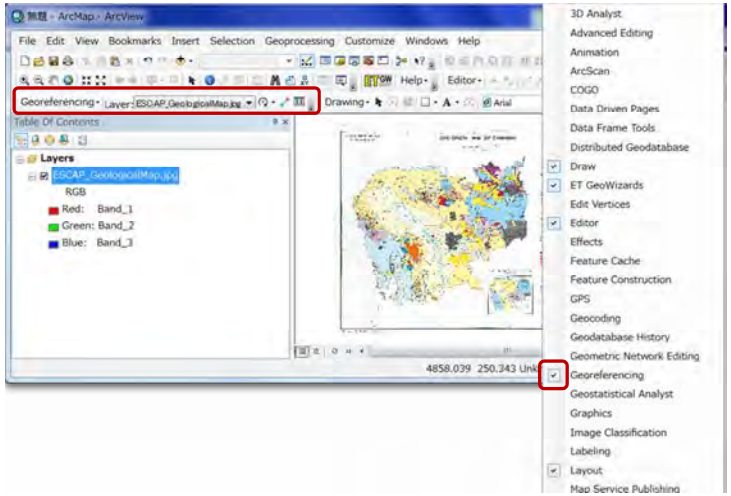


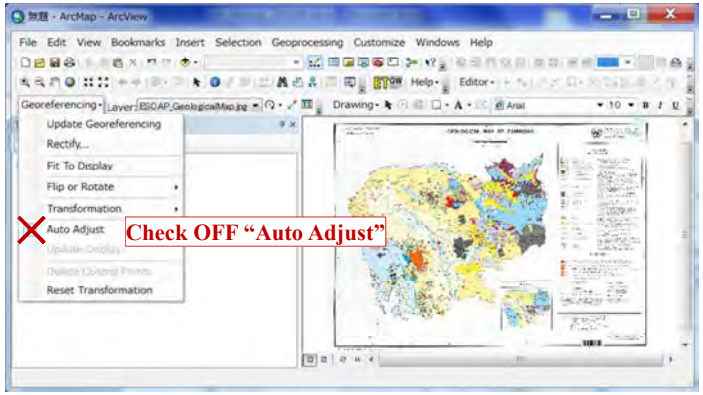




4-2-2 Georeference

Setting Georeferencing Toolbar

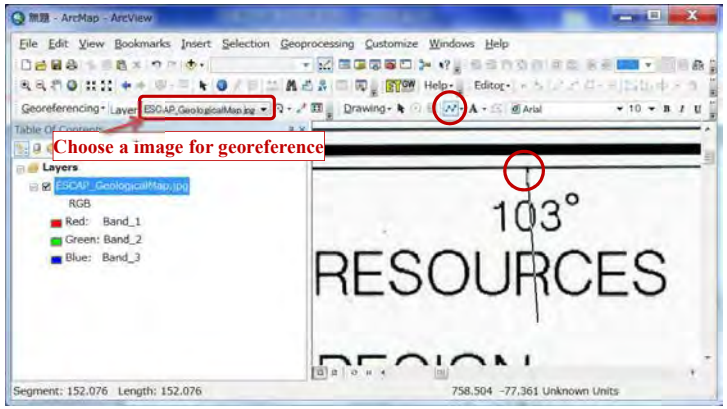




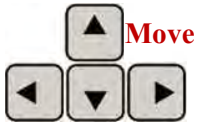
Georeference based on X,Y value

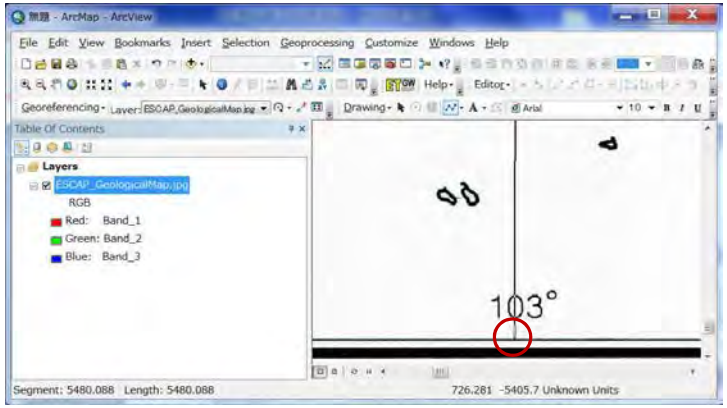
Draw grid for control points

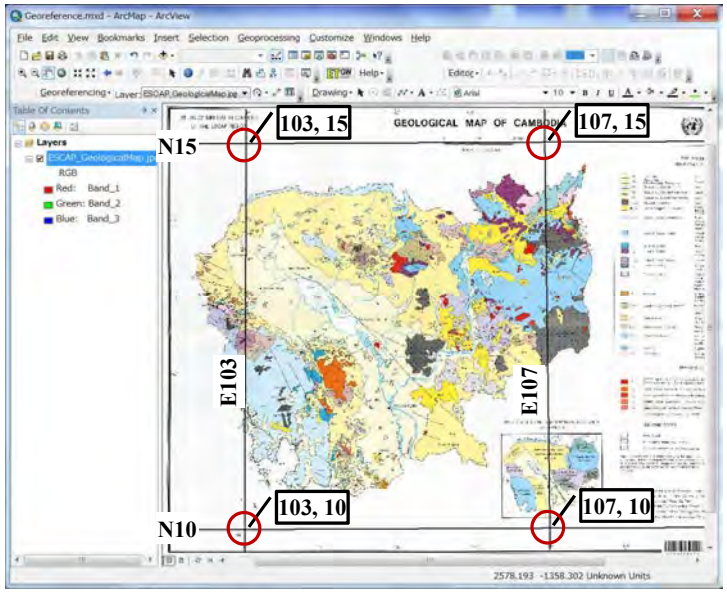
If the map has no grid, it is better to draw temporary grid for accurate control points.



Use mouse wheel and keyboard to zoom up/down and move the map on ArcMap

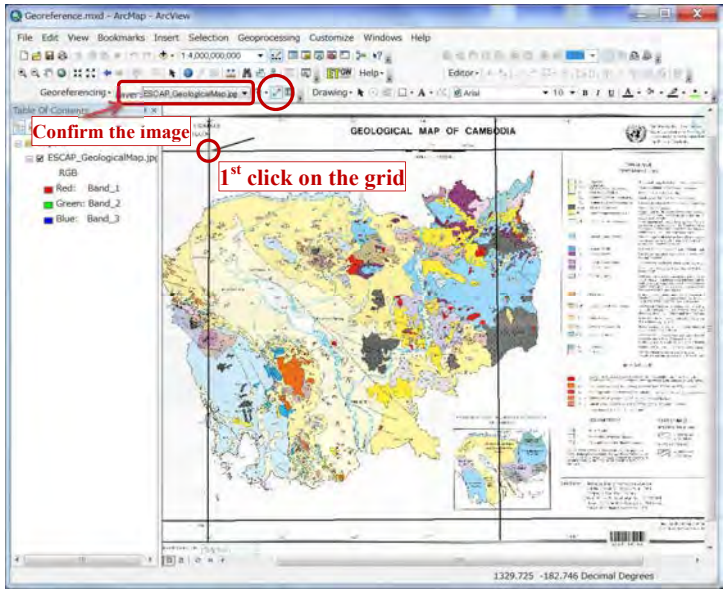


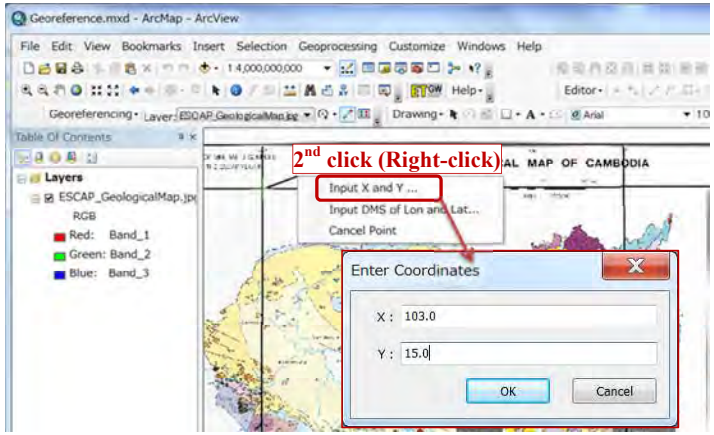




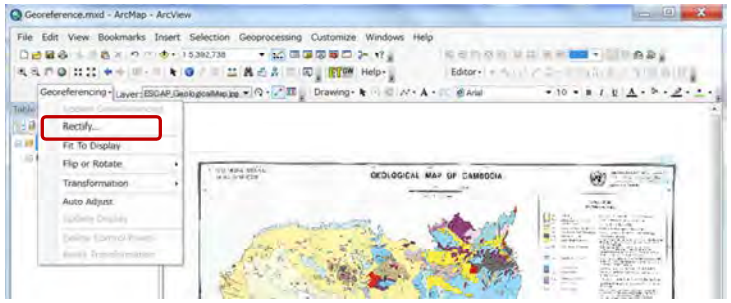
Input control points from X,Y

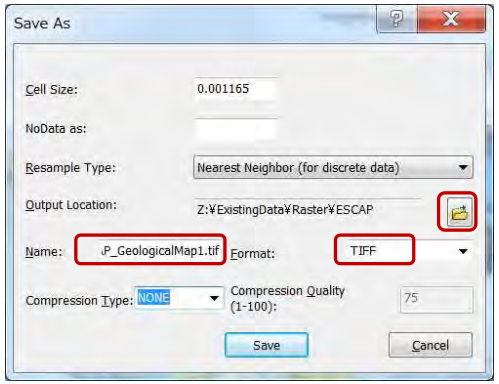
- 1st click : select control point
- 2nd click : input X,Y

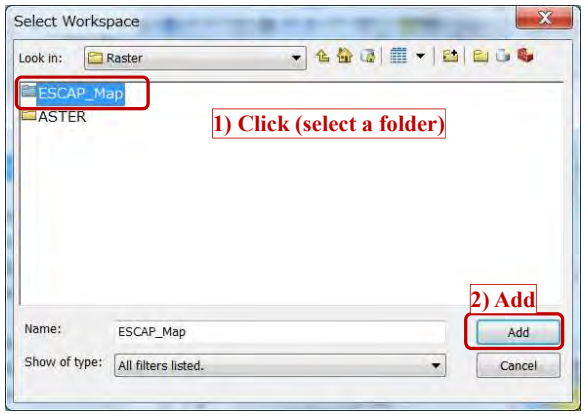


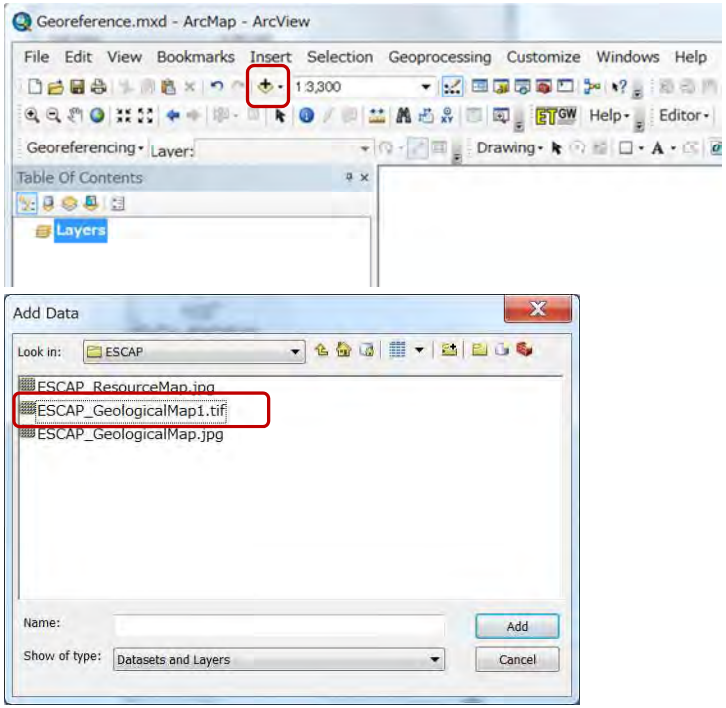


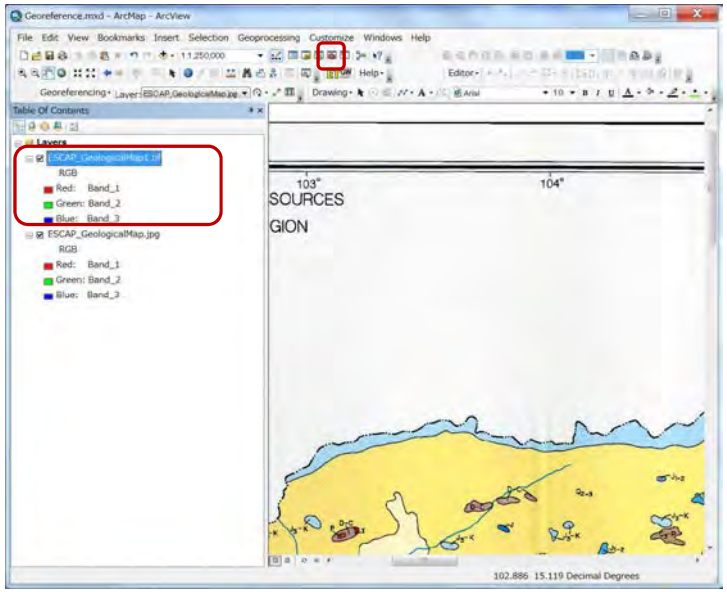
Save as GeoTIFF file



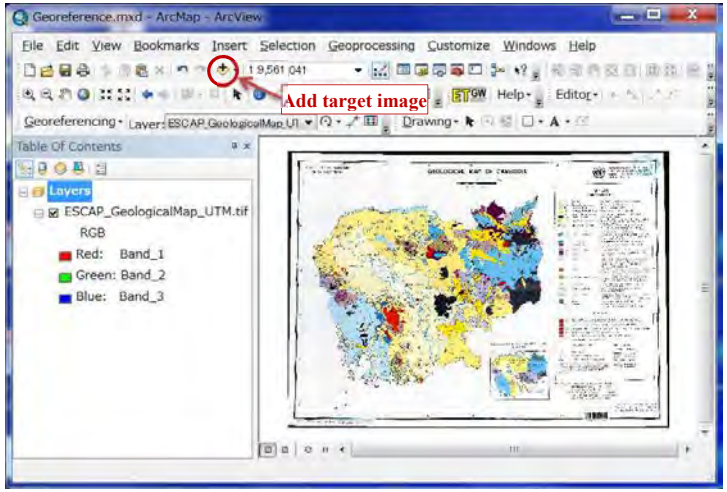


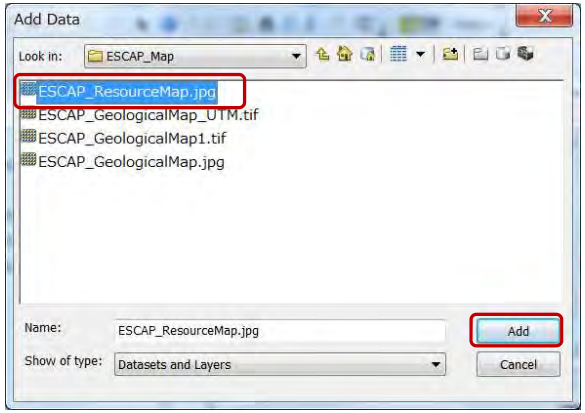


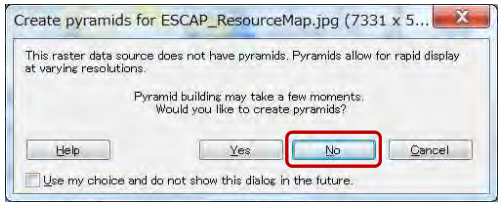

Georeference.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:3,300
Georeferencing
Layer:
Drawing
Help
Editor
Table Of Contents
Layers
Add Data
Look in:
ESCAP
ESCAP_ResourceMap.jpg
ESCAP_GeologicalMap1.tif
ESCAP_GeologicalMap.jpg
Name:
Add
Show of type:
Datasets and Layers
Cancel

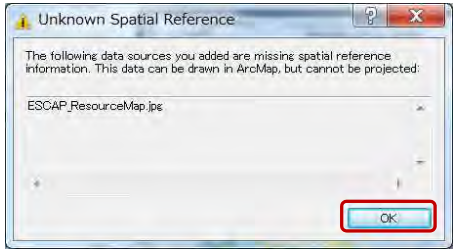

Georeference.mxd - ArcMap - ArcView
Table Of Contents
Layers
ESCAP_GeologicalMap1.tif
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
ESCAP_GeologicalMap.jpg
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
103°
104°
SOURCES
GION
102.886 15.119 Decimal Degrees

Georeference based on other layer objects

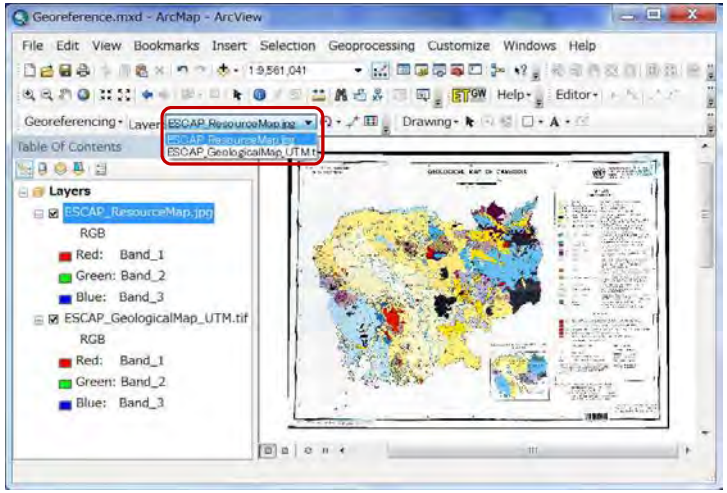


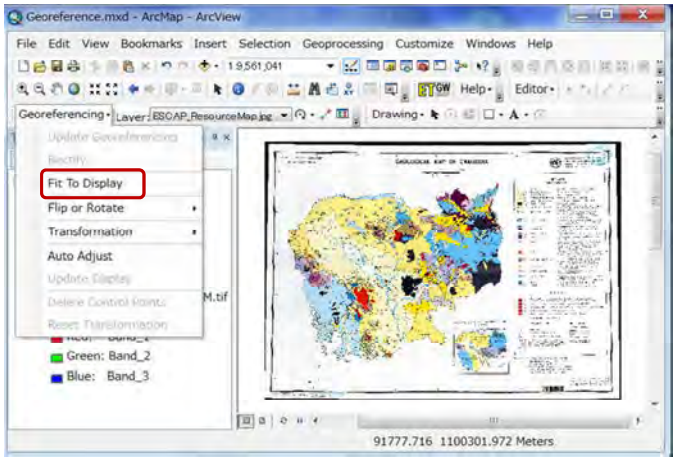


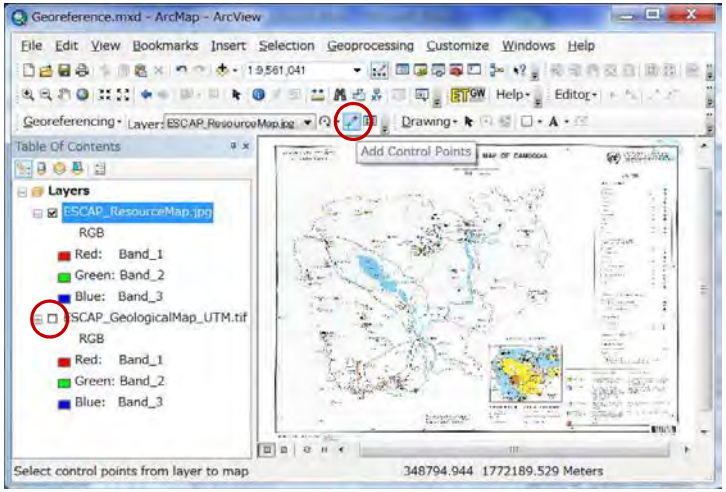


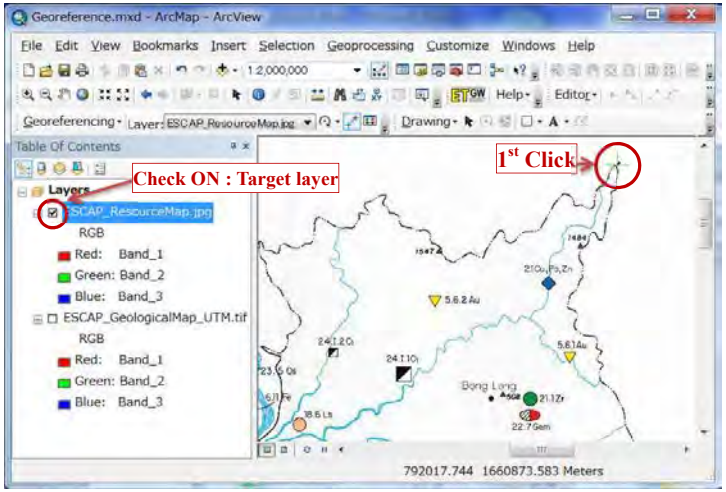


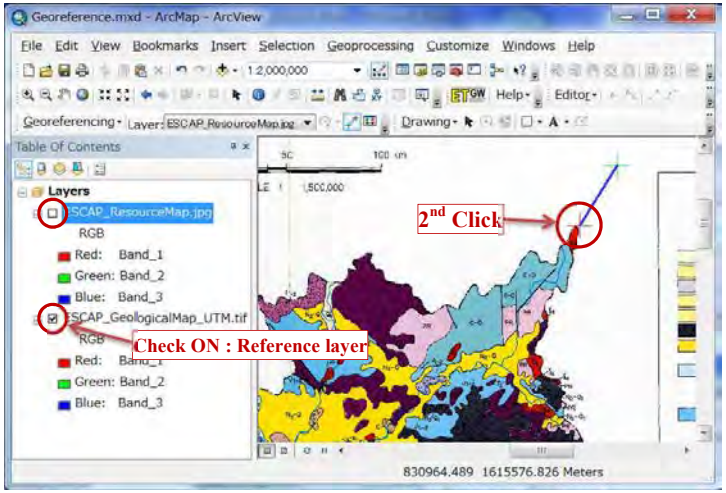
Assign Control points from other object



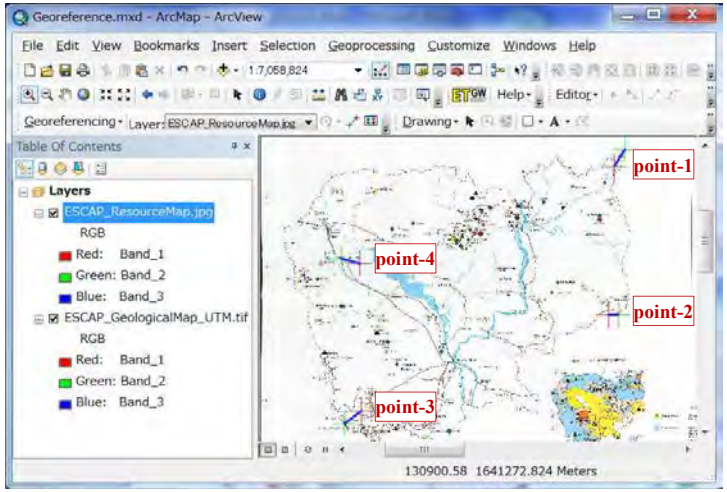

Georeference.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Georeferencing
Fit To Display
Flip or Rotate
Transformation
Auto Adjust
Update Georeferencing
Rectify
Update Display
Delete Control Points
Reset Transformation
Green: Band_2
Blue: Band_3
91777.716 1100301.972 Meters


Georeference.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Georeferencing
Add Control Points
Table Of Contents
Layers
ESCAP_ResourceMap.jpg
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
ESCAP_GeologicalMap_UTM.tif
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
Select control points from layer to map
348794.944 1772189.529 Meters

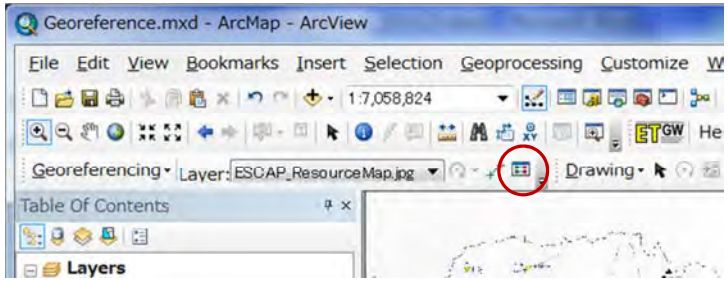

Georeference.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Georeferencing
Table Of Contents
Layers
Check ON : Target layer
1st Click
ESCAP_ResourceMap.jpg
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
ESCAP_GeologicalMap_UTM.tif
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
792017.744 1660873.583 Meters

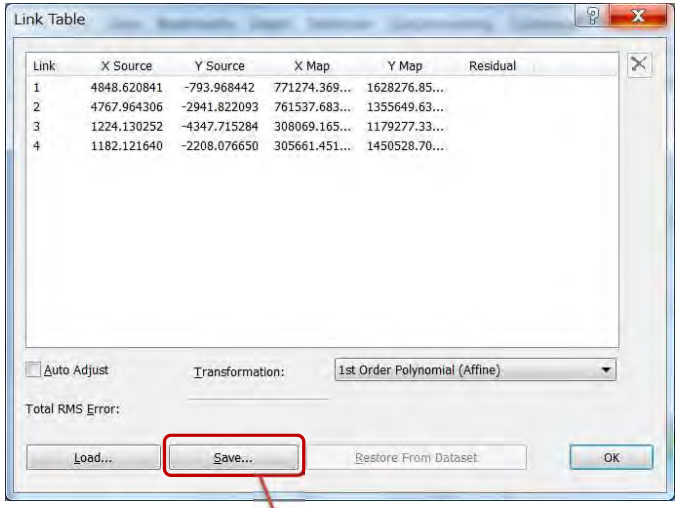

Georeference.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Georeferencing
Table Of Contents
Layers
2nd Click
ESCAP_ResourceMap.jpg
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
ESCAP_GeologicalMap_UTM.tif
Check ON : Reference layer
RGB
Green: Band_2
Blue: Band_3
830964.489 1615576.826 Meters

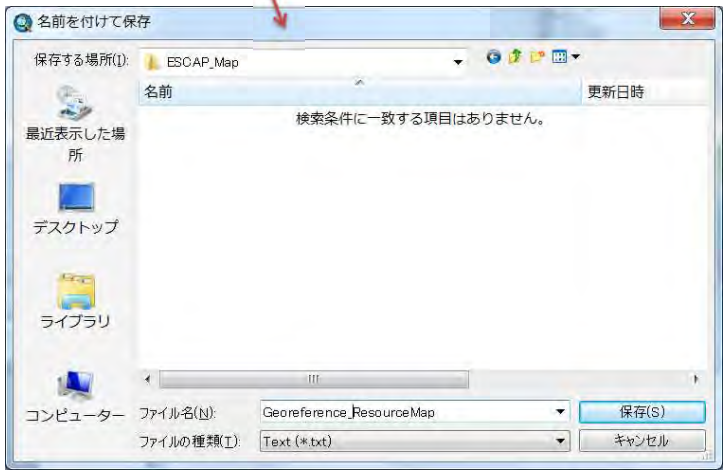
Continue to give at least 4 control points.

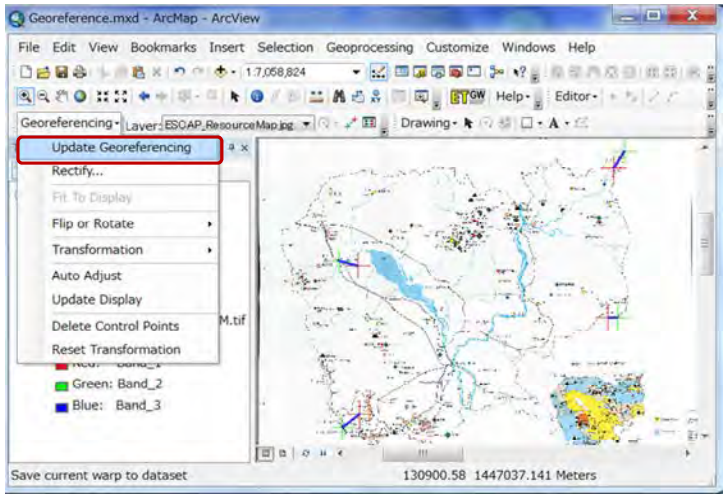


View Control points values

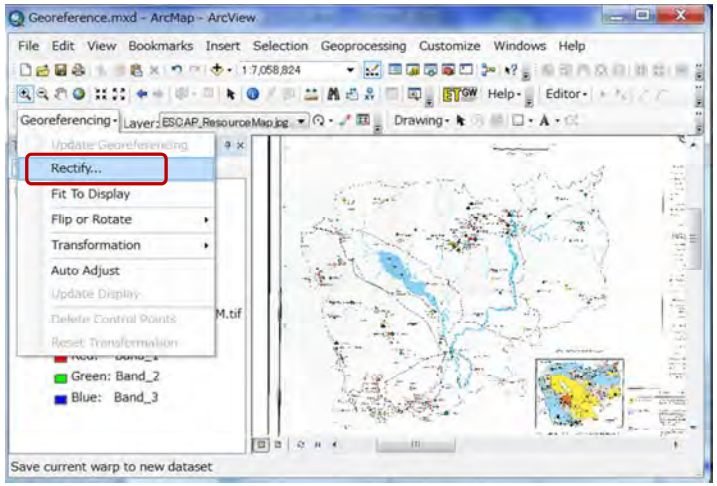


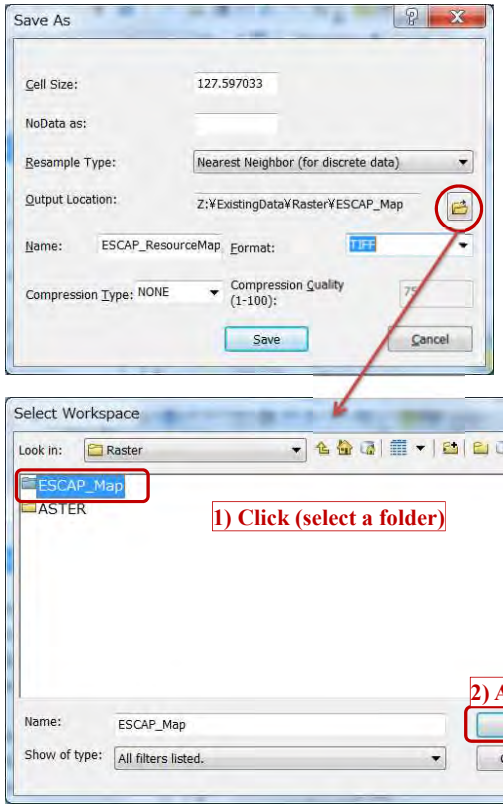




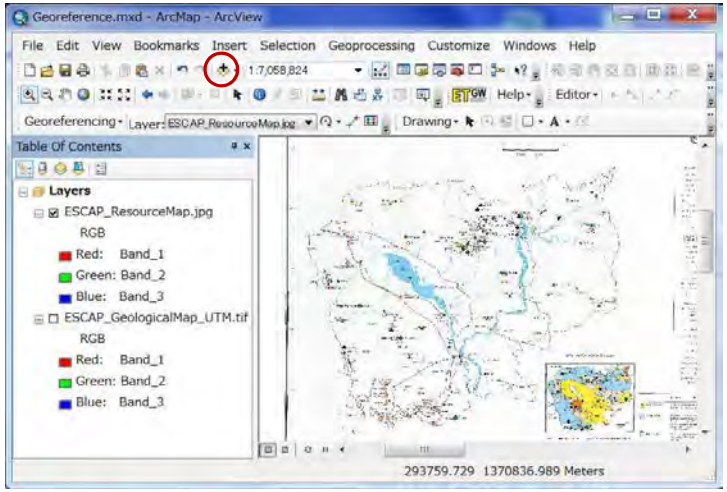


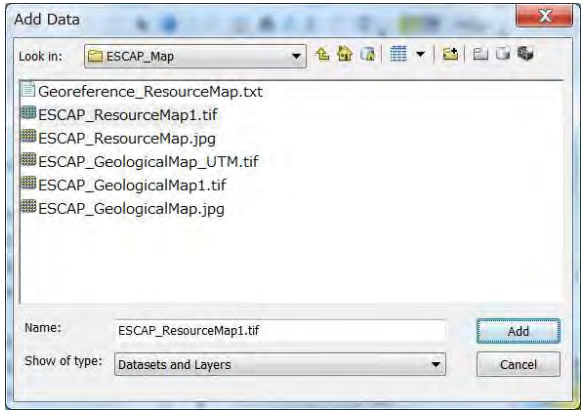
Save as GeoTIFF file

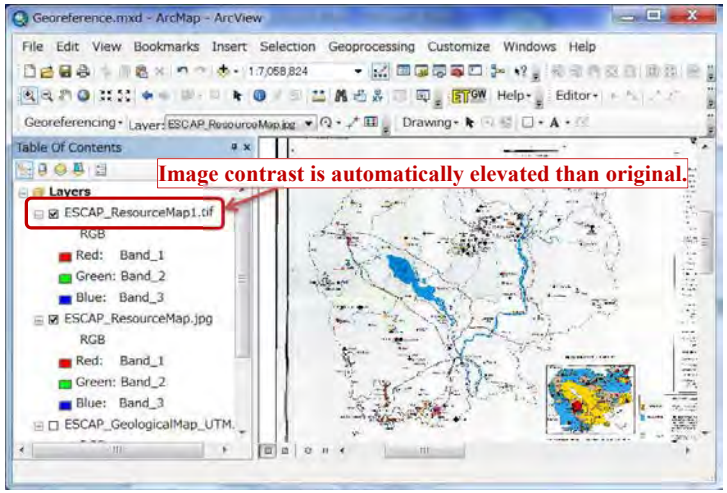




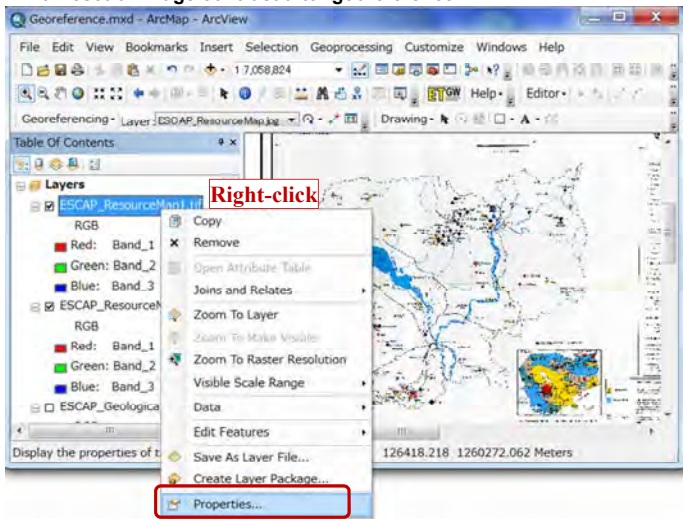
Add created GeoTIFF file to ArcMap

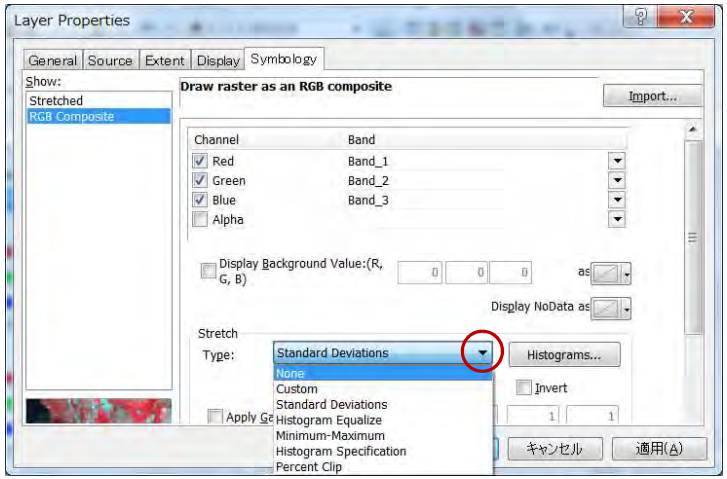


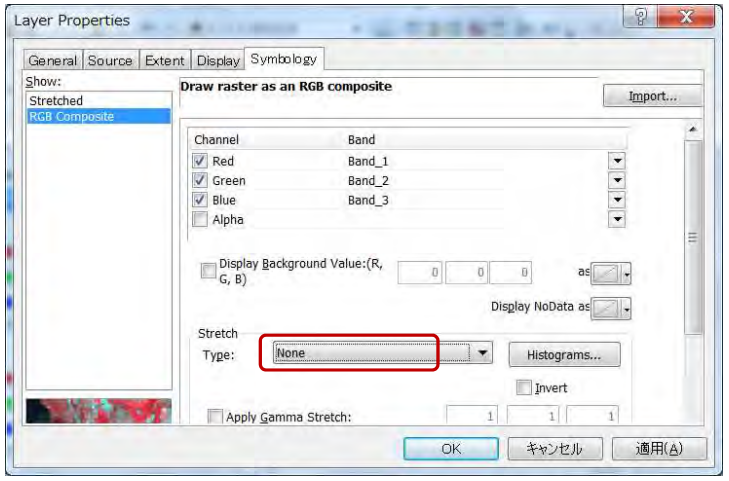


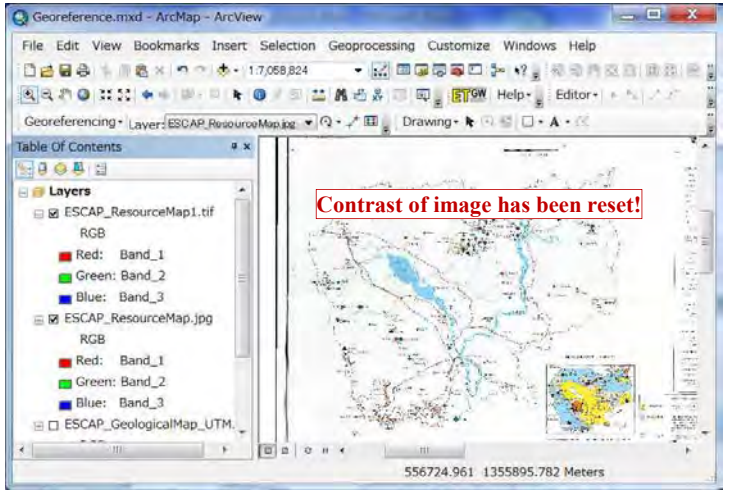


4-2-3 Reset of image contrast after georeference



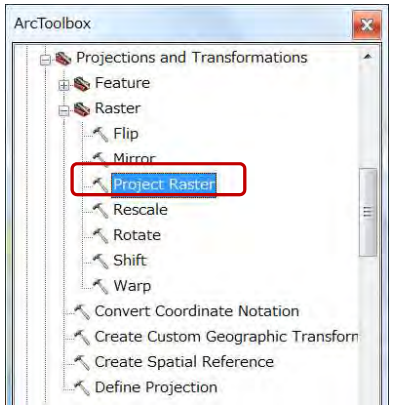


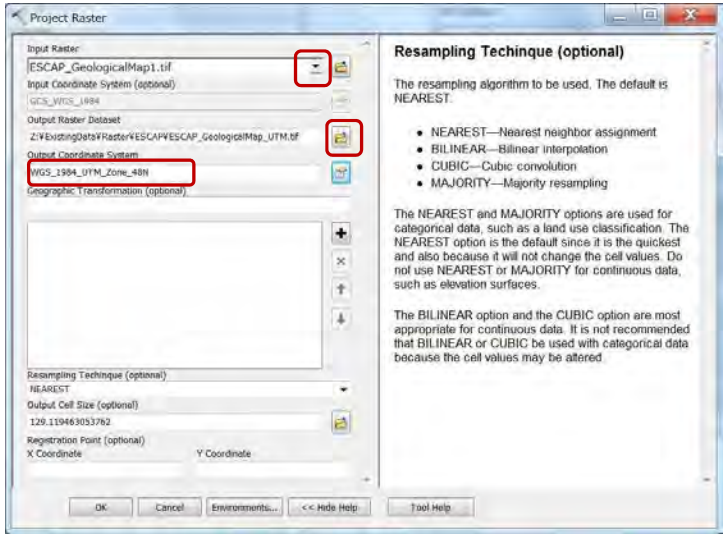


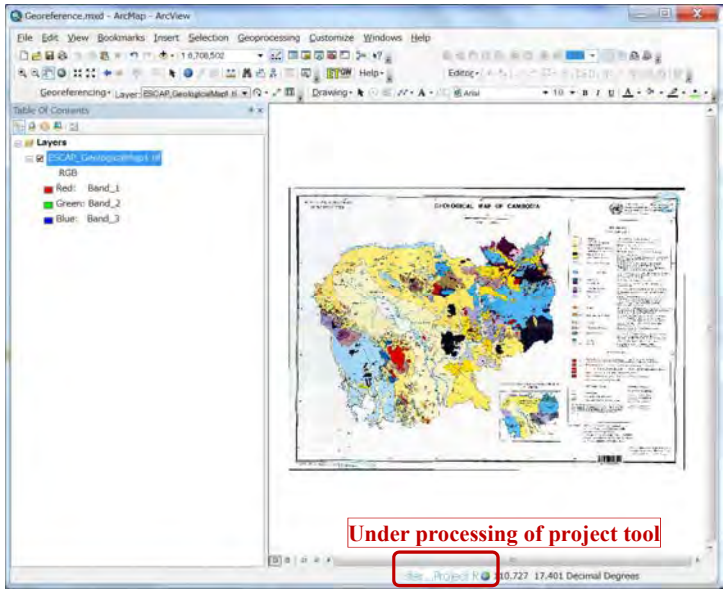


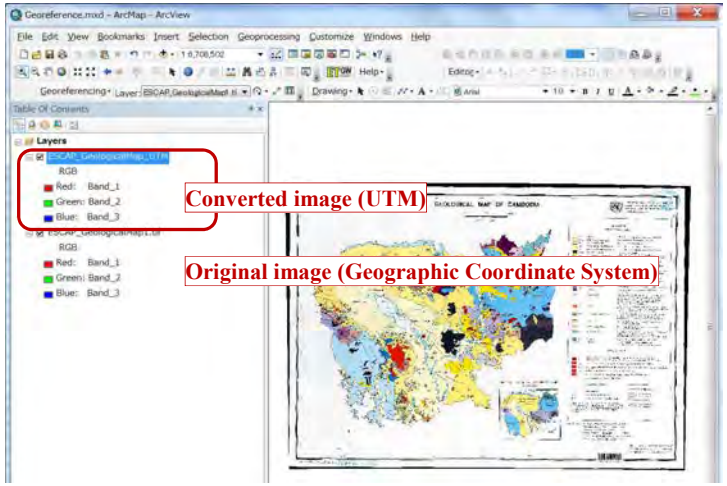
4-2-4 Convert coordinate system of raster data

Use “Project Raster” tools of ArcToolbox.

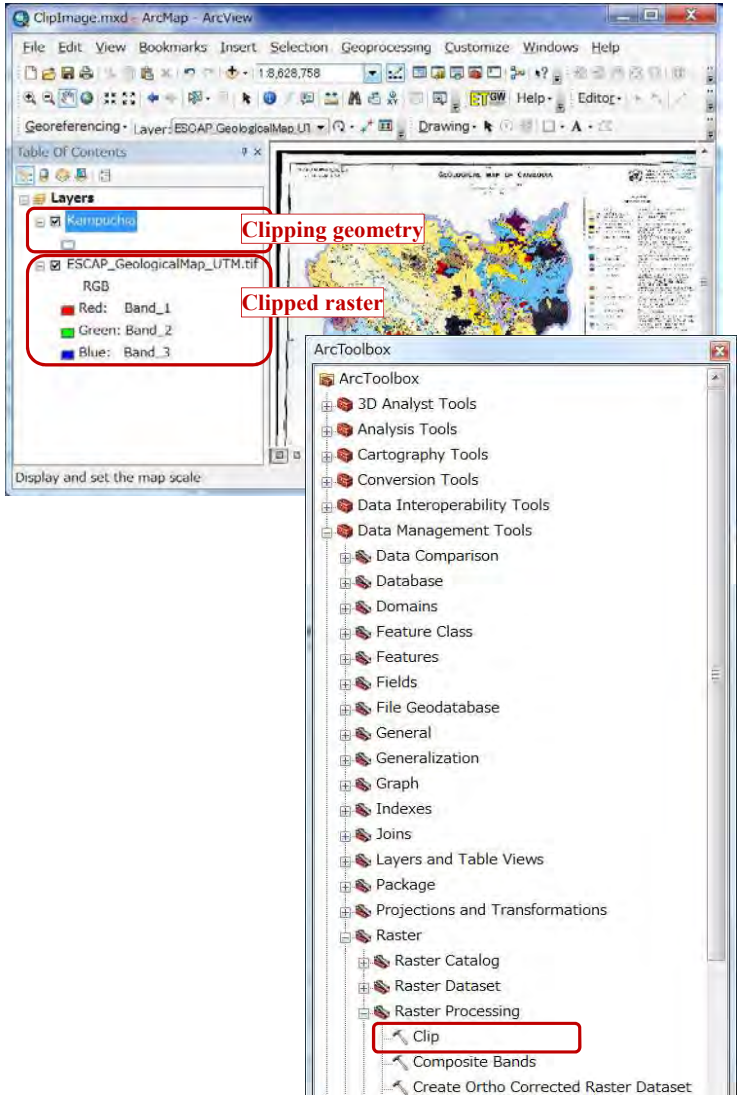


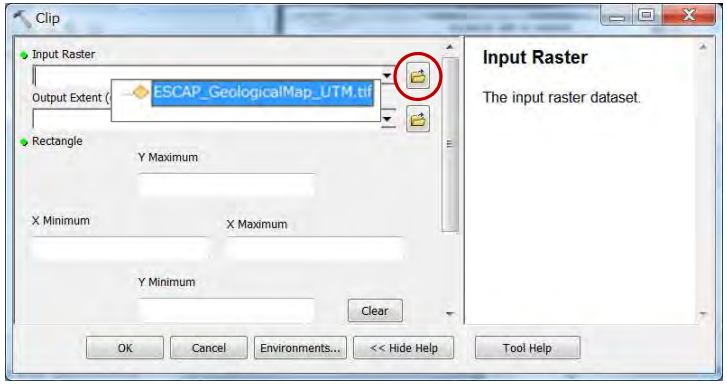


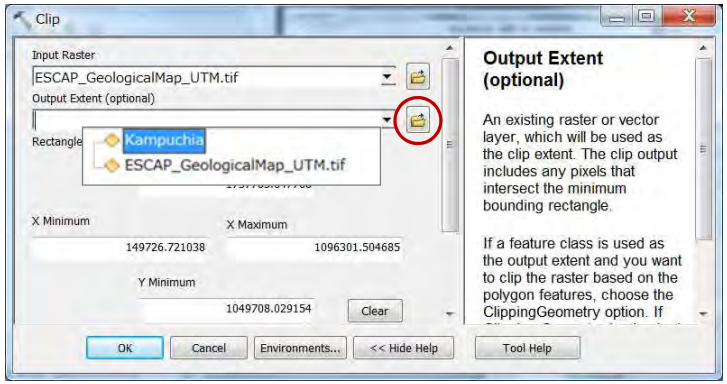


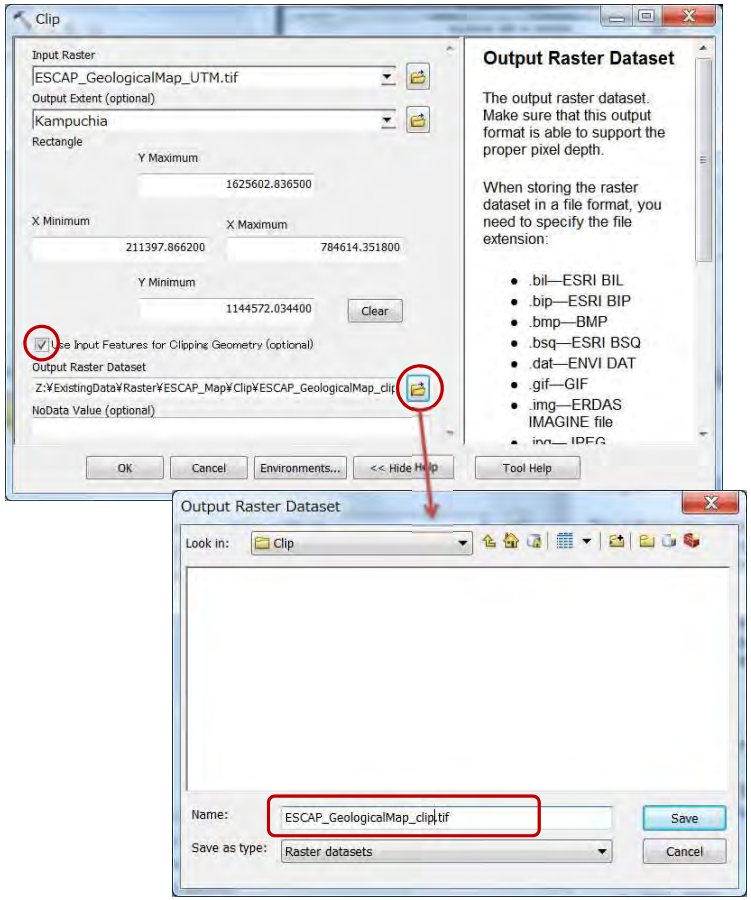


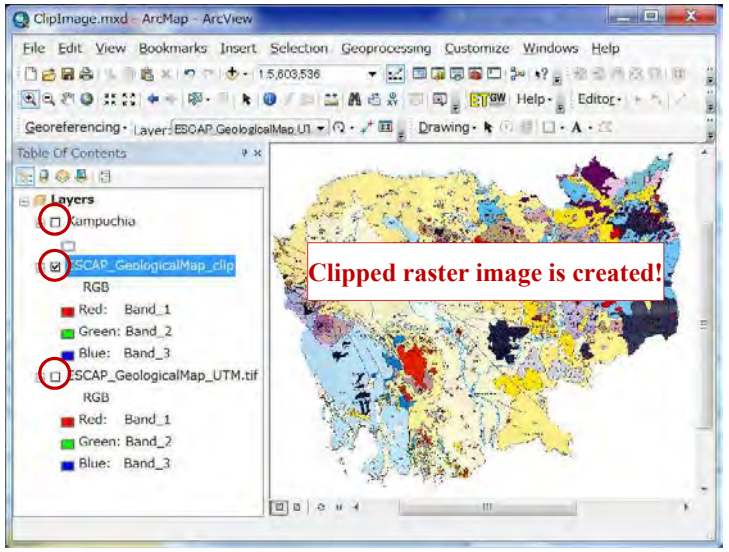
4-2-5 Clip the image by polygon





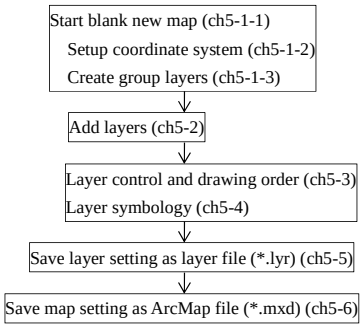



Clip
Input Raster
ESCAP_GeologicalMap_UTM.tif
Output Extent (optional)
Kampuchia
Rectangle
Y Maximum
1625602.836500
X Minimum
211397.866200
X Maximum
784614.351800
Y Minimum
1144572.034400
Clear
Use Input Features for Clipping Geometry (optional)
Output Raster Dataset
Z:¥ExistingData¥Raster¥ESCAP_Map¥Clip¥ESCAP_GeologicalMap_clip
NoData Value (optional)
OK
Cancel
Environments...
<< Hide Help
Tool Help
Output Raster Dataset
The output raster dataset. Make sure that this output format is able to support the proper pixel depth.
When storing the raster dataset in a file format, you need to specify the file extension:
.bil—ESRI BIL
.bip—ESRI BIP
.bmp—BMP
.bsq—ESRI BSQ
.dat—ENVI DAT
.gif—GIF
.img—ERDAS IMAGINE file
Output Raster Dataset
Look in:
Clip
Name:
ESCAP_GeologicalMap_clip.tif
Save
Save as type:
Raster datasets
Cancel


ClipImage.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Georeferencing
Layer: ESCAP_GeologicalMap_UTI
Drawing
Table Of Contents
Layers
Kampuchia
ESCAP_GeologicalMap_clip
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
ESCAP_GeologicalMap_UTM.tif
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
Clipped raster image is created!

5. Create a new map in ArcMap

Chapter 5 shows how to create a new map and design it. To start with defining the map coordinate system is recommended. The content is to add spatial data and table data to map layer, to design the layer appearance, and to save these settings as ArcMap file.



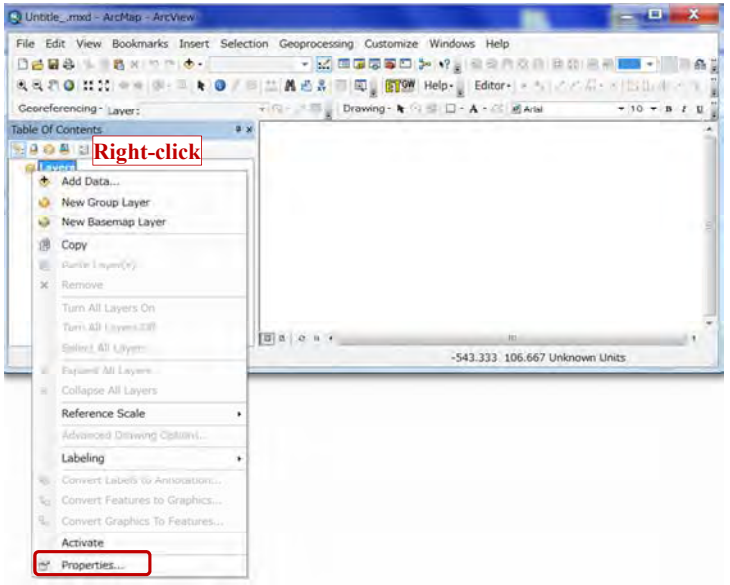
5-1 Setup a new map frame

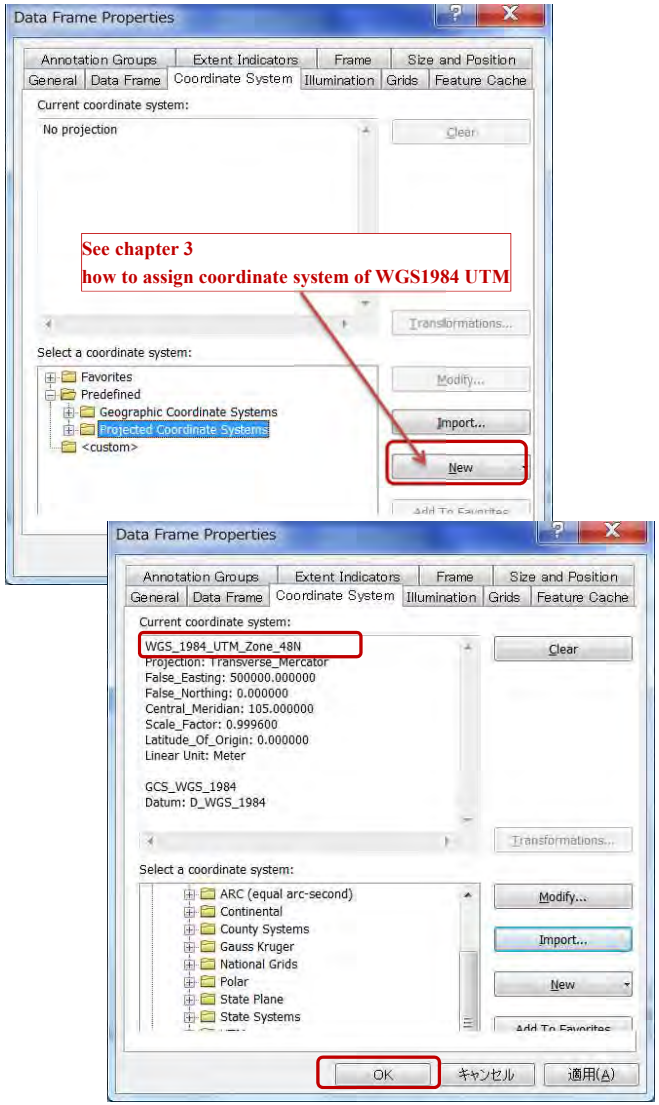
A layer of different coordinate system shows sometimes wrong location, so not recommended.

5-1-1 Create new ArcMap file

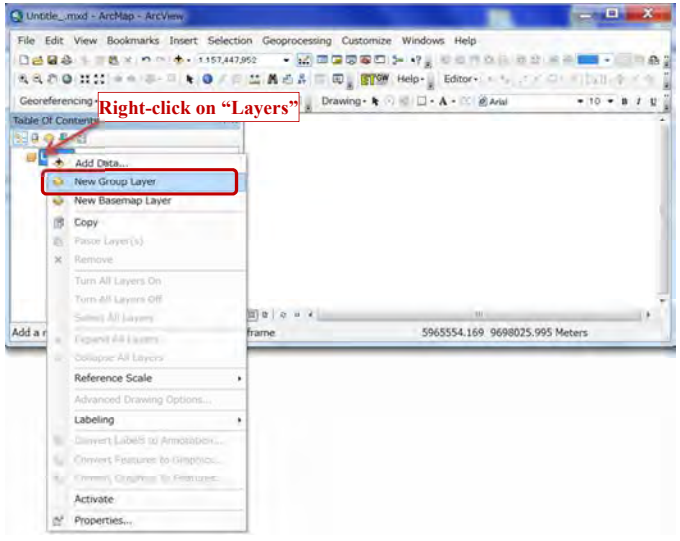
If ArcMap has already been running, click “New map file” icon.

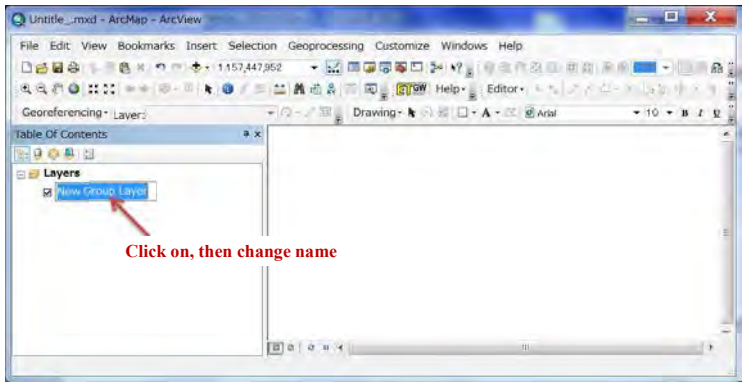
5-1-2 Setup coordinate system of map

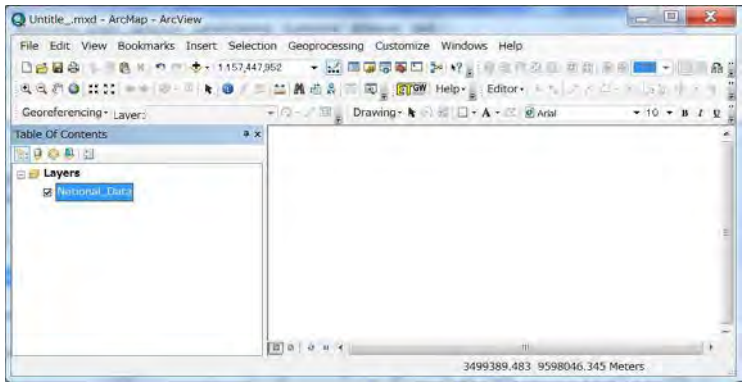


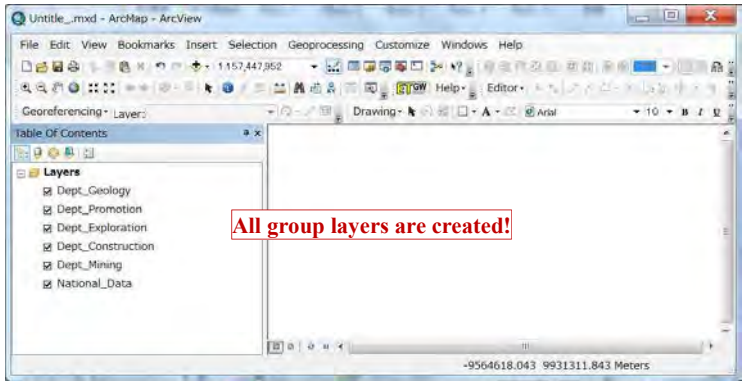


5-1-3 Create Group layer



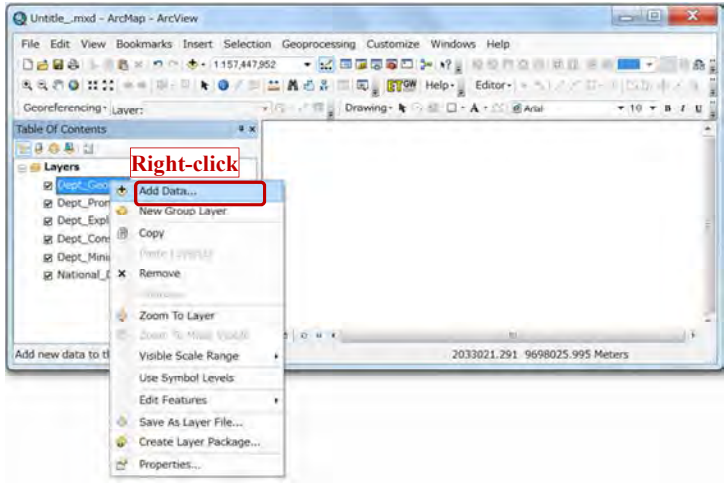


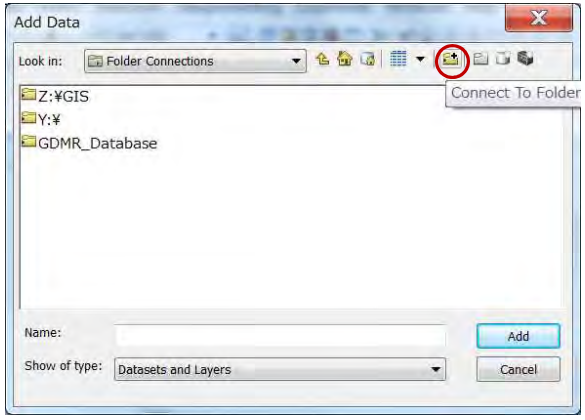


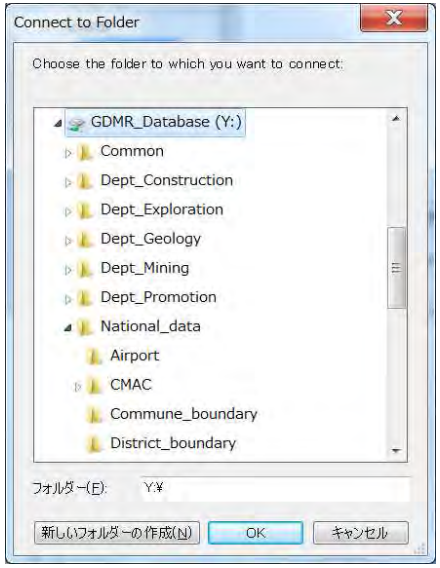


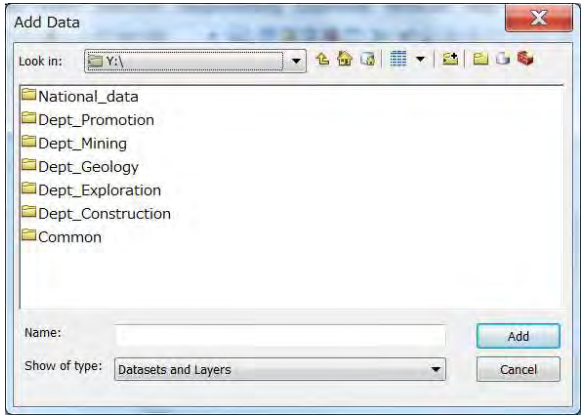
5-2 Add layers of spatial data

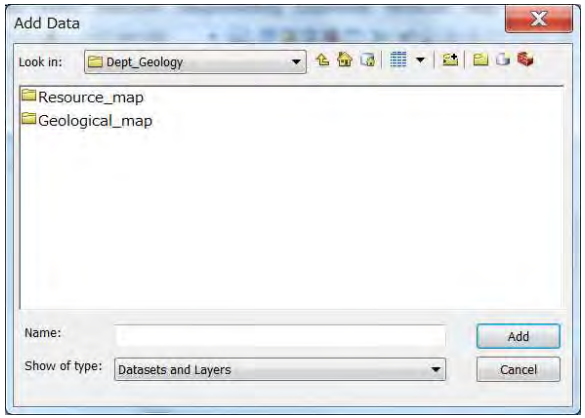
5-2-1 Shapefile

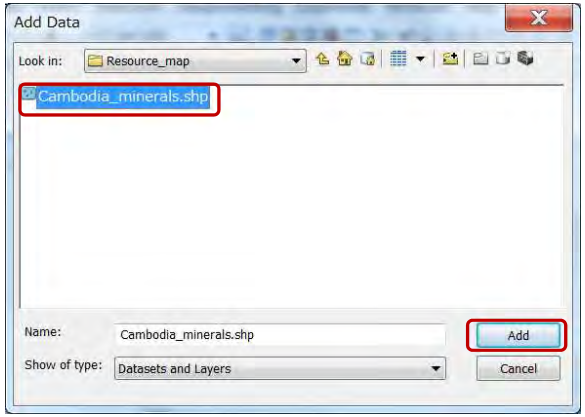


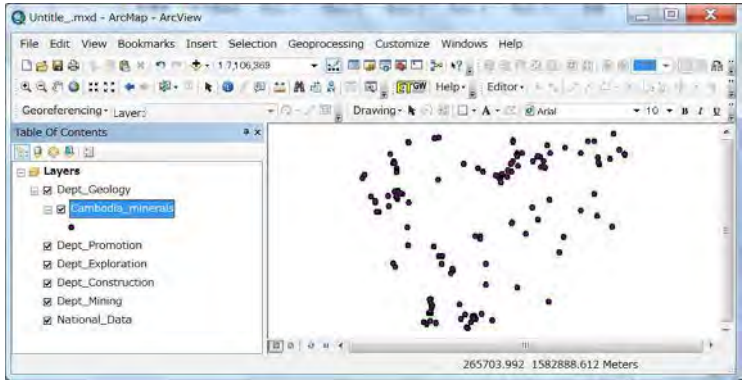



Connect to Folder
Choose the folder to which you want to connect:
GDMR_Database (Y:)
Common
Dept_Construction
Dept_Exploration
Dept_Geology
Dept_Mining
Dept_Promotion
National_data
Airport
CMAC
Commune_boundary
District_boundary
フォルダー(F):
Y:¥
新しいフォルダーの作成(N)
OK
キャンセル

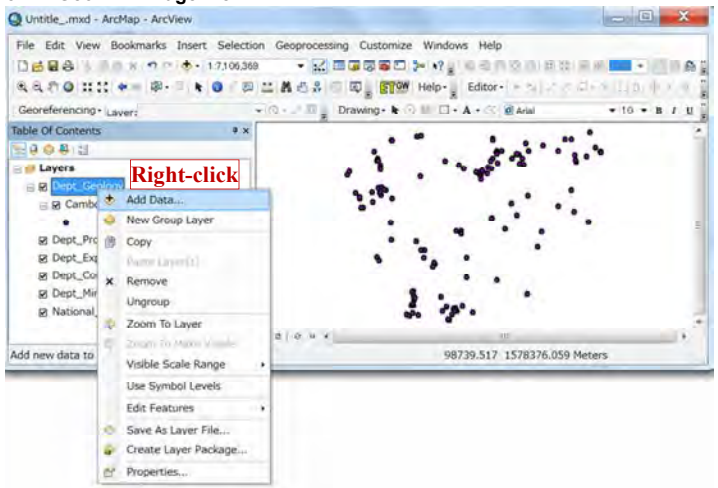

Add Data
Look in:
Y:\
National_data
Dept_Promotion
Dept_Mining
Dept_Geology
Dept_Exploration
Dept_Construction
Common
Name:
Show of type:
Datasets and Layers
Add
Cancel

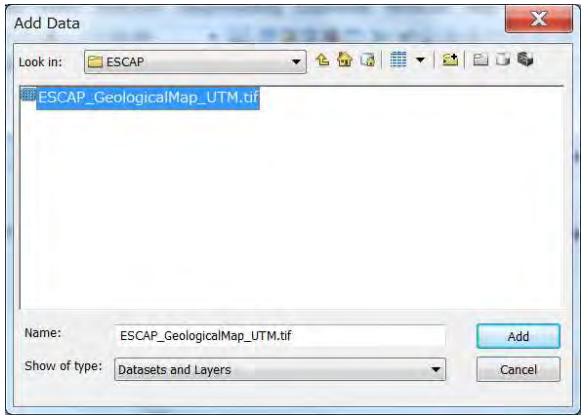

Add Data
Look in:
Dept_Geology
Resource_map
Geological_map
Name:
Show of type:
Datasets and Layers
Add
Cancel

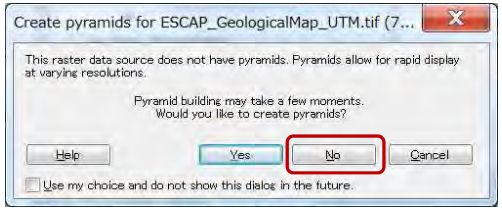

Add Data
Look in:
Resource_map
Cambodia_minerals.shp
Name:
Cambodia_minerals.shp
Show of type:
Datasets and Layers
Add
Cancel



5-2-2 GeoTIFF image file

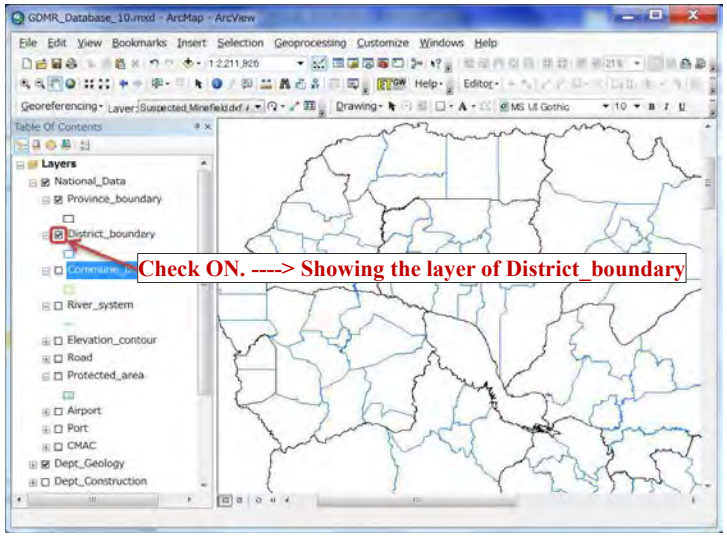






5-3 Layer control

5-3-1 To show / hide layers

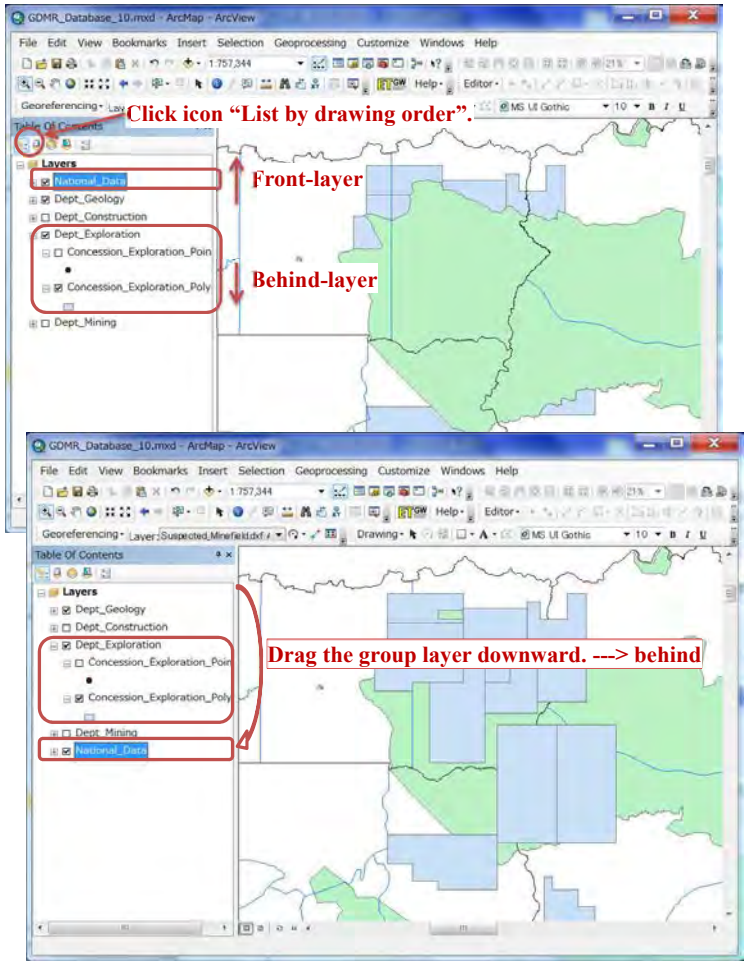


5-3-2 Drawing order

Click the icon of “List by drawing order”, for arranging the layer order.

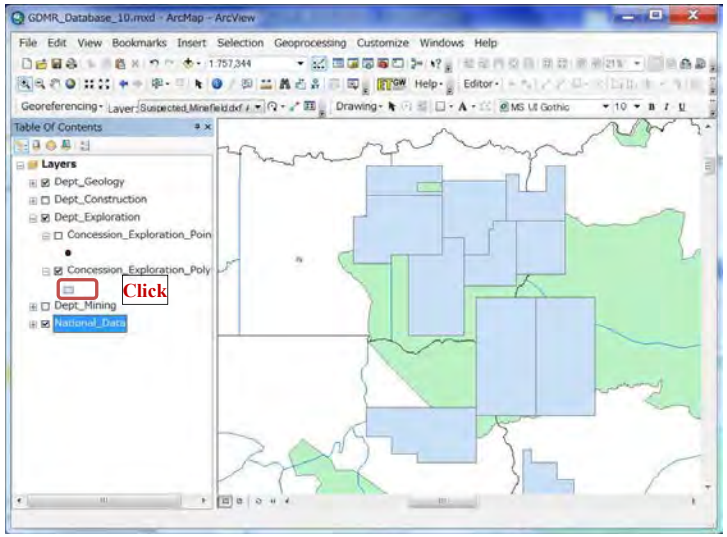
Front layer is shown upper in the layer list. Behind layer is shown downward.

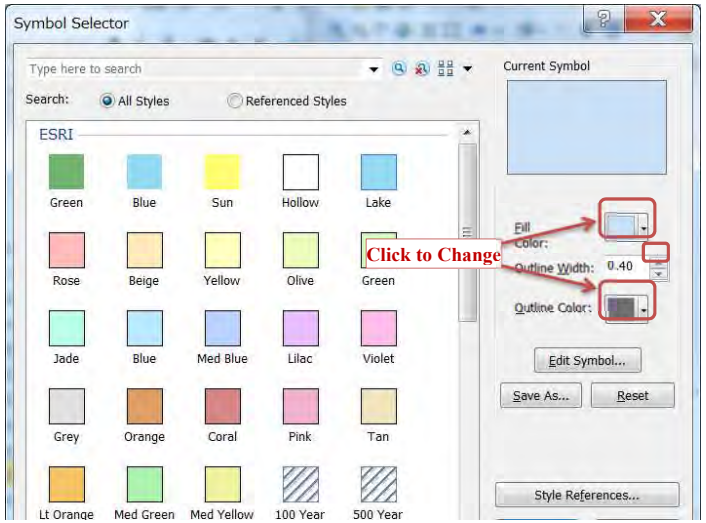
Point layers are shown automatically at front side, while polygon layers at behind.

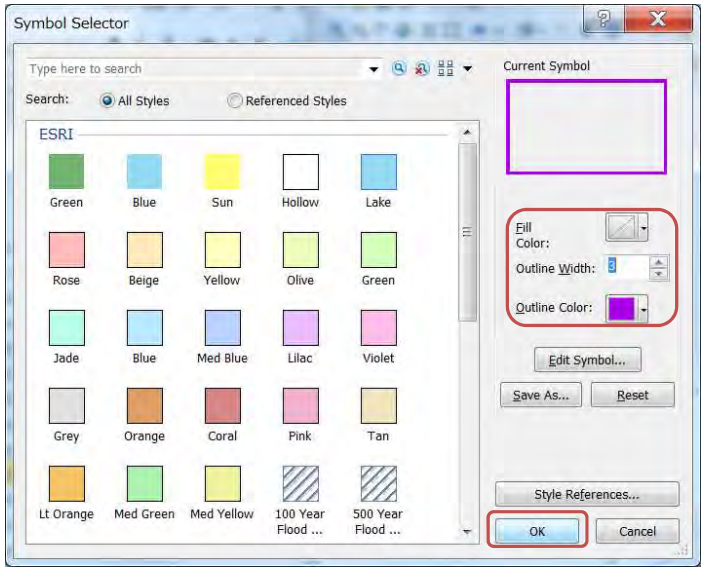


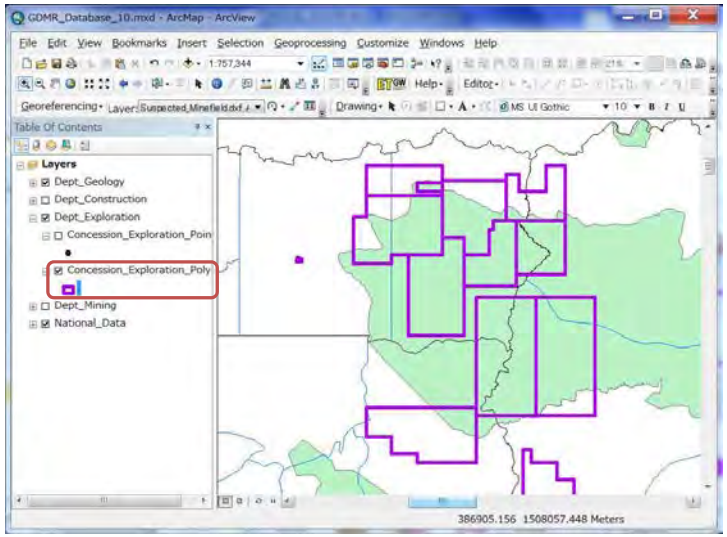
5-4 Symbology of layer

5-4-1 Basic symbology

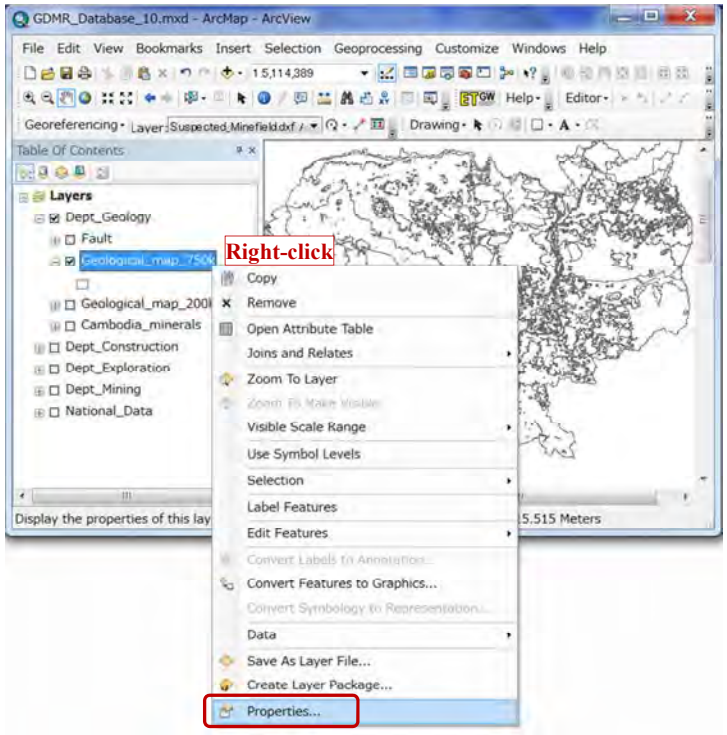


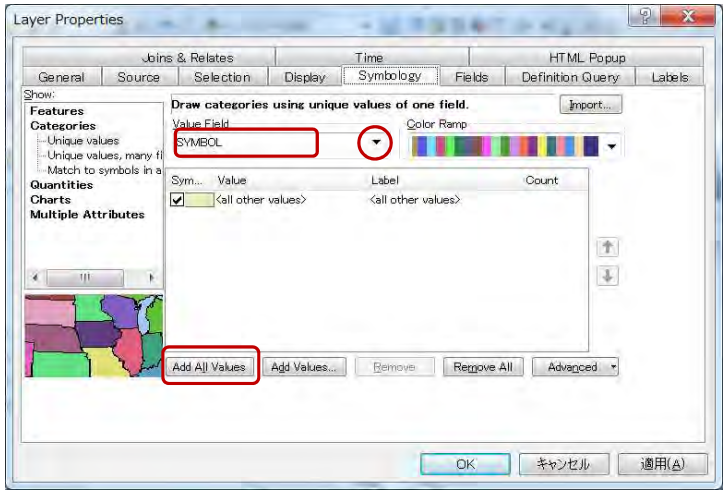


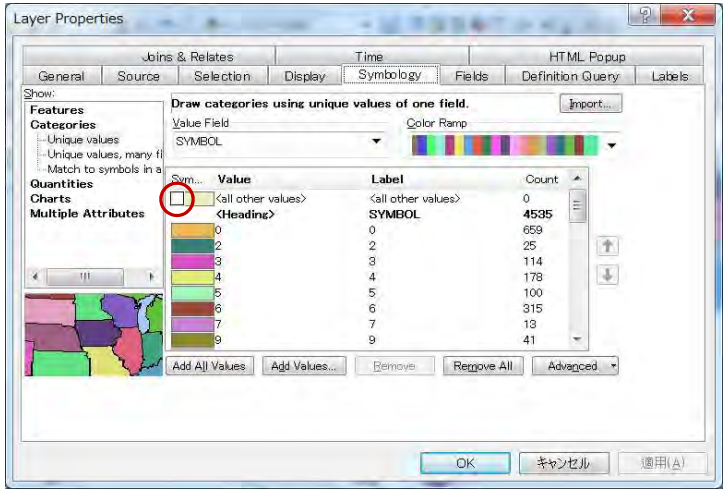


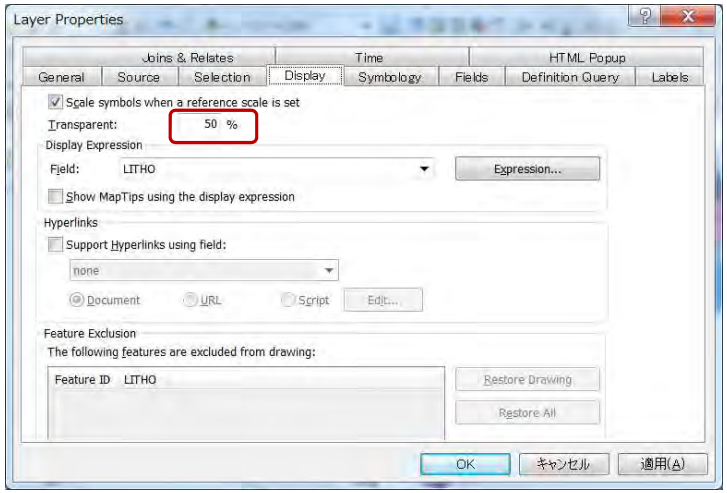


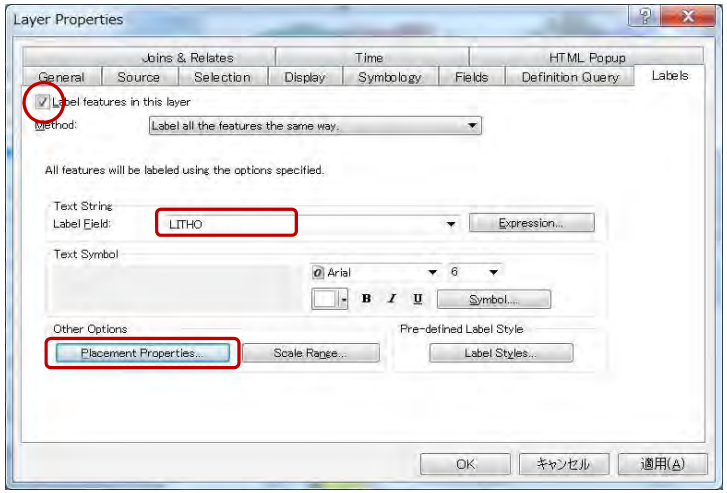
5-4-2 Advance symbology for geology

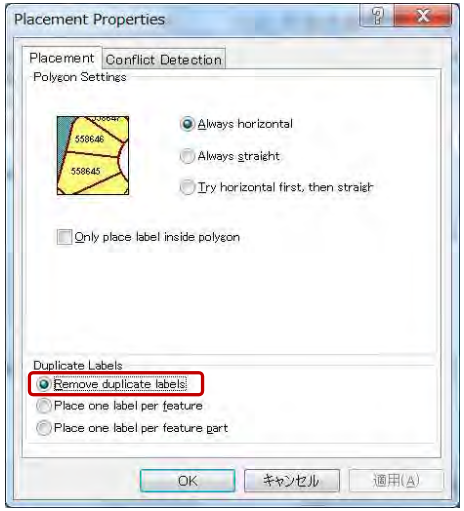


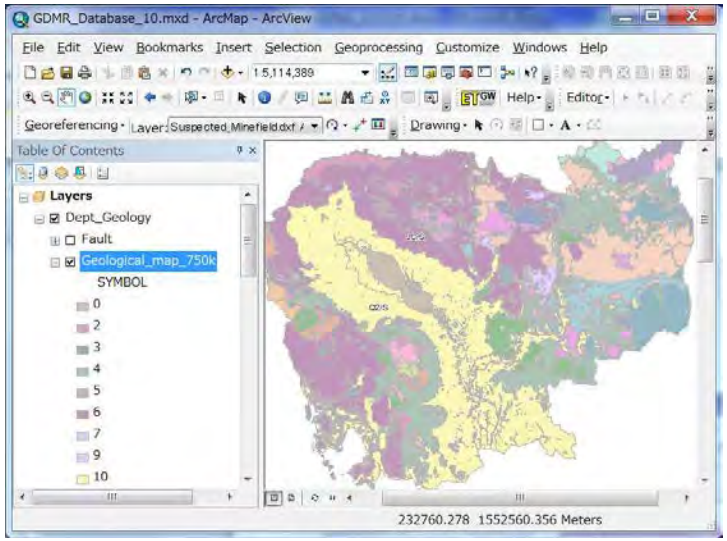





Layer Properties
Joins & Relates
Time
HTML Popup
General
Source
Selection
Display
Symbology
Fields
Definition Query
Labels
Scale symbols when a reference scale is set
Transparent:
50 %
Display Expression
Field:
LITHO
Expression...
Show MapTips using the display expression
Hyperlinks
Support Hyperlinks using field:
none
Document
URL
Script
Edit...
Feature Exclusion
The following features are excluded from drawing:
Feature ID LITHO
Restore Drawing
Restore All
OK
キャンセル
適用(A)

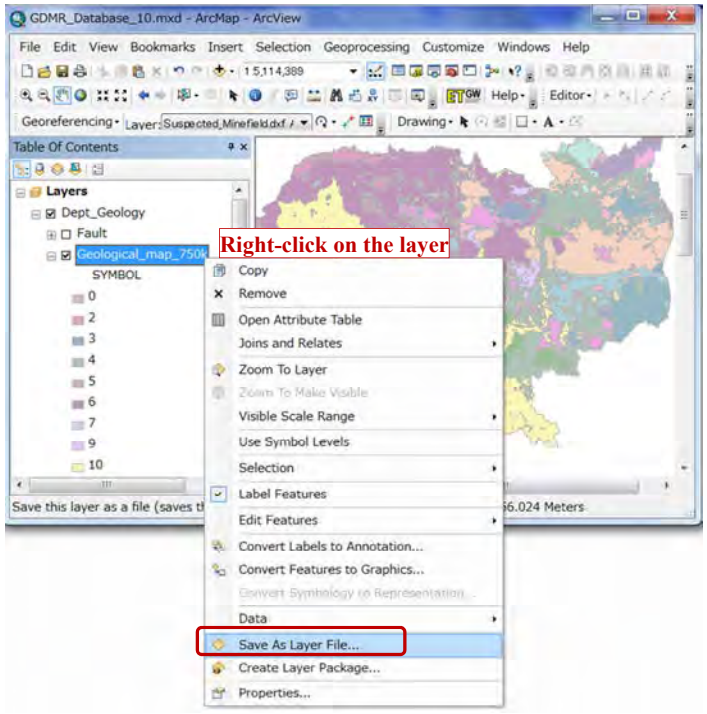

Layer Properties
Joins & Relates
Time
HTML Popup
General
Source
Selection
Display
Symbology
Fields
Definition Query
Labels
Label features in this layer
Method:
Label all the features the same way
All features will be labeled using the options specified.
Text String
Label Field:
LITHO
Expression...
Text Symbol
Arial
6
B
I
U
Symbol...
Other Options
Placement Properties...
Scale Range...
Pre-defined Label Style
Label Styles...
OK
キャンセル
適用(A)

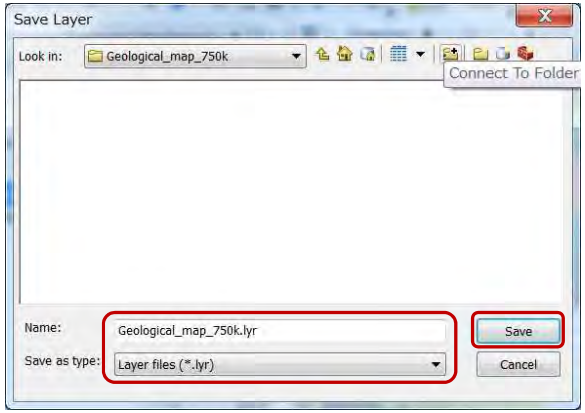

Placement Properties
Placement
Conflict Detection
Polygon Settings
559646
559645
Always horizontal
Always straight
Try horizontal first, then straight
Only place label inside polygon
Duplicate Labels
Remove duplicate labels
Place one label per feature
Place one label per feature part
OK
キャンセル
適用(A)

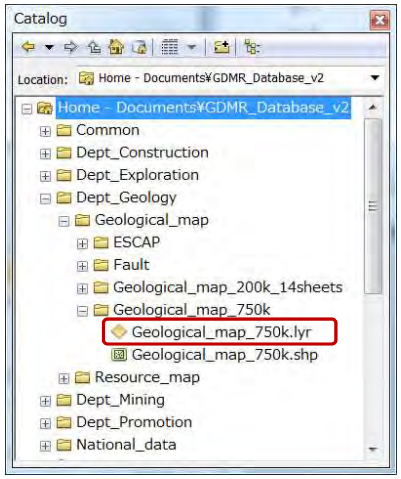

GDMR_Database_10.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:5,114,389
Help
Editor
Georeferencing
Layer: Suspected Minefield.dxf
Drawing
Table Of Contents
Layers
Dept_Geology
Fault
Geological_map_750k
SYMBOL
0
2
3
4
5
6
7
9
10
232760.278 1552560.356 Meters

5-5 Save as layer file (lyr file)

Save the layer setting as a layer file. The setting of either individual layer or a Group layer, can be saved in layer file

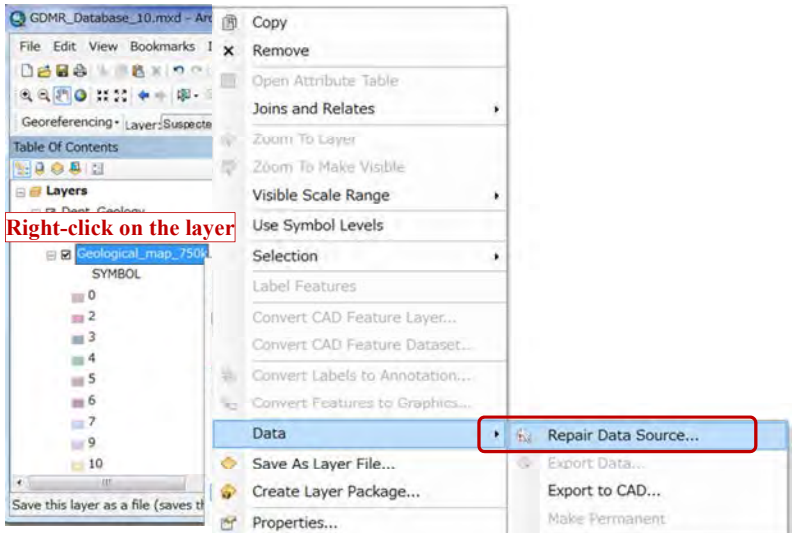




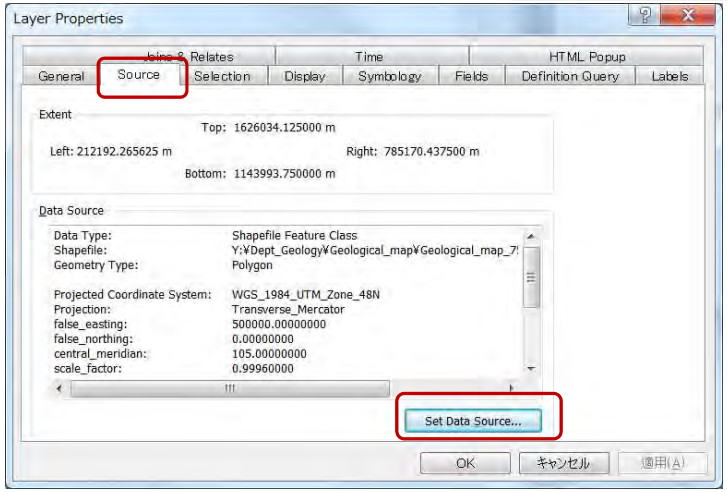


Trouble of missing the path of source file

Since a layer and a layer file stores only layer setting like symbology, NOT its source data. If missing the path of source file, a layer shows nothing. You have to recover to assign the path of source file as follows;



Or Right-click on the layer, to choose Properties...

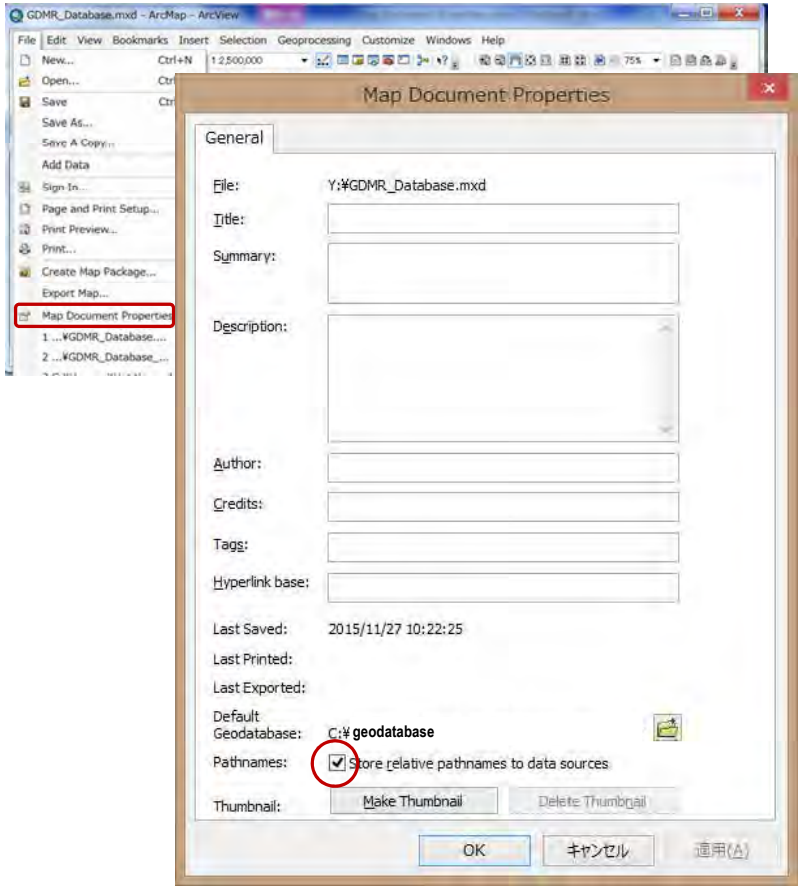


5-6 Save as ArcMap file (mxd file)

ArcMap file can save the setting of all layers of map and layout setting. It covers the path of data file, but does not cover the data themselves.

5-6-1 Relative path

When saving ArcMap file, relative path is convenient. If moved to different folder location, relative path still keep a connection to the source files.

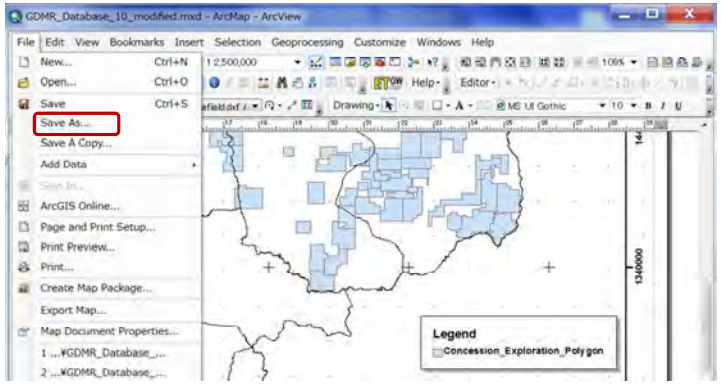


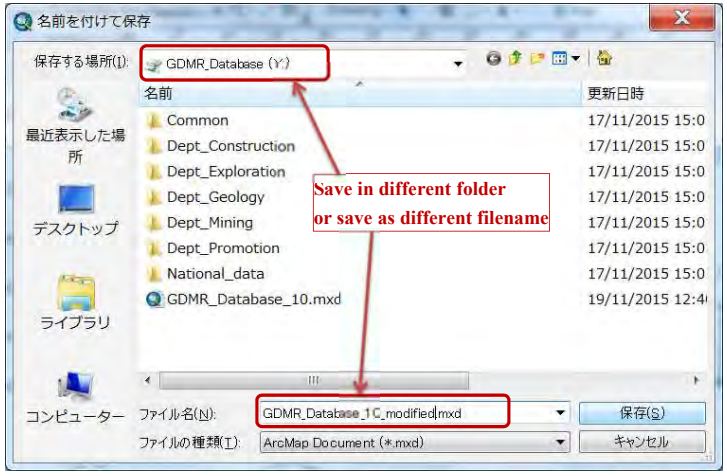
5-6-2 Save

When choosing Save, the ArcMap file is overwritten.

5-6-3 Save as (different filename or in other folder)

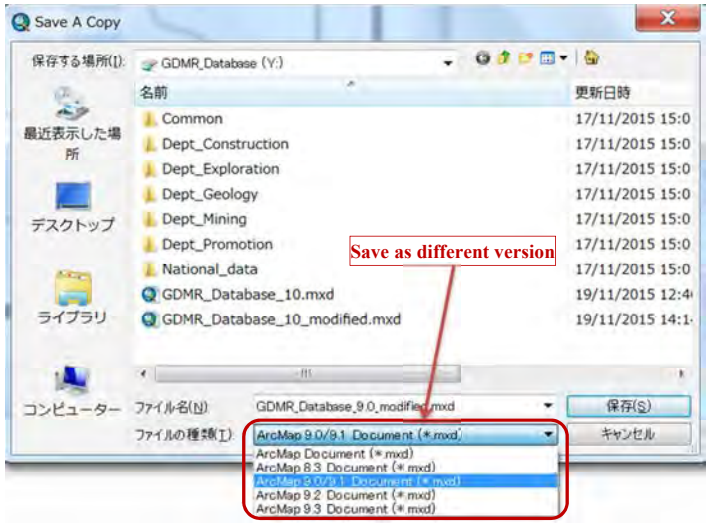
When choosing Save As..., the ArcMap file can be saved at different folder location, or saved as different file.





5-6-4 Save copy (as older version)

When choosing Save copy, ArcMap file can be saved as older version.



5-7 Troubleshooting

Typical troubles are shown below.

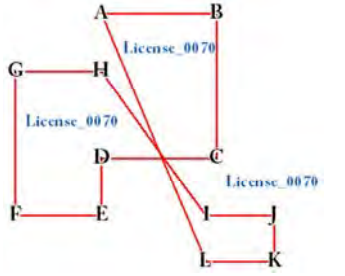
5-7-1 Wrong coordinates value in Excel sheet

Wrong coordinates data in “Concession.xls” lead to wrong polygon. Check the data range of Excel sheet. It may contain unnecessary rows and columns in case.

	Case1: Wrong coordinates Case2: Blank data of coordinates (meaning zero value) Case3: Wrong data-range of Concession.xls. Try to delete unnecessary columns and rows of Excel.

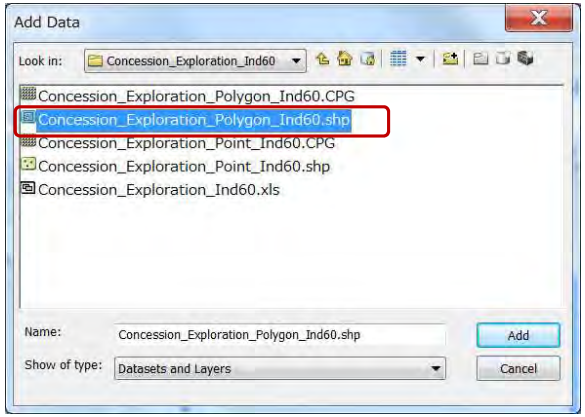
5-7-2 Wrong input (License number, order of RefMark)

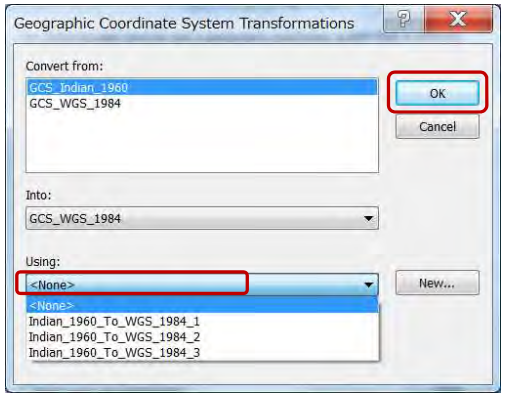
Location of points is correct, but polygon shows wrong geometry. Check if three cases occur.

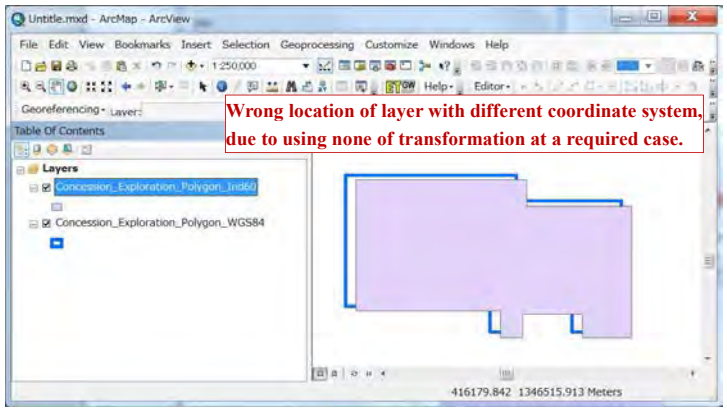
	Case1: Point I,J,K,L belong to License_0070 but of different year. Case2: Point I,J,K,L belong NOT to License_0070 (mis-typed). Case3: Order of RefMark is wrongly connected.

5-7-3 Adding layers of different coordinate system without transformation

Not always but some datum conversion requires transformation. In such a case without transformation, shows layers of different coordinate system at wrong location.

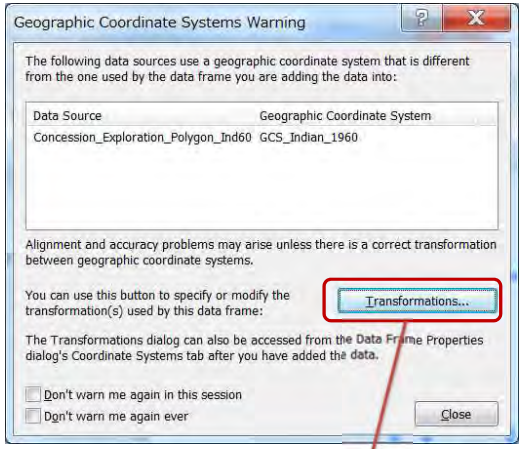


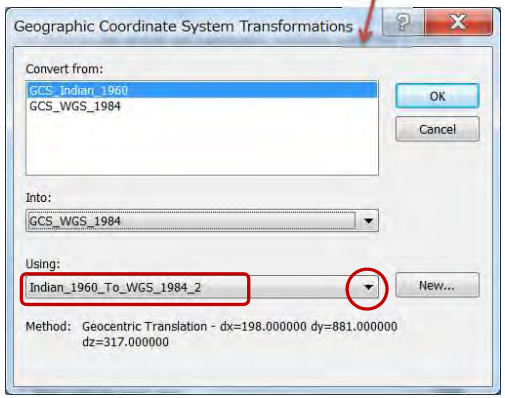


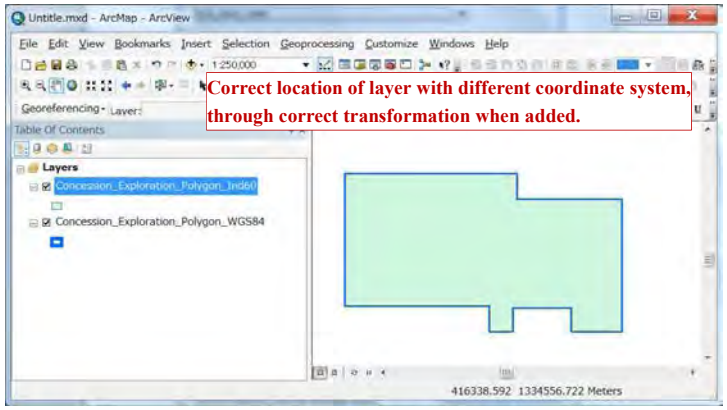


How to add layers with different coordination

Although not recommended, layers with different coordination can be added, if correct transformations are given as follows.

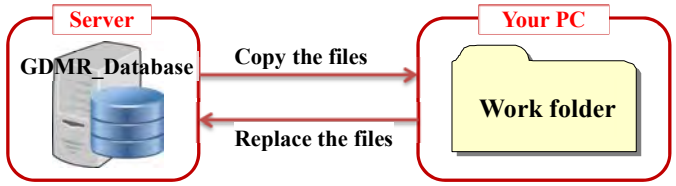






6. Update data

Chapter 6 shows which data should be updated, who and how to update. To record the log of history when and who updated should be attached.



6-1 Kind of data to be updated

6-1-1 License and concession data

License and concession data in three department (Exploration, Construction materials, Mining) should be updated at anytime to be issued. License stage is summarized below ;

License cycle	Case	Files to be updated
Start new license	New issue, Relinquish concession	License_*.xls (Add new data) Concession_*.xls (Add new data) Mines_ Mining.xls
Continue operation	(Operation data)	Mines_Mining.xls
Temporary stop	Surrender	License_*.xls (Add the date and reason) Mines_ Mining.xls
End of license	Expire Revoke Return	License_*.xls (Add the date and reason) Mines_ Mining.xls

Issue new license

There are two cases of new license issued.

- New concession
- Relinquish existing consession

Based on license certificate, add new license number, issuer, date, and other conditions described in certificate (License.xls). It is also necessary to add coordinates data (Concession.xls and shapefiles from it).

Surrender license for a time

License may be surrendered, where operation is stopped temporarily.

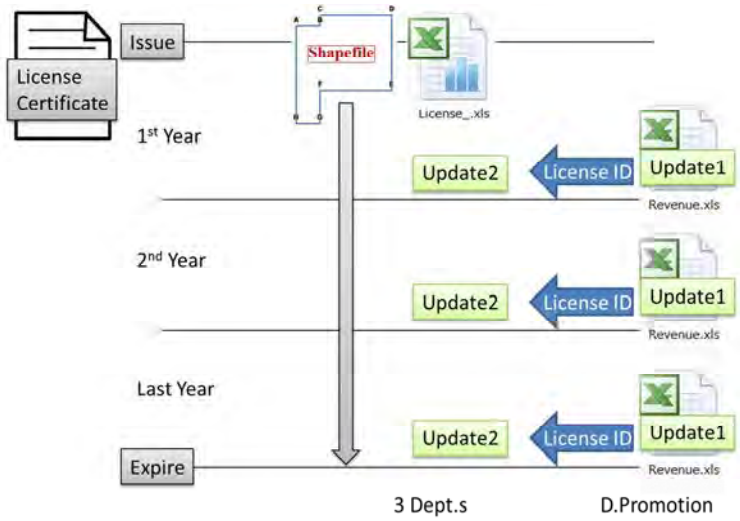
Input the date and reason in License_*.xls

Expired / Return / Revoke license

When license is expired according to license certificate, or returned, the payment should be checked by Department of Promotion. Keep these license at least until end of license-year in current database.

6-1-2 Revenue data

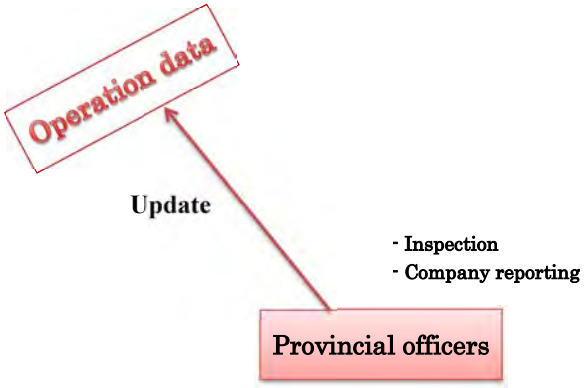
Department of Promotion manages revenue for all licenses of three departments. This data is controlled and updated by department of Promotion. The license number is not unique or different format between departments. So License ID is introduced and assigned by department of Promotion.



6-1-3 Mines data (Operation data)

Basic operation data shall be saved in the file of Mines.xls. These information is in many case provided by local provincial office, or sometimes by site-inspection. For sharing within GDMR, those data should be updated. Using License number, you can view from concession map.

Mines.xls
License_N
Name_Mines
Operator
Stage
MineLocation
MiningArea_sqkm
StartMineD
CloseMineD
Female_Worker
Male_Worker
Commodity_Code
Monthly_Production
Annual_Production
Sales
MineLife_years
Ore_Resource_ton
Ore_Reserve_ton



6-2 File list and the responsibility to update

6-2-1 Files in “Dept_Exploration” folder

Officers of Department of Exploration have a responsibility to update under this folder and subfolders. Timing of update shall be decided by Department of Exploration.

The list of required files to be updated is below.

Input	Concession_Exploration_Indian60.xls	License_Exploration.xls
	Concession_Exploration_Point_Indian60.shp Concession_Exploration_Point.shp Concession_Exploration_Polygon.shp	
Output	Concession_Exploration_Joined.shp	

6-2-2 Files in “Dept_Construction” folder

Officers of Department of Construction materials have a responsibility to update under this folder and subfolders. Timing of update shall be decided by Department of Construction materials.

The list of required files to be updated is below.

Input	Concession_Construction_Indian60.xls	License_Construction.xls
	Concession_Construction_Point_Indian60.shp Concession_Construction_Point.shp Concession_Construction_Polygon.shp	
Output	Concession_Construction_Joined.shp	

6-2-3 Files in “Dept_Mining” folder

Officers of Department of Mining have a responsibility to update under this folder and subfolders. Timing of update shall be decided by Department of Mining.

The list of required files to be updated is below.

Input	Concession_Mining_Indian60.xls	License_Mining.xls
	Concession_Mining_Point_Indian60.shp Concession_Mining_Point.shp Concession_Mining_Polygon.shp	
Output	Concession_Mining_Joined.shp	

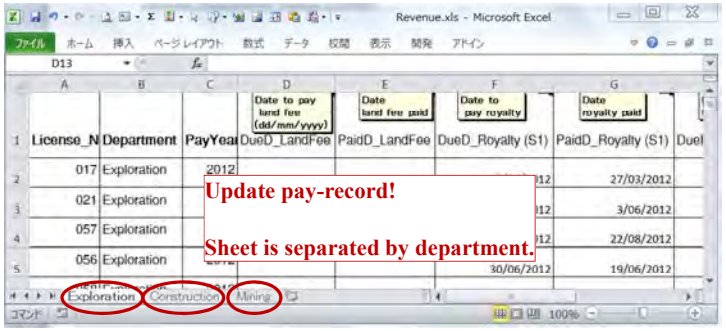
Input/Output	Mines_Mining.xls

6-2-4 Files in “Dept_Promotion” folder

Officers of Department of Promotion have a responsibility to update under this folder and subfolders. Timing of update shall be decided by Department of Promotion.

The list of required files to be updated is below.

Input/Output	Revenue.xls “Exploration” sheet “Construction” sheet “Mining” sheet



6-2-5 Files in “Dept_Geology” folder

Officers of Department of geology have a responsibility to update under this folder and subfolders.

There are two kinds of geological map in this database.

1) Compiled geological map (S=1/750,000) based on ASEAN database including some GIS data from JICA(2010).

2) Local geological map (S=1/200,000), 14sheets.

Timing of update shall be decided by Department of geology. It depends on the progress by ASEAN database project on seamless geology.

6-3 Procedure to update the files

How to setup the file for updating work is shown here.

Preparation of work folders in your PC, then start with updating data in Excel files.

Copy the files from the database.
Paste in your PC. Update data

↓

Stop sharing the database.

Replace the files.
Record update history.

Start sharing the database.

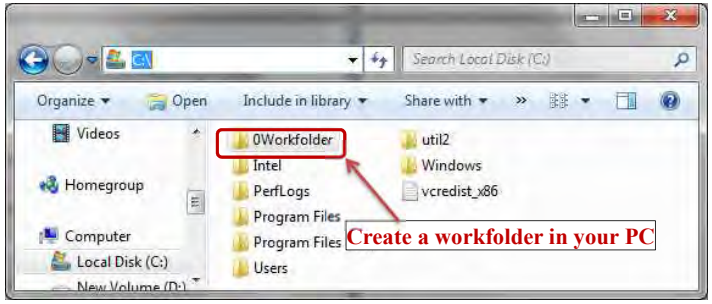
Make whole data kept and retained (Add new data besides existing data), in Excel files.

Regarding to updating license data,

- See chapter 2 how to input into Excel file
- See chapter 3 how to create shapefile

6-3-1 Create a work-folder in your PC.

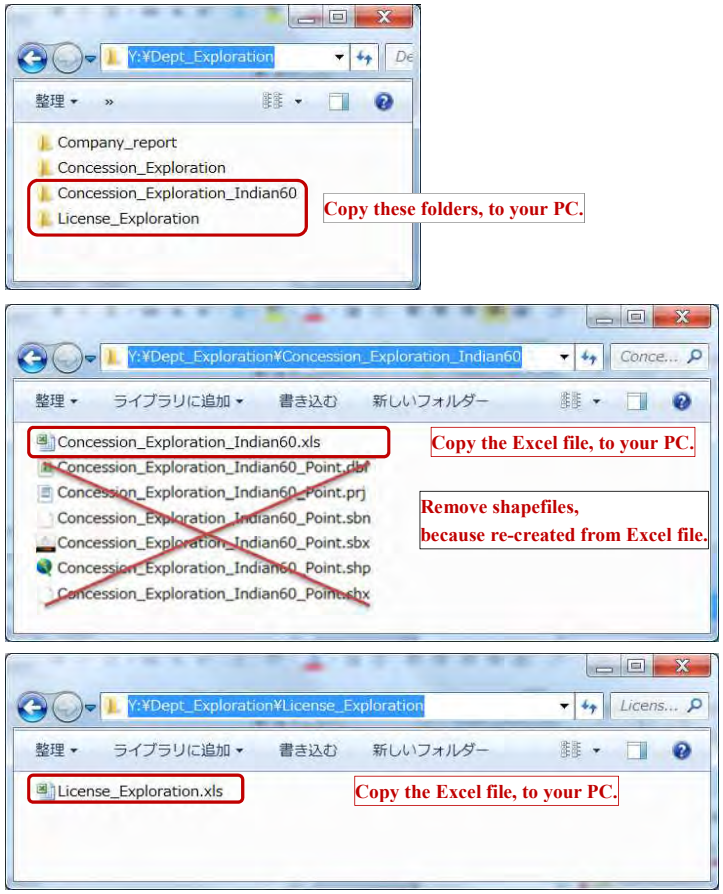
For example; C:¥0Workfolder



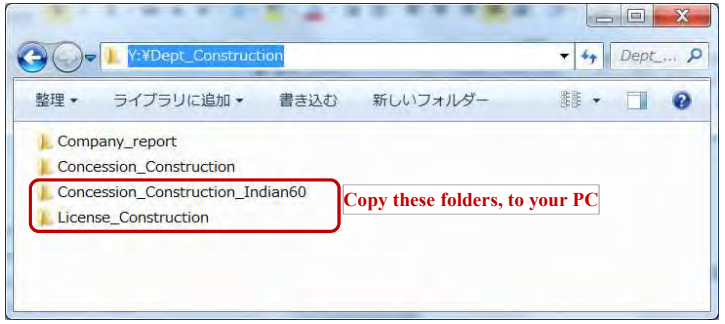
6-3-2 Copy the files from database to your PC

Copy from Dept_Exploration folder

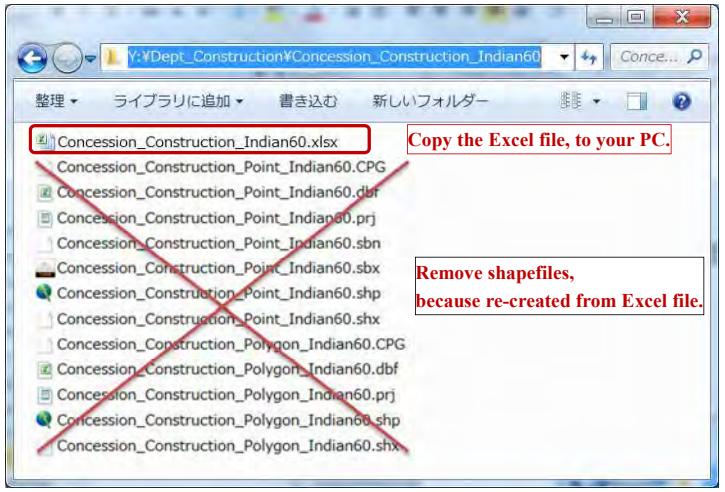
Open the folder of “Dept_Exploration”

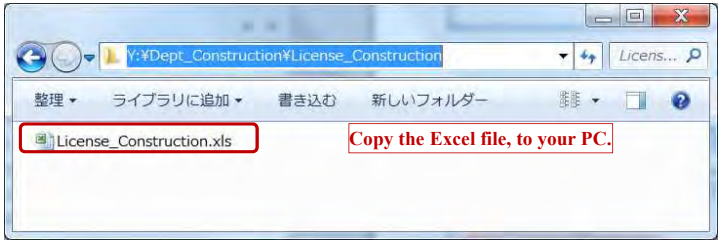


Copy from Dept_Construction folder



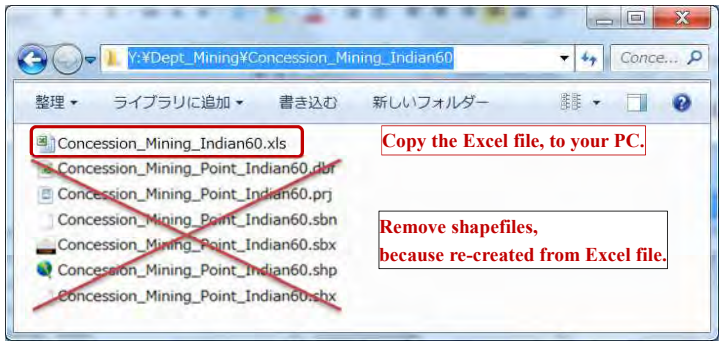
Copy the folders into your PC. Only Excel files are necessary. Shapefile is NOT necessary, because created again from updated Excel files. .

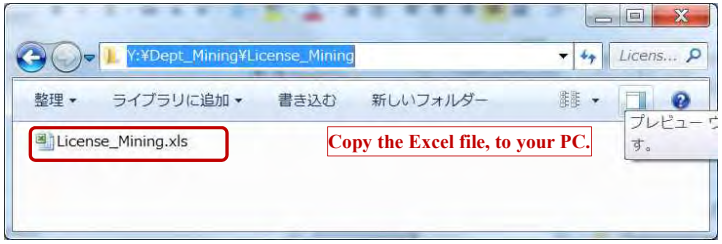




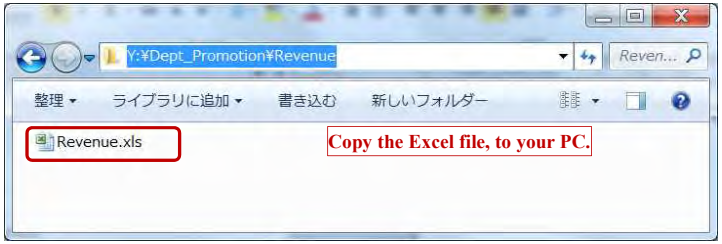
Copy from Dept_Mining folder

Copy the folders into your PC. Only Excel files are necessary. Shapefile is NOT necessary, because created again from updated Excel files. .





Copy from Dept_Promotion folder

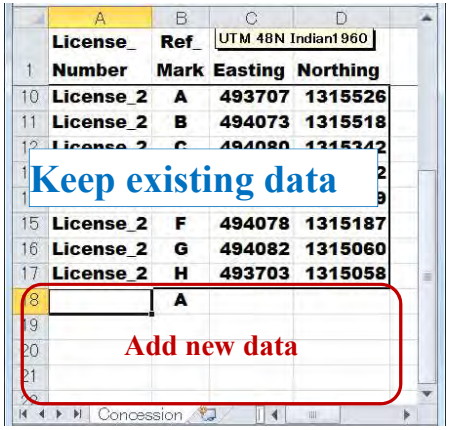


6-3-3 Update the files and save in your work-folder

(Step1) Update the Excel files

Edit data. Add new data, besides existing data .

Do not remove the license data, until annual update and decision by Department or Promotion.



(Step2) Create shapefiles from X,Y data of concession.xls

(See chapter 3-1, to create shapefiles of concession).

6-3-4 Replace the files in the database.

Note for update in database folders

If someone using the ArcMap file on database, you cannot update the files referenced by the ArcMap file. So it is necessary to stop use by other users.

(Step 1) Stop sharing the database.

(Step 2) Replace the files in the database.

Copy the updated files from your work-folder.

Paste (replace) to the assigned folder in database

(Step 3) Start sharing the database.

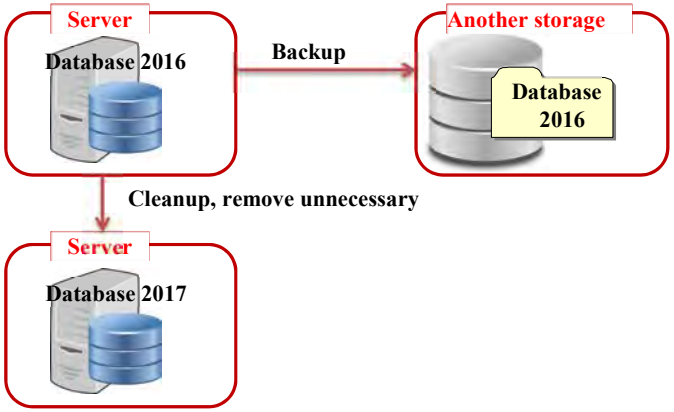
6-3-5 Record of updating history

When updating, record the date and person in the text file, which is put in the same folder as updated file. The filename for the log is like “UpdateMemo_***.txt (*** is original filename), to identify the file .

6-4 Annual updates of whole part of database (Task for Database Administrators)

When new license-year starts, renew the database.

Backup whole part of current database into another storage/media.



Clean up unnecessary file. Recover or reset the ArcMap file.

Choice of license data to transfer, which depends on both the license status and the payment, shall be decided by Department of Promotion.

Choice of license data to transfer to next year database (annual update)

Status / Payment	Valid licenses (including Surrender)	Expire /Return / Revoke
Paid completely	Select *	Remove**
Un-paid license	Select *	Select *

*Select: Transfer data to next year database

**Remove: Remove from next year database (Stored in past database)

7. View a map on ArcMap

Chapter 7 shows how to view the map for all users. After opening the ArcMap file "GDMR_Database.mxd", basic guide is navigated how to view or zoom the map, how to handle the layers of map. As advance step, the case of how to view license data related to concession map is instructed.

Understanding to use ArcMap
- To view a map of ArcMap (ch7-1)
- To control layers of map (ch7-2)

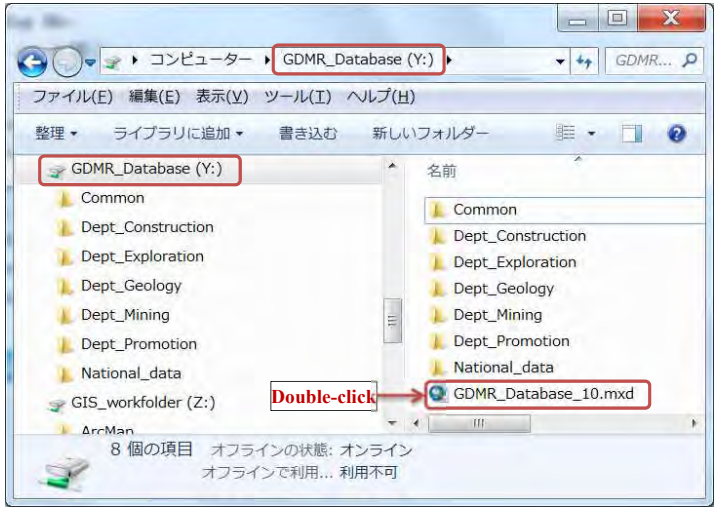
↓

Example of
- Using attribute table, Join with Excel data (ch7-3)
- Search for expired, unpaid concessions (ch7-4)
- Spatial search for concessions (ch7-5)

7-1 View a map

7-1-1 Open ArcMap file

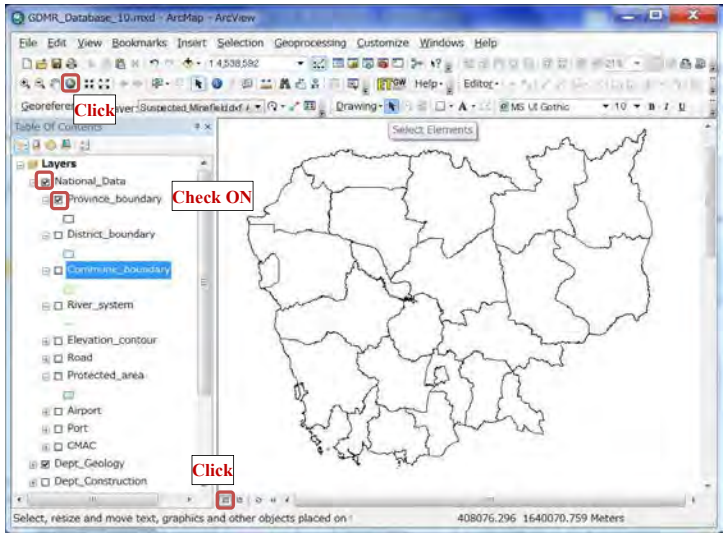
Connect to "GDMR_Database", then double-click on ArcMap file "GDMR_Database_10.mxd".



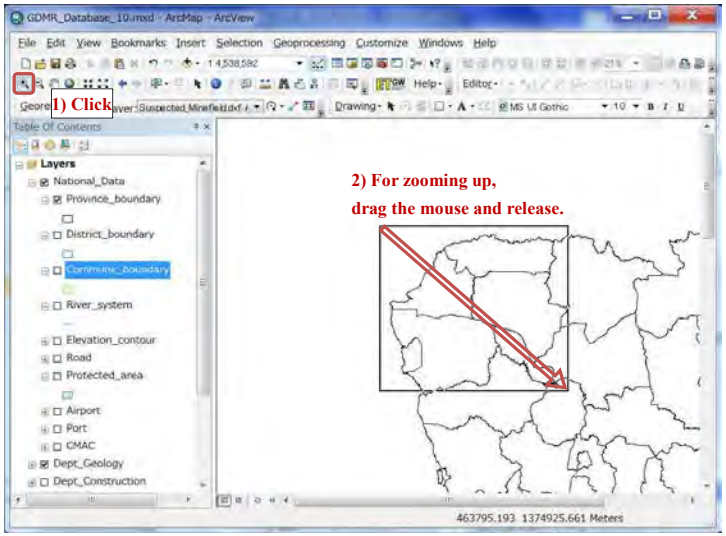
If you cannot open the file, check the file version and software version.

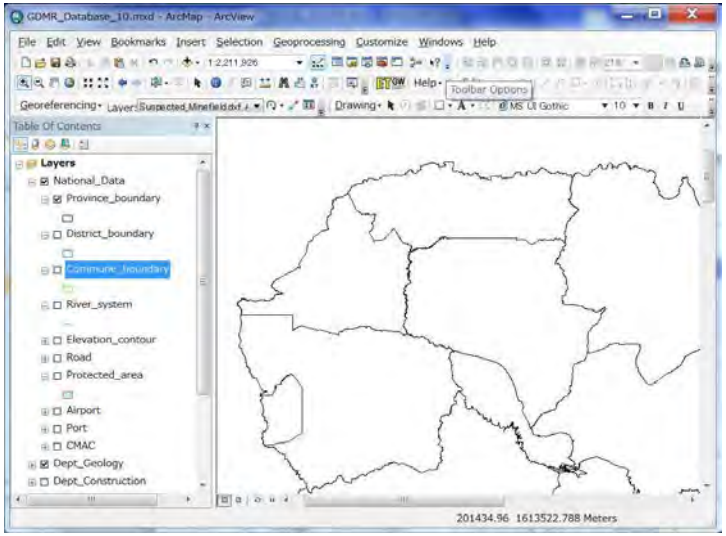
ArcMap File version	Available Software version

Version 9 (mxd file)	ArcGIS 9 ArcGIS 10.0 ArcGIS 10.1 ArcGIS 10.2 ArcGIS 10.3
Version 10.0 (mxd file)	ArcGIS 10.0 ArcGIS 10.1 ArcGIS 10.2 ArcGIS 10.3
Version 10.1 (mxd file)	ArcGIS 10.1 ArcGIS 10.2 ArcGIS 10.3
Version 10.2 (mxd file)	ArcGIS 10.2 ArcGIS 10.3
Version 10.3 (mxd file)	ArcGIS 10.3

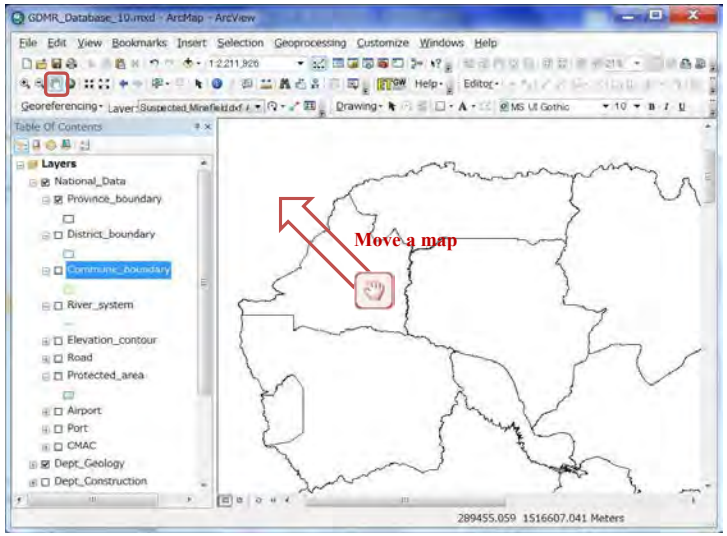


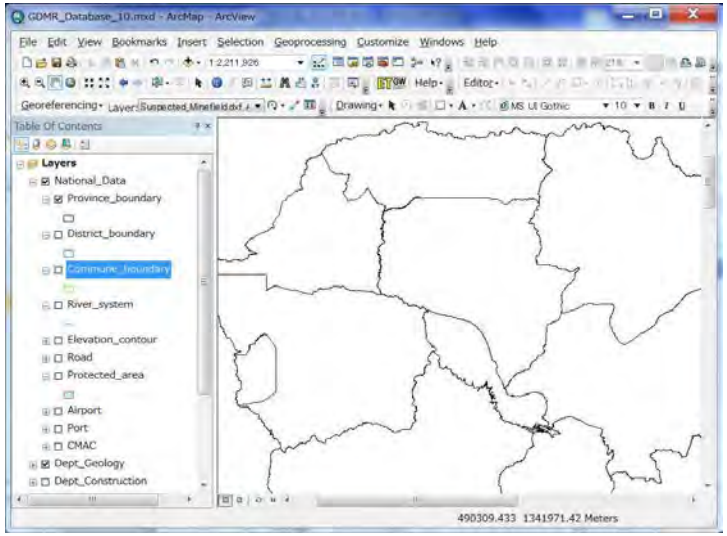
7-1-2 Zoom in/out map





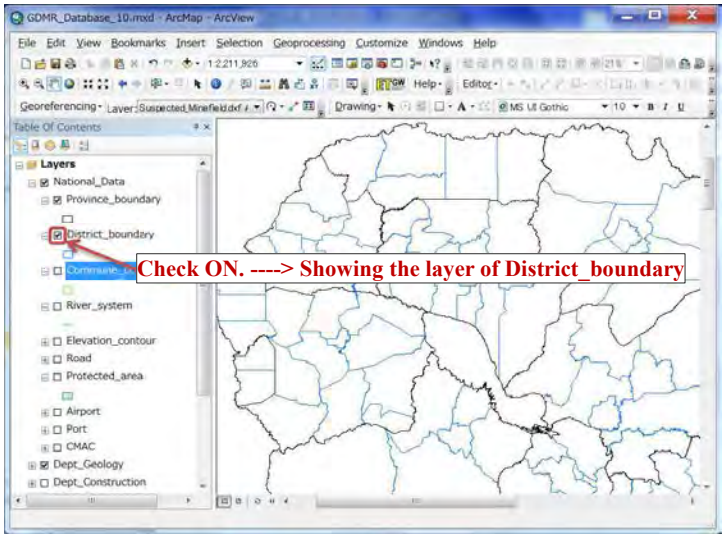
7-1-3 Move a map



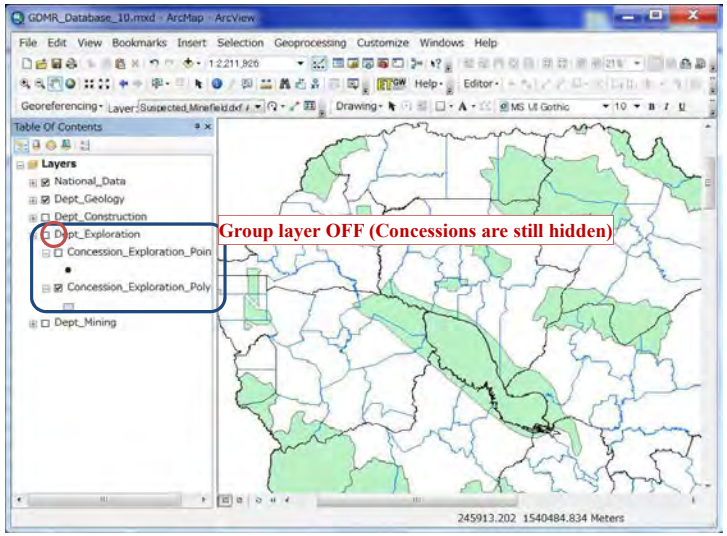


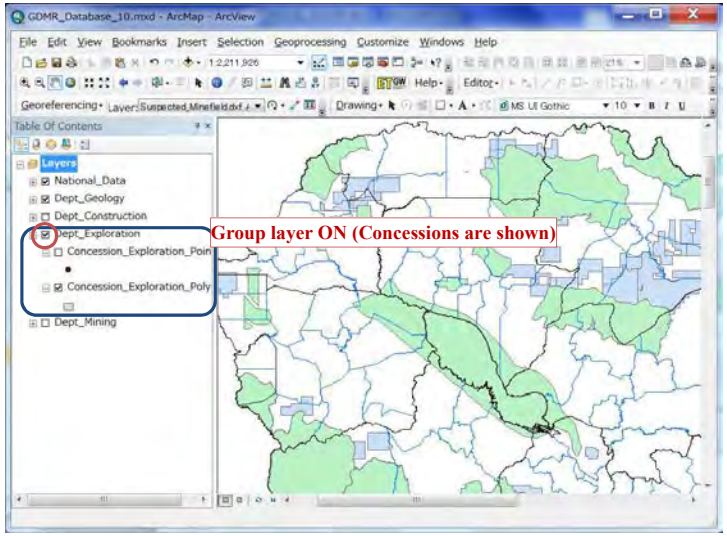
7-2 Layer control

7-2-1 To show / hide layers



7-2-2 Group layer



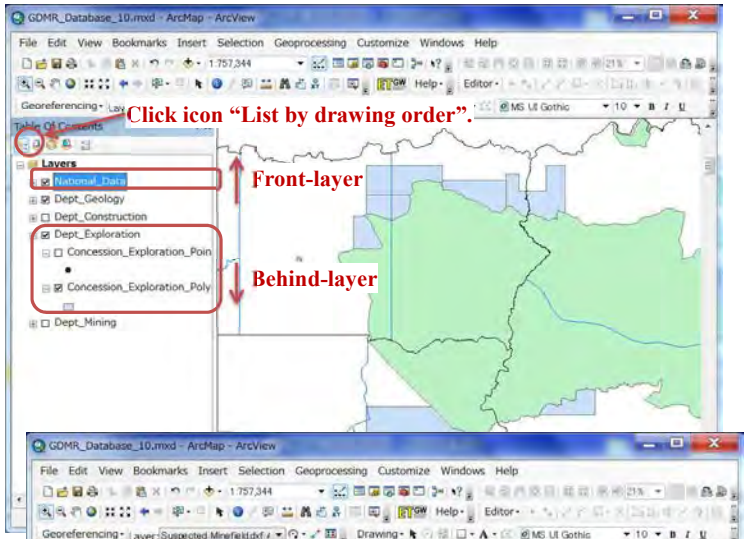


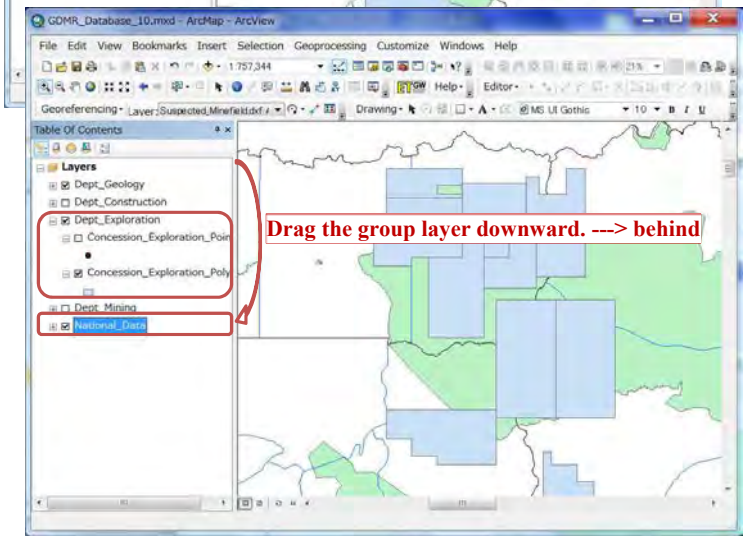
7-2-3 Drawing order

Click the icon of “List by drawing order”, for arranging the layer order.

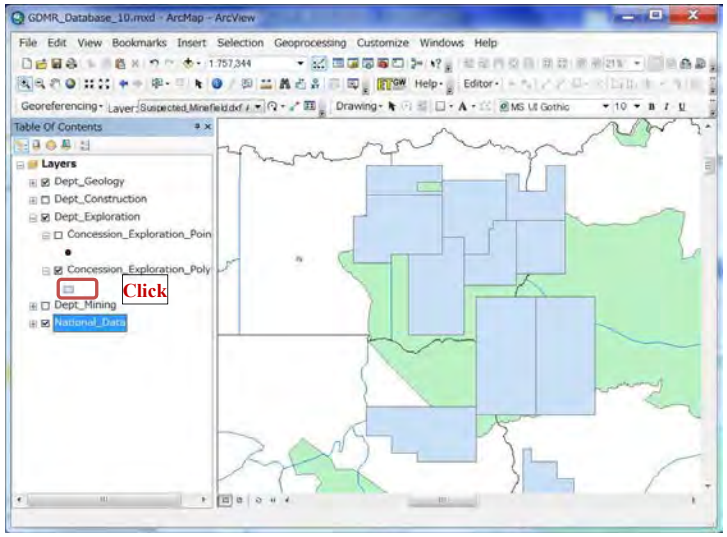
Front layer is shown upper in the layer list. Behind layer is shown downward.

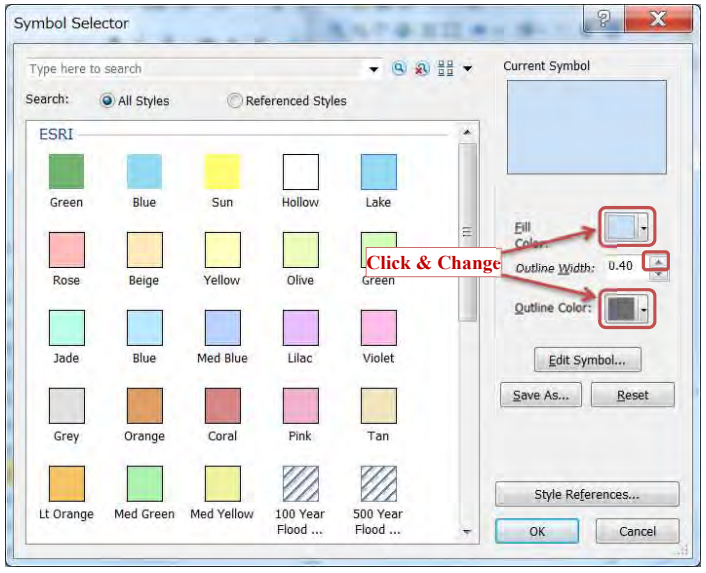
Point layers are shown automatically at front side, while polygon layers at behind.

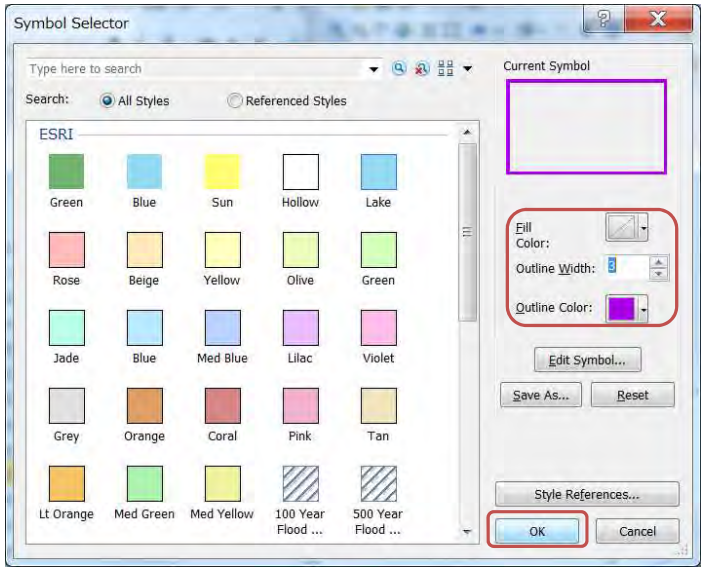


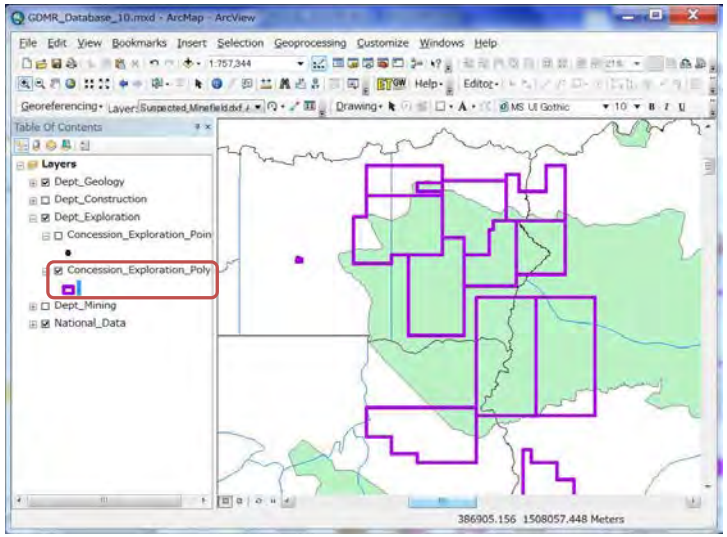


7-2-4 Symbology of layer





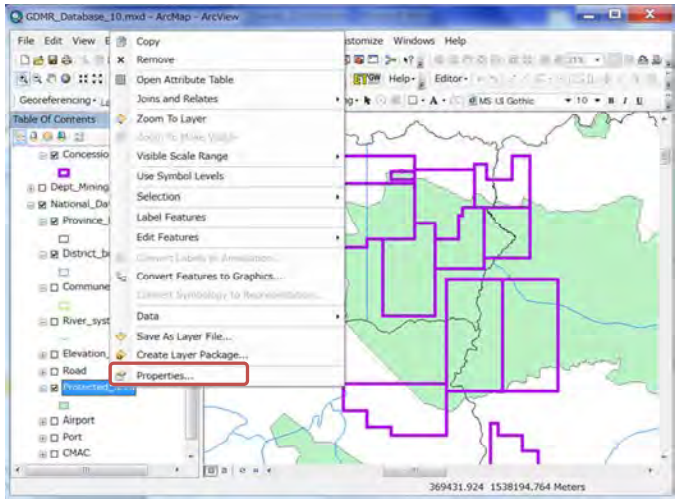


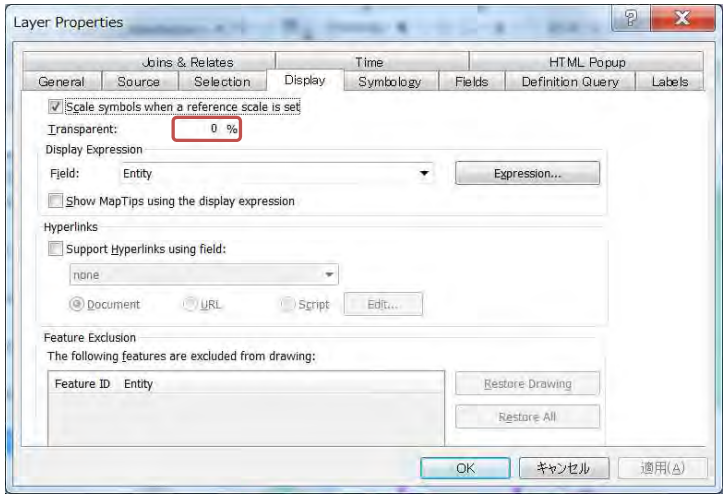


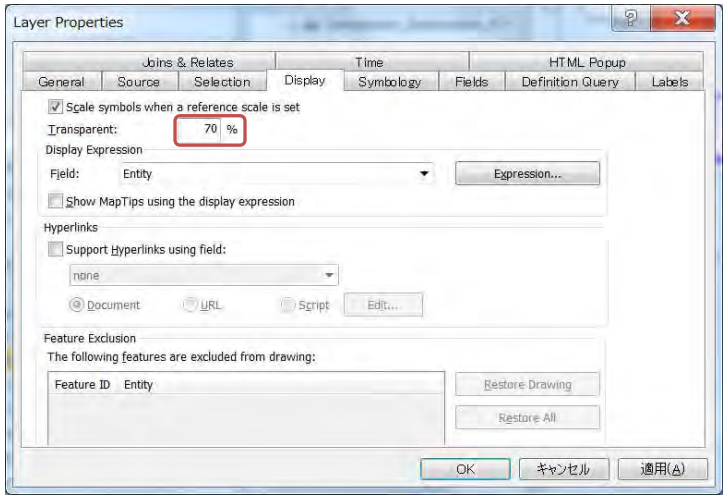
7-2-5 Advance layer control

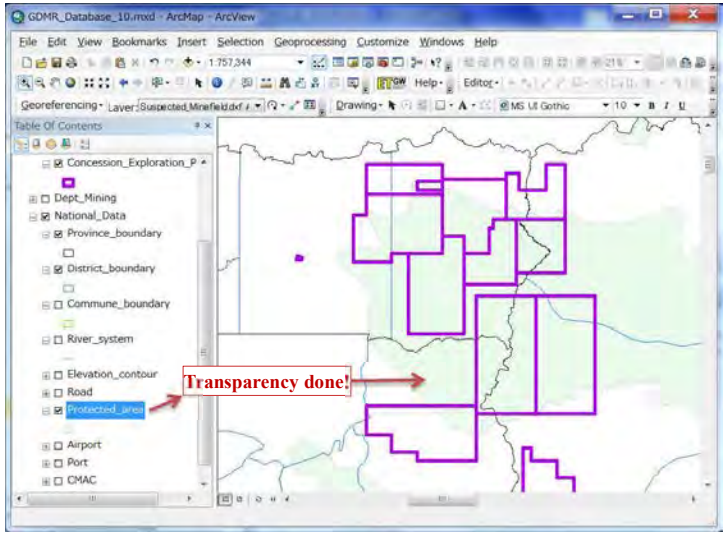
From “Layer properties”, various settings of layer appearance are available.

transparency of layer

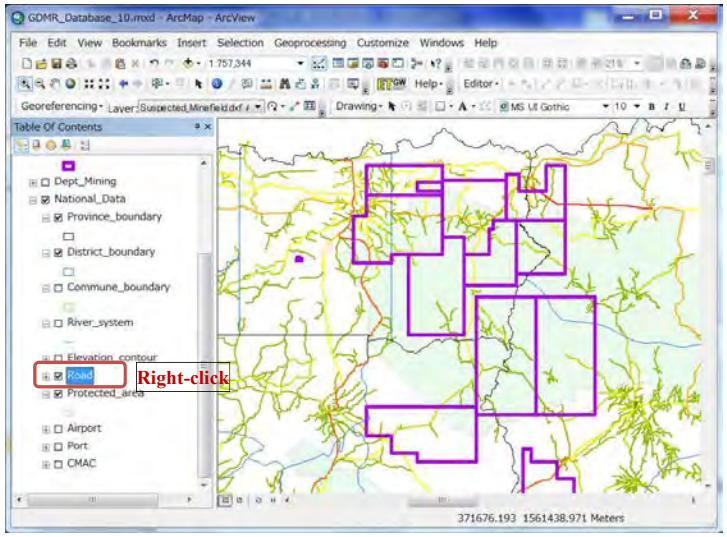


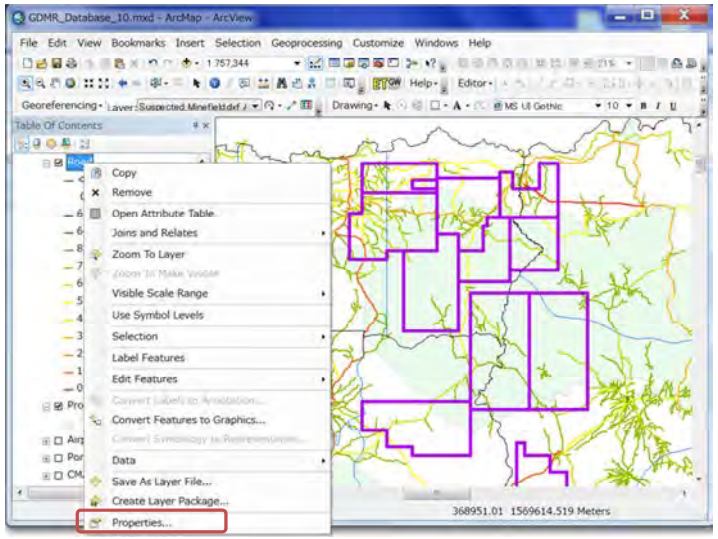


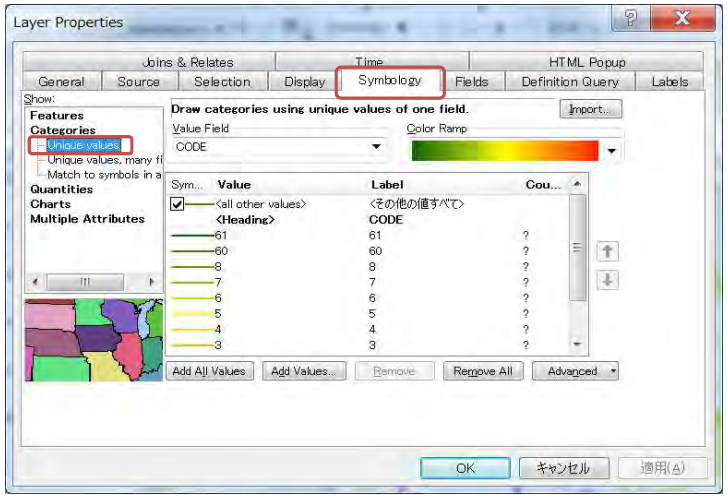


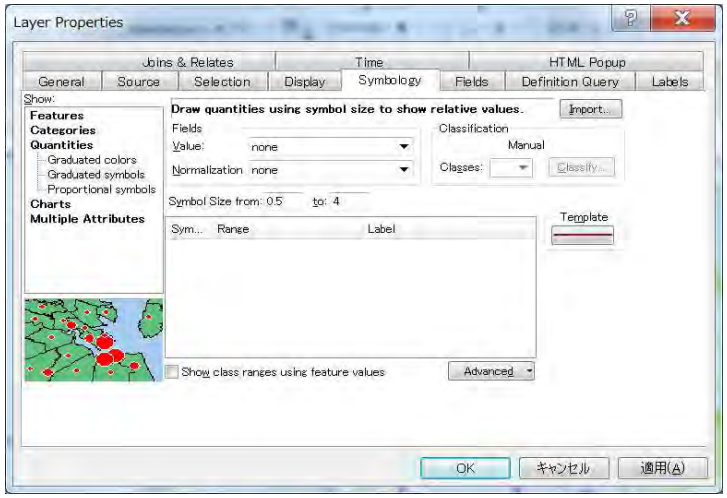


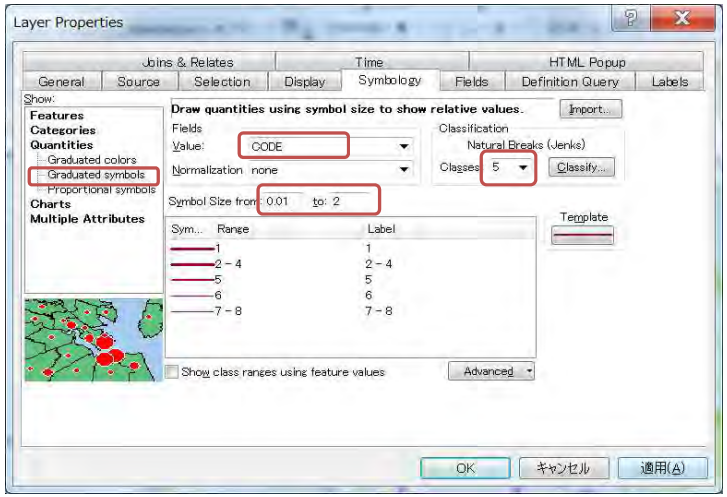
Categorized symbology

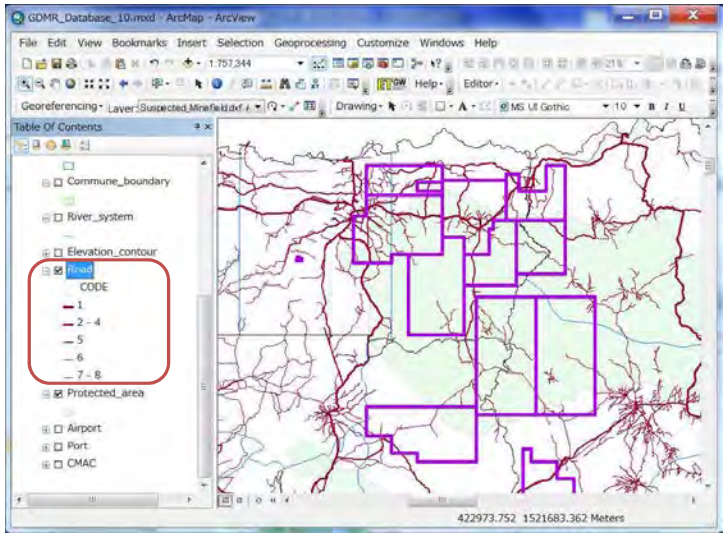






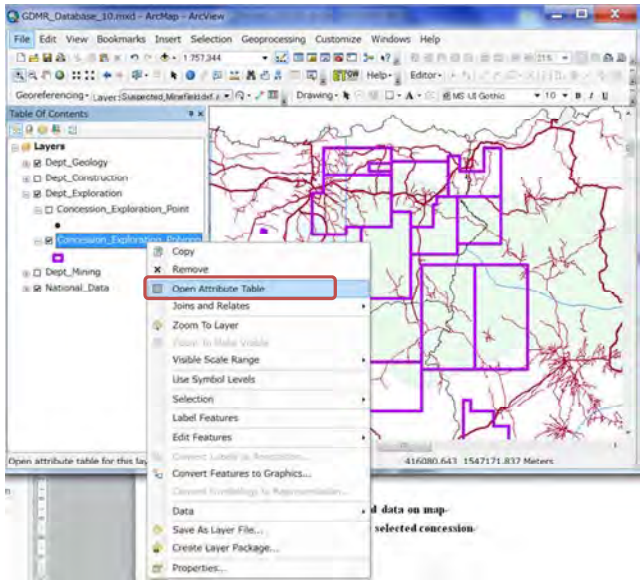


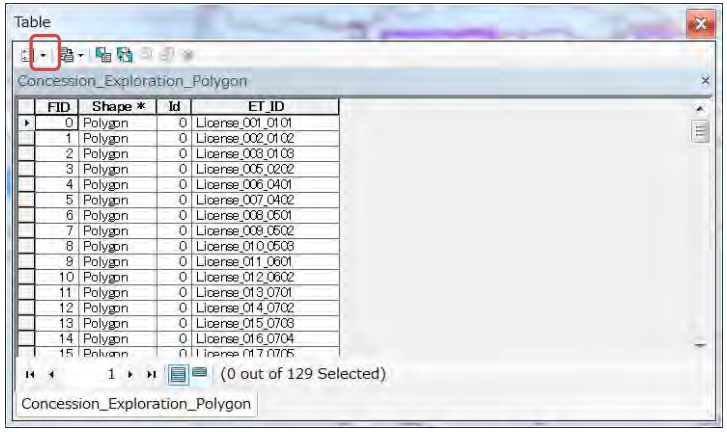




7-3 Attribute table of shapefile

7-3-1 Calculate the concession area





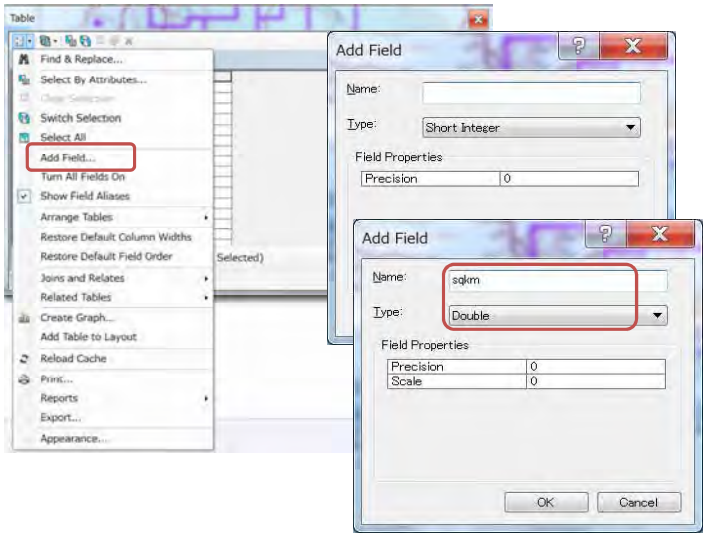


Table
Find & Replace...
Select By Attributes...
Switch Selection
Select All
Add Field...
Turn All Fields On
Show Field Aliases
Arrange Tables
Restore Default Column Widths
Restore Default Field Order
Joins and Relates
Related Tables
Create Graph...
Add Table to Layout
Reload Cache
Print...
Reports
Export...
Appearance...
Add Field
Name:
Type:
Short Integer
Field Properties
Precision
0
Add Field
Name:
sqkm
Type:
Double
Field Properties
Precision
Scale
0
0
OK
Cancel

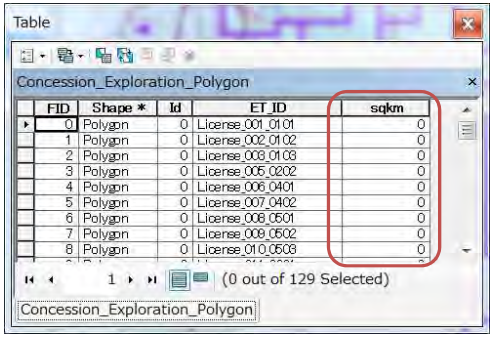


Table
Concession_Exploration_Polygon
FID
Shape *
Id
ET_ID
sqkm
0 Polygon 0 License_001_0101 0
1 Polygon 0 License_002_0102 0
2 Polygon 0 License_003_0103 0
3 Polygon 0 License_005_0202 0
4 Polygon 0 License_006_0401 0
5 Polygon 0 License_007_0402 0
6 Polygon 0 License_008_0501 0
7 Polygon 0 License_009_0502 0
8 Polygon 0 License_010_0503 0
1
(0 out of 129 Selected)
Concession_Exploration_Polygon

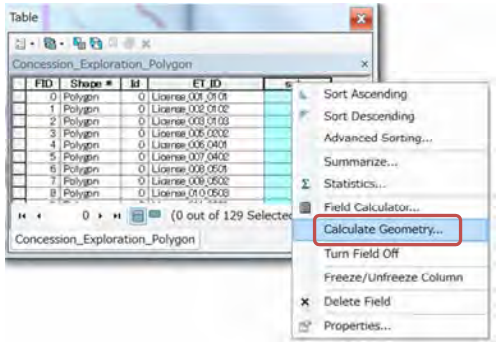
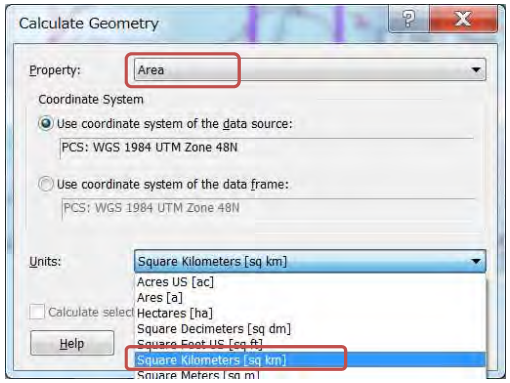
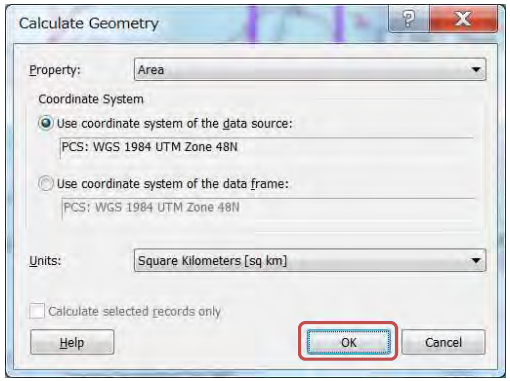
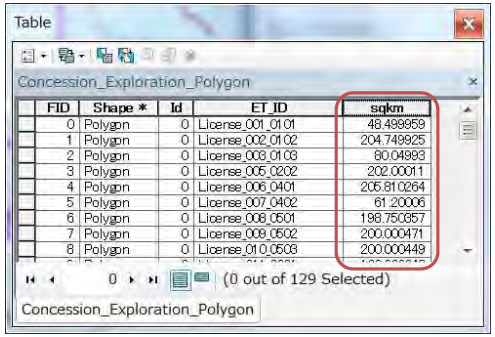


Table
Concession_Exploration_Polygon
Sort Ascending
Sort Descending
Advanced Sorting...
Summarize...
Statistics...
Field Calculator...
Calculate Geometry...
Turn Field Off
Freeze/Unfreeze Column
Delete Field
Properties...
(0 out of 129 Selected)
Concession_Exploration_Polygon

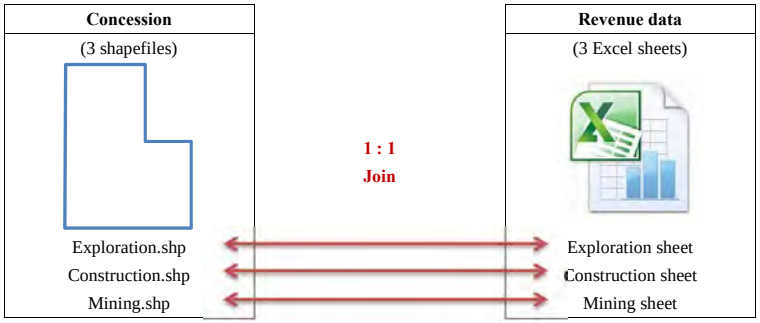

Calculate Geometry
Property:
Area
Coordinate System
Use coordinate system of the data source:
PCS: WGS 1984 UTM Zone 48N
Use coordinate system of the data frame:
PCS: WGS 1984 UTM Zone 48N
Units:
Square Kilometers [sq km]
Acres US [ac]
Ares [a]
Hectares [ha]
Square Decimeters [sq dm]
Square Kilometers [sq km]
Help

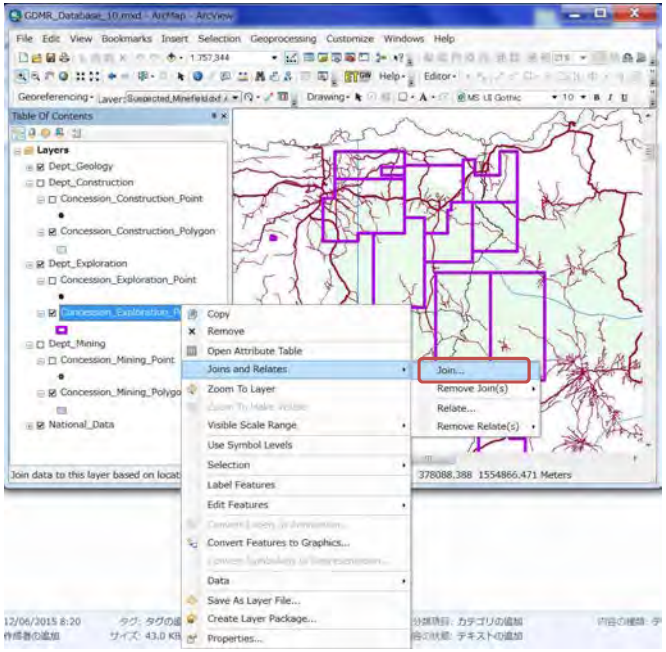

Calculate Geometry
Property:
Area
Coordinate System
Use coordinate system of the data source:
PCS: WGS 1984 UTM Zone 48N
Use coordinate system of the data frame:
PCS: WGS 1984 UTM Zone 48N
Units:
Square Kilometers [sq km]
Calculate selected records only
Help
OK
Cancel

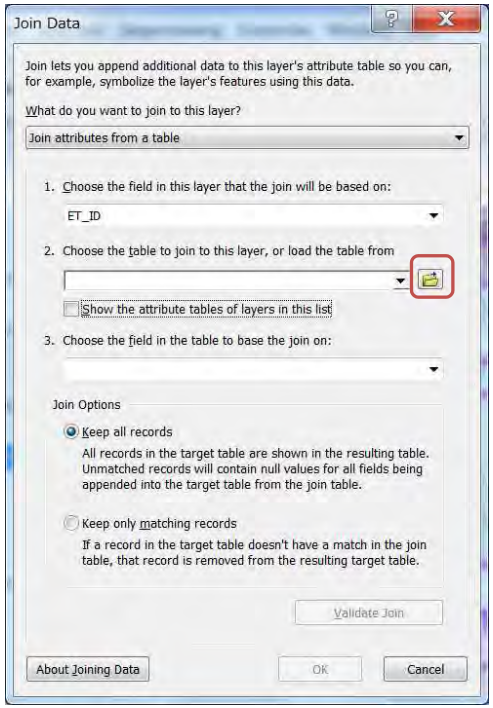


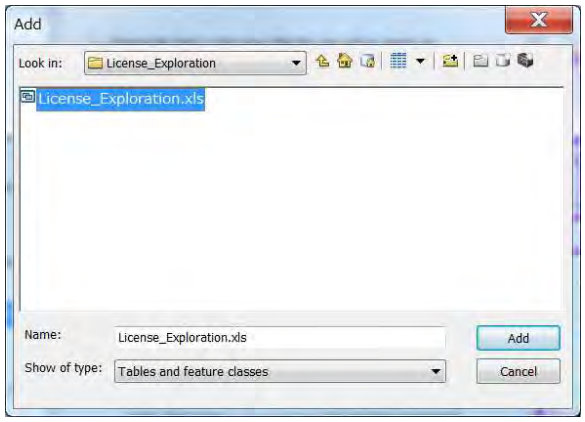
7-3-2 Join revenue data to concession

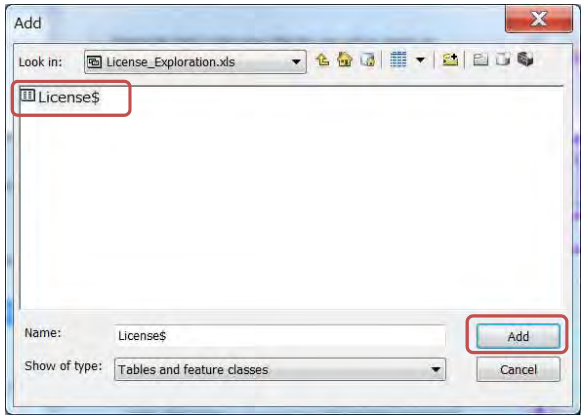
Revenue data are stored in a Excel file, having three sheets, of Exploration, Construction, Mining. Concession of Exploration shall be joined with revenue data of Exploration, by License_ID.

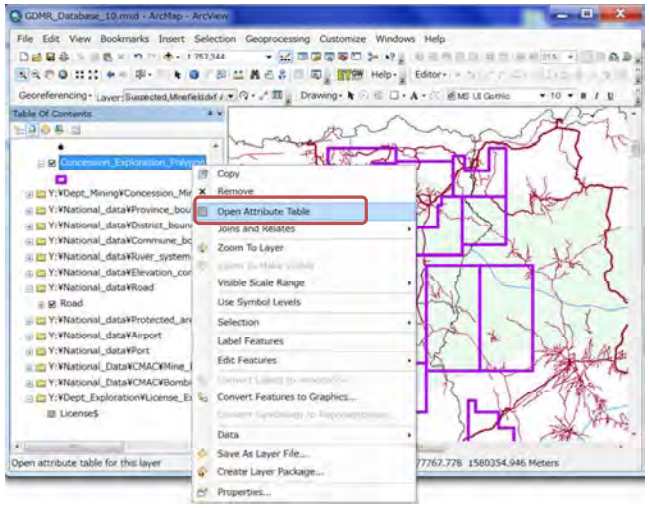


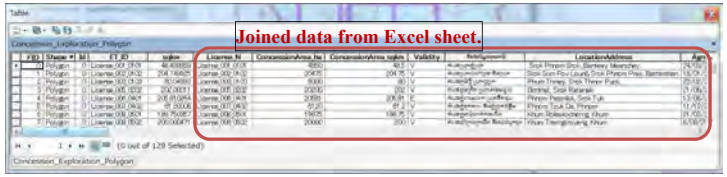



Join Data
Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data.
What do you want to join to this layer?
Join attributes from a table
1. Choose the field in this layer that the join will be based on:
ET_ID
2. Choose the table to join to this layer, or load the table from
Show the attribute tables of layers in this list
3. Choose the field in the table to base the join on:
Join Options
Keep all records
All records in the target table are shown in the resulting table. Unmatched records will contain null values for all fields being appended into the target table from the join table.
Keep only matching records
If a record in the target table doesn't have a match in the join table, that record is removed from the resulting target table.
Validate Join
About Joining Data
OK
Cancel

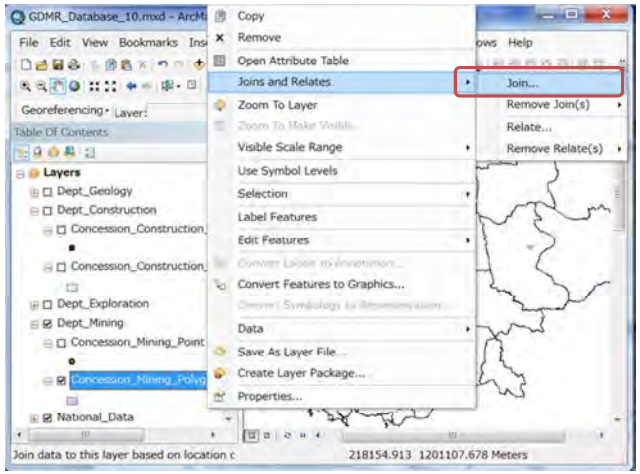

Add
Look in:
License_Exploration
License_Exploration.xls
Name:
License_Exploration.xls
Add
Show of type:
Tables and feature classes
Cancel

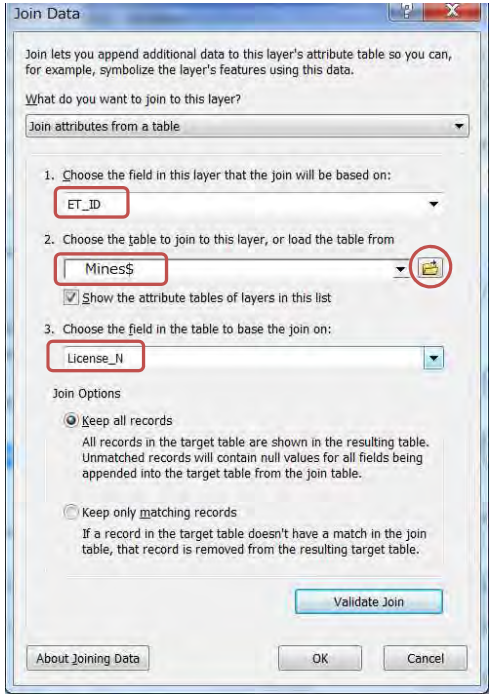

Add
Look in:
License_Exploration.xls
License$
Name:
License$
Add
Show of type:
Tables and feature classes
Cancel

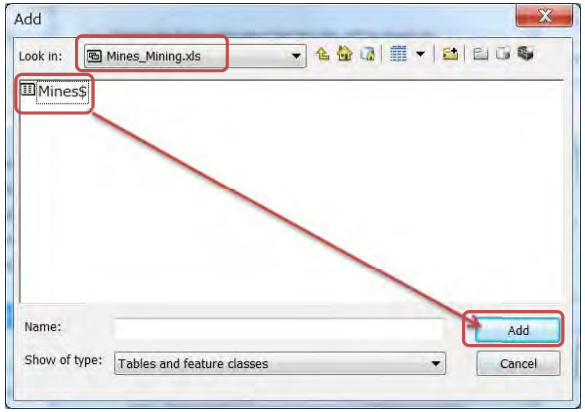

GDMR_Database_10.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Table Of Contents
Road
License$
Copy
Remove
Open Attribute Table
Joins and Relates
Zoom To Layer
Visible Scale Range
Use Symbol Levels
Selection
Label Features
Edit Features
Convert Features to Graphics...
Data
Save As Layer File...
Create Layer Package...
Properties...
Open attribute table for this layer

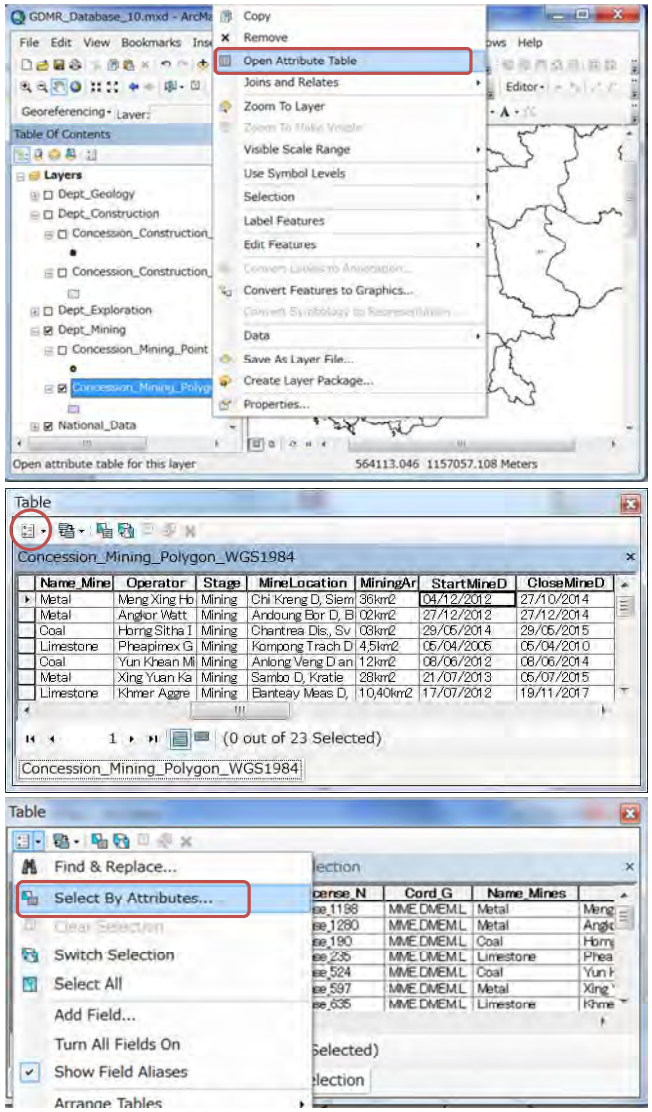

Joined data from Excel sheet.

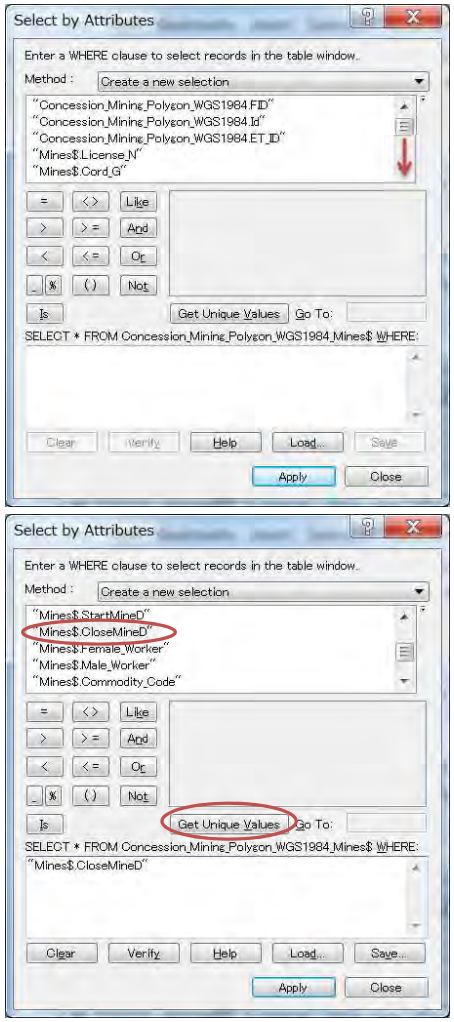
7-3-3 View mine data (closed mine last year)

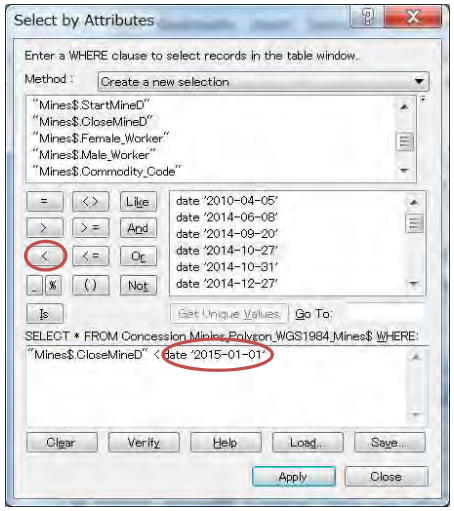







GDMR_Database_10.mxd - ArcMa
File Edit View Bookmarks Ins
Georeferencing Layer:
Table Of Contents
Layers
Dept_Geology
Dept_Construction
Concession_Construction_
Concession_Construction_
Dept_Exploration
Dept_Mining
Concession_Mining_Point
Concession_Mining_Polyg
National_Data
Copy
Remove
Open Attribute Table
Joins and Relates
Zoom To Layer
Zoom To Make Visible
Visible Scale Range
Use Symbol Levels
Selection
Label Features
Edit Features
Convert Features to Graphics...
Data
Save As Layer File...
Create Layer Package...
Properties...
Open attribute table for this layer
564113.046 1157057.108 Meters
Table
Concession_Mining_Polygon_WGS1984
Name_Mine Operator Stage MineLocation MiningAr StartMineD CloseMineD
Metal Meng Xing Ho Mining Chi Kreng D, Siem 36km2 04/12/2012 27/10/2014
Metal Anglor Watt Mining Andoung Bor D, Bi 02km2 27/12/2012 27/12/2014
Coal Horng Sitha I Mining Chantrea Dis., Sv 03km2 29/05/2014 29/05/2015
Limestone Pheapimex G Mining Kompong Trach D 4,5km2 05/04/2005 05/04/2010
Coal Yun Kheon Mi Mining Anlong Veng D an 12km2 08/06/2012 08/06/2014
Metal Xing Yuan Ka Mining Sambo D, Kratie 28km2 21/07/2013 05/07/2015
Limestone Khmer Aggre Mining Banteay Meas D, 10,40km2 17/07/2012 19/11/2017
1
(0 out of 23 Selected)
Concession_Mining_Polygon_WGS1984
Table
Find & Replace...
Select By Attributes...
Clear Selection
Switch Selection
Select All
Add Field...
Turn All Fields On
Show Field Aliases
Arrange Tables
cense_N Cord_G Name_Mines
se_1198 MME DMEM L Metal
se_1280 MME DMEM L Metal
se_190 MME DMEM L Coal
se_235 MME DMEM L Limestone
se_524 MME DMEM L Coal
se_597 MME DMEM L Metal
se_635 MME DMEM L Limestone
Selected)
lection


Select by Attributes
Enter a WHERE clause to select records in the table window.
Method : Create a new selection
"Concession_Mining_Polygon_WGS1984.FID"
"Concession_Mining_Polygon_WGS1984.Id"
"Concession_Mining_Polygon_WGS1984.ET_ID"
"Mines$.License_N"
"Mines$.Cord_G"
= <> Like
> >= And
< <= Or
_ % ( ) Not
Is Get Unique Values Go To:
SELECT * FROM Concession_Mining_Polygon_WGS1984_Mines$ WHERE:
Clear Verify Help Load... Save...
Apply Close
Select by Attributes
Enter a WHERE clause to select records in the table window.
Method : Create a new selection
"Mines$.StartMineD"
"Mines$.CloseMineD"
"Mines$.Female_Worker"
"Mines$.Male_Worker"
"Mines$.Commodity_Code"
= <> Like
> >= And
< <= Or
_ % ( ) Not
Is Get Unique Values Go To:
SELECT * FROM Concession_Mining_Polygon_WGS1984_Mines$ WHERE:
"Mines$.CloseMineD"
Clear Verify Help Load... Save...
Apply Close


Select by Attributes
Enter a WHERE clause to select records in the table window.
Method :
Create a new selection
"Mines$.StartMineD"
"Mines$.CloseMineD"
"Mines$.Female_Worker"
"Mines$.Male_Worker"
"Mines$.Commodity_Code"
=
<>
Like
>
>=
And
<
<=
Or
_
%
( )
Not
Is
Get Unique Values
Go To:
SELECT * FROM Concession_Mining_Polygon_WGS1984.Mines$ WHERE:
"Mines$.CloseMineD" < date '2015-01-01'
Clear
Verify
Help
Load...
Save...
Apply
Close

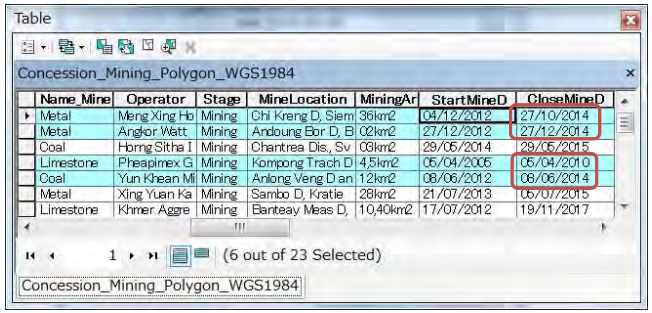
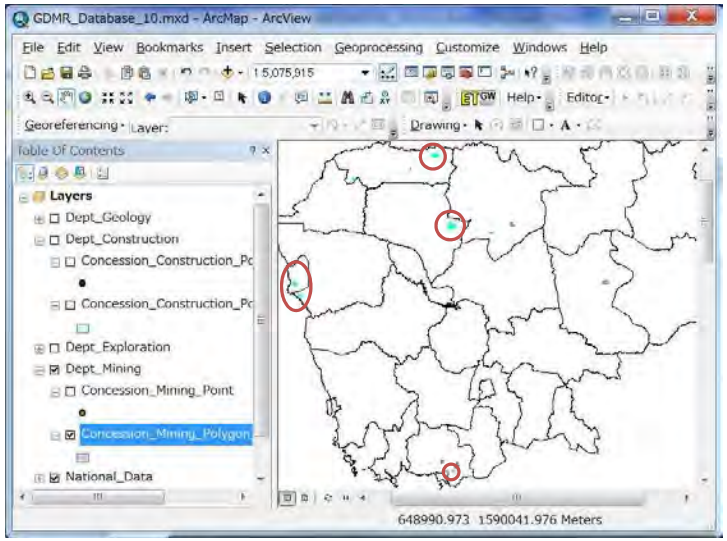
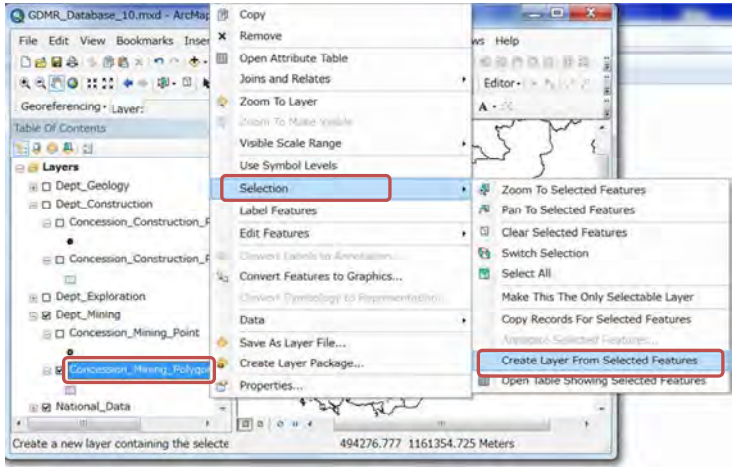
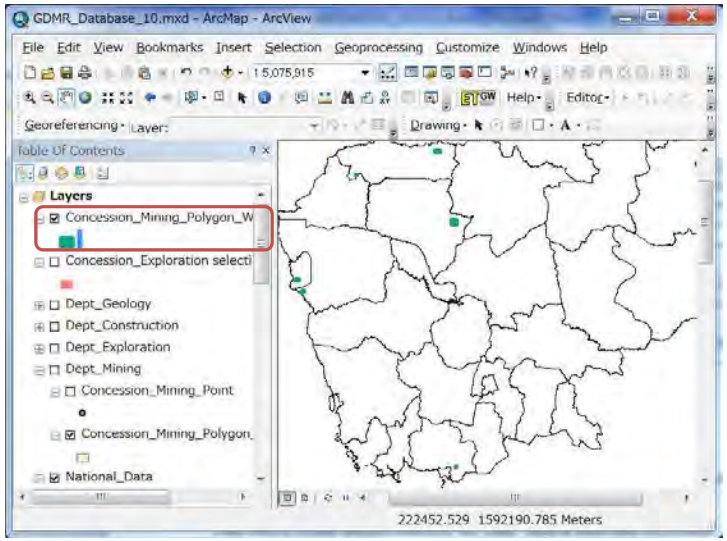


Table
Concession_Mining_Polygon_WGS1984
Name_Mine
Operator
Stage
MineLocation
MiningAr
StartMineD
CloseMineD
Metal
Meng Xing Ho
Mining
Chi Kreng D, Siem
36km2
04/12/2012
27/10/2014
Metal
Angkor Watt
Mining
Andoung Bor D, B
02km2
27/12/2012
27/12/2014
Coal
Horng Sitha I
Mining
Chantrea Dis., Sv
03km2
29/05/2014
29/05/2015
Limestone
Pheapimex G
Mining
Kompong Trach D
4,5km2
05/04/2005
05/04/2010
Coal
Yun Kheam Mi
Mining
Anlong Veng D an
12km2
08/06/2012
08/06/2014
Metal
Xing Yuan Ka
Mining
Sambo D, Kratie
28km2
21/07/2013
05/07/2015
Limestone
Khmer Aggre
Mining
Banteay Meas D,
10,40km2
17/07/2012
19/11/2017
1
(6 out of 23 Selected)
Concession_Mining_Polygon_WGS1984


GDMR_Database_10.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Table Of Contents
Layers
Dept_Geology
Dept_Construction
Concession_Construction_Pc
Concession_Construction_Pc
Dept_Exploration
Dept_Mining
Concession_Mining_Point
Concession_Mining_Polygon
National_Data
648990.973 1590041.976 Meters


Copy
Remove
Open Attribute Table
Joins and Relates
Zoom To Layer
Visible Scale Range
Use Symbol Levels
Selection
Label Features
Edit Features
Convert Features to Graphics...
Data
Save As Layer File...
Create Layer Package...
Properties...
Zoom To Selected Features
Pan To Selected Features
Clear Selected Features
Switch Selection
Select All
Make This The Only Selectable Layer
Copy Records For Selected Features
Create Layer From Selected Features
Create a new layer containing the selecte
494276.777 1161354.725 Meters



7-4 Attribute search for the concession

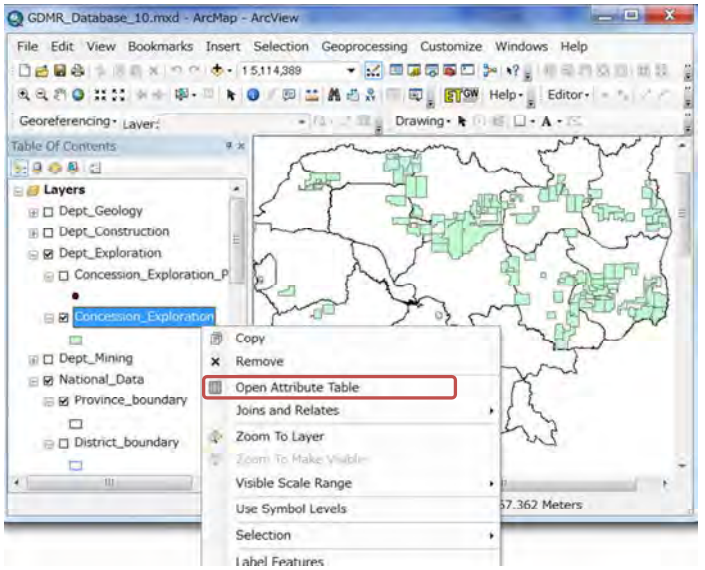
For practice, let's search the expired concessions with no payment record.

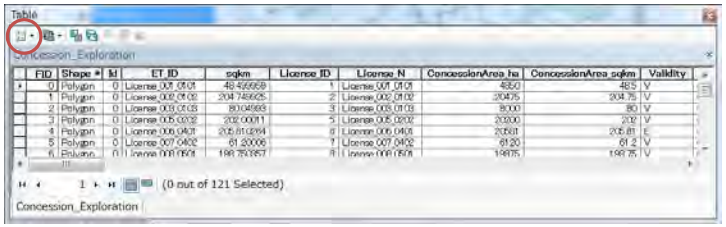
At first, search (create a selection of) expired concessions, and save as a new layer.

Secondly, join the new layer with revenue data.

Then search (create another selection of) "Null" data in Date field of revenue.

7-4-1 Expired concession





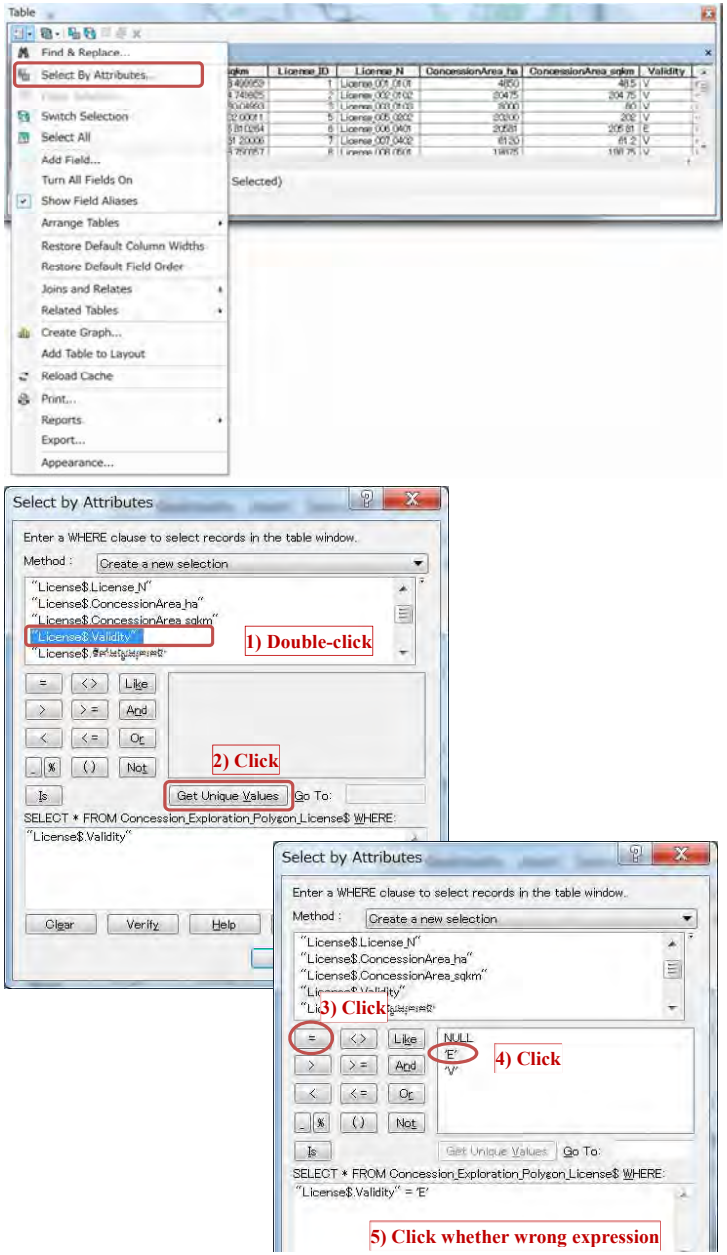
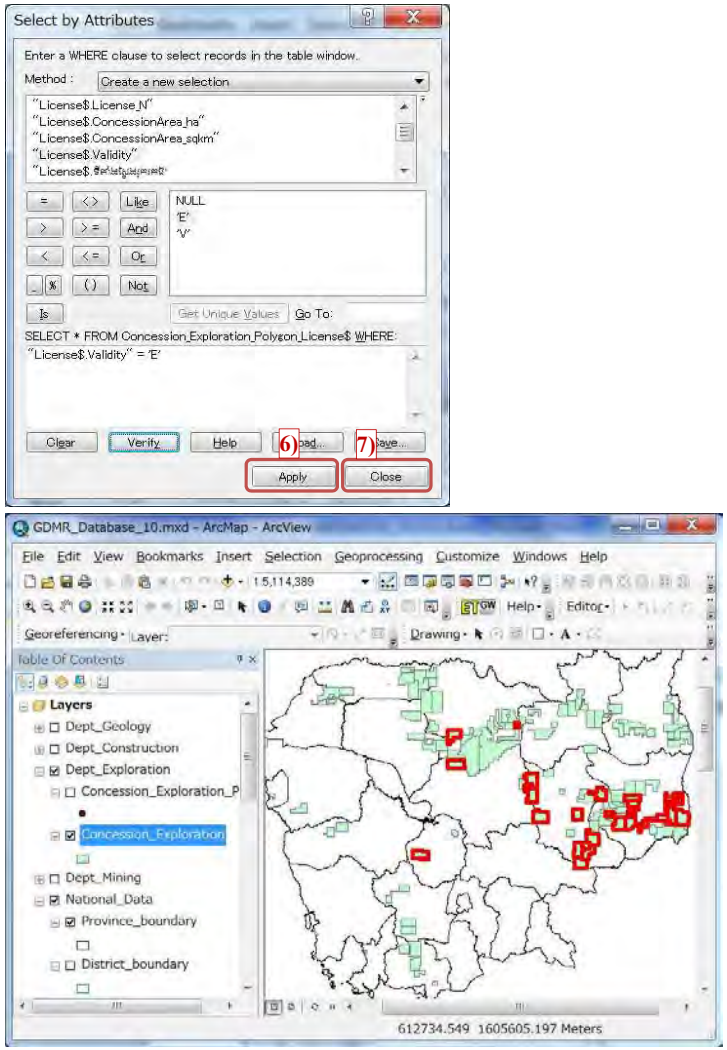


Table
Find & Replace...
Select By Attributes...
Switch Selection
Select All
Add Field...
Turn All Fields On
Show Field Aliases
Arrange Tables
Restore Default Column Widths
Restore Default Field Order
Joins and Relates
Related Tables
Create Graph...
Add Table to Layout
Reload Cache
Print...
Reports
Export...
Appearance...
Selected)
Select by Attributes
Enter a WHERE clause to select records in the table window.
Method : Create a new selection
"License$.License_N"
"License$.ConcessionArea_ha"
"License$.ConcessionArea_sqkm"
"License$.Validity"
1) Double-click
Like
And
Or
Not
Is
Get Unique Values
Go To:
2) Click
SELECT * FROM Concession_Exploration_Polygon_License$ WHERE:
"License$.Validity"
Clear
Verify
Help
3) Click
NULL
'E'
'V'
4) Click
"License$.Validity" = 'E'
5) Click whether wrong expression


Select by Attributes
Enter a WHERE clause to select records in the table window.
Method : Create a new selection
"License$.License_N"
"License$.ConcessionArea_ha"
"License$.ConcessionArea_sqkm"
"License$.Validity"
Like
And
Or
Not
Is
Get Unique Values
Go To:
NULL
'E'
'V'
SELECT * FROM Concession_Exploration_Polygon_License$ WHERE:
"License$.Validity" = 'E'
Clear
Verify
Help
6)
7)
Apply
Close
GDMR_Database_10.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Georeferencing
Layer:
Drawing
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Dept_Geology
Dept_Construction
Dept_Exploration
Concession_Exploration_P
Concession_Exploration
Dept_Mining
National_Data
Province_boundary
District_boundary
612734.549 1605605.197 Meters

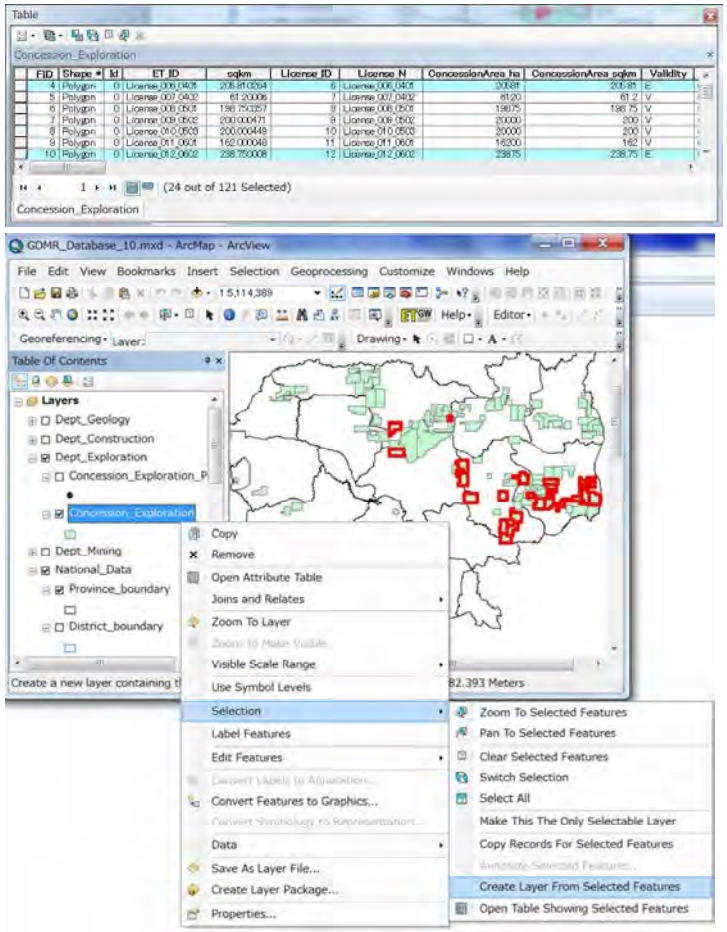
Table
Concession_Exploration
(24 out of 121 Selected)
GDMR_Database_10.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
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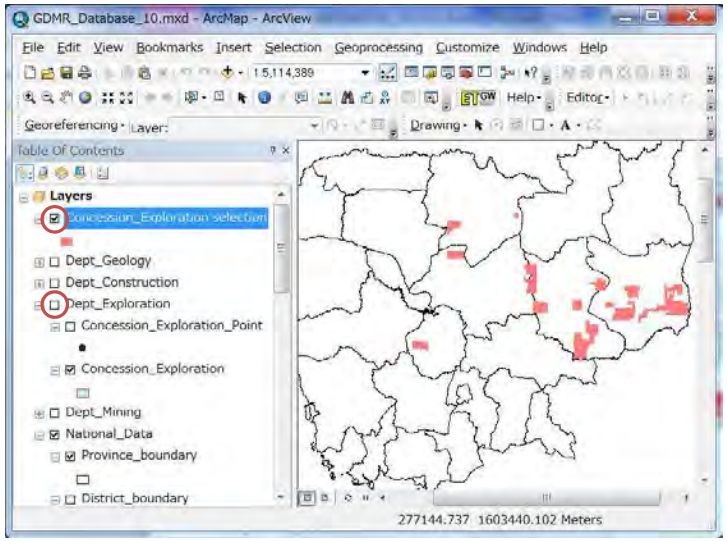
Layers
Dept_Geology
Dept_Construction
Dept_Exploration
Concession_Exploration_P
Concession_Exploration
Dept_Mining
National_Data
Province_boundary
District_boundary
Copy
Remove
Open Attribute Table
Joins and Relates
Zoom To Layer
Visible Scale Range
Use Symbol Levels
Selection
Label Features
Edit Features
Convert Features to Graphics...
Data
Save As Layer File...
Create Layer Package...
Properties...
Zoom To Selected Features
Pan To Selected Features
Clear Selected Features
Switch Selection
Select All
Make This The Only Selectable Layer
Copy Records For Selected Features
Create Layer From Selected Features
Open Table Showing Selected Features


GDMR_Database_10.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
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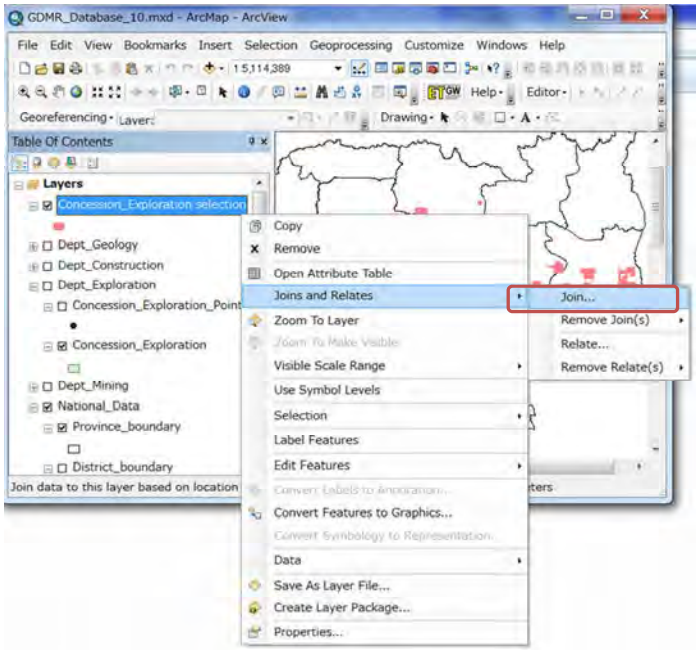
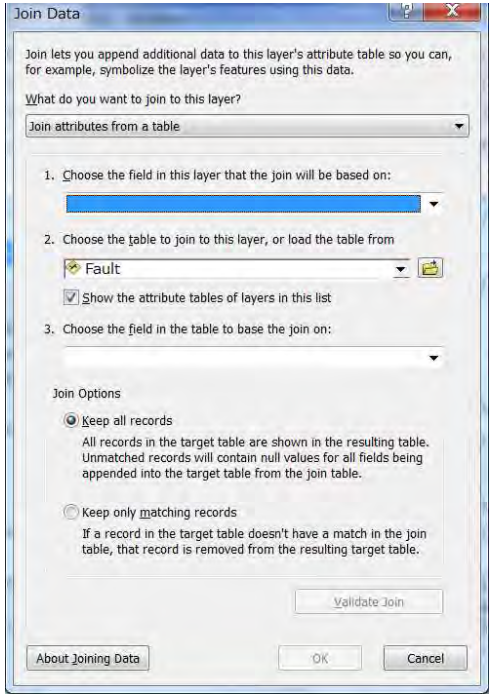
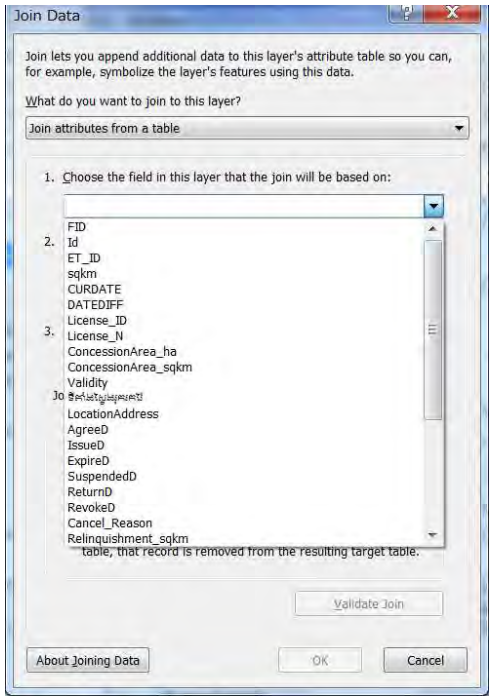
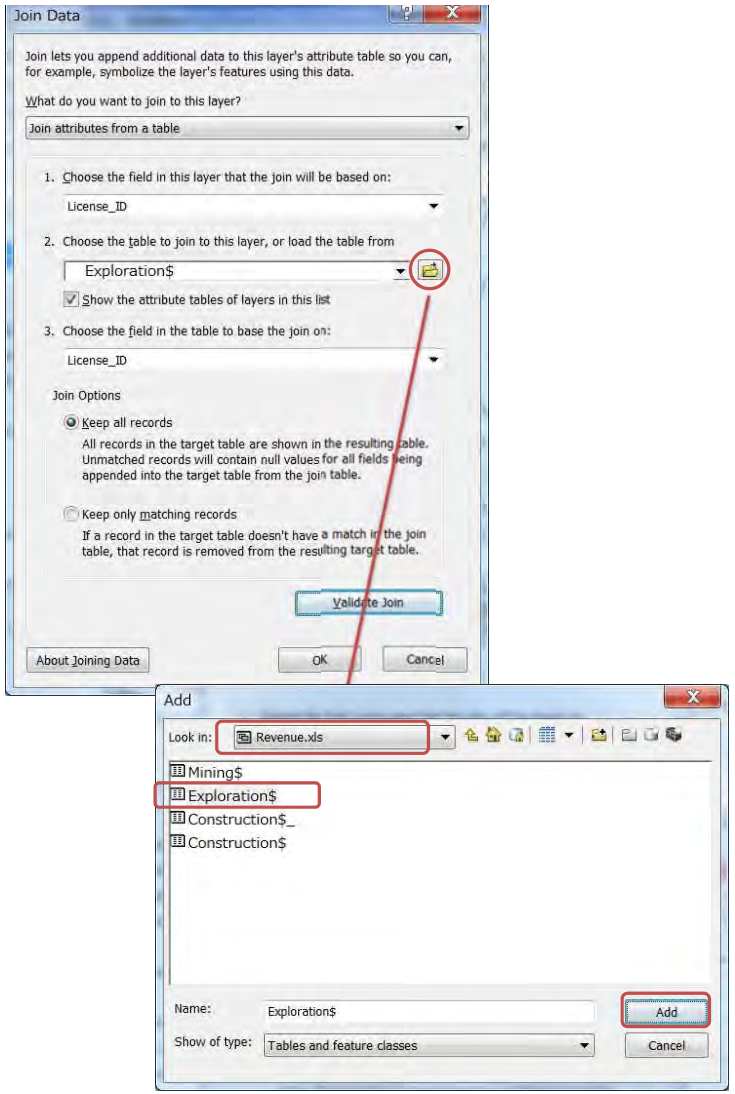
Dept_Construction
Dept_Exploration
Concession_Exploration_Point
Concession_Exploration
Dept_Mining
National_Data
Province_boundary
District_boundary
277144.737 1603440.102 Meters

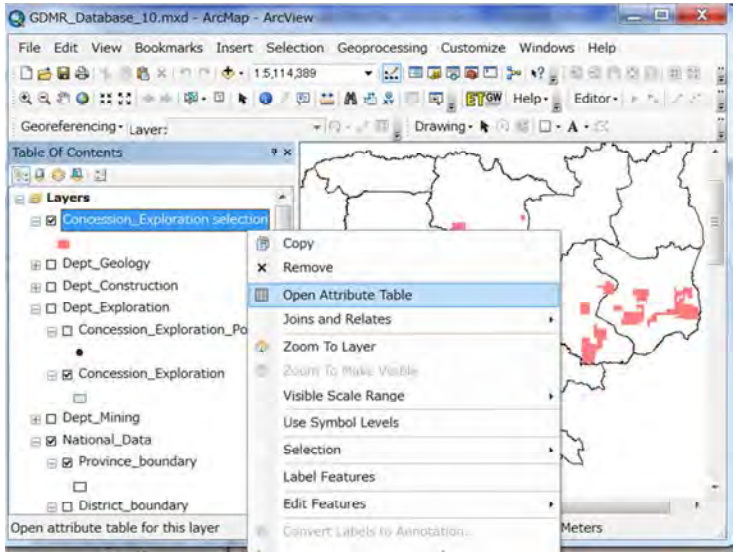
7-4-2 Unpaid concession






Join Data
Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data.
What do you want to join to this layer?
Join attributes from a table
1. Choose the field in this layer that the join will be based on:
2.
3.
FID
Id
ET_ID
sqkm
CURDATE
DATEDIFF
License_ID
License_N
ConcessionArea_ha
ConcessionArea_sqkm
Validity
LocationAddress
AgreeD
IssueD
ExpireD
SuspendedD
ReturnD
RevokeD
Cancel_Reason
Relinquishment_sqkm
table, that record is removed from the resulting target table.
Validate Join
About Joining Data
OK
Cancel


Join Data
Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data.
What do you want to join to this layer?
Join attributes from a table
1. Choose the field in this layer that the join will be based on:
License_ID
2. Choose the table to join to this layer, or load the table from
Exploration$
Show the attribute tables of layers in this list
3. Choose the field in the table to base the join on:
License_ID
Join Options
Keep all records
All records in the target table are shown in the resulting table. Unmatched records will contain null values for all fields being appended into the target table from the join table.
Keep only matching records
If a record in the target table doesn't have a match in the join table, that record is removed from the resulting target table.
Validate Join
About Joining Data
OK
Cancel
Add
Look in:
Revenue.xls
Mining$
Exploration$
Construction$_
Construction$
Name:
Exploration$
Add
Show of type:
Tables and feature classes
Cancel


GDMR_Database_10.mxd - ArcMap - ArcView
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Dept_Construction
Dept_Exploration
Concession_Exploration_Po
Concession_Exploration
Dept_Mining
National_Data
Province_boundary
District_boundary
Open attribute table for this layer
Copy
Remove
Open Attribute Table
Joins and Relates
Zoom To Layer
Visible Scale Range
Use Symbol Levels
Selection
Label Features
Edit Features
Meters

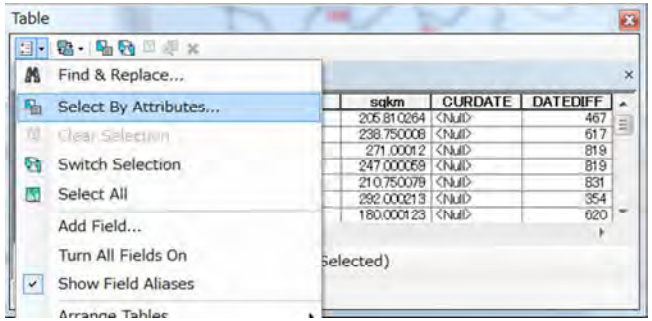
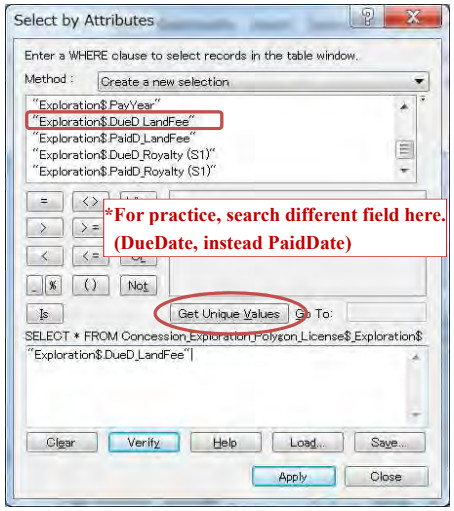
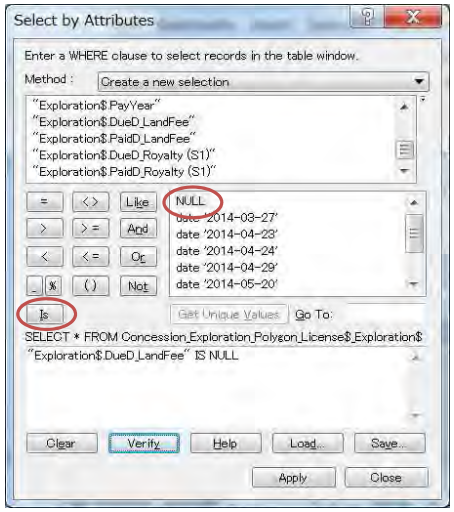
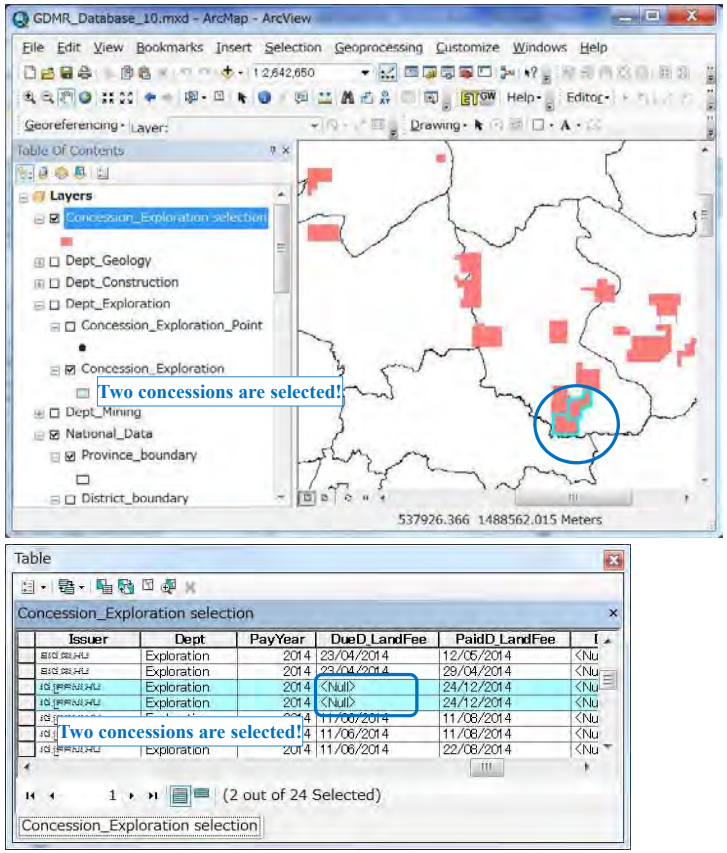


Table
Find & Replace...
Select By Attributes...
Clear Selection
Switch Selection
Select All
Add Field...
Turn All Fields On
Show Field Aliases
sqkm
CURDATE
DATEDIFF
205.810264 <Null> 467
238.750008 <Null> 617
271.00012 <Null> 819
247.000059 <Null> 819
210.750079 <Null> 831
292.000213 <Null> 954
180.000123 <Null> 620


Select by Attributes
Enter a WHERE clause to select records in the table window.
Method : Create a new selection
"Exploration$.PayYear"
"Exploration$.DueD_LandFee"
"Exploration$.PaidD_LandFee"
"Exploration$.DueD_Royalty (S1)"
"Exploration$.PaidD_Royalty (S1)"
*For practice, search different field here.
(DueDate, instead PaidDate)
Get Unique Values
Go To:
SELECT * FROM Concession_Exploration_Polygon_License$.Exploration$
"Exploration$.DueD_LandFee"
Clear
Verify
Help
Load...
Save...
Apply
Close


Select by Attributes
Enter a WHERE clause to select records in the table window.
Method : Create a new selection
"Exploration$.PayYear"
"Exploration$.DueD_LandFee"
"Exploration$.PaidD_LandFee"
"Exploration$.DueD_Royalty (S1)"
"Exploration$.PaidD_Royalty (S1)"
Like
NULL
And
Or
Not
Is
Get Unique Values
Go To:
SELECT * FROM Concession_Exploration_Polygon_License$.Exploration$
"Exploration$.DueD_LandFee" IS NULL
Clear
Verify
Help
Load...
Save...
Apply
Close



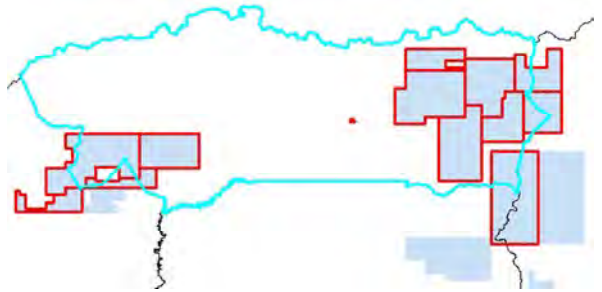
7-5 Spatial search for the concession

For example, let's search for the concessions in OddarMeanchey province.

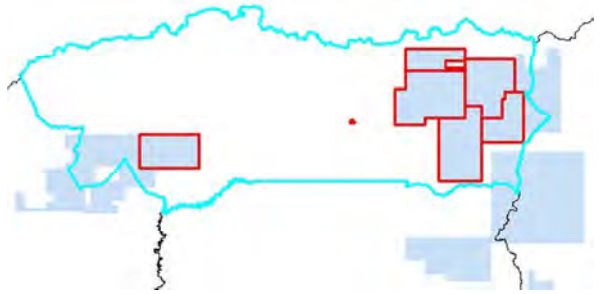
Concession layer is of polygon object. Province layer is of polygon object.

There are some spatial relationships between Polygon and Polygon.

Concessions, INTERSECTING OddorMeanchey province (see Ch7-5-3)

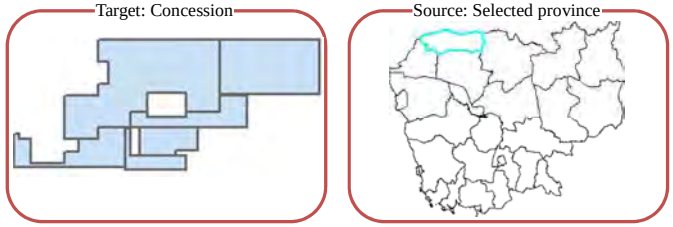


Concessions, WITHIN the OddorMeanchey province (see Ch7-5-4)

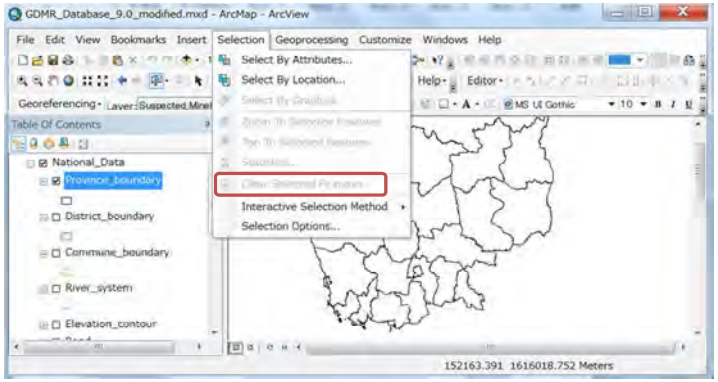


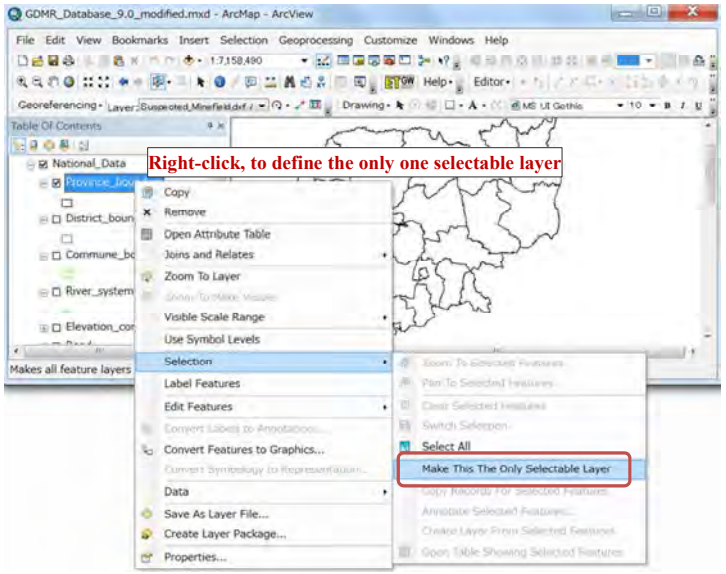
Concessions, crossed by OUTLINE of OddorMeanchey province (see Ch7-5-5)

7-5-1 Select a province as search source

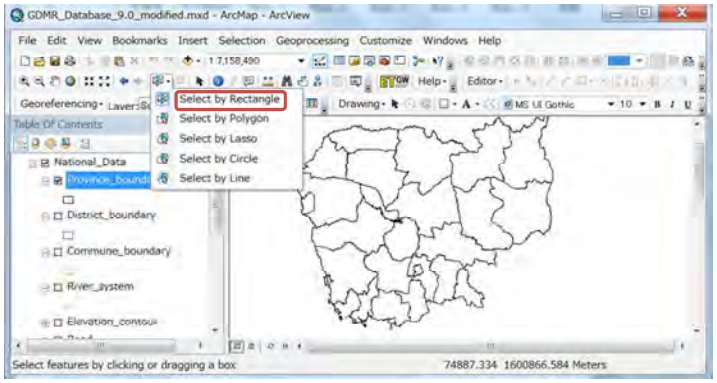


Reset the existing selection (Clear selected features).

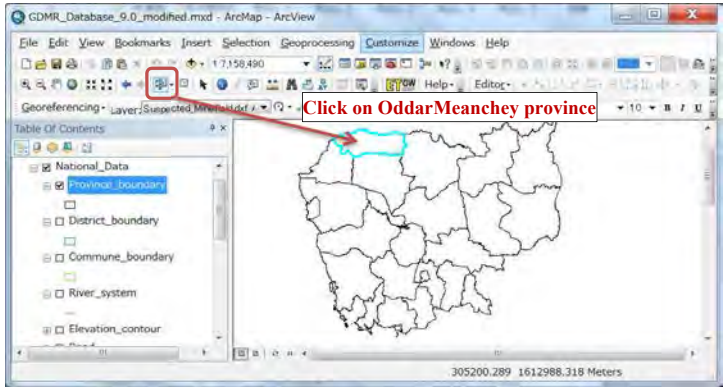




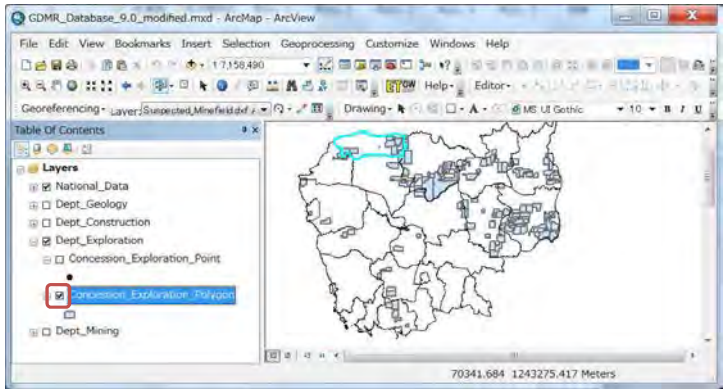
From Menu icons, click “Select By Rectangle”



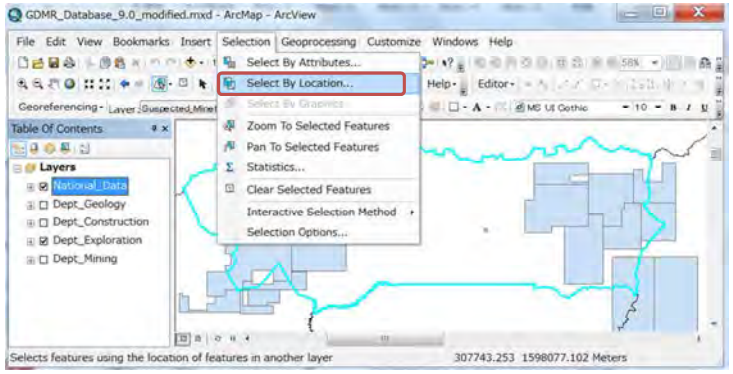
Click the object (OddarMeanchey) you want to select

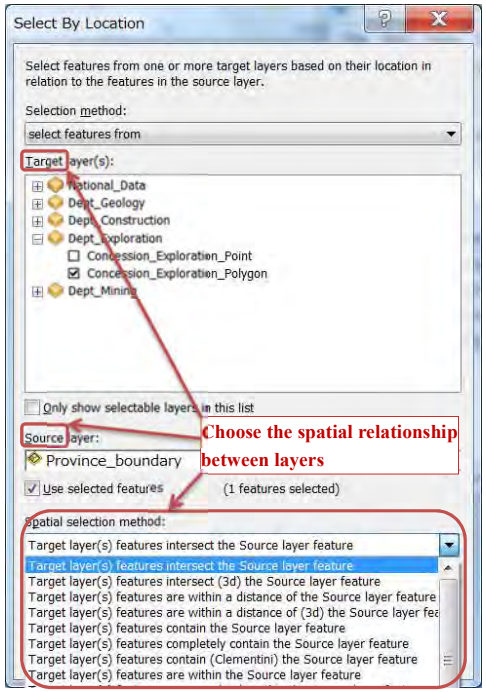


Show the target layer (concession layer) by checkbox ON.

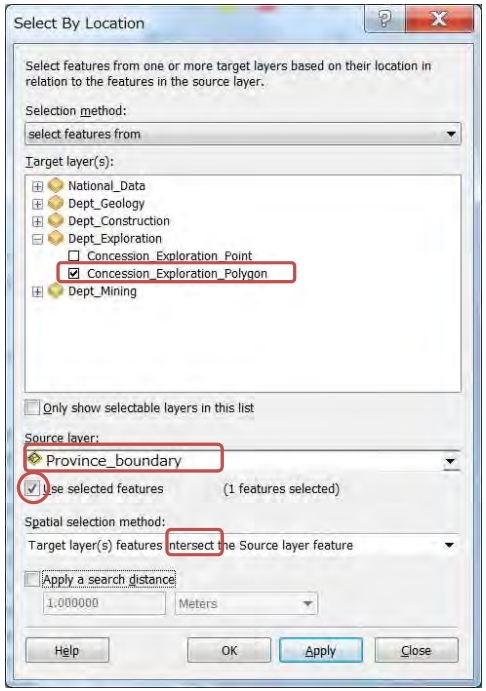


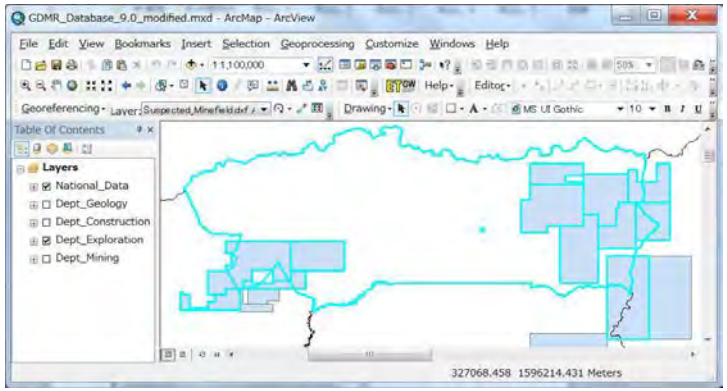
7-5-2 Select by location



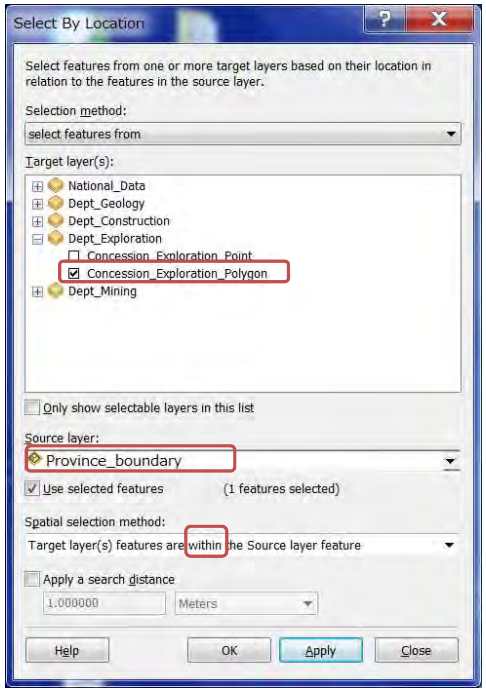


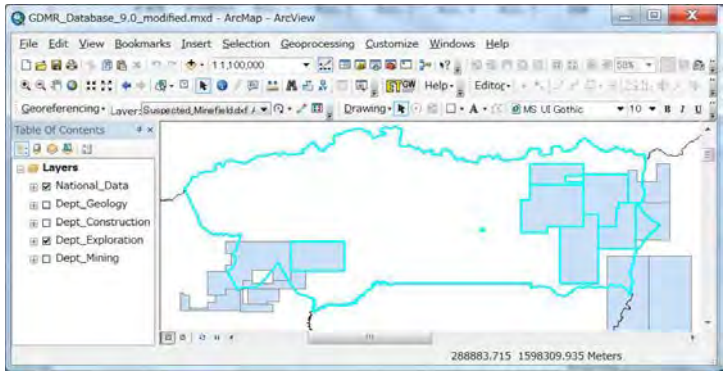
7-5-3 Search intersecting concessions



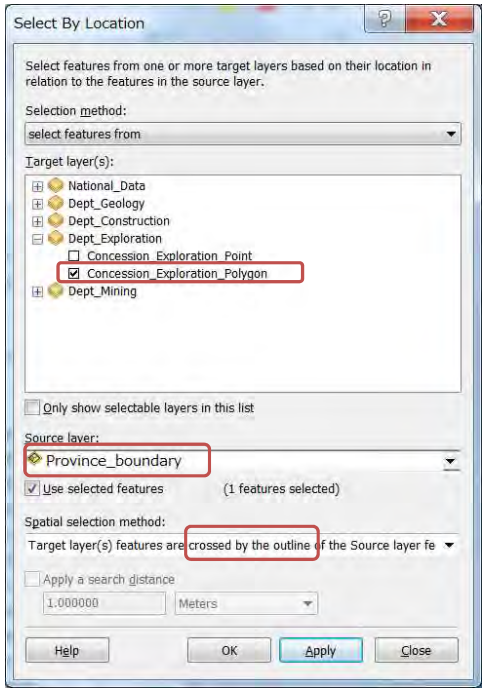


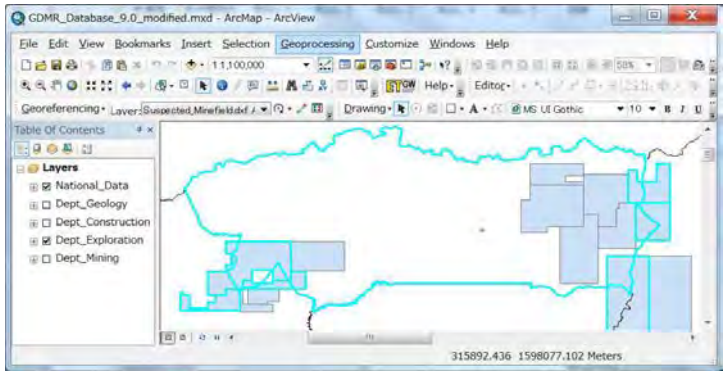
7-5-4 Search within-located concessions



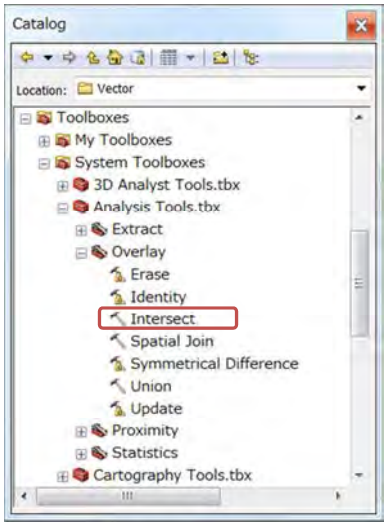


7-5-5 Search boundary-located concessions



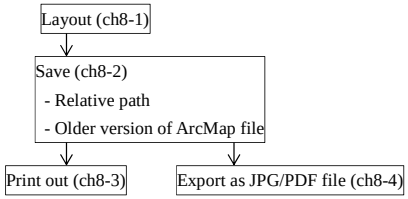


7-5-6 Create overlap objects between two polygon layers



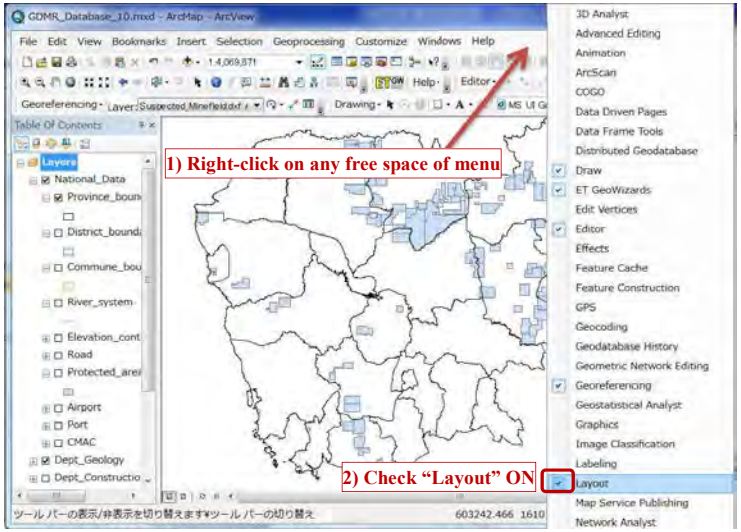
8. Printing map

Chapter 8 shows how to print out the map of ArcMap. At first you need to decide the paper size of map in layout window, then print out. The layout shall be saved in a “mxd” file. You can export the map as a digital file like JPG or PDF file.

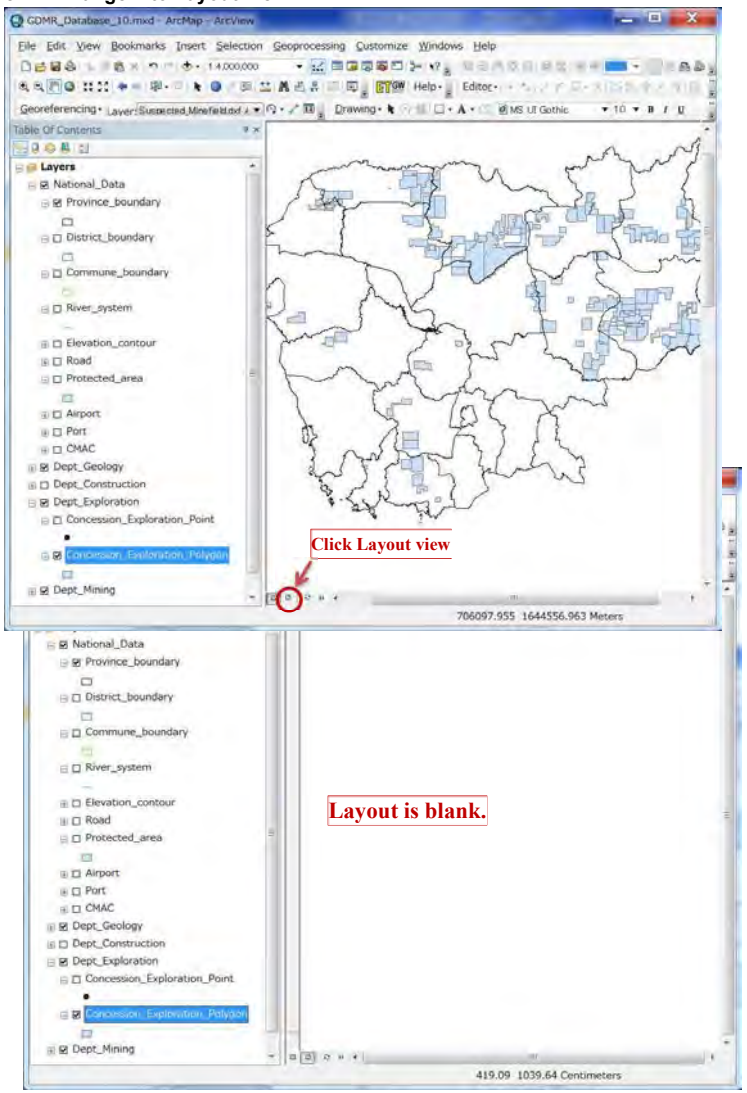


8-1 Create layout in ArcMap

8-1-1 Setup “Layout” toolbar

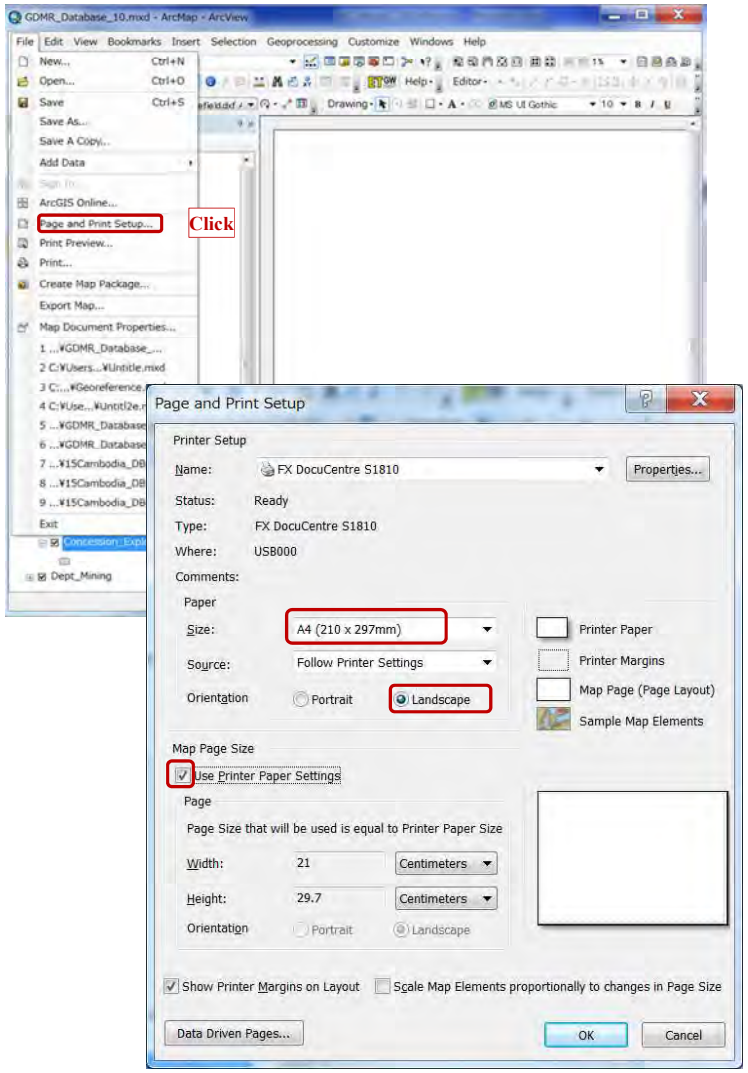


8-1-2 Change into Layout View

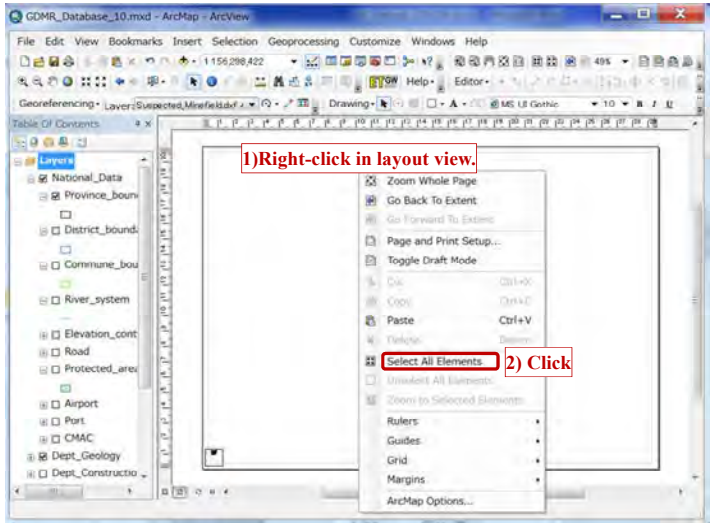


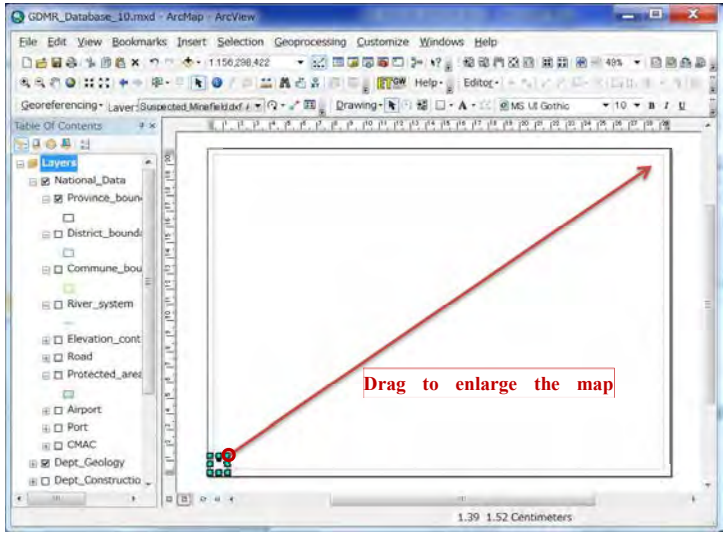
8-1-3 Page setup

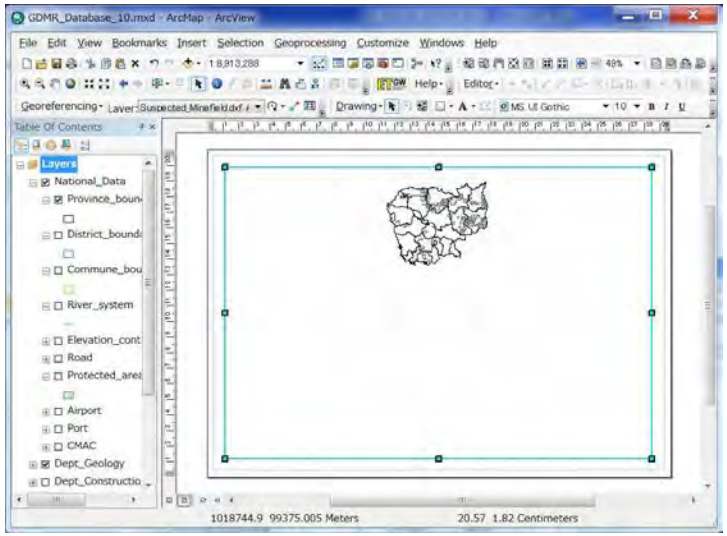
Setup paper size of map.



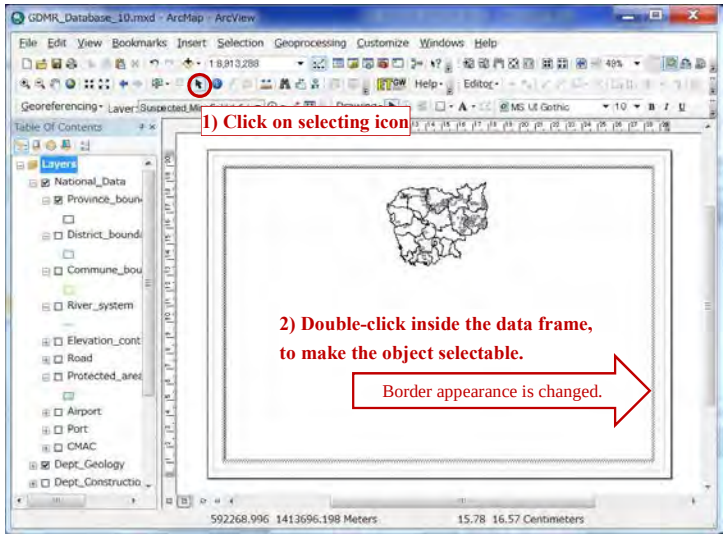
8-1-4 Data Frame

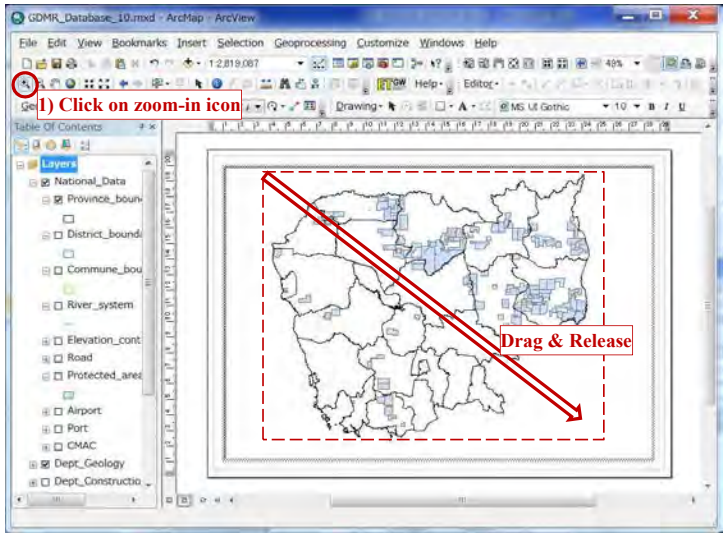


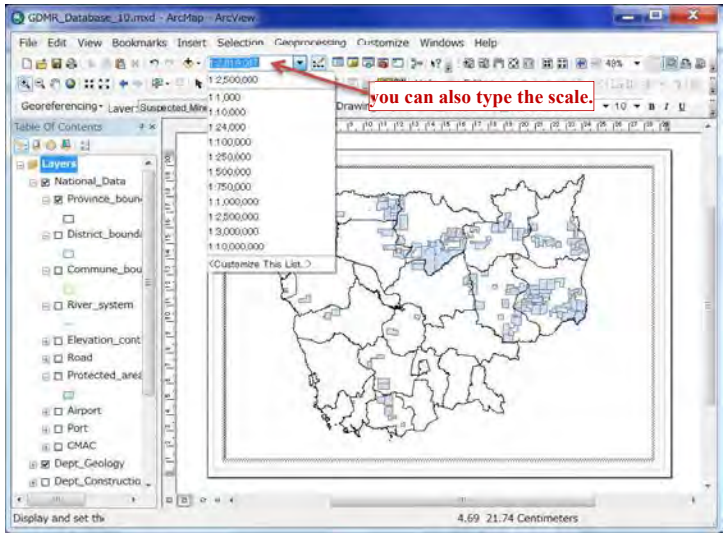


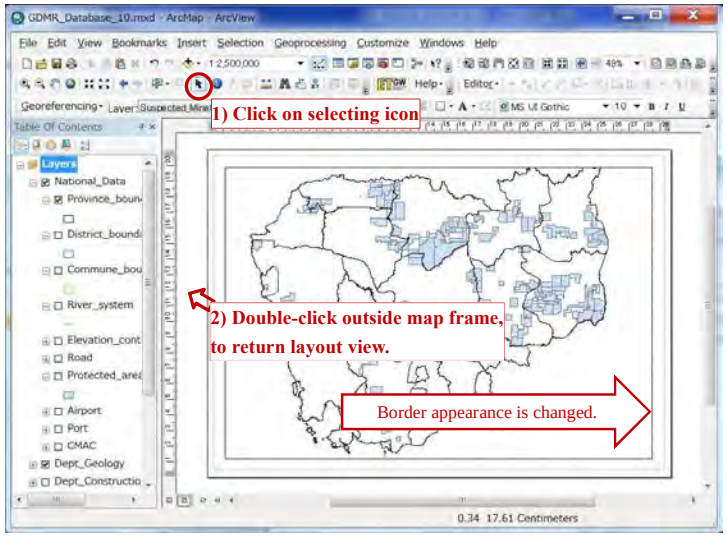


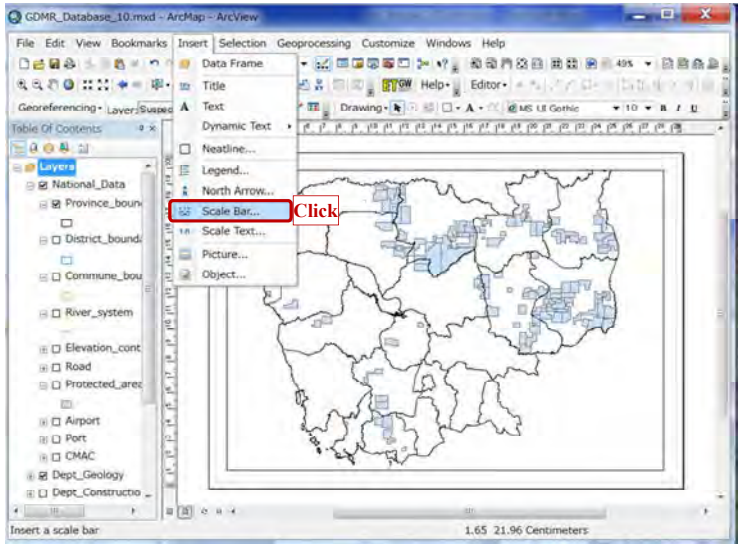
8-1-5 Map scale and scale bar

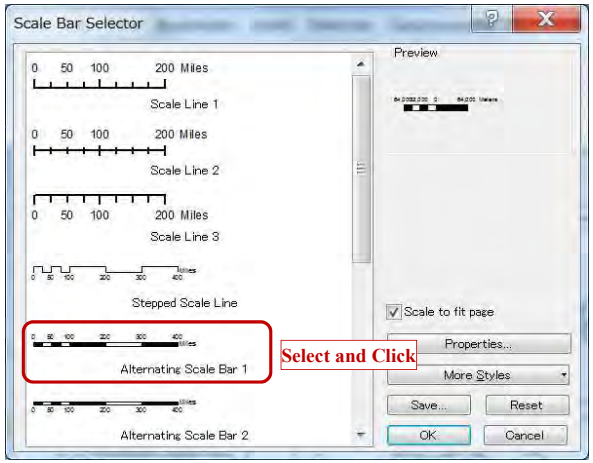




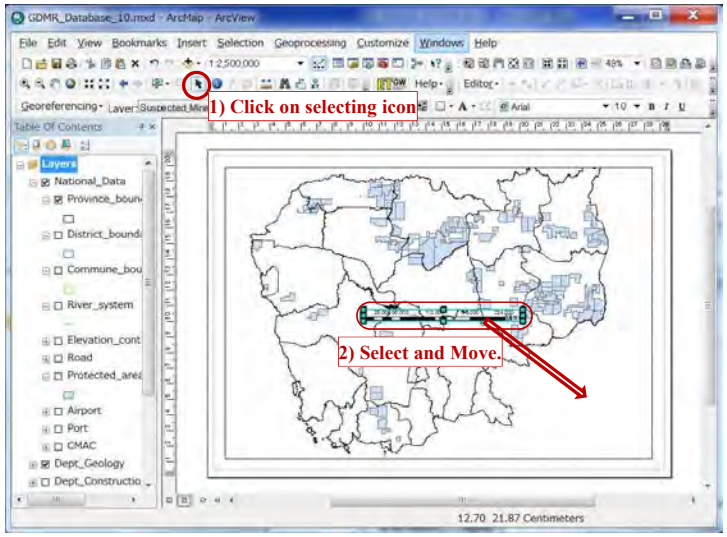

you can also type the scale.

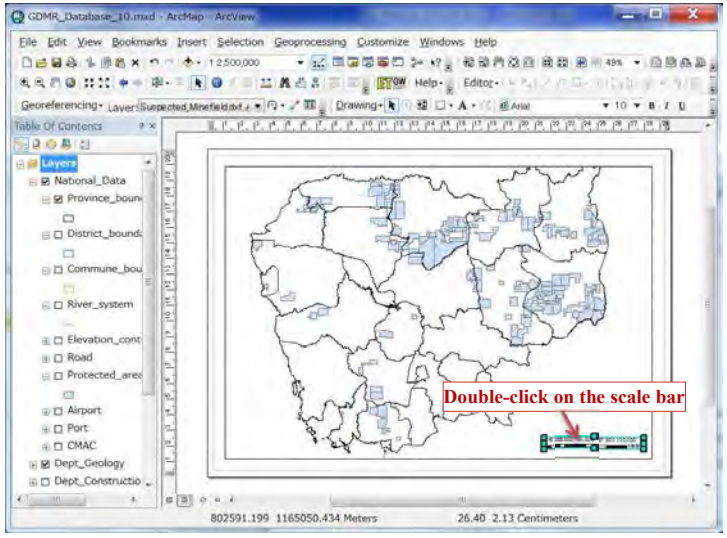

1) Click on selecting icon
2) Double-click outside map frame,
to return layout view.
Border appearance is changed.

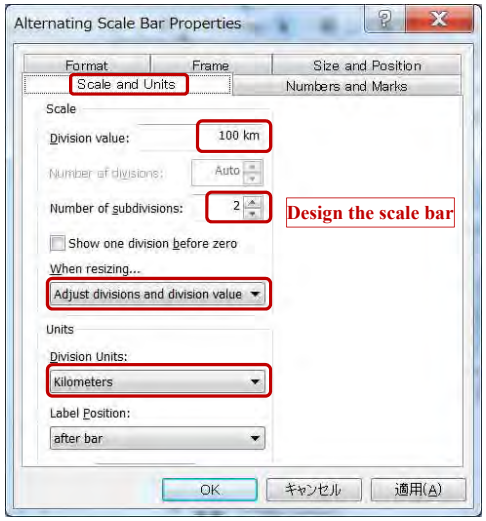

Click

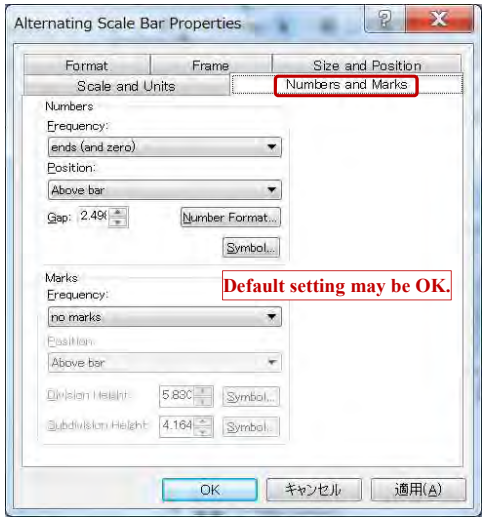

Scale Bar Selector
Preview
Scale Line 1
Scale Line 2
Scale Line 3
Stepped Scale Line
Alternating Scale Bar 1
Alternating Scale Bar 2
Select and Click
Scale to fit page
Properties...
More Styles
Save...
Reset
OK
Cancel

Adjust the location of Scale bar in layout.

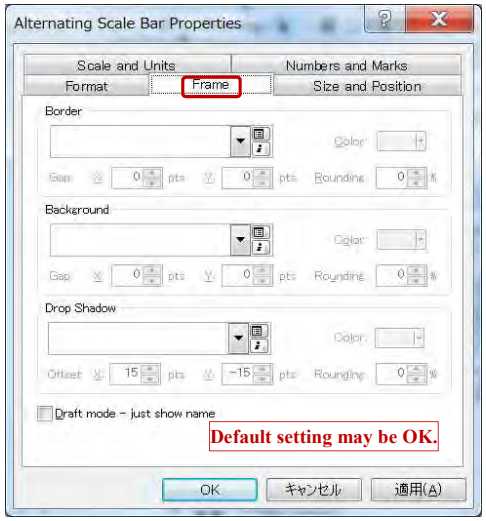


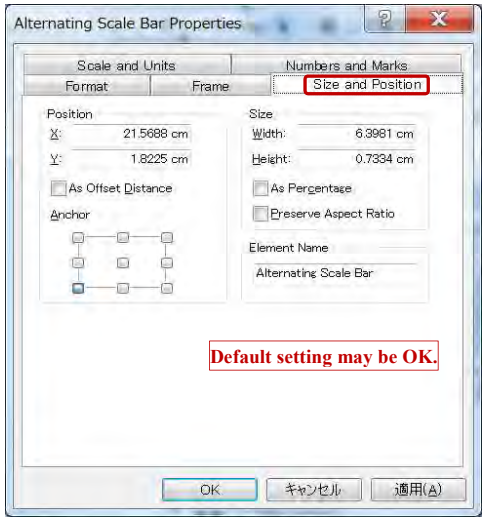


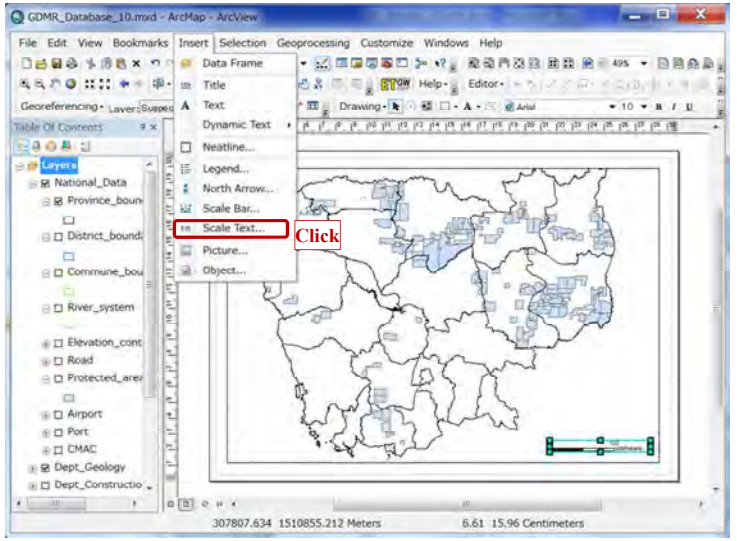


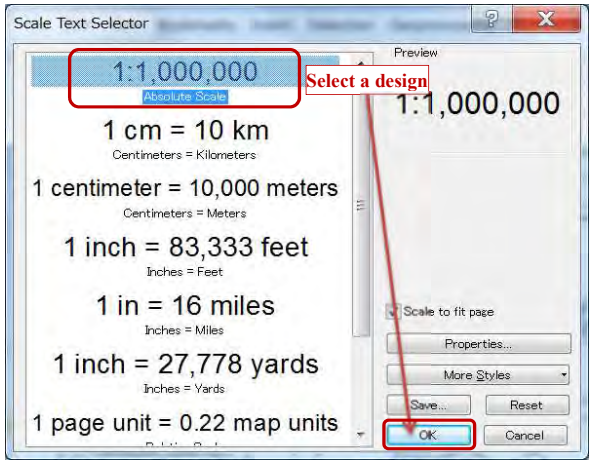



Alternating Scale Bar Properties
Scale and Units
Numbers and Marks
Format
Frame
Size and Position
Text
Font: Arial
Size: 10
Color:
Symbol...
Bar
Color:
Symbol...
Size: 4.997956
Symbol 2...
Style
0 100
Kilometers
Default setting may be OK.
OK
キャンセル
適用(A)


Alternating Scale Bar Properties
Scale and Units
Numbers and Marks
Format
Frame
Size and Position
Border
Color:
Gap: X: 0 pts Y: 0 pts Rounding: 0 %
Background
Color:
Gap: X: 0 pts Y: 0 pts Rounding: 0 %
Drop Shadow
Color:
Offset: X: 15 pts Y: -15 pts Rounding: 0 %
Draft mode - just show name
Default setting may be OK.
OK
キャンセル
適用(A)

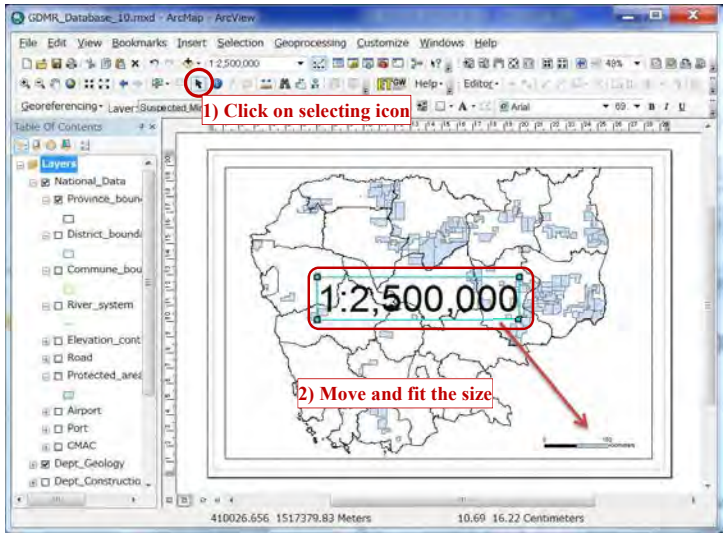

Alternating Scale Bar Properties
Scale and Units
Numbers and Marks
Format
Frame
Size and Position
Position
X: 21.5688 cm
Y: 1.8225 cm
As Offset Distance
Anchor
Size
Width: 6.3981 cm
Height: 0.7334 cm
As Percentage
Preserve Aspect Ratio
Element Name
Alternating Scale Bar
Default setting may be OK.
OK
キャンセル
適用(A)

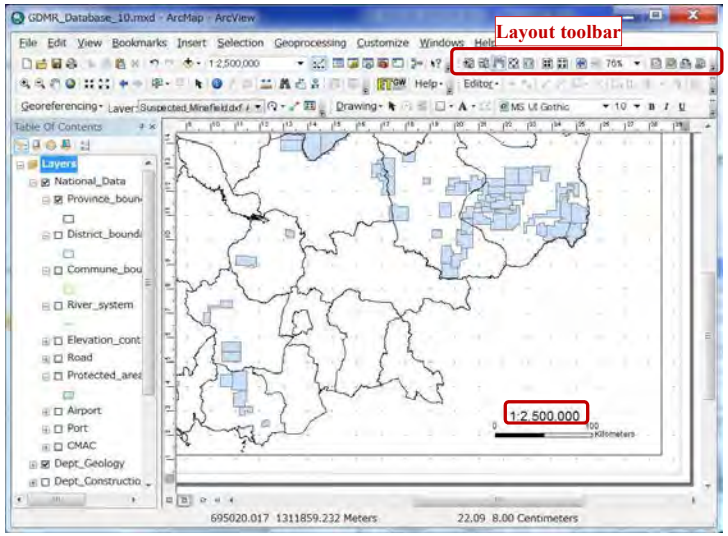

GDMR_Database_10.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Data Frame
Title
Text
Dynamic Text
Neatline...
Legend...
North Arrow...
Scale Bar...
Scale Text...
Picture...
Object...
Click
National_Data
Province_boun
District_bound
Commune_bou
River_system
Elevation_cont
Road
Protected_are
Airport
Port
CMAC
Dept_Geology
Dept_Constructio
307807.634 1510855.212 Meters
6.61 15.96 Centimeters



Select your favorite design of scale text, then click OK.

Adjust the position of scale text, using selecting (arrow) icon. .

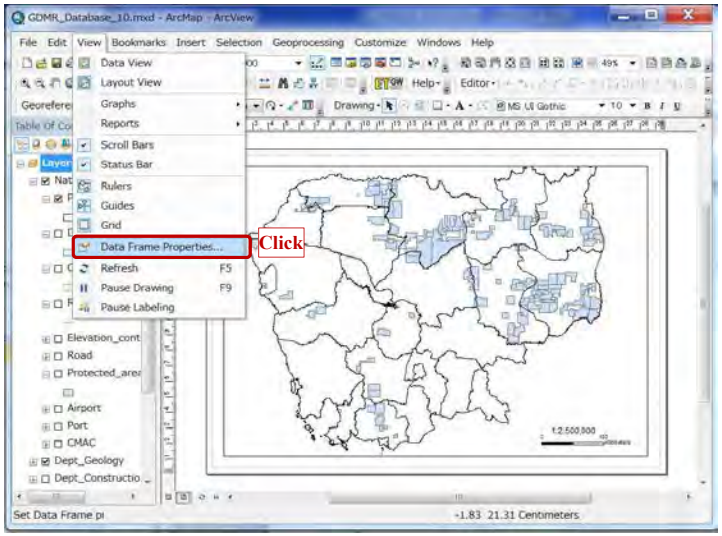


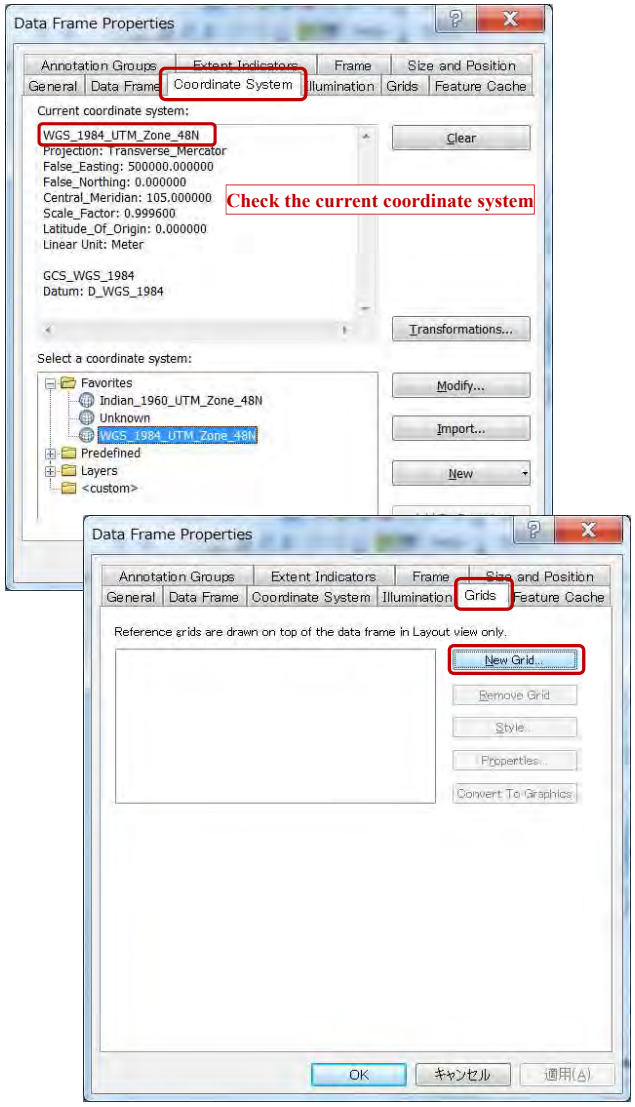


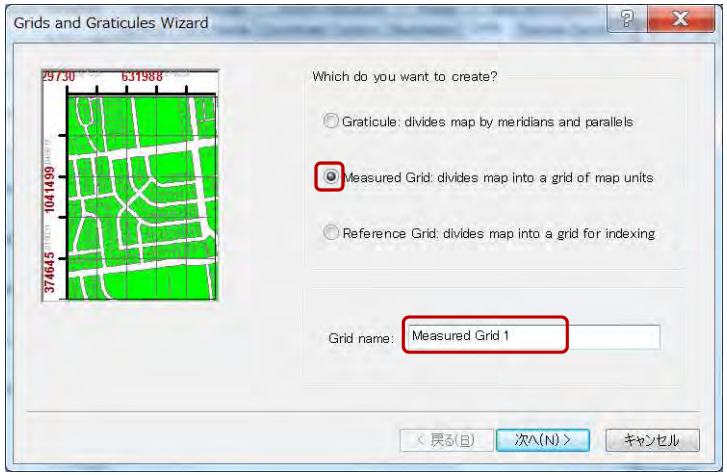
You can zoom or move the layout, by layout toolbar.

8-1-6 Coordinate grid

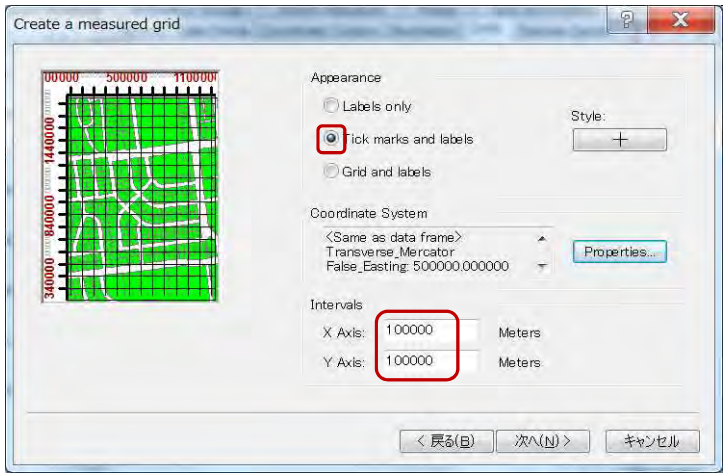
Add coordinate grid to map layout

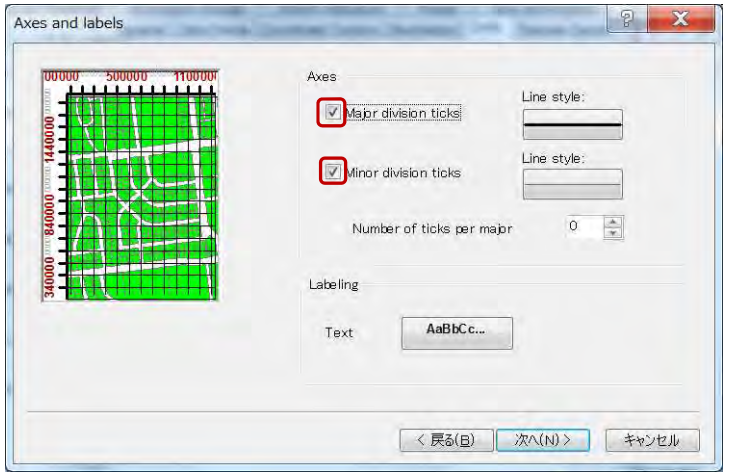


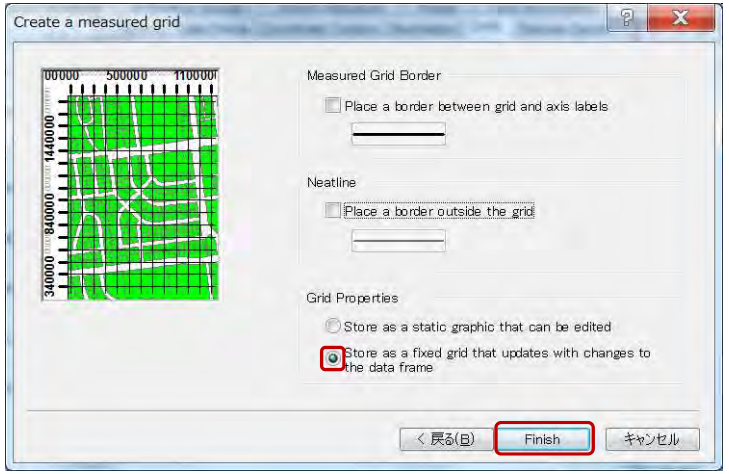




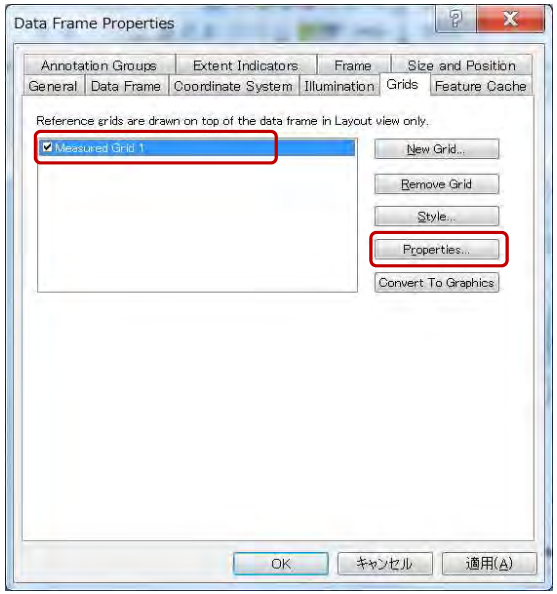
Select the type of grid units.



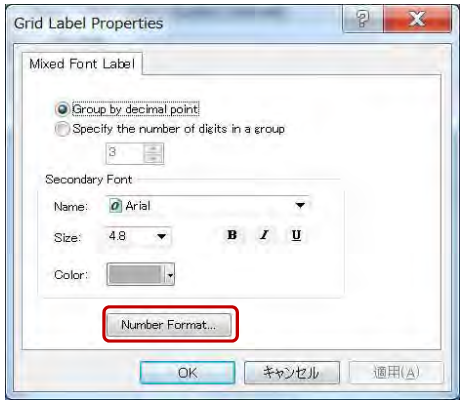


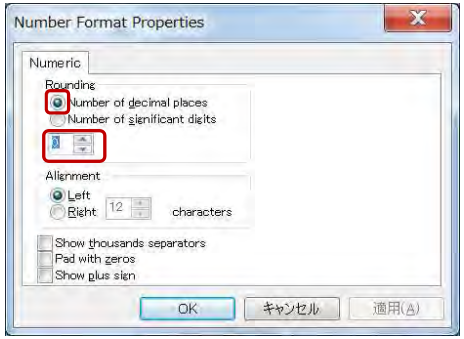


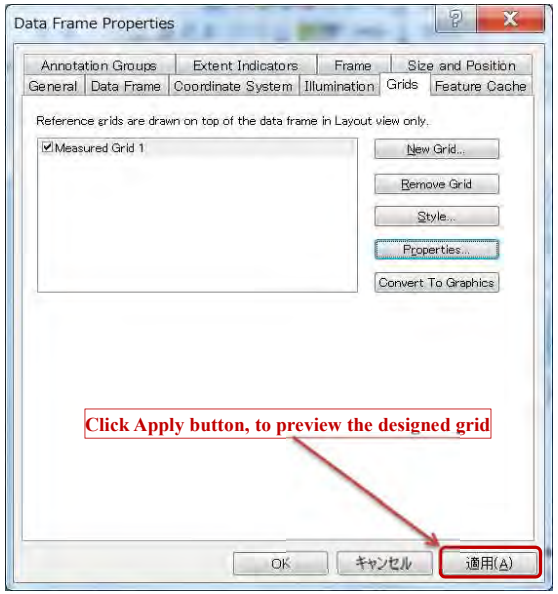
Select the grid on the list, then click Properties button

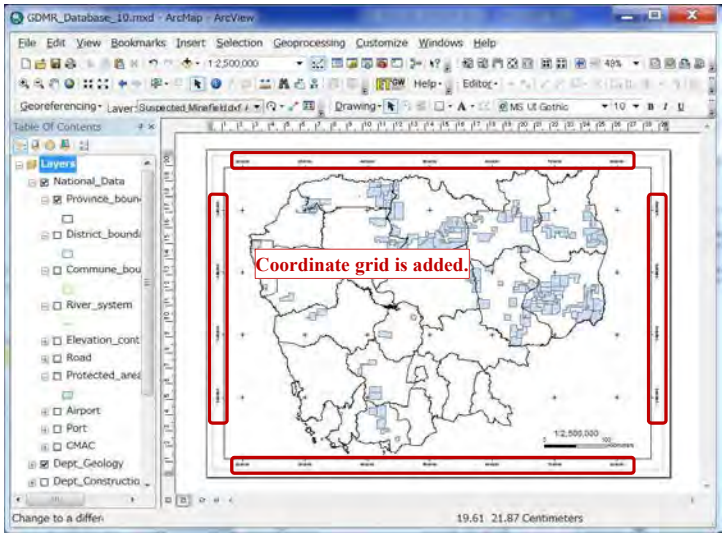

Data Frame Properties
Annotation Groups
Extent Indicators
Frame
Size and Position
General
Data Frame
Coordinate System
Illumination
Grids
Feature Cache
Reference grids are drawn on top of the data frame in Layout view only.
Measured Grid 1
New Grid...
Remove Grid
Style...
Properties...
Convert To Graphics
OK
キャンセル
適用(A)


Reference System Properties
Axes
Labels
Lines
System
Intervals
Label Axes
Top
Left
Bottom
Right
Label Style
Format: Mixed Font
Font: Arial
Size: 7.8
Color:
Label Offset: 6
pts
Additional Properties...
Label Orientation
Vertical Labels:
Top
Left
Bottom
Right
OK
キャンセル
適用(A)

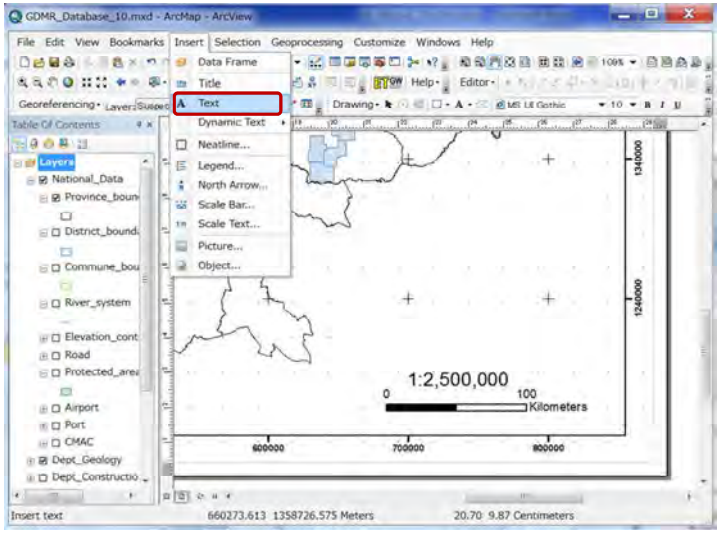

Grid Label Properties
Mixed Font Label
Group by decimal point
Specify the number of digits in a group
3
Secondary Font
Name: Arial
Size: 4.8
Color:
Number Format...
OK
キャンセル
適用(A)

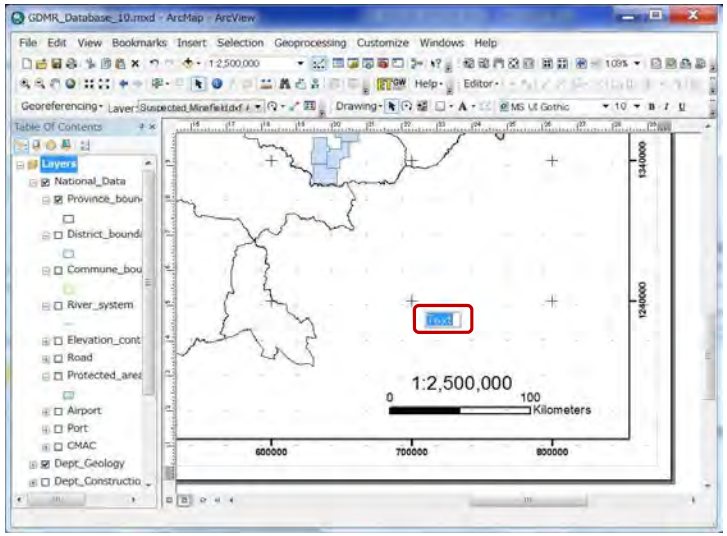

Number Format Properties
Numeric
Rounding
Number of decimal places
Number of significant digits
3
Alignment
Left
Right
12
characters
Show thousands separators
Pad with zeros
Show plus sign
OK
キャンセル
適用(A)

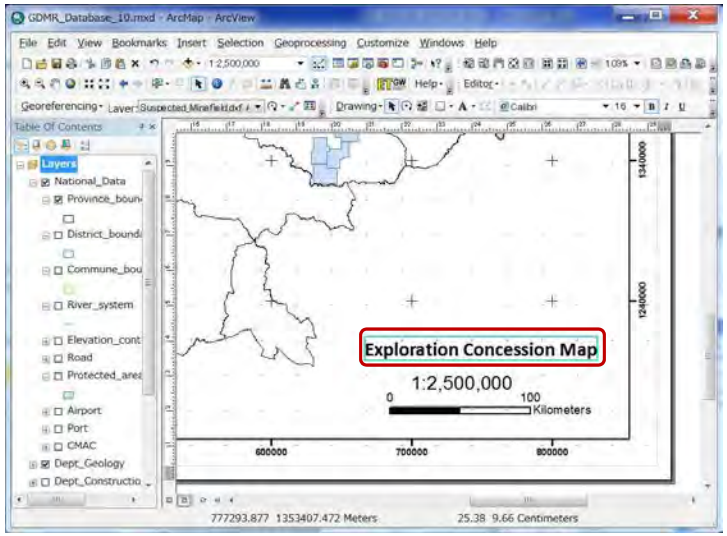




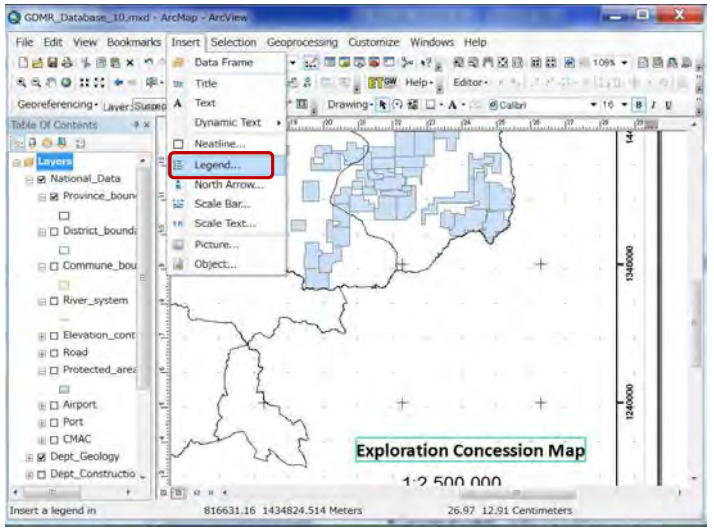
8-1-7 Insert Text

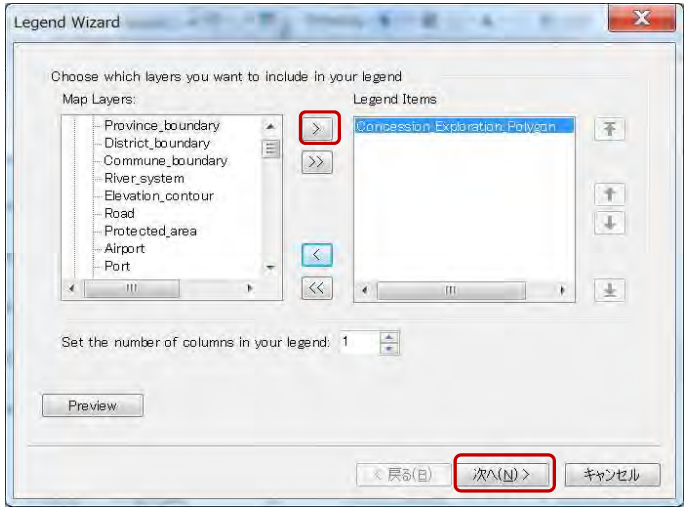


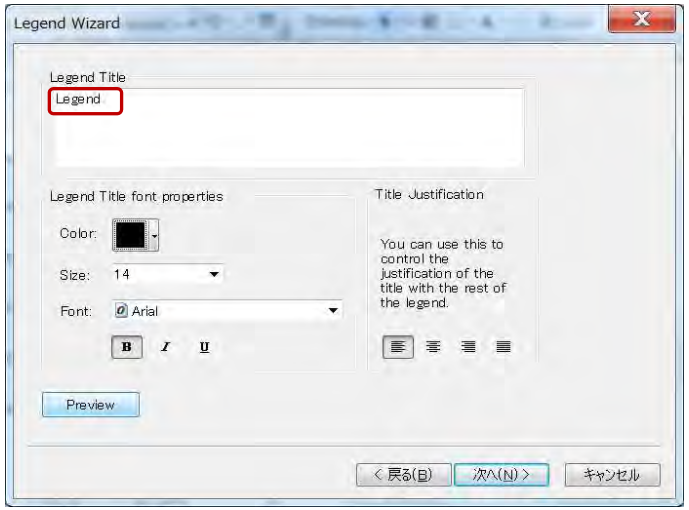

GDMR_Database_10.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Table Of Contents
Layers
National_Data
Province_boun
District_bound
Commune_bou
River_system
Elevation_cont
Road
Protected_area
Airport
Port
CMAC
Dept_Geology
Dept_Constructio
Text
1:2,500,000
0
100
Kilometers
600000
700000
800000
1340000
1240000

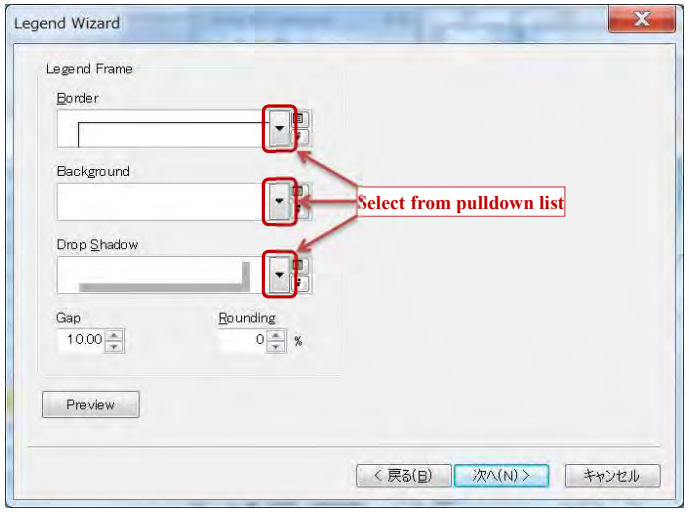

GDMR_Database_10.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Table Of Contents
Layers
National_Data
Province_boun
District_bound
Commune_bou
River_system
Elevation_cont
Road
Protected_area
Airport
Port
CMAC
Dept_Geology
Dept_Constructio
Exploration Concession Map
1:2,500,000
0
100
Kilometers
600000
700000
800000
1340000
1240000
777293.877 1353407.472 Meters
25.38 9.66 Centimeters

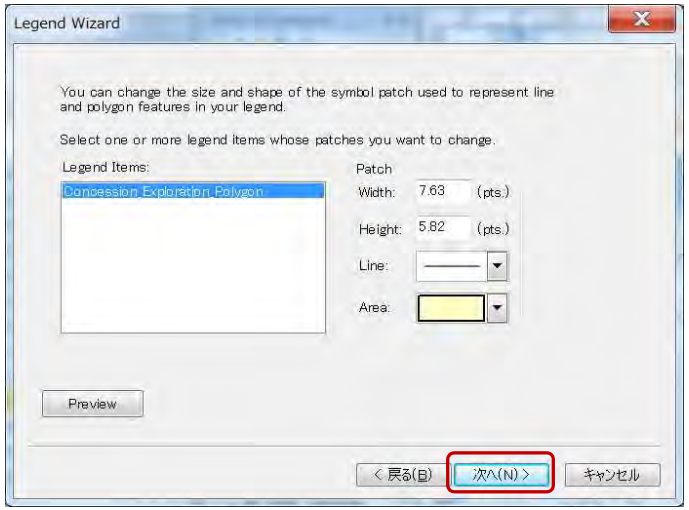
8-1-7 Legend

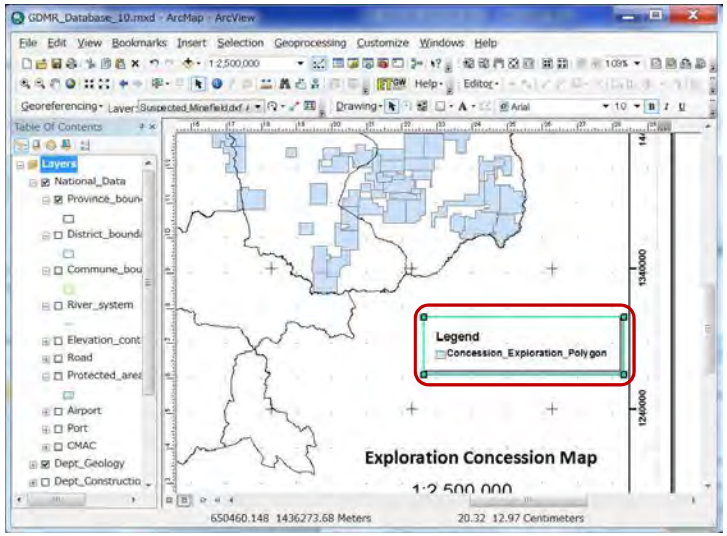

GDMR_Database_10.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Data Frame
Title
Text
Dynamic Text
Neatline...
Legend...
North Arrow...
Scale Bar...
Scale Text...
Picture...
Object...
Table Of Contents
Layers
National_Data
Province_boun
District_bound
Commune_bou
River_system
Elevation_cont
Road
Protected_area
Airport
Port
CMAC
Dept_Geology
Dept_Constructio
Exploration Concession Map
1:2,500,000
Insert a legend in
816631.16 1434824.514 Meters
26.97 12.91 Centimeters


Legend Wizard
Choose which layers you want to include in your legend
Map Layers:
Province_boundary
District_boundary
Commune_boundary
River_system
Elevation_contour
Road
Protected_area
Airport
Port
Legend Items
Concession Exploration Polygon
Set the number of columns in your legend: 1
Preview
< 戻る(B)
次へ(N) >
キャンセル


Legend Wizard
Legend Title
Legend
Legend Title font properties
Color:
Size: 14
Font: Arial
Title Justification
You can use this to control the justification of the title with the rest of the legend.
Preview
< 戻る(B)
次へ(N) >
キャンセル

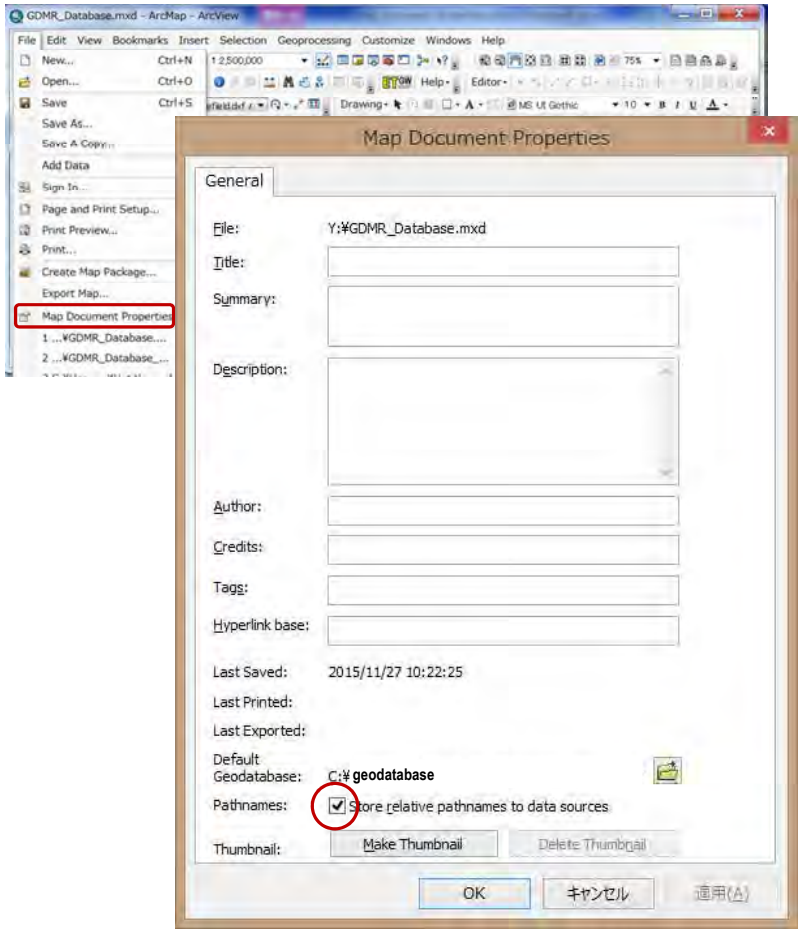

Legend Wizard
Legend Frame
Border
Background
Drop Shadow
Select from pulldown list
Gap
10.00
Rounding
0
%
Preview
< 戻る(B)
次へ(N) >
キャンセル


Legend Wizard
You can change the size and shape of the symbol patch used to represent line and polygon features in your legend.
Select one or more legend items whose patches you want to change.
Legend Items:
Concession_Exploration_Polygon
Patch
Width: 7.63 (pts.)
Height: 5.82 (pts.)
Line:
Area:
Preview
< 戻る(B)
次へ(N) >
キャンセル

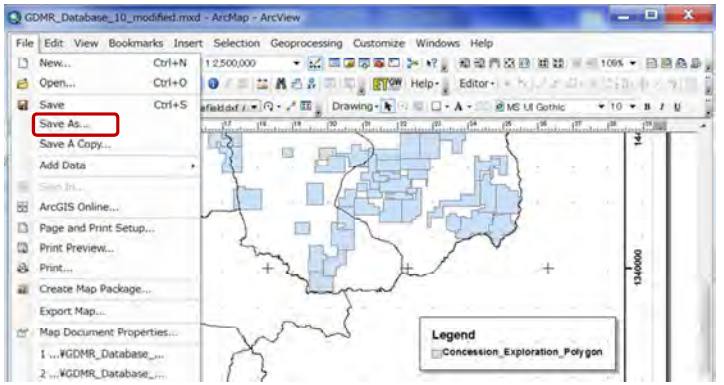

GDMR_Database_10.mxd - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Table Of Contents
Layers
National_Data
Province_boun
District_bound
Commune_bou
River_system
Elevation_cont
Road
Protected_are
Airport
Port
CMAC
Dept_Geology
Dept_Constructio
Legend
Concession_Exploration_Polygon
Exploration Concession Map
1:2,500,000
650460.148 1436273.68 Meters
20.32 12.97 Centimeters

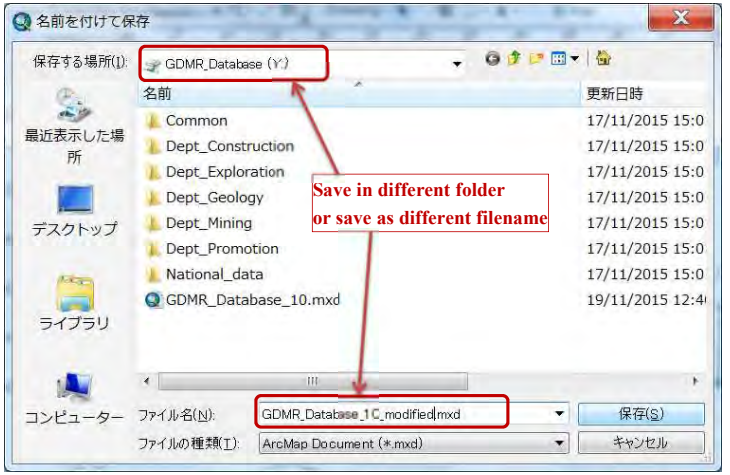
8-2 Save ArcMap file

8-2-1 Relative path

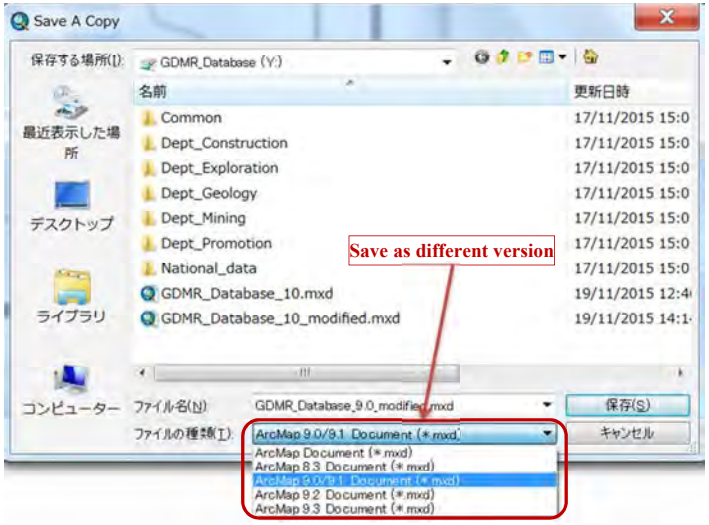


8-2-2 Save as different filename or filepath

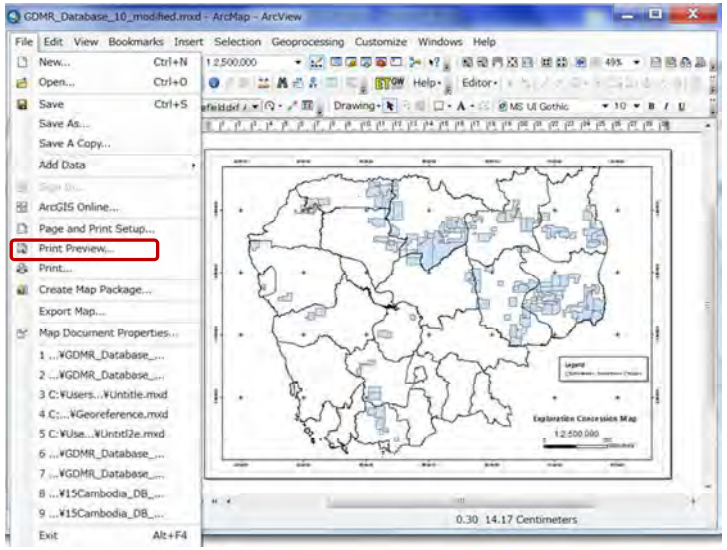


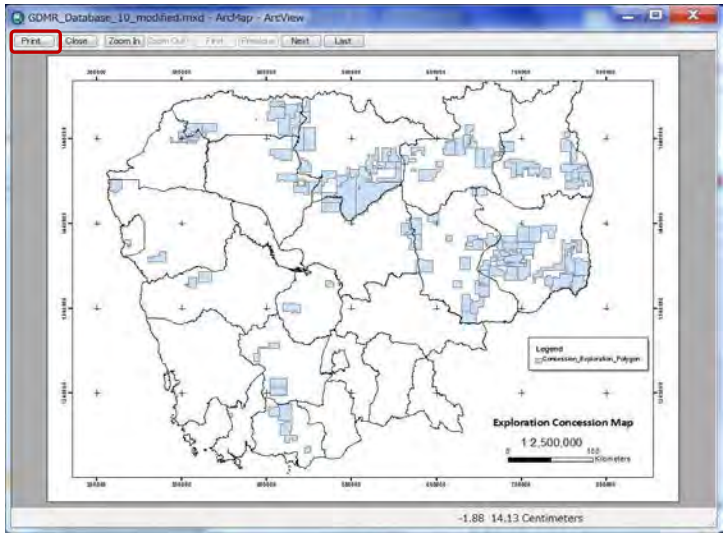


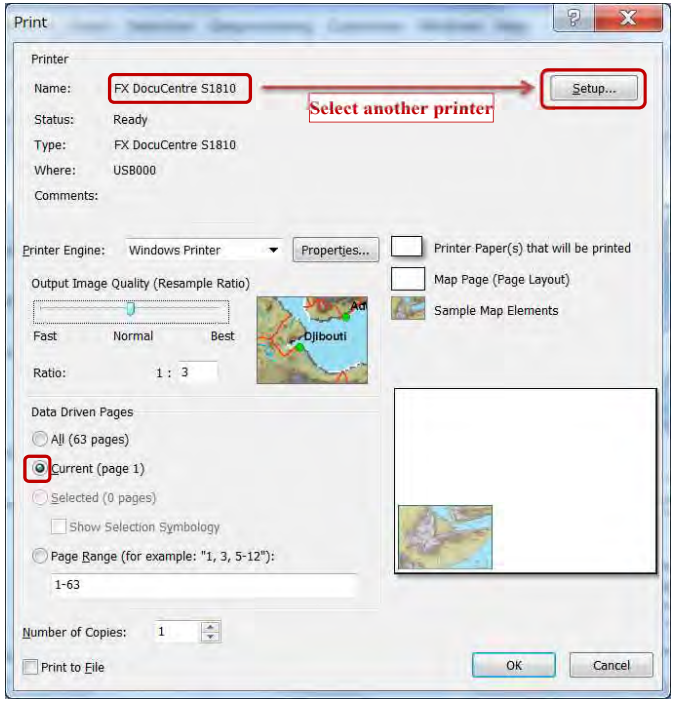
8-2-3 Save copy as older version



8-3 Print out

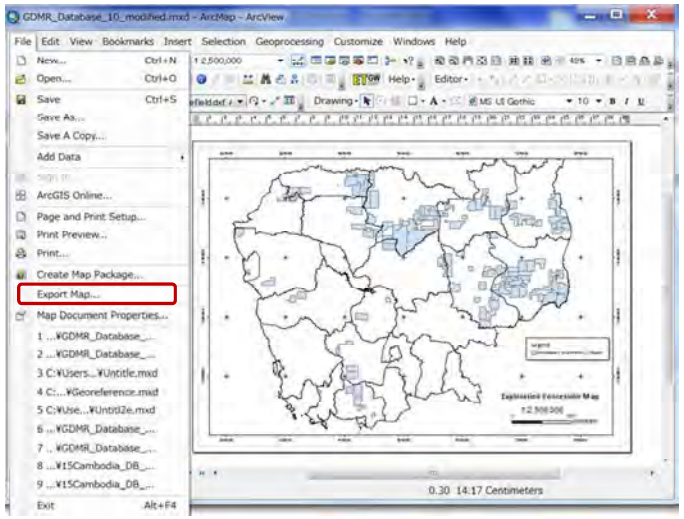




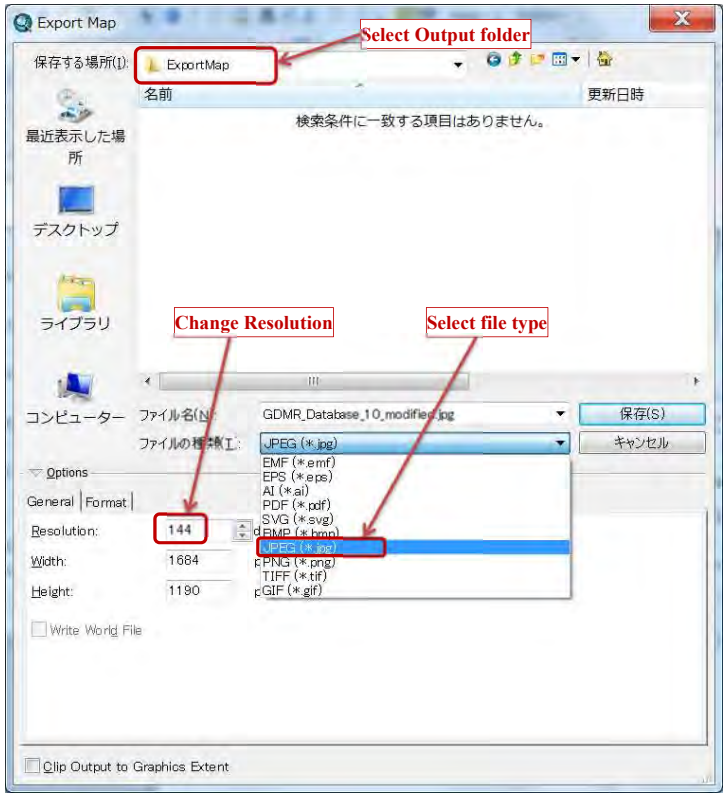


8-4 Export as digital map

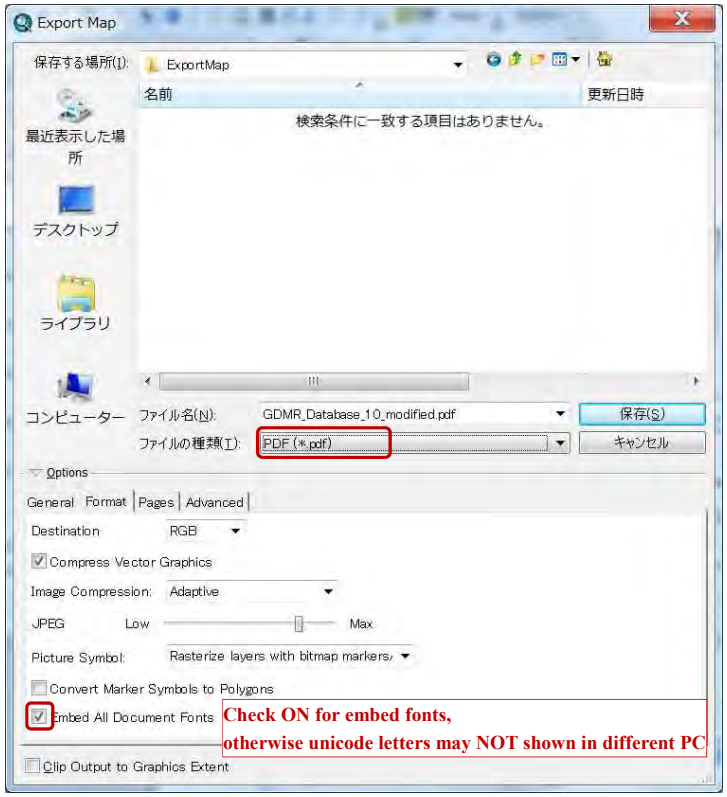
Available output files of a map is either raster map (JPG, TIFF, Bitmap, PNG, GIF) or vector map (PDF, AI).



8-4-1 Export as raster file (JPG)



8-4-2 Export as vector file (PDF)



9. Other usage of GIS data

Chapter 9 shows ;

- how to convert to/from GoogleEarth data
- how to export to/import from GPS

9-1 GoogleEarth

9-1-1 File type and Coordinate system in GoogleEarth

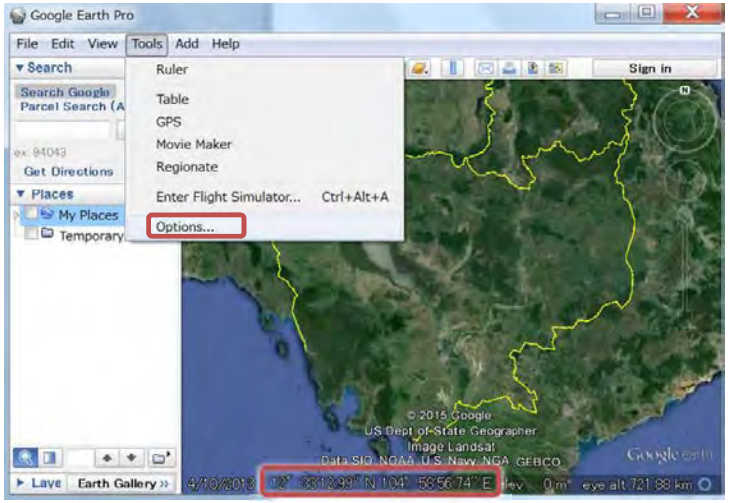
Google Earth uses KML file or KMZ file, which is compressed file of KML. ArcToolbox can convert between KMZ file and shapefile, as following section.

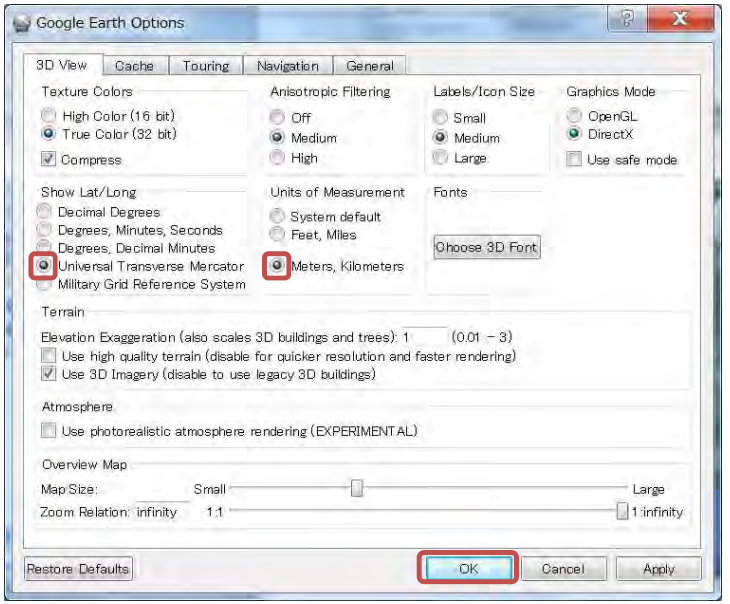
Google Earth coordinate system is based on the WGS84 datum, a global datum. You have to use WGS1984 in datum of coordinate system. Otherwise leading to wrong geolocation.

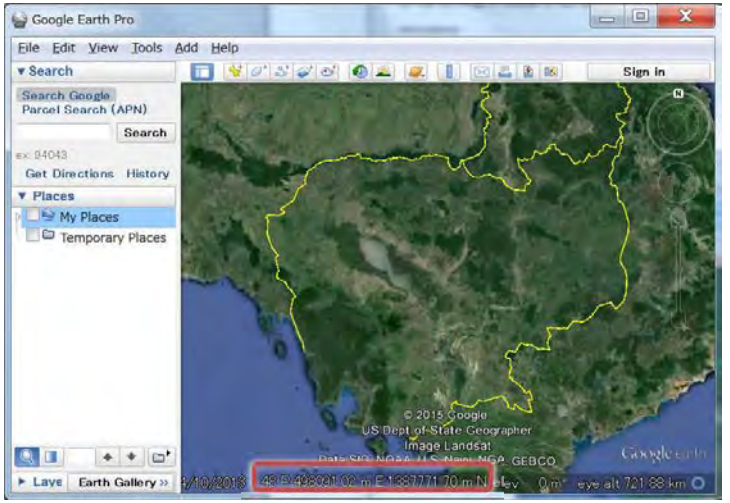
File type	Coordination system applied
- KML	- WGS1984 GCS (Geographic Coordinate System)
- KMZ	- WGS1984 UTM (Universal Transverse Mercator)

Choose available coordinate in GoogleEarth from options of Tools menu.

- decimal degrees
- DMS (degree minutes seconds)
- degrees decimal minutes,
- UTM (Universal Transverse Mercator).

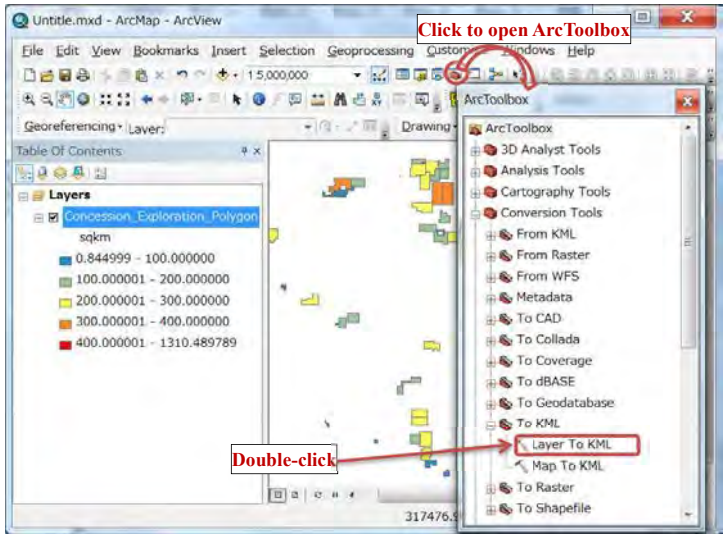




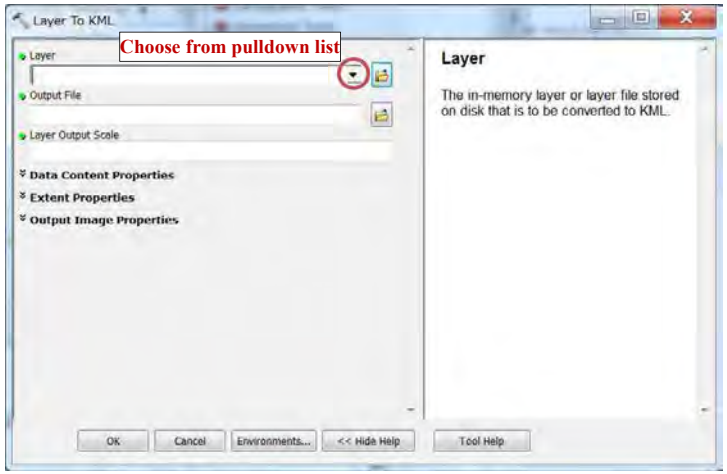


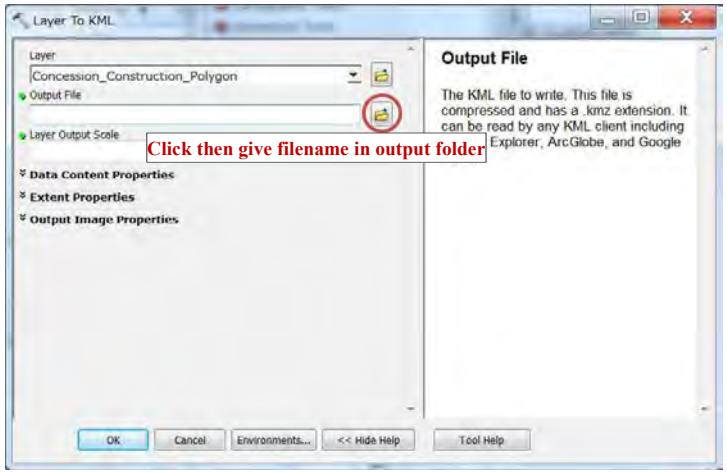
9-1-2 Convert a shapefile to a kmz file

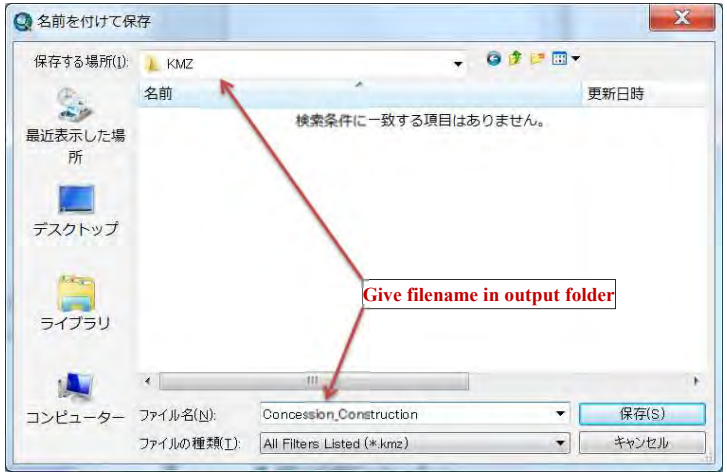
Open ArcMap file, then open ArcToolbox.

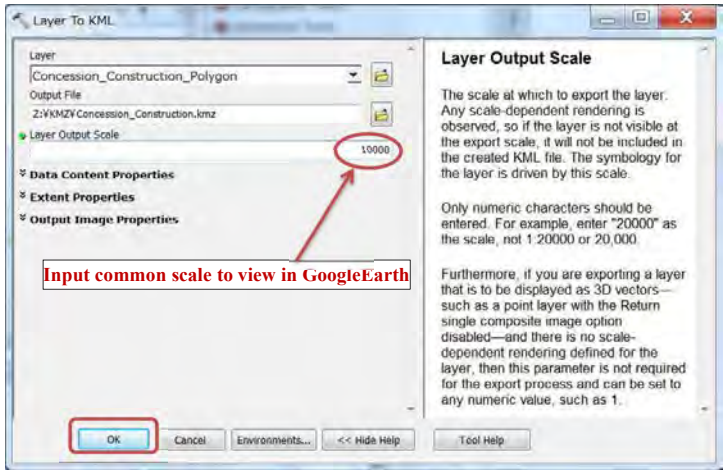


Double-click on “Layer To KML”.





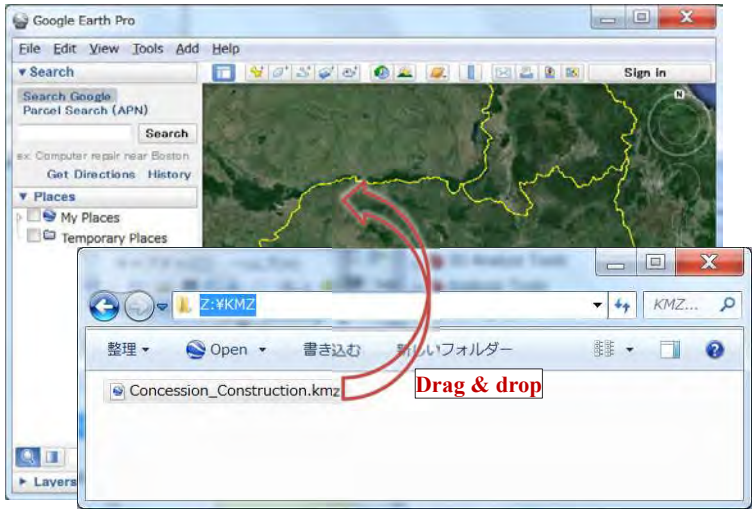


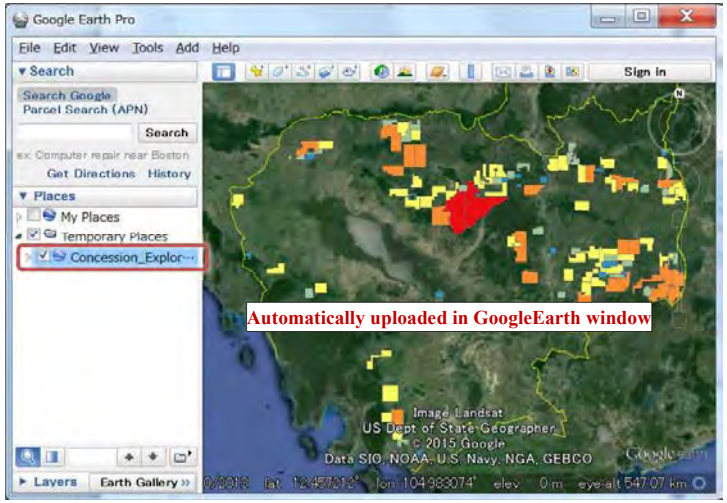


9-1-3 View in GoogleEarth

Start GoogleEarth (or GoogleEarth Pro) program.

Drag a kmz file into GoogleEarth window.





9-2 GPS

Most of Garmin GPS can exchange data with PC.

9-2-1 File type and required software

Garmin GPS uses GPX file type. Data exchange with PC requires a free software of "Garmin BaseCamp", and a USB connection. See chapter 1-3-4 for installation of "Garmin BaseCamp"

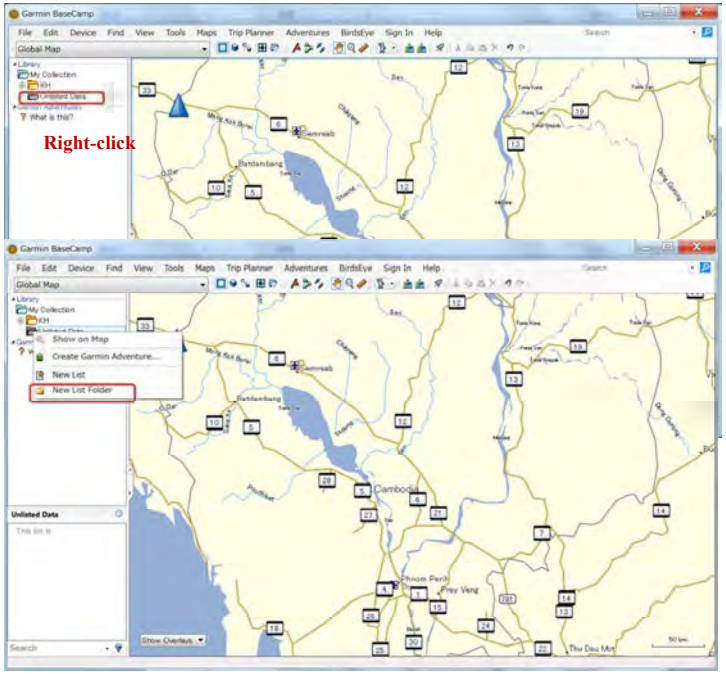
9-2-2 Export a shapefile to GPS

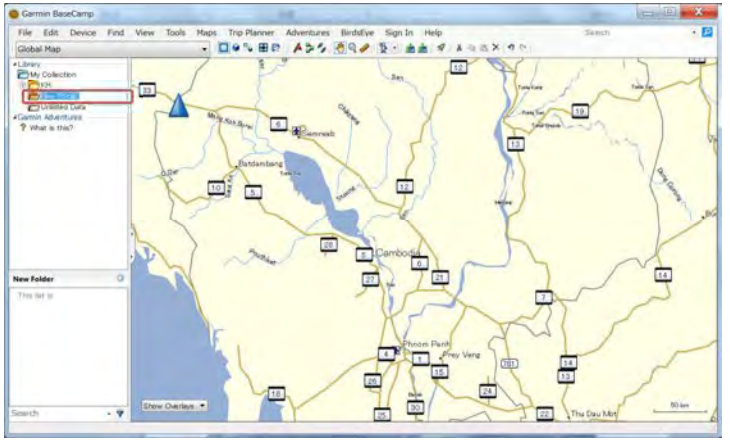
Step1: Convert a shapefile to a kmz file

(see Ch9-1-2)

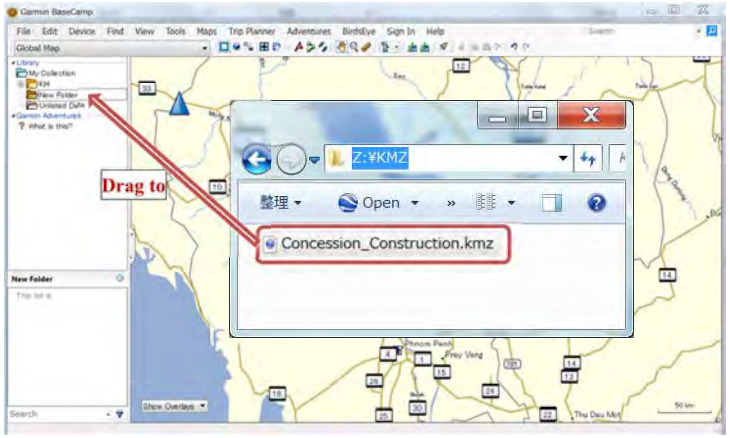
Step2: Upload KMZ files to BaseCamp window

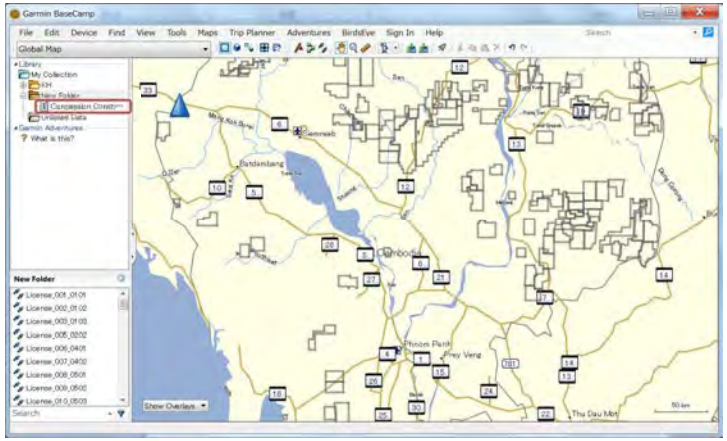
Setup new list in BaseCamp for uploading KMZ files



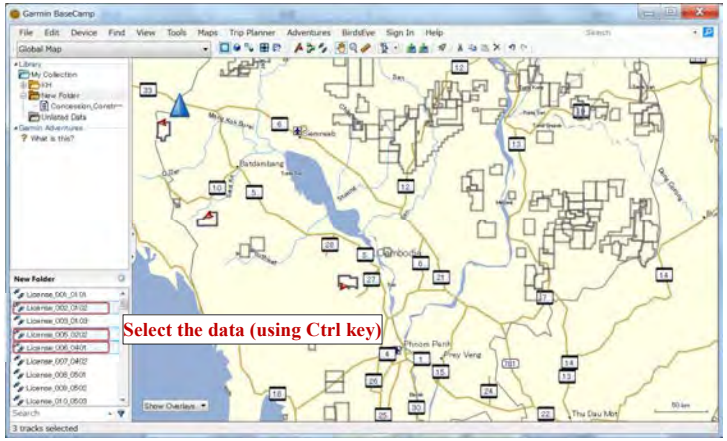


Click KMZ files in windows folder





Select the objects from the list

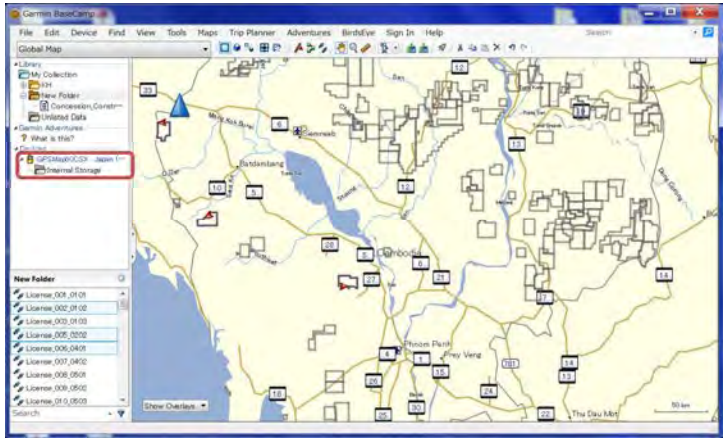


Step3: Send to GPS

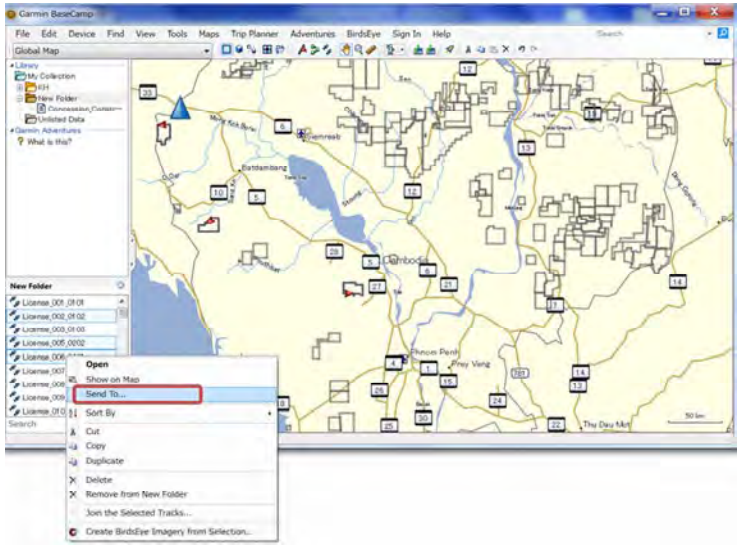
Connect GPS via USB cable.

Turn ON the GPS power.

GPS device is automatically detected and shown in BaseCamp window.



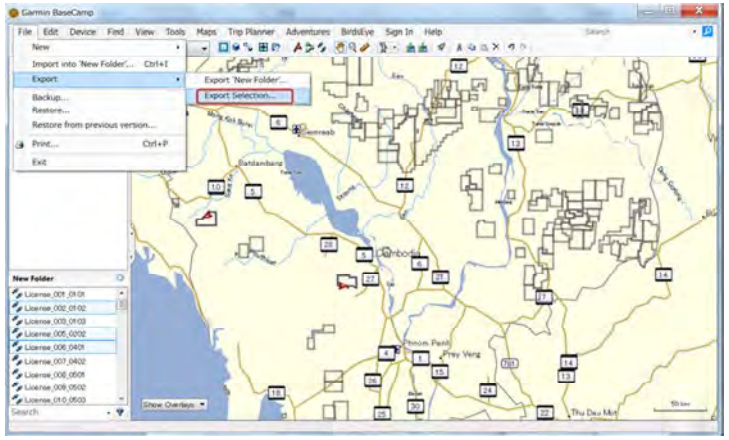
Right-click on any part of selected lists.

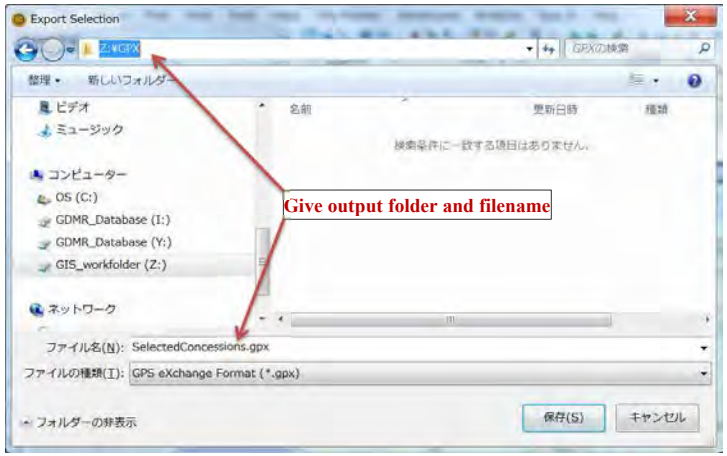


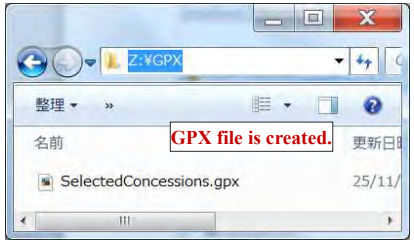
The selected data is copied to GPS in a short time.

Close Garmin BaseCamp software. Turn OFF power of GPS

Step4: Save as GPX file







9-2-3 Import vector data from GPS

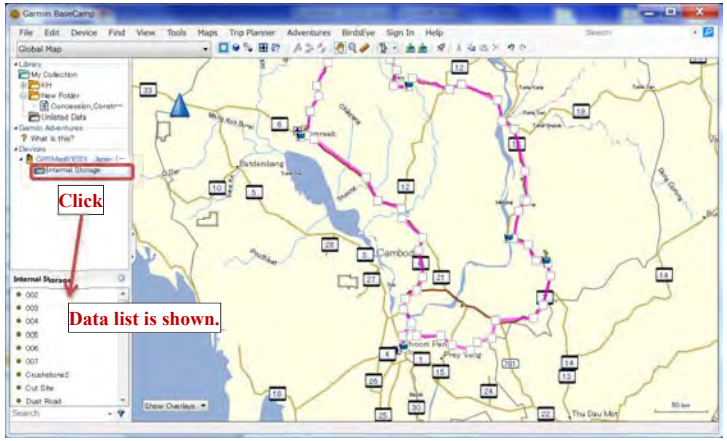
Step1: From GPS to KML file

Open BaseCamp software

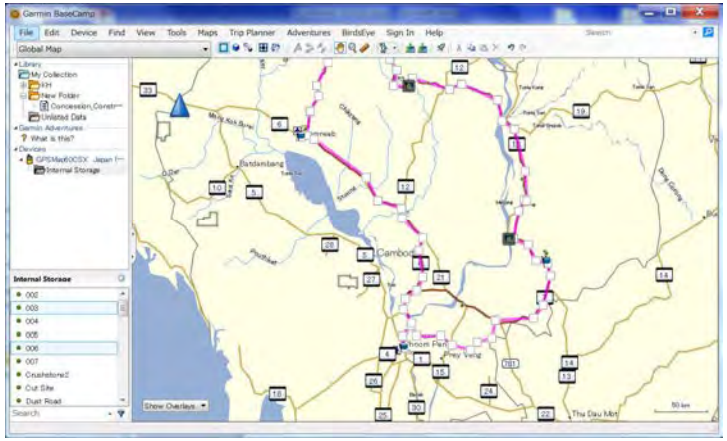
Connect GPS via USB cable.

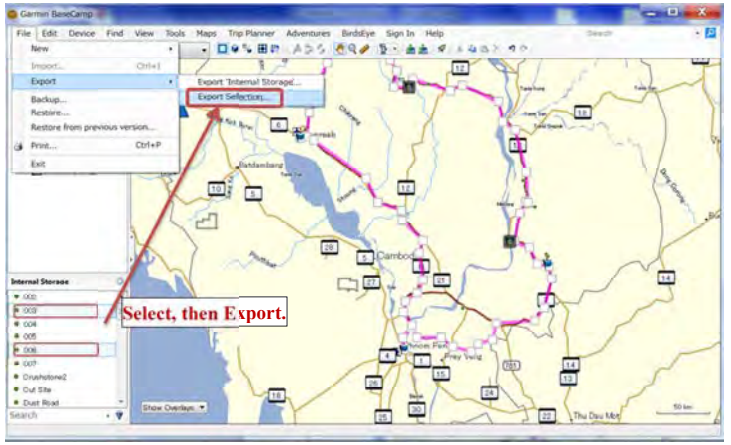
Turn ON the GPS power.

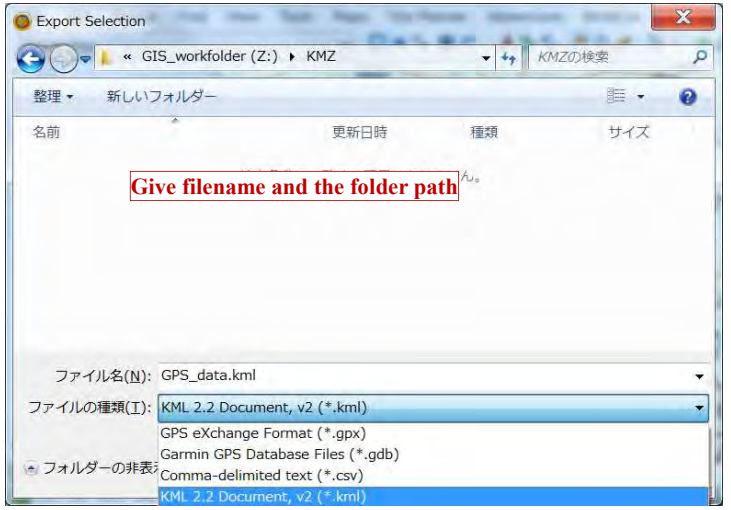
GPS device is automatically detected and shown in BaseCamp window.

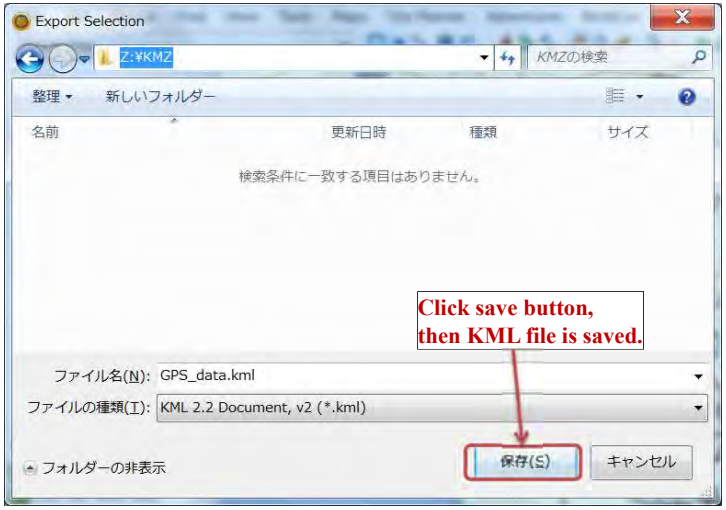


Select the data list, by using Ctrl key if more than 1 selected.





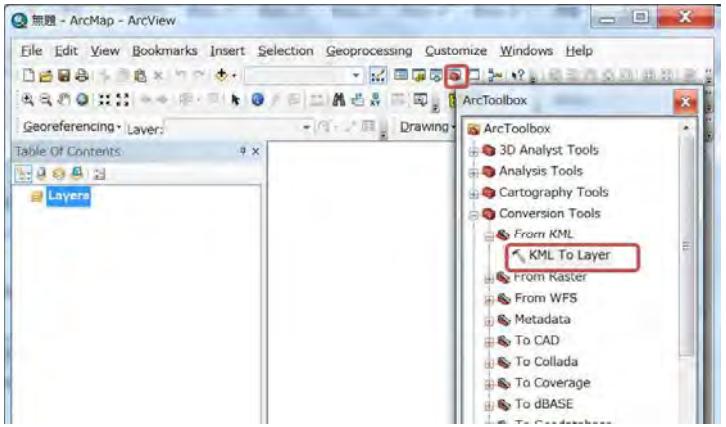


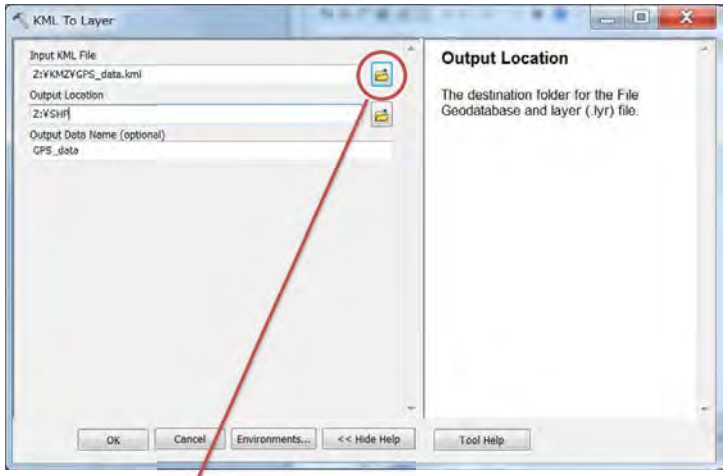


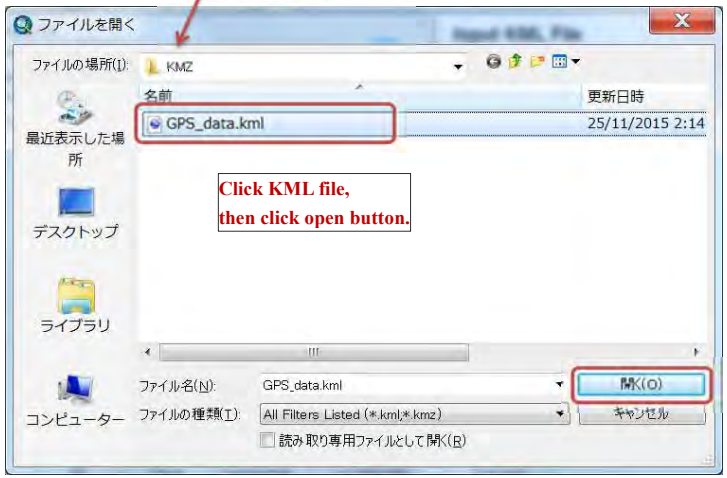
Close Garmin BaseCamp software. Turn OFF the GPS power.

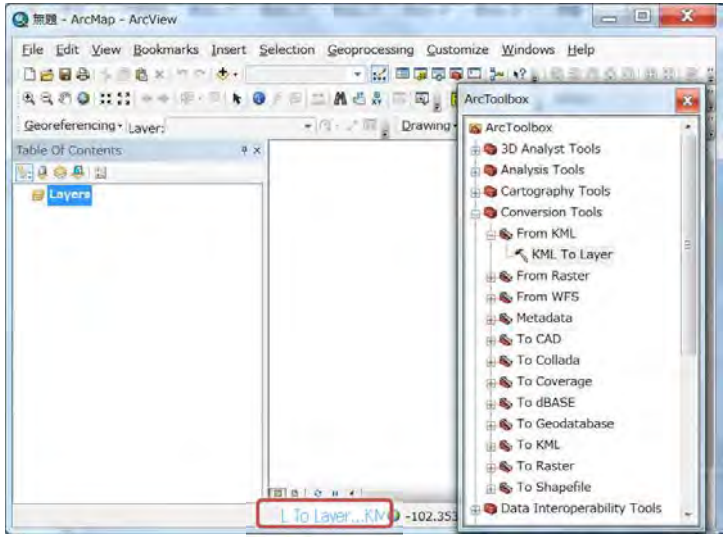
Step2: From KML file to shapefile

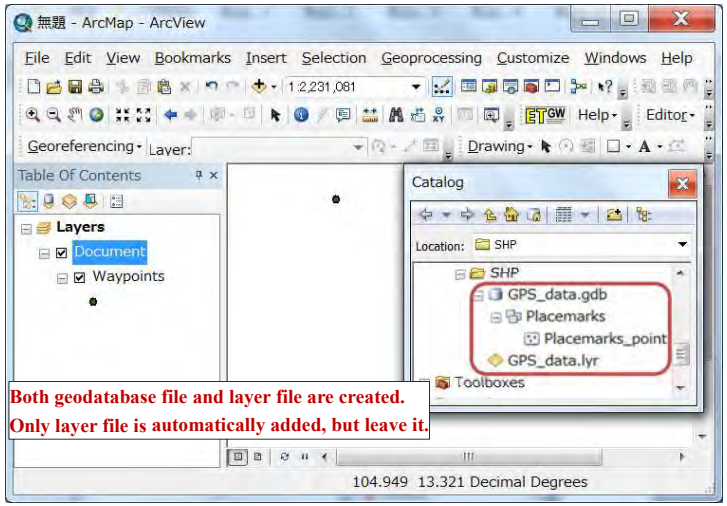
Open ArcMap software.



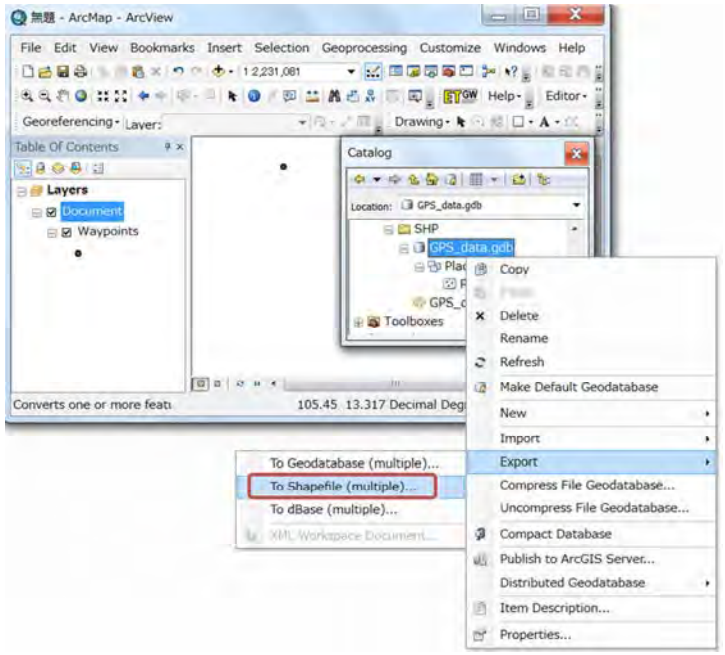


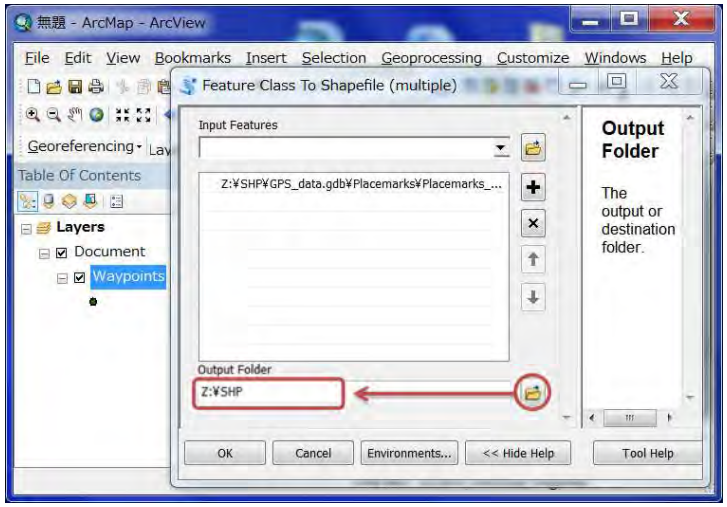






Both geodatabase file and layer file are created.
Only layer file is automatically added, but leave it.




無題 - ArcMap - ArcView
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Feature Class To Shapefile (multiple)
Input Features
Z:¥SHP¥GPS_data.gdb¥Placemarks¥Placemarks_...
Output Folder
The output or destination folder.
Output Folder
Z:¥SHP
OK
Cancel
Environments...
<< Hide Help
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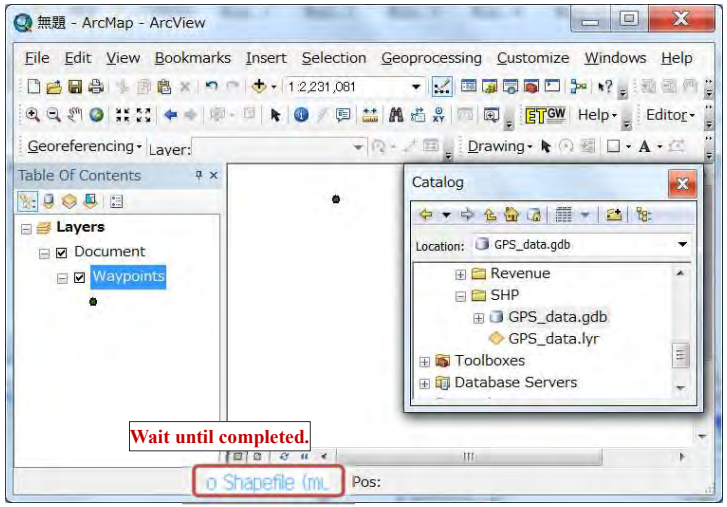
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Location: GPS_data.gdb
Revenue
SHP
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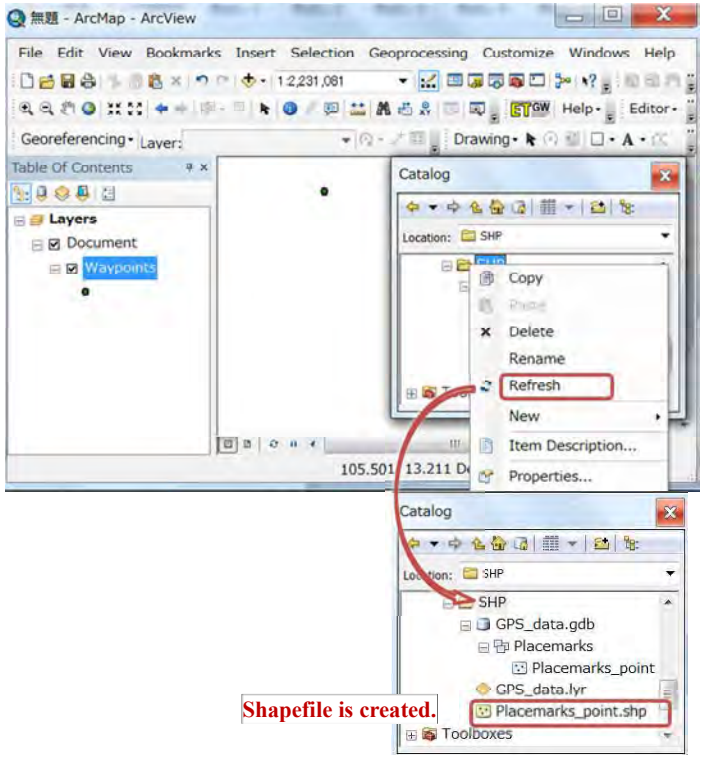
GPS_data.lyr
Toolboxes
Database Servers
Wait until completed.
Pos: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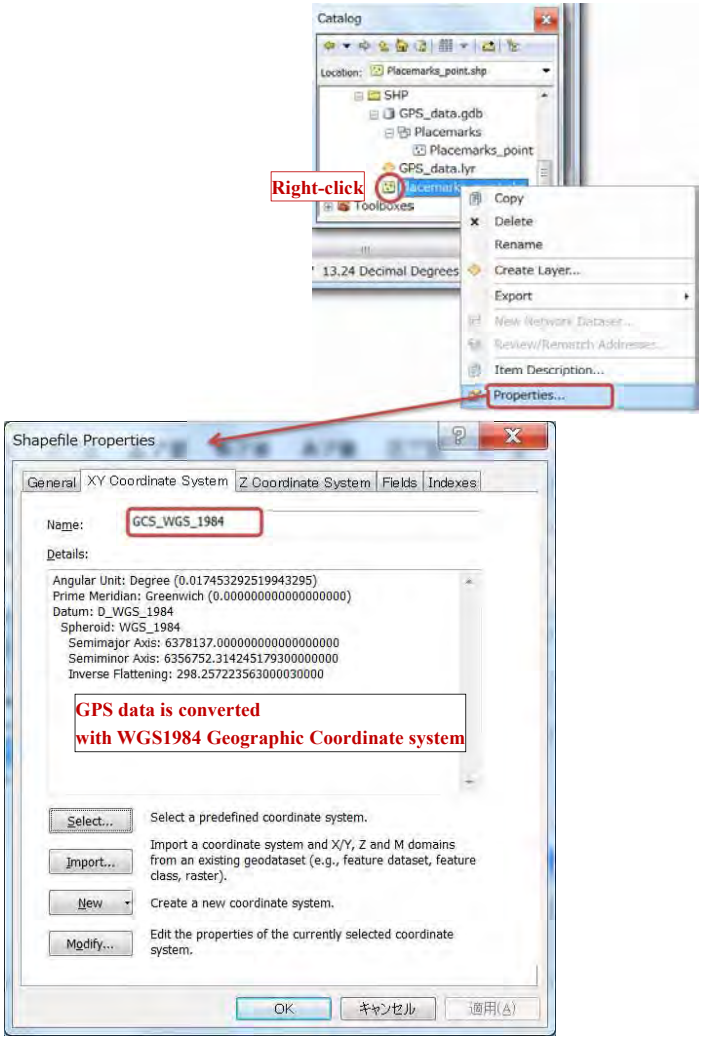
Item Description...
Properties...
SHP
GPS_data.gdb
Placemarks
Placemarks_point
GPS_data.lyr
Placemarks_point.shp
Toolboxes
Shapefile is created.

Check the coordinate system.of the converted shapefile



Database Management Manual

THE PROJECT ON CAPACITY DEVELOPMENT FOR MINING ADMINISTRATION IN THE KINGDOM OF CAMBODIA

Date of Issue: 14th December 2015

Japan International Cooperation Agency (JICA)

Table of contents

1. General about GDMR Database

This manual is described for administrators about maintenance of the GDMR Database. The concept and design of the database is described in chapter 1. For maintenance of the database, database administrator is needed. The task is listed up in chapter 2. When data are updated, database administrators need to support and work together, as the procedures shown in chapter 3.

1-1 Concept of GDMR Database

This database works on ArcGIS Desktop Version 10.0 Basic model (ArcView).

Checklist	Volume	Application
Users	Limited numbers (within GDMR)	Excel
Update frequency	Less (weekly /monthly)	Excel
Type of data resource	Spacial data (shapefile, GeoTIFF,...) Table data (Excel file)	ArcGIS
Number of records	Less (up to Thousands)	Excel

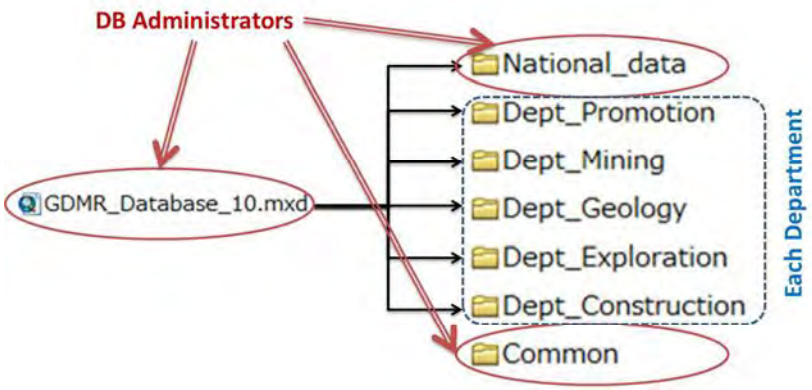
Current version is designed based on ArcGIS Desktop Version 10.0 ArcView (Basic model).

1-2 Responsibility to the data

Database administrators have a responsibility to secure the whole data and performance of database. He is required to understand ArcGIS and to recover the ArcMap file with connecting paths of source files. The folders of each department may be updated sometimes occasionally. So the data of each department is taken care by each department's responsibility.

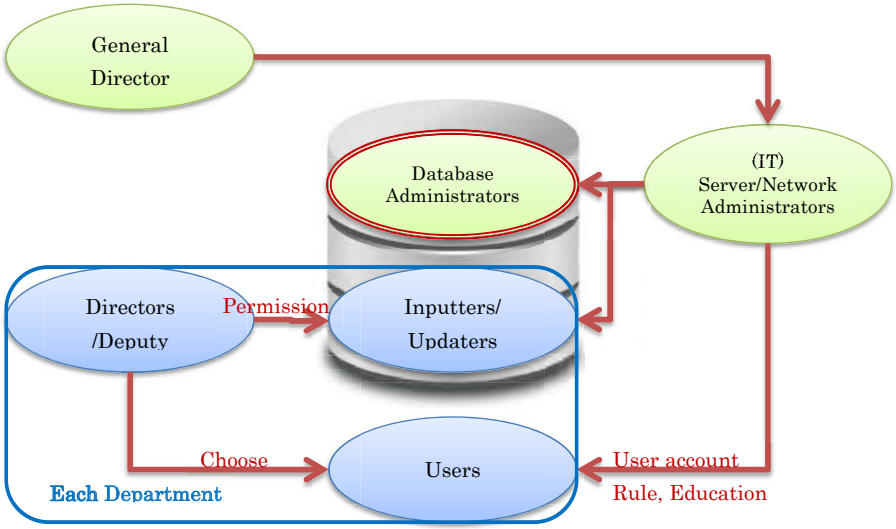
"National data" folder includes huge size of remote sensing data, which are not so often updated.

"Common" folder includes the manual and law and regulation related to mining activity.



2. Roles and tasks for management and maintenance

To maintain the database, administrators to do it are needed. One is database administrators, and the other is server/network administrators. The two roles can be played by same person, who has the skill of both tasks.



2-1 Database Administrators

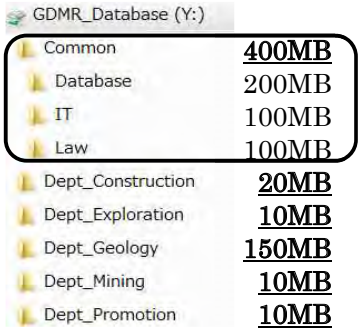
Tasks of database administrators are :

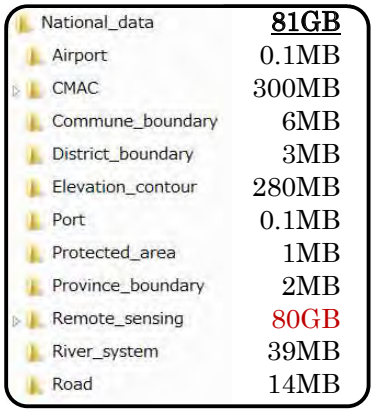
- Monitoring data-folder size
- Installation / version-up / patch of GIS software (ArcGIS)
- Backup GDMR Database
- Recovery (Re-build) GDMR Database (source file connection to the ArcMap file)
- Check performance of database, Clean up unnecessary files
- Trouble-shooting for database user
- Monitor the data/folder size and report to Server Administrators

The roles of Database administrators and Server administrators

Database Administrators	**IT (Network/server) Administrators**
• DATABASE maintenance • Application update (ArcGIS) • Backup – Whole backup – Differential backup (Updated datafolder only) • Monitor data size – Cleanup unnecessary files • Recover the ArcMap file – Layer source-file path	• Server maintenance • Network maintenance • Security setting (Antivirus, firewall) • User account update • User (Network) security rule • Education to Users • Support database update-work – Stop network service • Monitor Disk space of server • Backup and Recover data

Current data-size is shown below.





2-2 Updaters of each department

Director chooses the inputter/updaters from his department. When updating, updaters get the permission from (his Director). The time to update is decided by individual department.

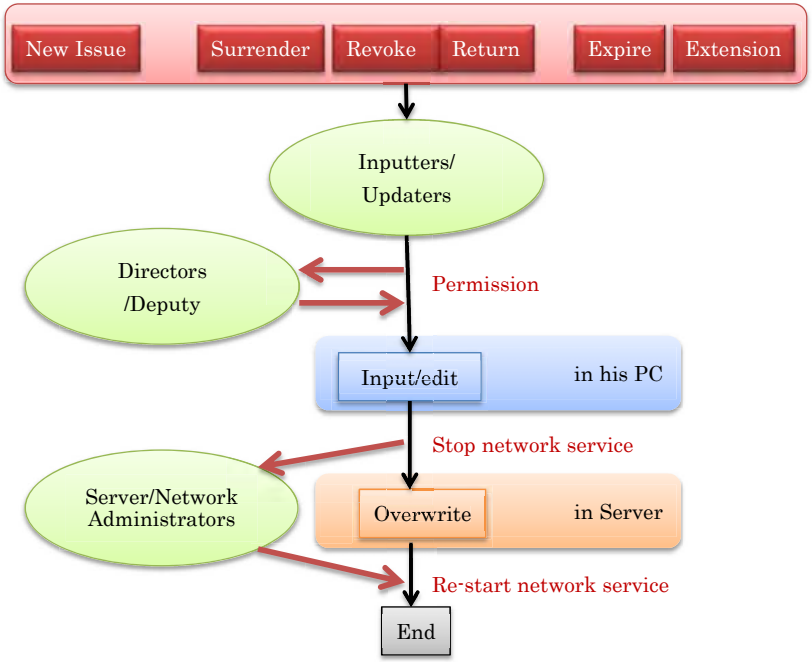
3. Procedures on update work

3-1 Anytime update

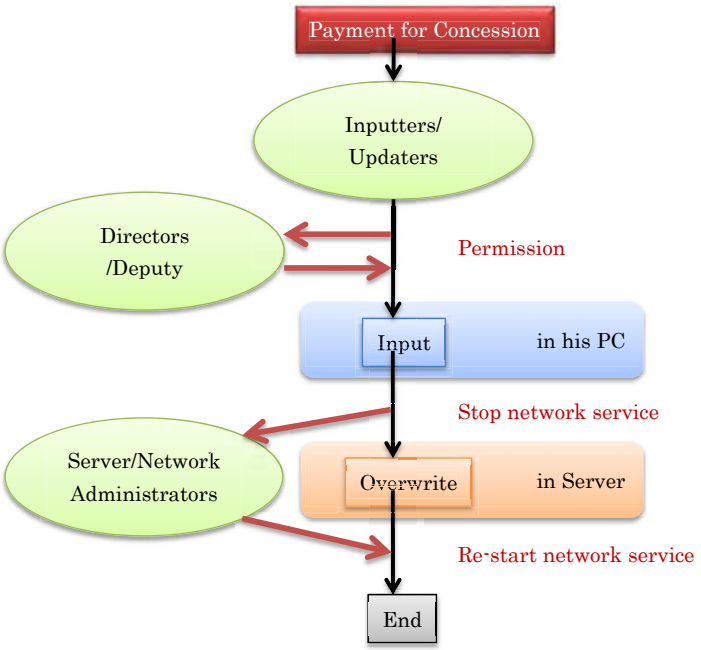
The procedures on updating license data is shown below.

The event on license issue is like new issue, surrender, revoke, return, expire, or extension.

When the event on license occurs, inputters/updaters get permission from (his director) before updating. The work of editing data is done in his PC. During overwriting the files on the database, network should be stopped to make no other person using the database.



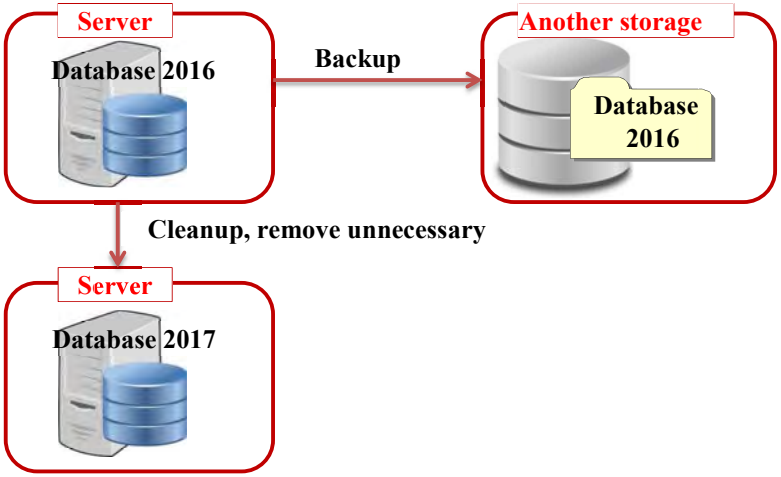
The procedures on updating revenue data is in the same way as shown below.



3-2 Annual updates

When new license-year starts, renew the database.

Backup whole part of current database into another storage/media.



Clean up unnecessary file. Recover or reset the ArcMap file.

Choice of license data to transfer, which depends on both the license status and the payment, shall be decided by Department of Promotion.

Choice of license data to transfer to next year database (annual update)

Status / Payment	Valid licenses (including Surrender)	Expire /Return / Revoke
Paid completely	Select *	Remove**
Un-paid license	Select *	Select *

*Select: Transfer data to next year database

**Remove: Remove from next year database (Stored in past database)

Quick Manual
on Tips for
Interested Topics

How to Count Number of Queried Concessions

Method-1 by ArcMap only
Method-2 by ArcMap + Excel pivot

Counting Method-1

ArcGIS Tools
- Spatial Join
- Intersect
- Merge

→ **ArcMap Layer**
- Open Attribute Table, Select by Attribute
- Open Layer properties, Symbology, Categories

✓ Manually Counting, on map

Counting Method-2

ArcGIS Analysis Tools
- Spatial Join
- Intersect
- Merge

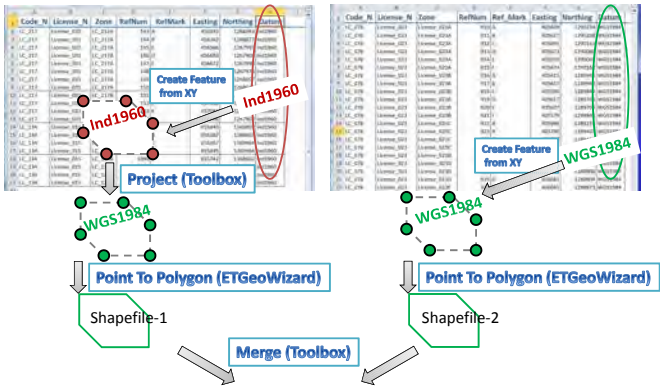
→ Table to Excel

Convert to Excel file, without breaking data;
✓ Khmer character
✓ Comma, dot, space

Excel
- Formula (SUM, COUNT,...)
- Pivot Table

✓ To create Statistical table is easier than ArcMap.

Concession (on Different Datum)



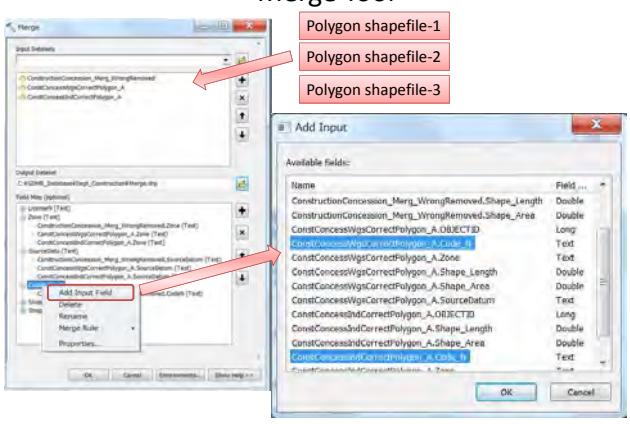
One shapefile (combined)

Various types of Concession

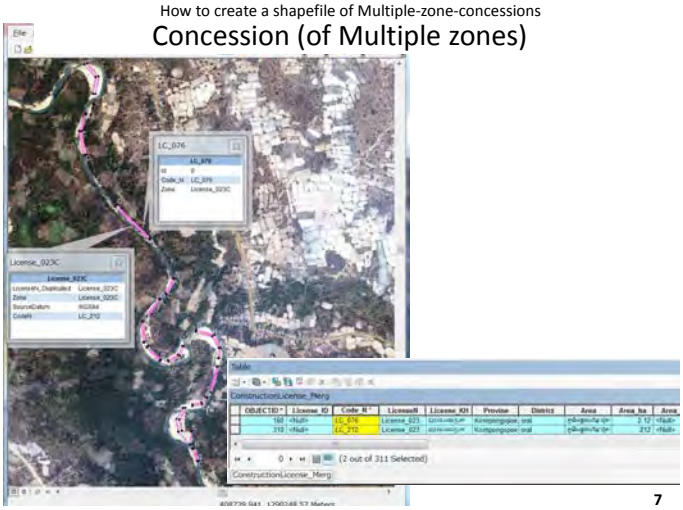
- Multiple zones of a license → Polygon shapefile-1
  - Input Zone to separate polygon
- Different datum → Polygon shapefile-2
  - Seperately to create Feature from XY
- LINE (Linear) concession → Polygon shapefile-3
  - Create Polyline by ETGeoWizard
  - Buffer of ArcToolbox

→ "Merge" Tool

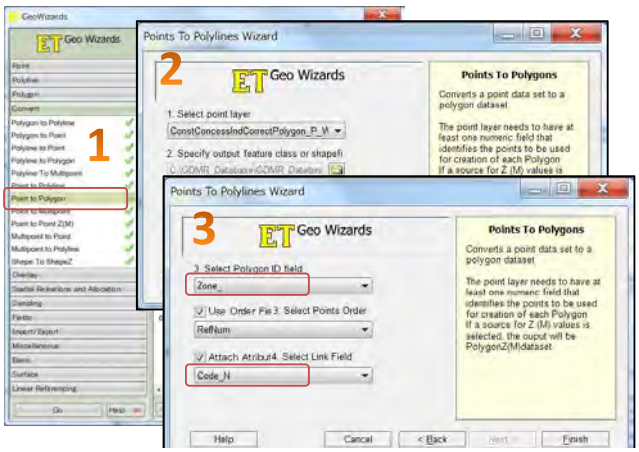
Merge Tool



Concession (of Multiple zones)

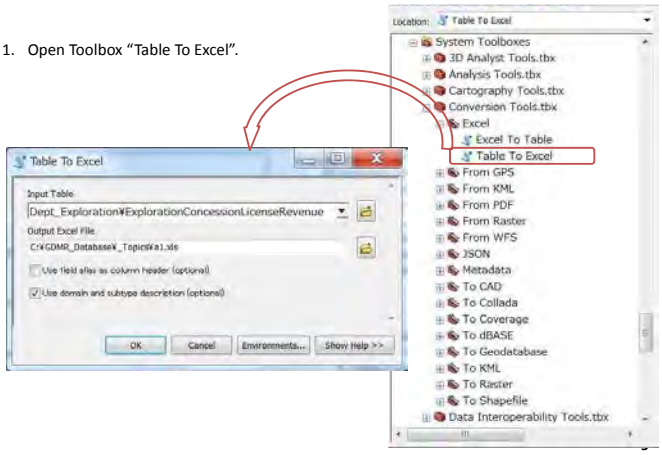


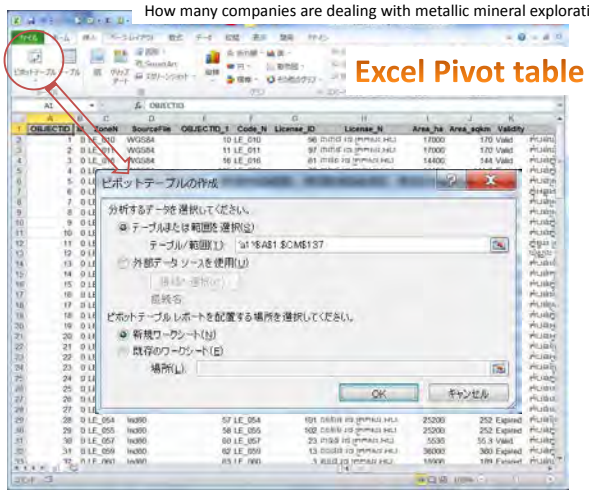
Point to Polygon By Zone



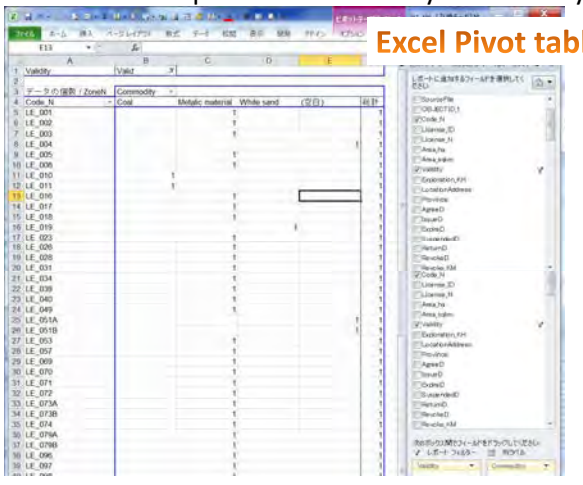
How to create Excel's Statistical table from GIS data

1. Open Toolbox "Table To Excel".

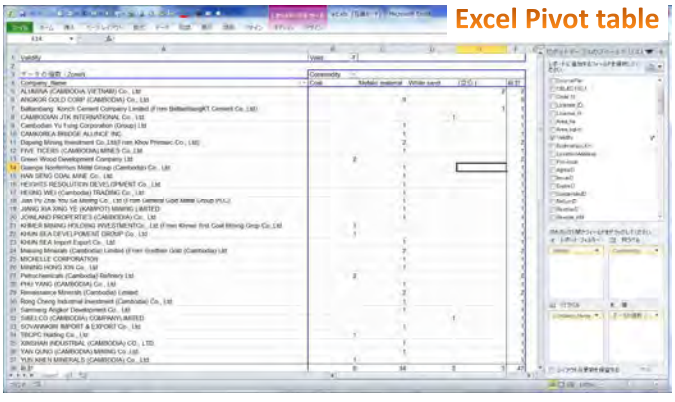




Number of Exploration License by Commodity,

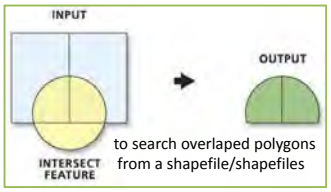


Number of Company by Commodity

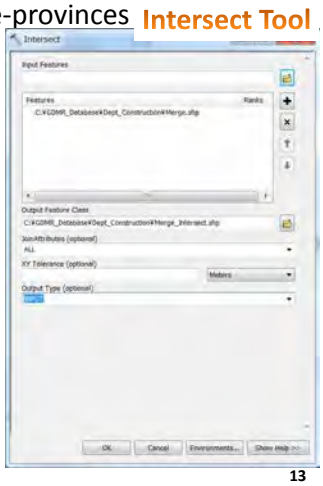


How many concessions in Mondulkiri province (should count those to border 2 or 3 provinces)?

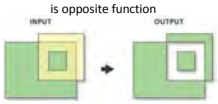
over Multiple-provinces Intersect Tool



to search overlaped polygons from a shapefile/shapefiles

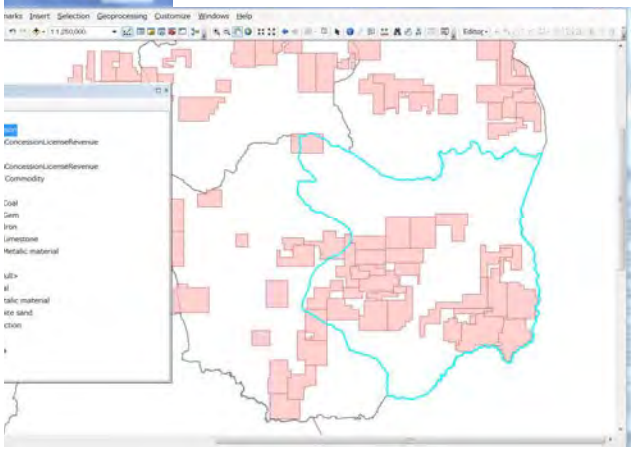


cf) Symmetrical Difference (Analysis) is opposite function

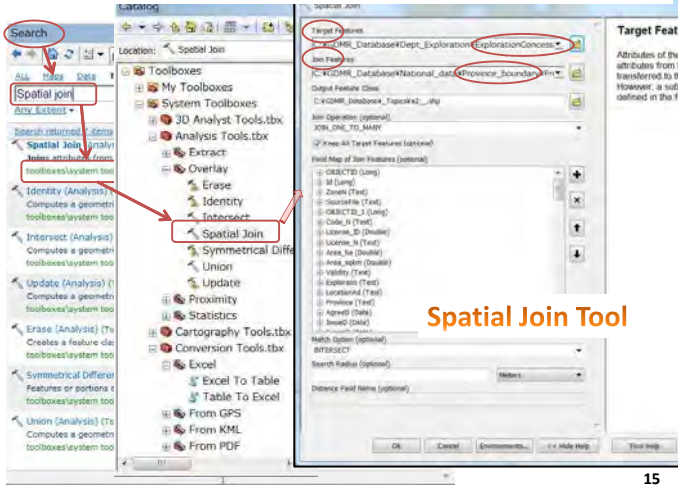


How many concessions in Mondulkiri province (should count those to border 2 or 3 provinces)?

How to Select Intersected Concession



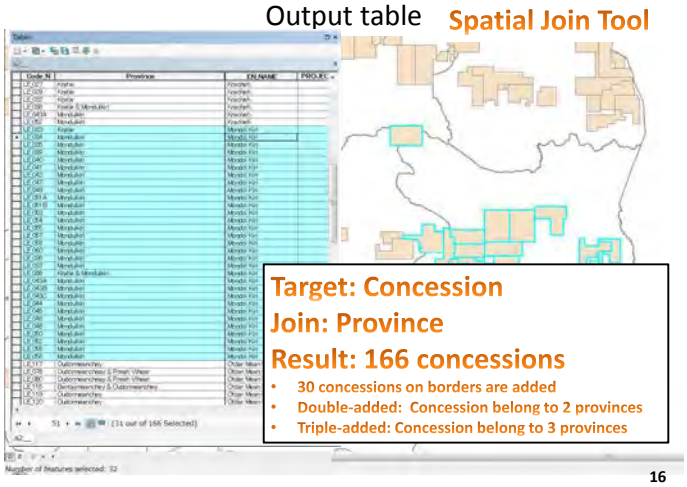
How many concessions in Mondulkiri province (should count those to border 2 or 3 provinces)?



Spatial Join Tool

How many concessions in Mondulkiri province (should count those to border 2 or 3 provinces)?

Output table Spatial Join Tool

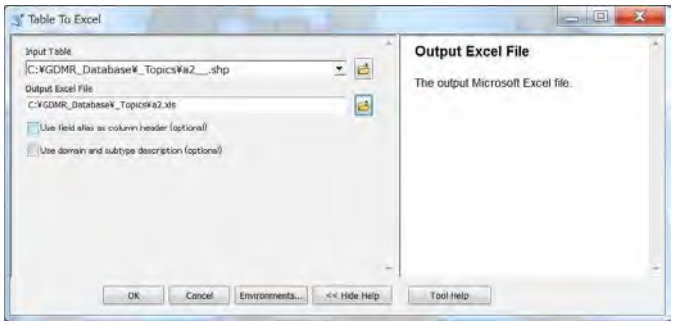


Target: Concession
Join: Province
Result: 166 concessions

- 30 concessions on borders are added
- Double-added: Concession belong to 2 provinces
- Triple-added: Concession belong to 3 provinces

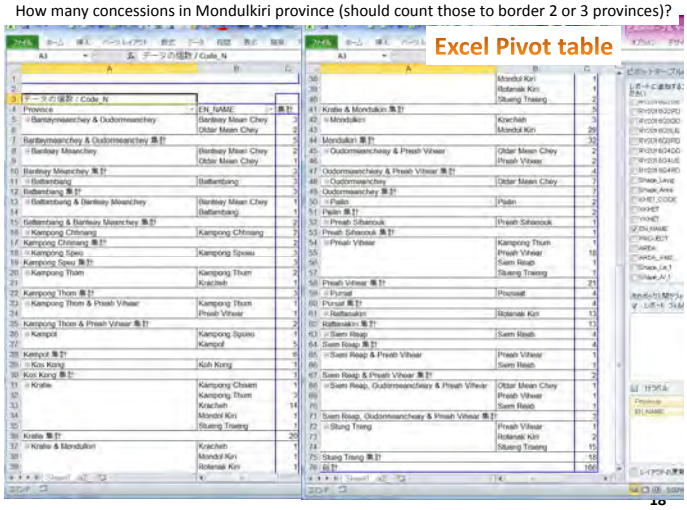
How many concessions in Mondulkiri province (should count those to border 2 or 3 provinces)?

Output to Excel file Spatial Join result

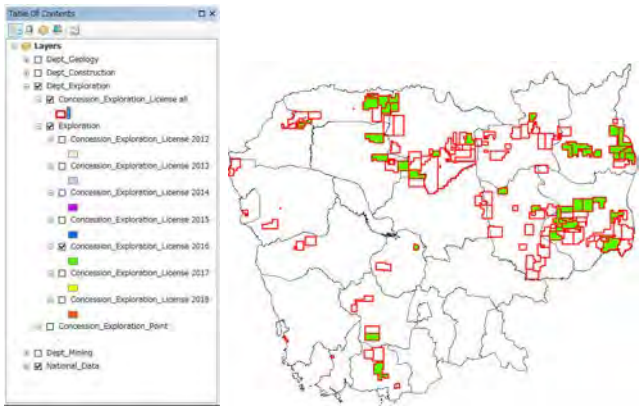


How many concessions in Mondulkiri province (should count those to border 2 or 3 provinces)?

Excel Pivot table



Valid Concession by Year



Valid Concession of 2016