

Let' s find a theme and analyze it

How to find a theme

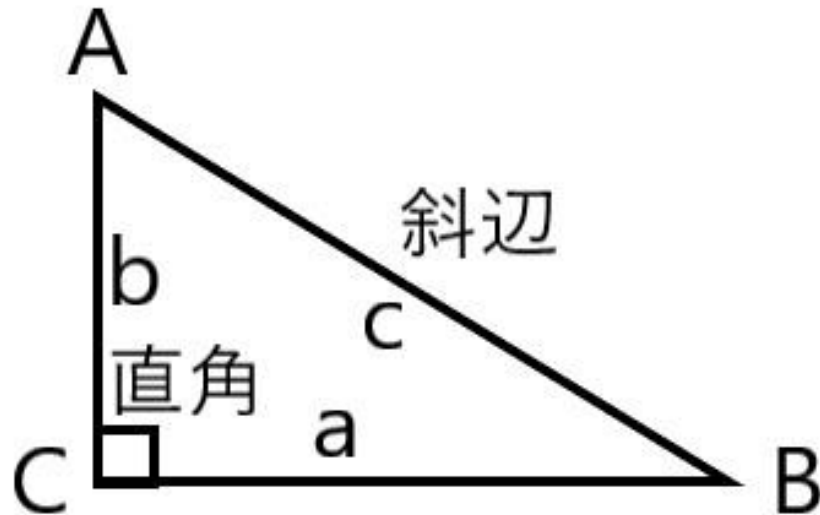
- A local action to visit a company or a research institute and discuss it by interview.
- Visiting some facilities and make a report on impression.
- Deepen an environmental problem from a newspaper and/or a book

How to analyze a theme

- Quick surveying outside.
- SWOT analysis, figure (diagram) with a use of EXCEL, and a use of GIS.

Introduction to surveying

- Review of trigonometrical function



Sine : $\sin B = b \div c$ (b/c)

Cosine : $\cos B = a \div c$ (a/c)

Tangent : $\tan B = b \div a$ (b/a)

For example

Assume $C=90^\circ$ $B=30^\circ$ $A=60^\circ$

$a=\text{square root } 3 (= 1.73)$, $b=1$, $c=2$

$\sin 30 = 1 \div 2 = 0.5$,

$\cos 30 = 1.73 \div 2 = 0.87$,

$\tan 30 = 1 \div 1.73 = 0.58$

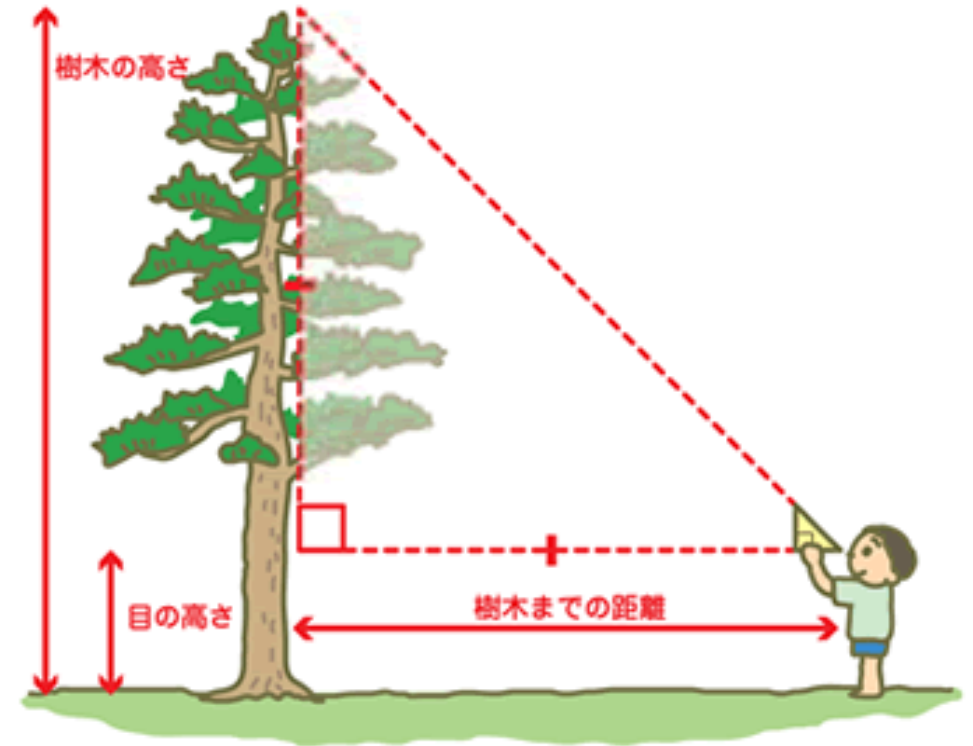
Calculate the height

Question

Top of the tree is measured 30° from horizon, Distance to the tree is 20 m, measure base (eyes) is 1.5 m height. How is the tree height?

Answer

$20\text{m} \times \tan 30 = 20 \times 0.58 = 11.6 \text{ m}$,
Measure base (eyes) height 1.5 m is added. Result is 13.1 m



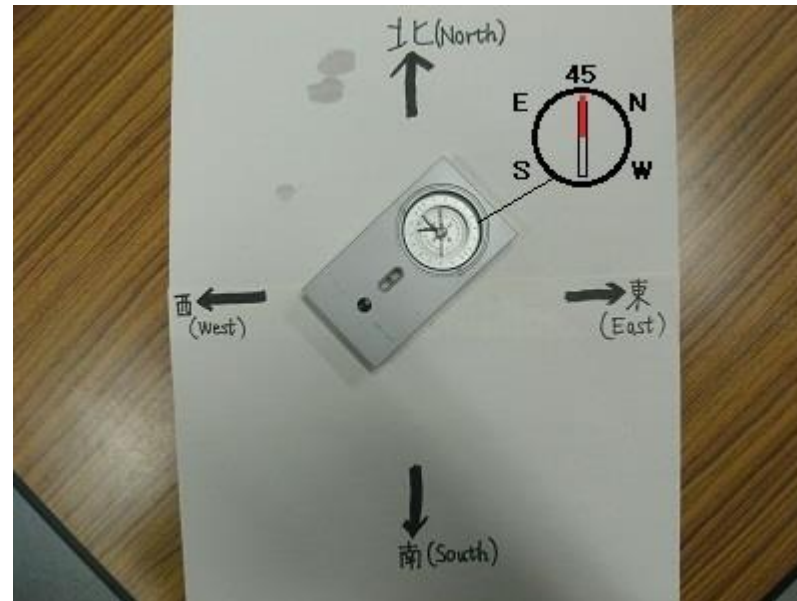
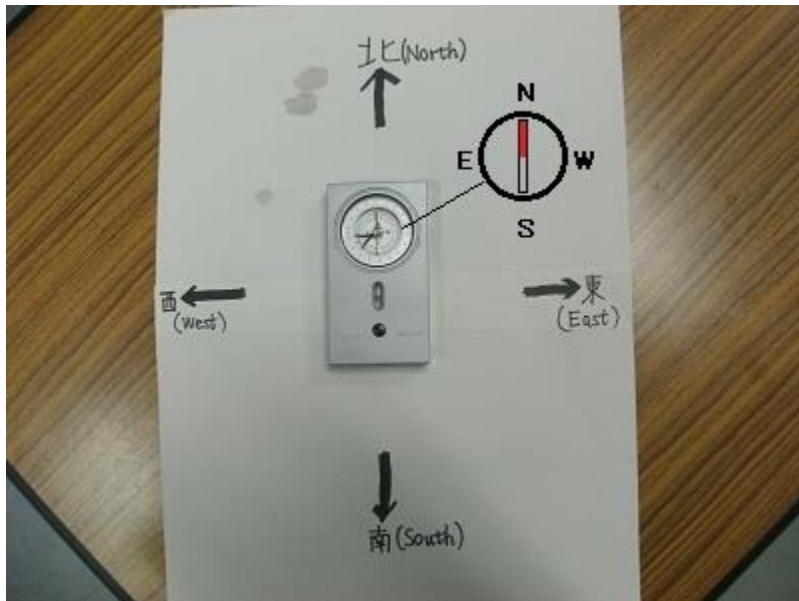
Japan Green Center HP

Measuring distance by a step

- A ruler tape can give distance to the point. Laser instrument can also give.
- Foot steps can give distance without using the tool .

Measuring direction

- Left: The magnetic needle (colored side) shows the north when you put a clinometer to the direction of the north.
- Right: The magnetic needle (colored side) shows 45 degrees east from the north ($N 45^{\circ} E$) when you turn a clinometer to the direction of northeast ($N 45^{\circ} E$).



SWOT Analyses

Strength

A good point of the company and the company product. A positive factor of the internal environment.

Weakness

A bad point of the company and the company product. A negative factor of the internal environment.

Inner negative

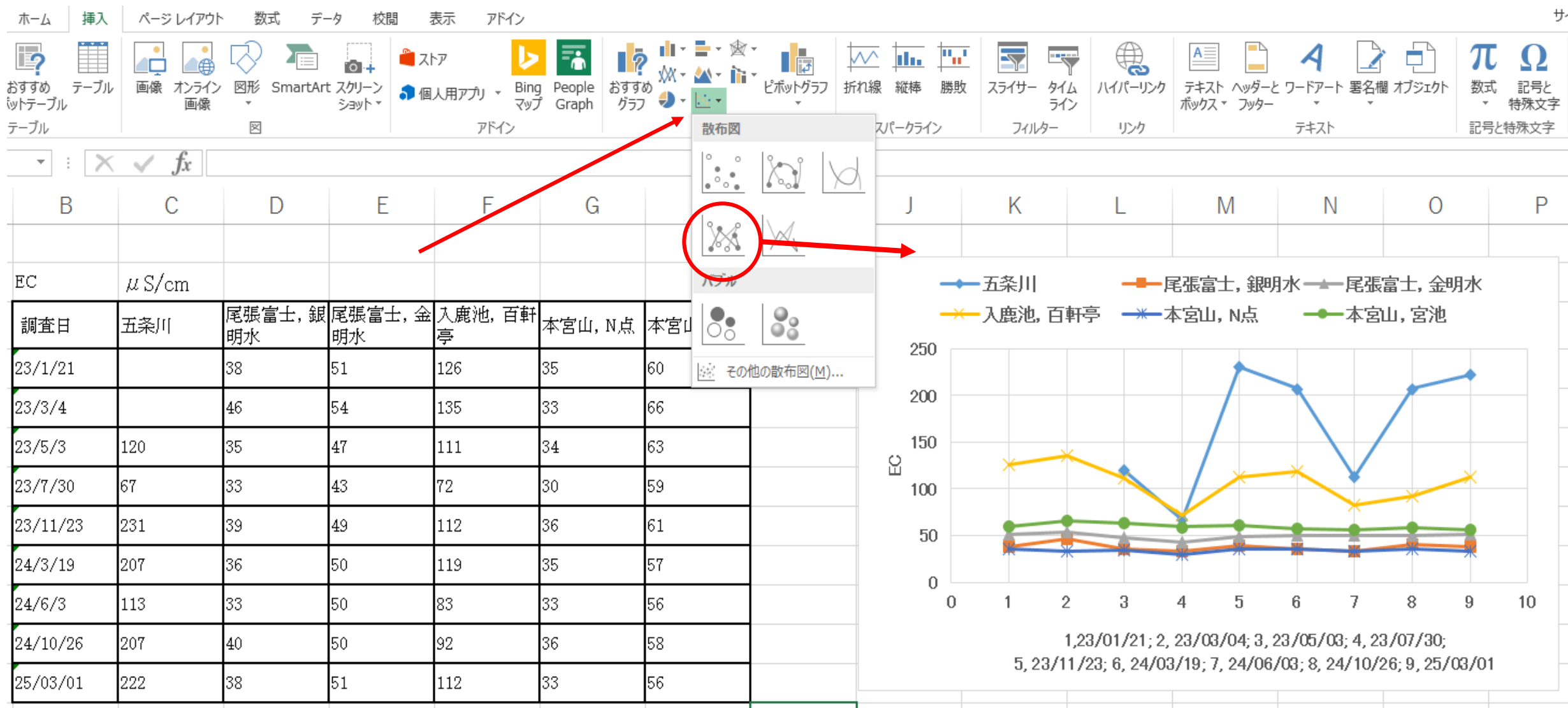
Opportunity

A good point for the company and the company product by society or the market. A positive factor of the external environment.

Threat

A bad point for the company and the company product by society or the market. A negative factor of the external environment.

Making a graph from analytical data



Data processing GIS (Geographical Information System)

First download TNT mips of Microimages

<http://www.microimages.com/downloads/tntmips.htm>

This time the background (base) map image is small data size, so we can use freely this soft wear.

Targets in data processing

1. Location point is defined on the map by coordination (GPS data).
2. Input each point analytical data.
3. Each point data is distinguished by color and/or size in the map.
4. Figures are prepared for a presentation slide or a report.

Start TNT mips, then Select “Main” in Menu bar then “Edit”.

Menu bar: Main Image Geometric Terrain Database Script Tools

↓ (Pull down)

Display

Edit

Georeference

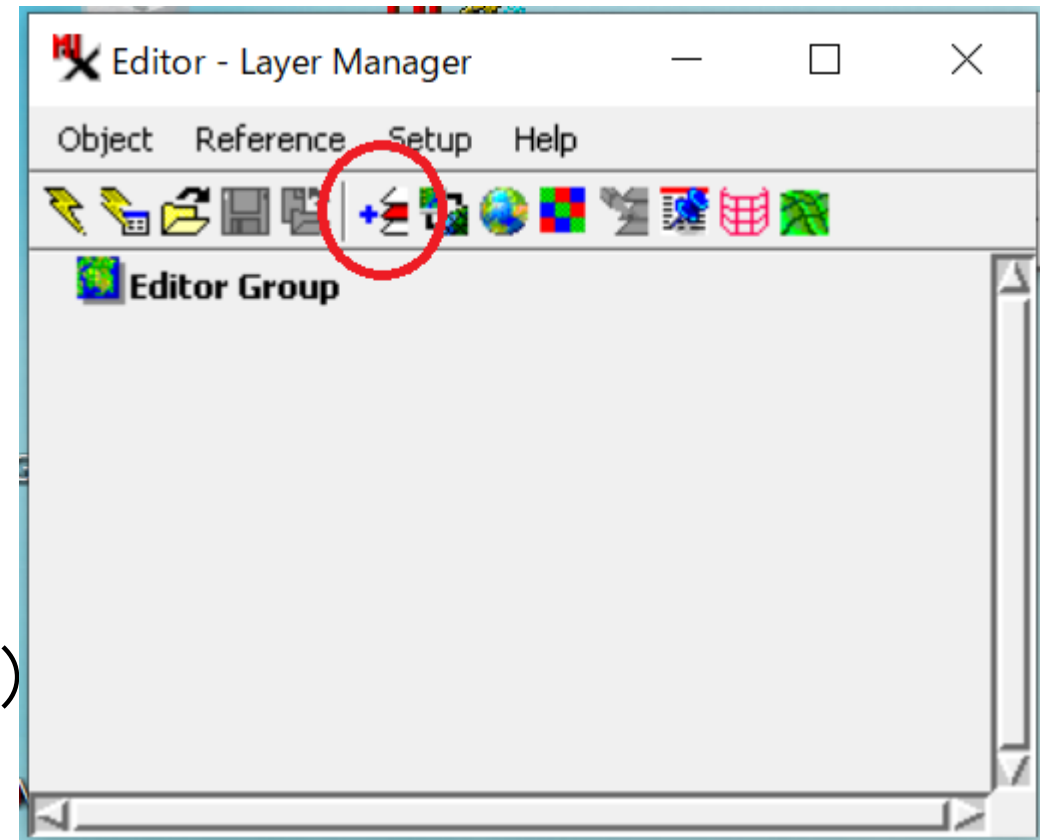
:

Exit

In Layer Manager,

Push +Mark Symbol (Add reference object)

Select object to display



Editor View and Layer Manager

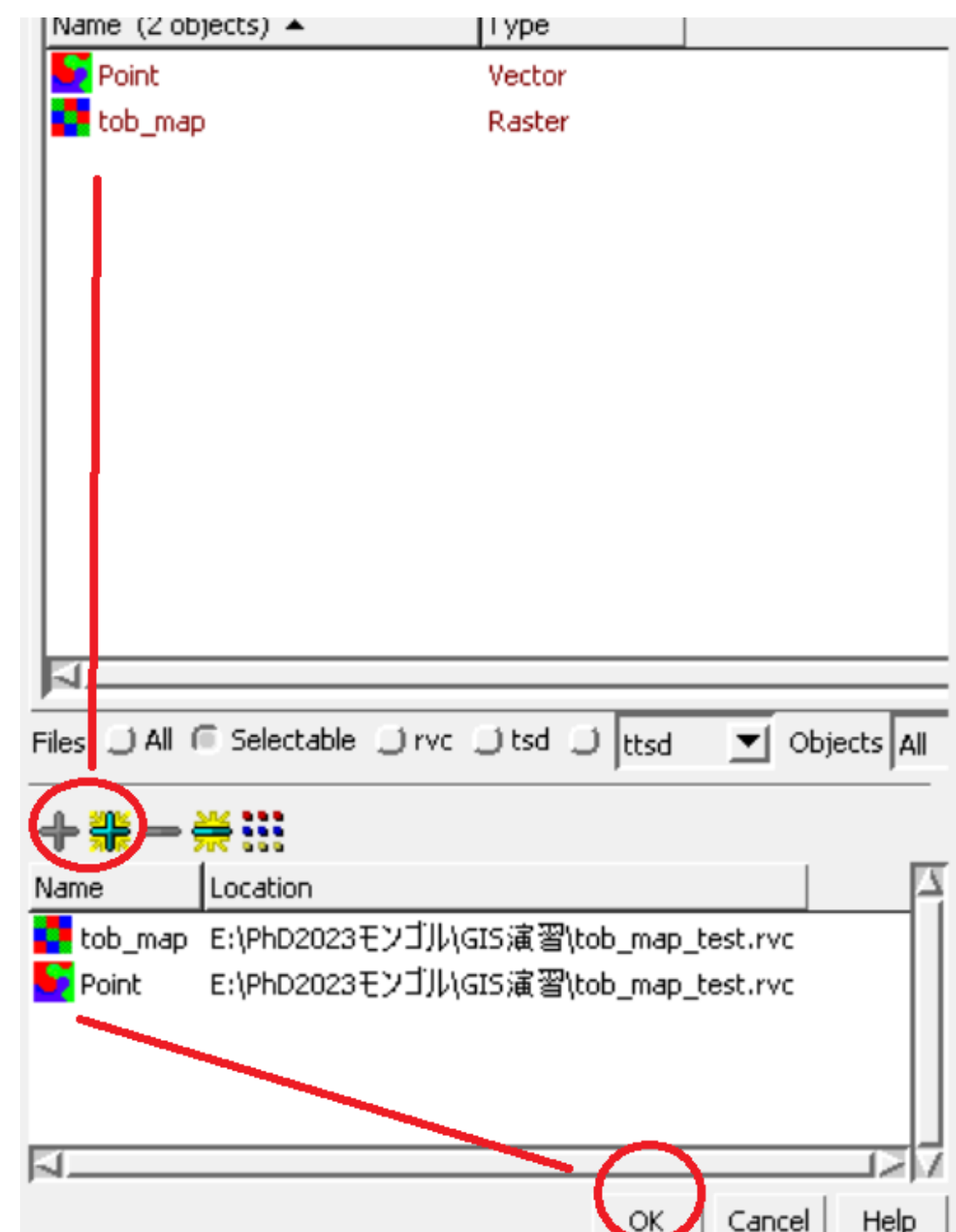
Select file (“tob map test”) and then select objects (“tob_map” – raster image) and “Point” (vector).

Push OK, then open “Layer Manager” and “Editor – View”

Remarks

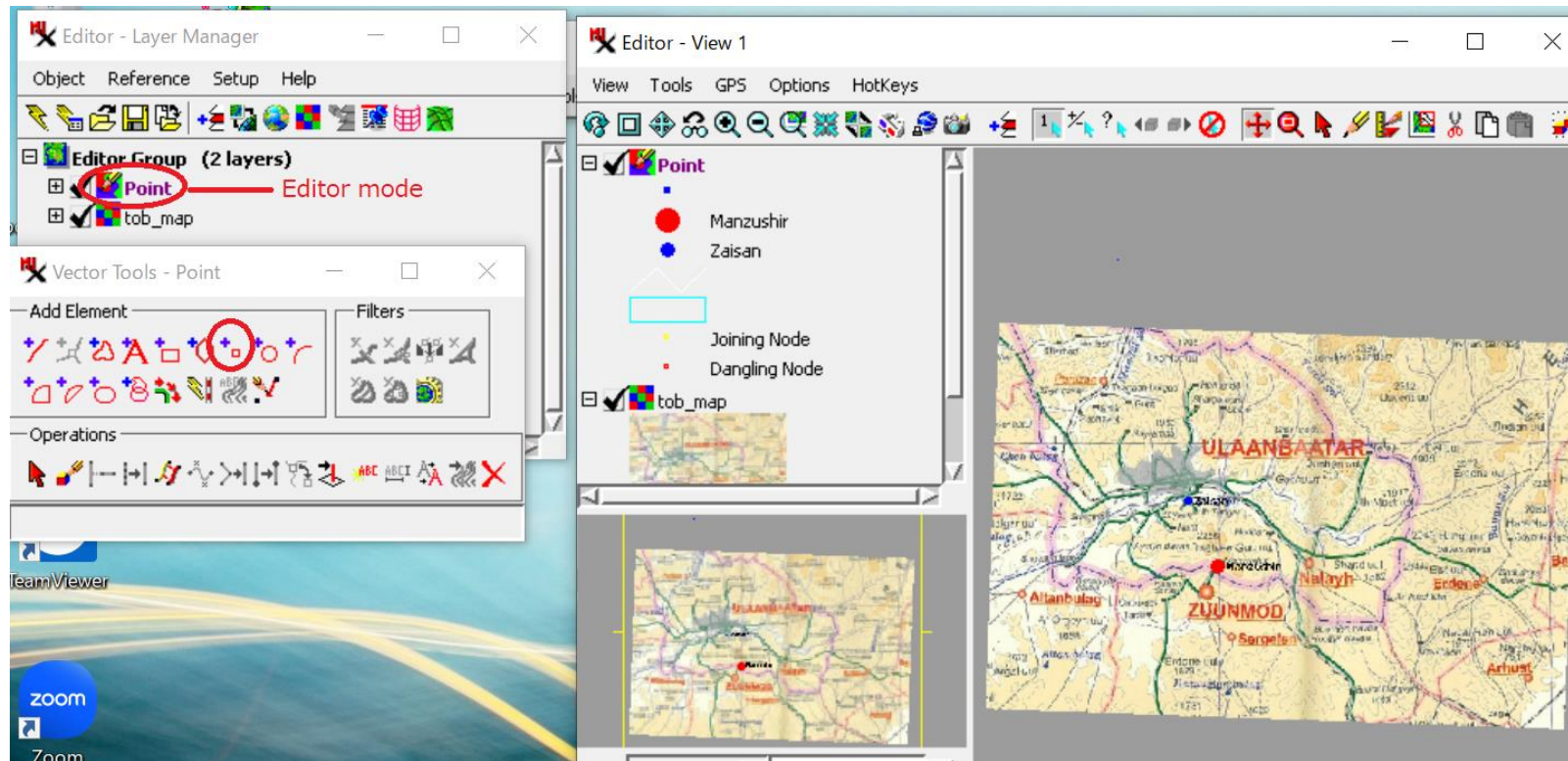
Training data file: tob_map_test. rvc

Research data file: Mongolia_2023. rvc



In Layer Manager, Select “Point” and push a pencil mark button. “Vector Tools – Point” appears.

In “Add Element”, select point (+□).



1. Input coordination data in “Add Point Parameters”.
2. With a use of Manual Entry,
Put data into Longitude and Latitude (decimal).Then push “Add”.

For example, test data **Plant3** (2017, G4 206): 47_53_55.4, 106_52_01.9 pH 6.76, EC 28.9, Ca 52.2, NO₃ 7.2

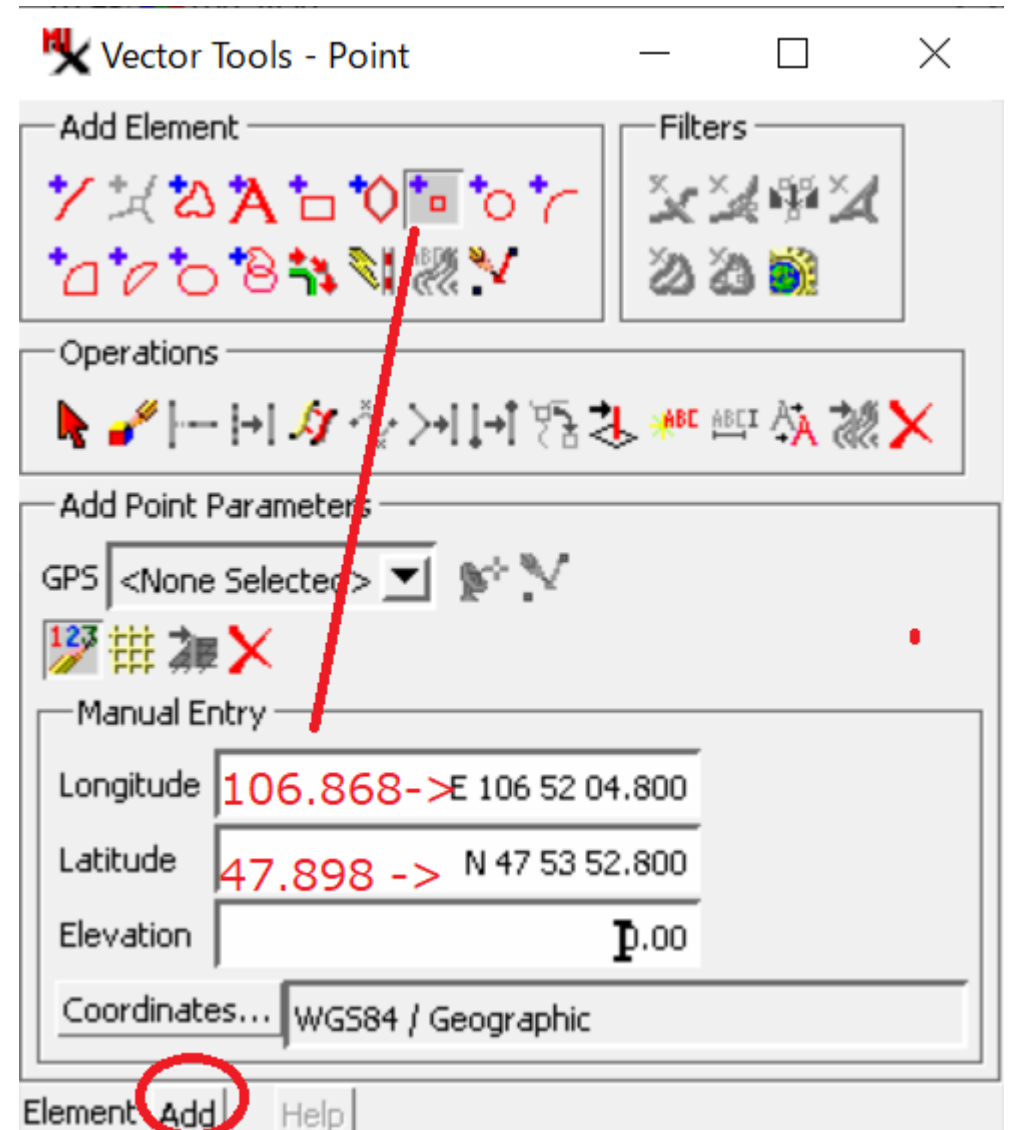
Latitude: $47+53/60+55.4/3600$

$=47.883+0.015=47.898,$

Longitude: $106+52/60+1.9/3600$

$=106.867+0.001=106.868$

How to define a point from GPS data



Input data in a table

In Editor–Layer Manager

Push “+” of the object (Point)

(+) (Vector object mark)

(+)Points

Lines

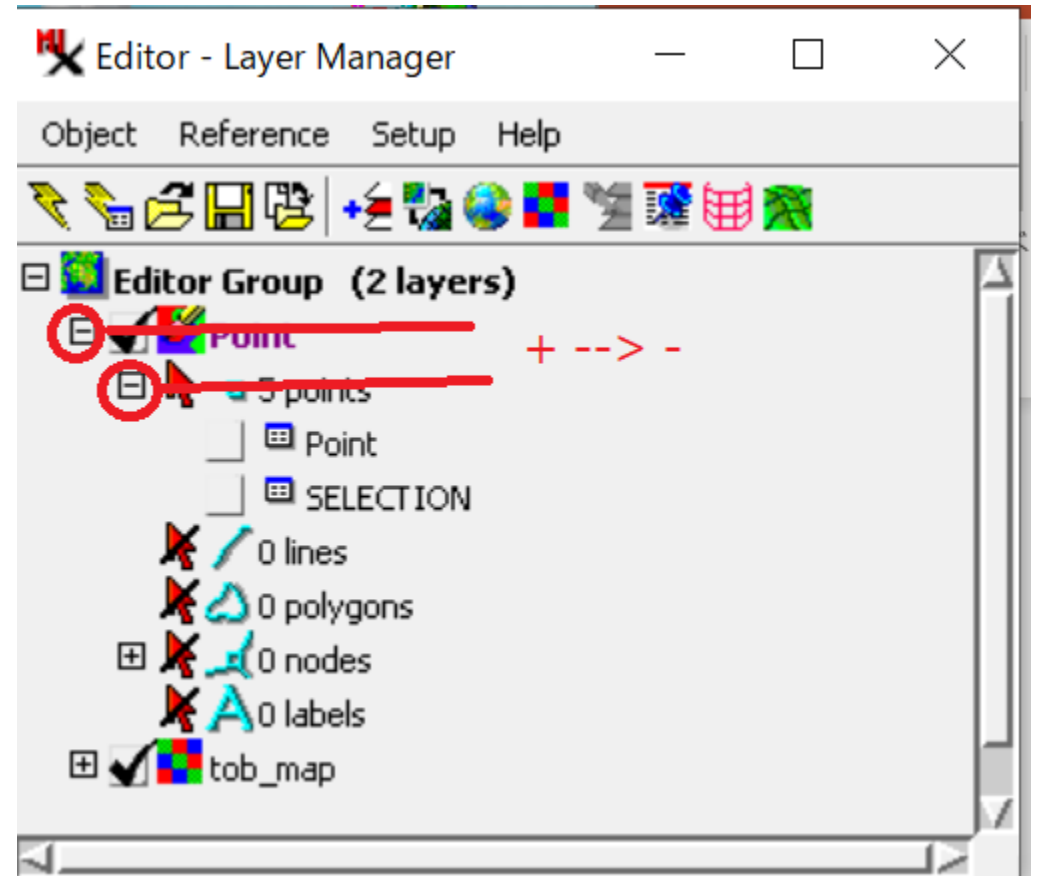
Polygons

Nodes

Labels

Push “+” of points

Table for the point data is prepared.



- Push next table mark, then Table appears.
- Push “Arrow mark” for the new point in the Editor View.
- Input data of the new point.

Table

The screenshot shows a GIS application window with a menu bar (Object, Reference, Setup, Help) and a toolbar. The 'Editor Group (2 layers)' is expanded, showing 'Point (2)' with a sub-menu containing '1 of 5 points marked', 'Point', and 'SELECTION'. Below this, there are icons for lines, polygons, nodes, and labels, all with a red 'X' over them, indicating they are not active. The 'tob_map' layer is also visible.

Below the editor group, a table is displayed with the following data:

No.	pH
Power 3	6.76
Zaisan	6.37

Red arrows and labels indicate the steps:

- (1) Table opens: Points to the 'Table' button in the toolbar.
- (2) Push: Points to the 'Arrow mark' icon in the toolbar.
- (3) Space for the new point: Points to the empty row in the table.
- (4) Input data: Points to the 'Power 3' and '6.76' cells in the table.

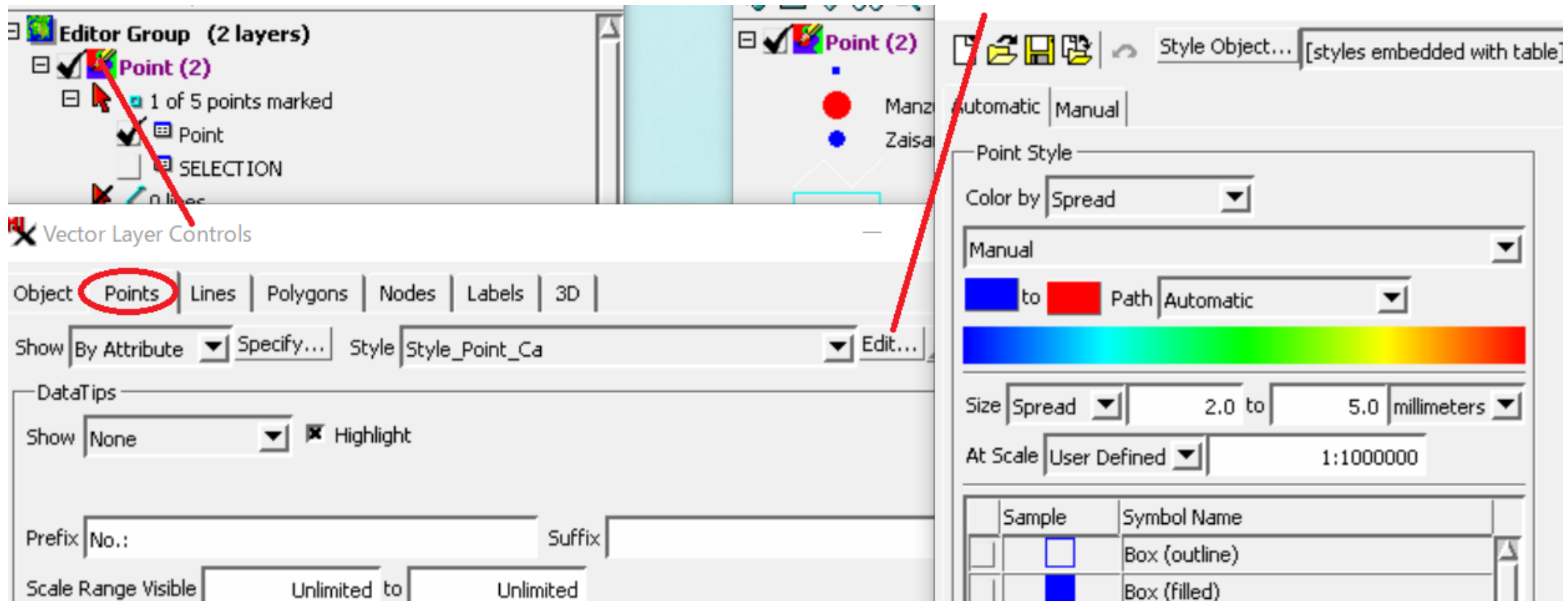
The background shows a map of the Ulaanbaatar area with labels for 'ULAANBAAT', 'ZUUNMOD', 'Sergelen', and 'Zaisan'.

1. Data symbol (size and color) is shown automatically on the map.
2. You can modify style. Push the object mark in the layer manager.

“Vector Layer Control” appears.

Menu: Object **Points** Lines Polygons Nodes Labels 3D

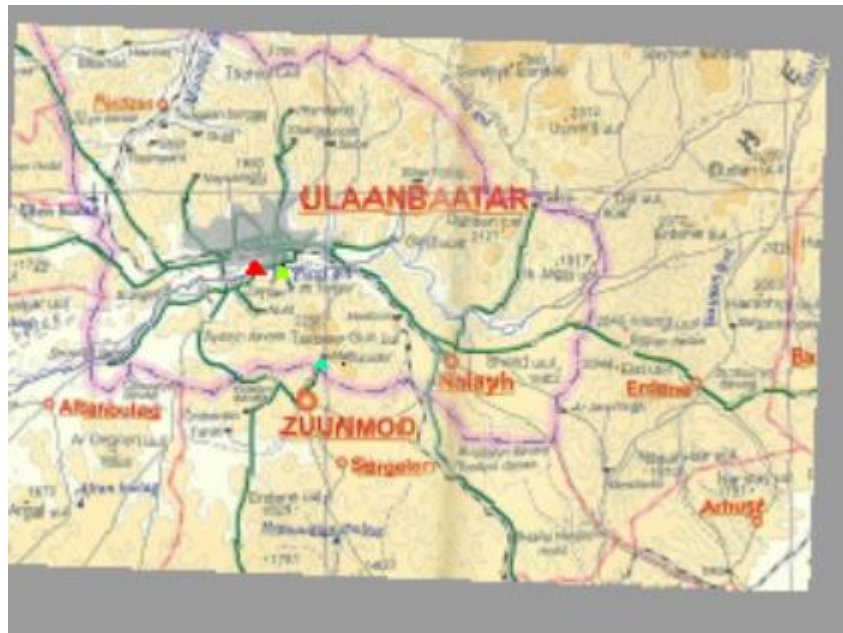
Select “Points” / Show {By Attribute} / Select by Attributes or New one.



Push [Edit...]

Style: Color and Size are defined.

e.g., Color is Spread (blue – red) and Size is 2.0 to 5.0 millimeters
at scale, User defined 1:1000000.



How to print a map image In Display Group – View View

/Print Snapshot

/Output,

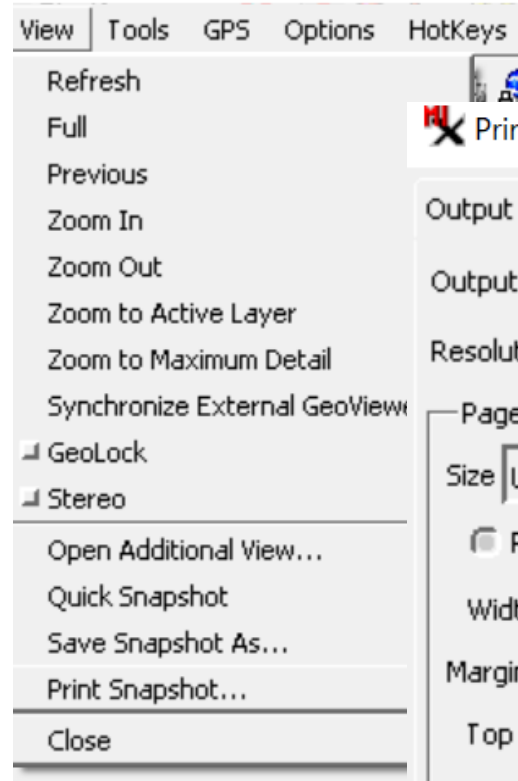
select style, e.g.,
SVG

Print

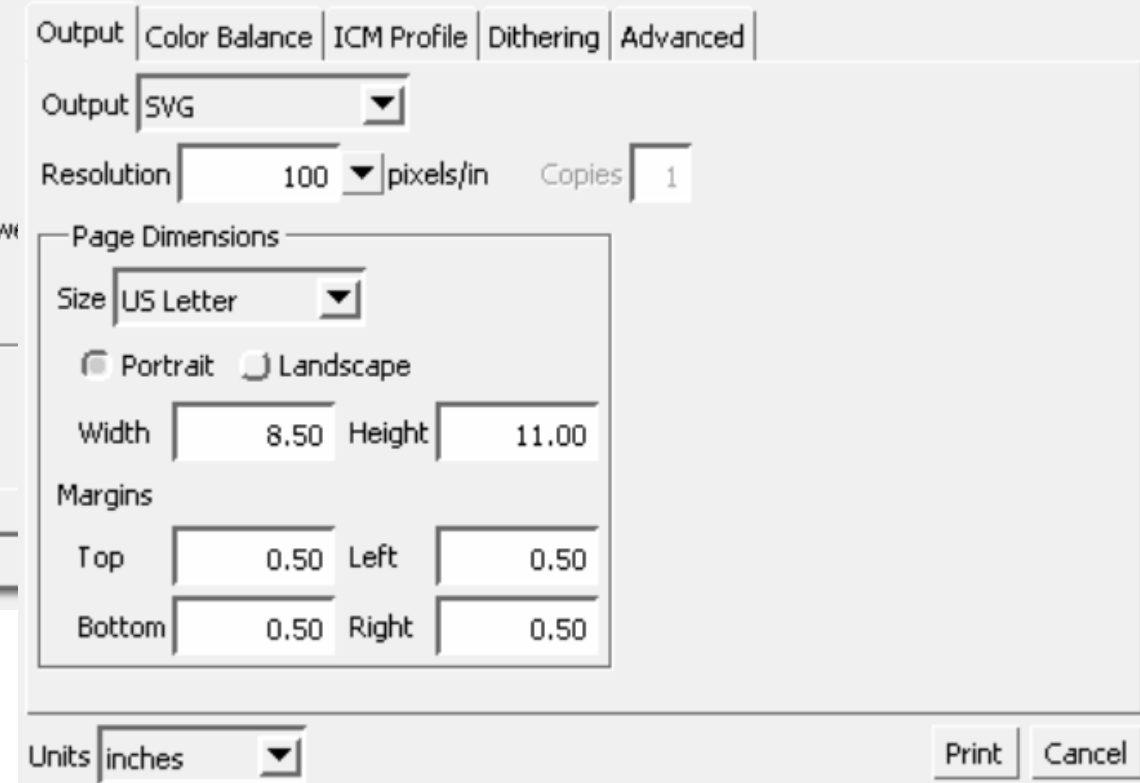
/Select file to print

Create New file or
Overlay previous file.

Display Group 1 - View 1



Print Snapshot...



This image is shown on paint soft after saving.

You can use this image in your document or slide.

