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Modified:

# Retrieving bathymetry data of the Oceans and its processing for iRIC calculation

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Training Course for iRIC

Sep.19(Thu) Nays2D Flood

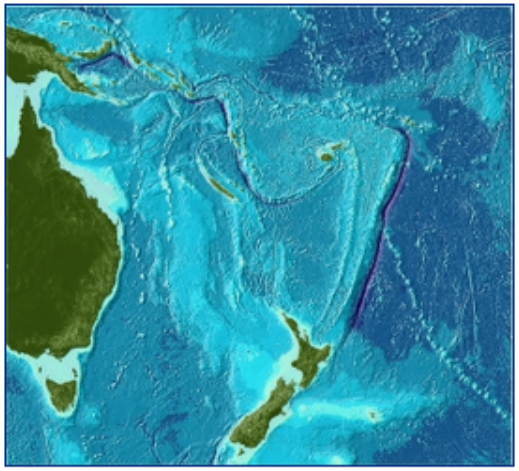
# GEBCO Top


- http://www.gebco.net/

# Gridded bathymetry data top page

## Gridded bathymetry data

GEBCO provides global bathymetry data sets for the world's oceans.



We make the following gridded bathymetry data sets available:

- **The GEBCO_08 Grid** — a global 30 arc-second grid largely generated by combining quality-controlled ship depth soundings with interpolation between sounding points guided by satellite-derived gravity data. However, in areas where they improve on the existing grid, data sets generated by other methods have been included. Land data are largely based on the Shuttle Radar Topography Mission (SRTM30) gridded digital elevation model. A 'source identifier', SID, grid is also available to download to accompany the GEBCO_08 Grid. This shows which grid cells have been constrained by bathymetry data during the gridding process.

- **The GEBCO One Minute Grid** — a global one arc-minute grid

  Released: 2003, updated: 2008 — largely based on the most recent set of bathymetric contours contained within the GEBCO Digital Atlas.

Click the link to download page

On behalf of GEBCO, the GEBCO_08 and GEBCO One Minute Grid are **available to download** from the British Oceanographic Data Centre (BODC). Using this web application, you can select to download the **complete global grid files** or **data for a user-defined area** using an interactive map or by entering the geographic co-ordinates of your area of interest in a dialogue box.

# BODC top page

British Oceanographic Data Centre
NATURAL ENVIRONMENT RESEARCH COUNCIL

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Where to find data
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Argo floats
CTD and underway data (AMT)
Gridded bathymetry data (GEBCO)
UK Tide Gauge Network
Historical UK tide gauge data
International sea level
Numerical model data
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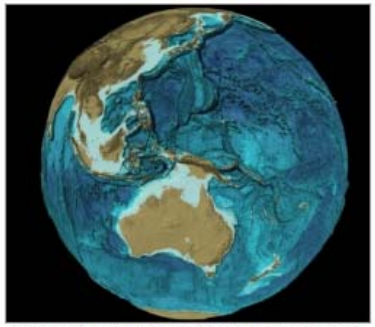
General Bathymetric Chart of the Oceans (GEBCO)

## Gridded bathymetric data sets

GEBCO's aim is to provide the most authoritative, publicly-available bathymetry for the world's oceans. It operates under the joint auspices of the Intergovernmental Oceanographic Commission (IOC) and the International Hydrographic Organization (IHO).


Bathymetry data from the GEBCO_08 Grid ©

Two GEBCO gridded bathymetric data sets, maintained and distributed by BODC, are available to download as netCDF files. You may opt to download data for a user-defined area or the complete global file(s).

- The **GEBCO One Minute Grid** — a global one arc-minute grid

  Released: 2003, updated: 2008 — largely based on the most recent set of bathymetric contours contained within the GEBCO Digital Atlas.

- The **GEBCO_08 Grid** — a global 30 arc-second grid

  Released: September 2010 — generated by combining quality-controlled ship depth soundings with interpolation between sounding points guided by satellite derived gravity data. A 'source identifier', SID, grid is also available to download to accompany the GEBCO_08 Grid. This shows which grid cells have been constrained by bathymetry data during the gridding process.

  The GEBCO_08 Grid is currently a development product which will undergo periodic update. Although every effort has been made to reduce the number of errors in the data set, we expect that some grid artifacts will be found. A list of reported bugs may be found on the errata pages.

To download the data you are required to be a registered BODC web user. If you have already registered, please log in, alternatively please register to become a new user.

Additional infor

Data set documentation al
is also available

For downloading GEBCO data, you need to create an account , register, and log in to the account home page

# Registration

My account

## User registration

### Why register?

By providing us with a few simple details about yourself we can

- Provide you with access to our inventories and data download areas
- Keep you informed of changes to this site and the data accessible through it
- Get a better idea of who our customers are and what they want

If you consider yourself an academic user, please regis s to quickly validate your academic status.

Fill in the forms and create your account

Email address:

Password:

Confirm password:

Title:

First name:

Last name:

Organisation:

Address:

### Your login details

You will use this information to login to areas of the BODC web site. The password may be between 8 and 20 characters in length. Capitalisation also matters for your password!

### Your contact details

The 'Personal Details' provided will not be given to any third parties and will only be used to provide you with data and/or information and to generate the online licences for when you request data.

This information will also enable us to characterise the user profile of clients using BODC web services over the internet. This characterisation of the client base will allow us to direct future web-based developments and services to you, our users. It will also provide 'performance indicators' to support future funding of our web development.

# Link to bathymetry data

- The **GEBCO One Minute Grid** — a global one arc-minute grid

  Released: 2003, updated: 2008 — largely based on the most recent set of bathymetric contours contained within the GEBCO Digital Atlas.

- The **GEBCO_08 Grid** — a global 30 arc-second grid

  Released: September 2010 — generated by combining quality-controlled ship depth soundings with interpolation between sounding points guided by satellite derived gravity data. A 'source identifier', SID, grid is also available to download to accompany the GEBCO_08 Grid. This shows which grid cells have been constrained by bathymetry data during the gridding process.

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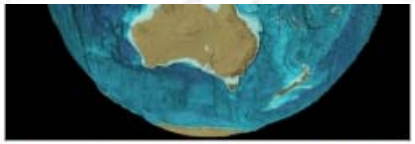


Bathymetry data from the GEBCO_08 Grid
©

After registering and logging in, link button to download page appears

Users must familiarise themselves with the terms of use before accessing the GEBCO bathymetry data.

☑ **I have read and agree to the terms of use**

Access the GEBCO gridded bathymetry data

## Additional information

Data set documentation along with information on export formats, grid version numbering and bug alerts for each of GEBCO's gridded data sets is also available

- GEBCO_08 grid — 30 arc-second resolution
- GEBCO one minute grid — one arc-minute resolution

Free software is available for viewing and accessing data from the grids in ASCII as well as netCDF. Find out more about the GEBCO Grid display software

# GEBCO gridded bathymetry data sets

General Bathymetric Chart of the Oceans (GEBCO)

## Gridded bathymetric data sets

Data are available for download from GEBCO's gridded bathymetric data sets in netCDF. You may opt to select and download data for a user-defined area using the map or form below or use the default global area to download the complete grid files.

To accompany the GEBCO_08 grid, a 'source identifier' or SID grid is also available; this shows which grid cells are based on bathymetric soundings or depth values from a grid and which cells contain predicted depth values.

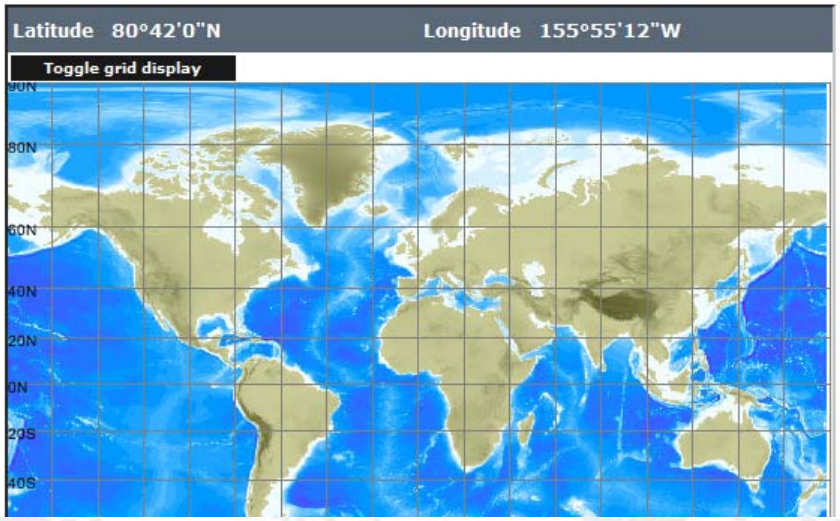
Please note that the bathymetric grids do not contain detailed information in shallow water areas.

### Interactive map

Use the interactive map below to define the geographic area of the gridded data sets that you want to download. Alternatively, type the coordinates of the required area in the form below the map.

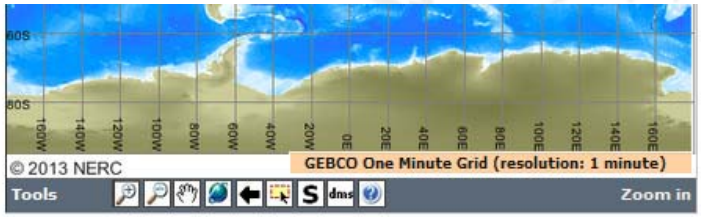
The default display is the GEBCO One Minute Grid. To view the GEBCO_08 Grid (30 arc-second resolution) use the 'Toggle grid display' tab above the map display area.

The GEBCO_08 Grid display includes the option to view the Source Identifier (SID) grid by toggling the 'Toggle SID grid display'. It shows those grid cells for which the data in the GEBCO_08 Grid are based on bathymetric sounding or grid values. It is best viewed at a zoomed in level to appreciate the detail in the data set.




In the download page, you can select your region of interest in the interactive map like shown in this figure, however, several steps are needed for accessing GEBCO data.

# Downloading world ocean data




Leave values and characters unchanged

Northernmost latitude 90 ° 0 ' N

Westernmost longitude 180 ° 0 ' W

Easternmost longitude 180 ° 0 ' E

Southernmost latitude 90 ° 0 ' S

Reset to World

## Download data

### Grid selection

Use the tick boxes to select the dataset you wish to download for the geographic region defined above.

Depending on the grid resolution and the size of your area selection, data delivery may take several minutes. For this reason t different grid files need to be downloaded separately.

- GEBCO_08 Grid (30 arc-second interval) ☑
- GEBCO_08 SID Grid (30 arc-second interval) ☐
- GEBCO One Minute Grid (1 arc-minute interval) ☐

### Grid format selection

The data file will be made available as a netCDF formatted data file consisting of a one-dimensional (1D) array of 2-byte signe integer values.

Free software is available to download to view and access the data in ASCII or netCDF formats. Further information can be foun the data set documentation.

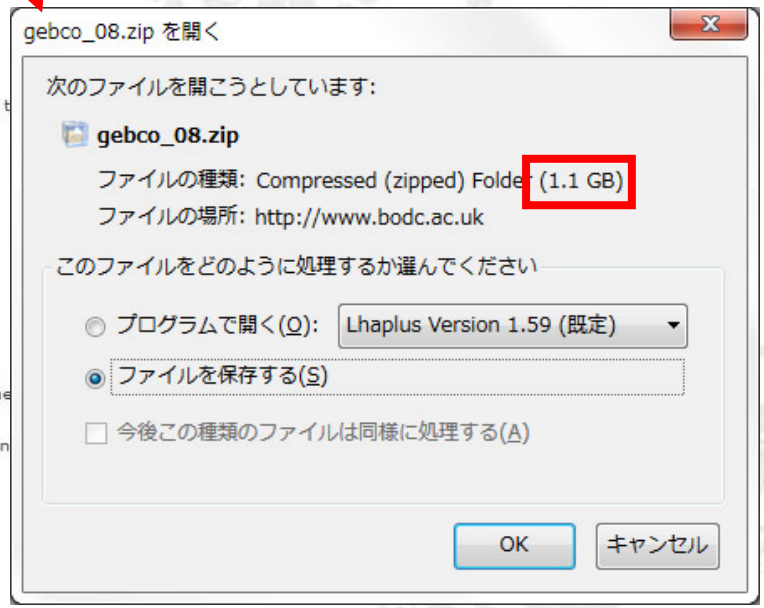
### Download

You must download the documentation first which includes the license and grid documentatio

Download Documentation | Download Data

Data delivery may take several minutes depending on the grid resolution and area selection, please be patient.

Firstly, you must download the whole data, namely, GEBCO_08 grid (30 arc-second interval).



# Downloading free software

Use the tick boxes to select the dataset you wish to download for the geographic region defined above.

Depending on the grid resolution and the size of your area selection, data delivery may take several minutes. For this reason the different grid files need to be downloaded separately.

GEBCO_08 Grid (30 arc-second interval)

GEBCO_08 SID Grid (30 arc-second interval)

GEBCO One Minute Grid (1 arc-minute interval)

Secondly, for visualization of GEBCO data, a software provided in the same page is needed. Download link is just above the "Download Data" button.

## Grid format selection

The data file will be made available as a netCDF formatted data file consisting of a one-dimensional (1D) array of 2-byte signed integer values. Free software is available to download to view and access the data in ASCII or netCDF formats. Further information can be found in the data set documentation.

## Download

You must download the documentation first which includes the license and grid documentation.

Download Documentation | Download Data

Data delivery may take several minutes depending on the grid resolution and area selection, please be patient.

## Additional information

Data set documentation along with information on export formats, grid version numbering and bug alerts for each of GEBCO's gridded data sets is also available

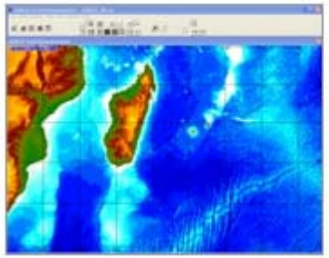
- GEBCO_08 grid — 30 arc-second resolution
- GEBCO one minute grid — one arc-minute resolution

BODC software products

# GEBCO Grid display

The GEBCO grid display software allows you to view and access data from GEBCO's gridded bathymetric data sets

- the GEBCO One Minute Grid — a global one arc-minute grid
- the GEBCO_08 Grid — a global 30 arc-second grid



Viewing data from the GEBCO_08 Grid

The software is available to download under licence and can be used with either or both gridded data sets. Please note that **the software is designed for use with the complete, global data files.** It will not work with subsets of the full global data sets.

It provides the means for displaying the data and accessing the data in netCDF and also in simple ASCII formats, including one suitable for conversion to a raster file which can be used with ESRI ArcGIS products.

The software has been developed by BODC to run on a PC running Microsoft Windows 95 or later. It is controlled by a series of drop-down menus and toolbar buttons. The **current version is 2.13** and was released in April 2010.

Find out more about the GEBCO Grid display software and updates included in this release. (27 KB)

## Features of the GEBCO Grid display software

- Display GEBCO's gridded bathymetric data sets on your PC screen, colour coded for depth/elevation.
- Export data in simple ASCII formats including a format that can be converted to a raster file, which can be used with ESRI ArcGIS products.
- Export data in netCDF.
- Choice of five map projections for display — Equidistant Cylindrical, Mercator, Miller Cylindrical, Lambert Cylindrical Equal-Area and Polar Stereographic.
- Import your own file(s) of data points to display in the map area.
- Select your geographic area of interest either by chart number, by latitude and longitude limits, or by an on-screen zoom box.
- Zoom into and pan across your selected area.
- Overlay a geographic grid for reference.

## Reported bug on 31 July 2012

A bug has been reported in the GEBCO grid display software that affects the export of the GEBCO_08 Grid and GEBCO_08 SID grid. **In some limited cases** when the selected geographic region for export is defined as a fraction of a whole degree, then the exported data value at each grid point has been shifted (in longitude) by one grid cell, i.e. 30 arc-seconds, from its correct value.

We apologise for any inconvenience caused and are working to fix this bug. We will make a revised version of the software available as soon as possible.

In the meantime, we recommend that users of the GEBCO grid display software select geographic regions for export at whole degree intervals rather than as fractions of a degree.

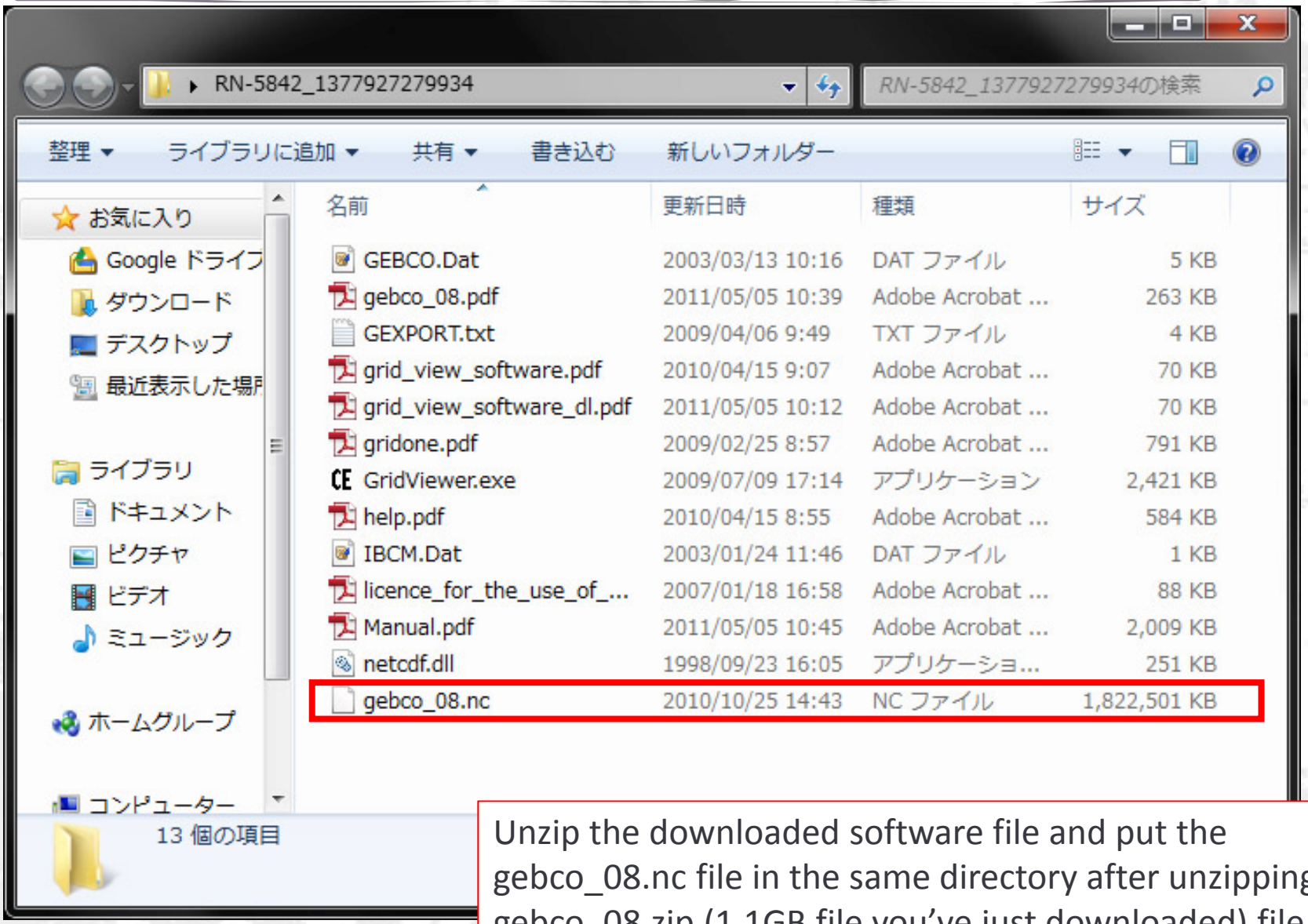
## Software download

To download this software you are required to have a BODC web user account. If you have already registered and have an account, please follow the link below to download the software. Alternatively, register to become a new user.

Download the GEBCO Grid display software — the download consists of a compressed zip file containing the software, the user guide and help files (3090 KB).

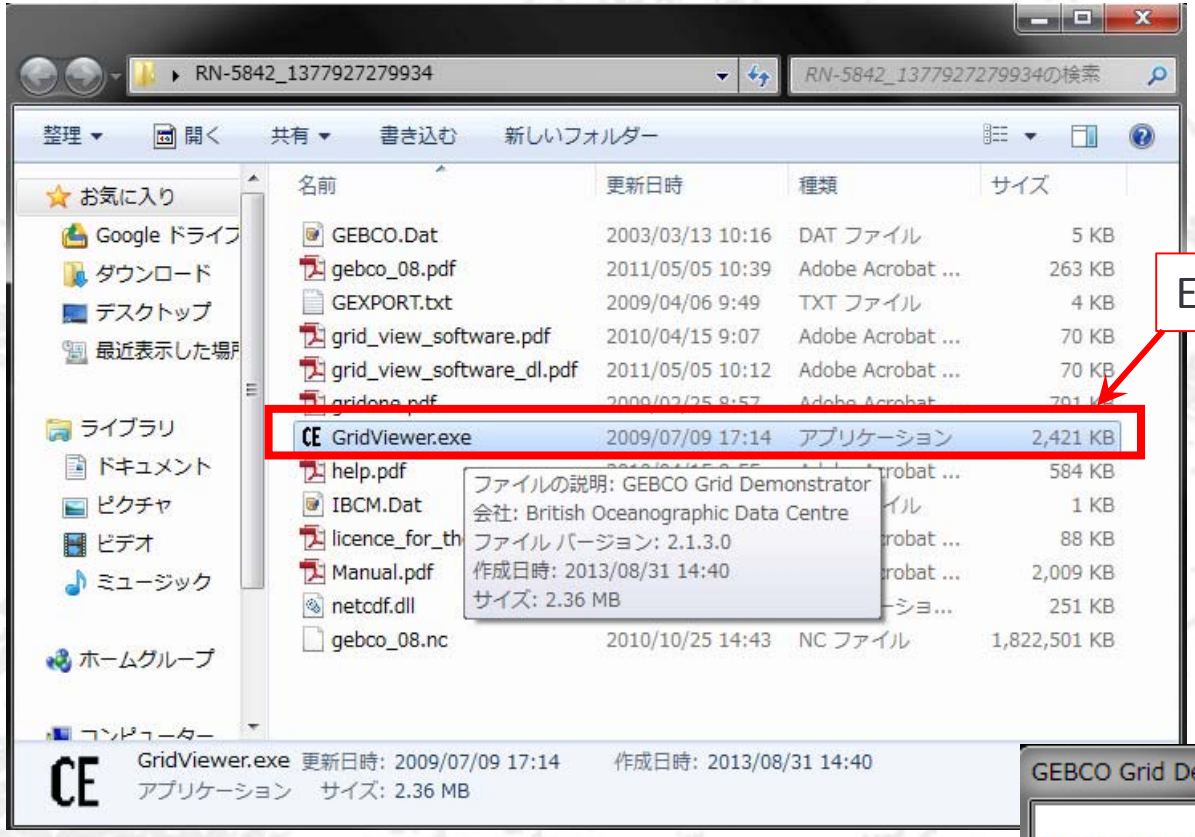
Link to GEBCO Grid display software is at the bottom of the download page.

# Grid Viewer download

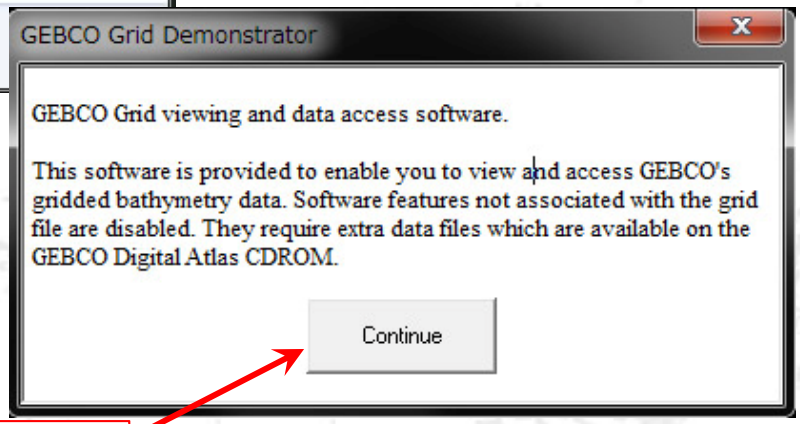



Unzip the downloaded software file and put the gebco_08.nc file in the same directory after unzipping gebco_08.zip (1.1GB file you've just downloaded) file.

# Execute the viewer

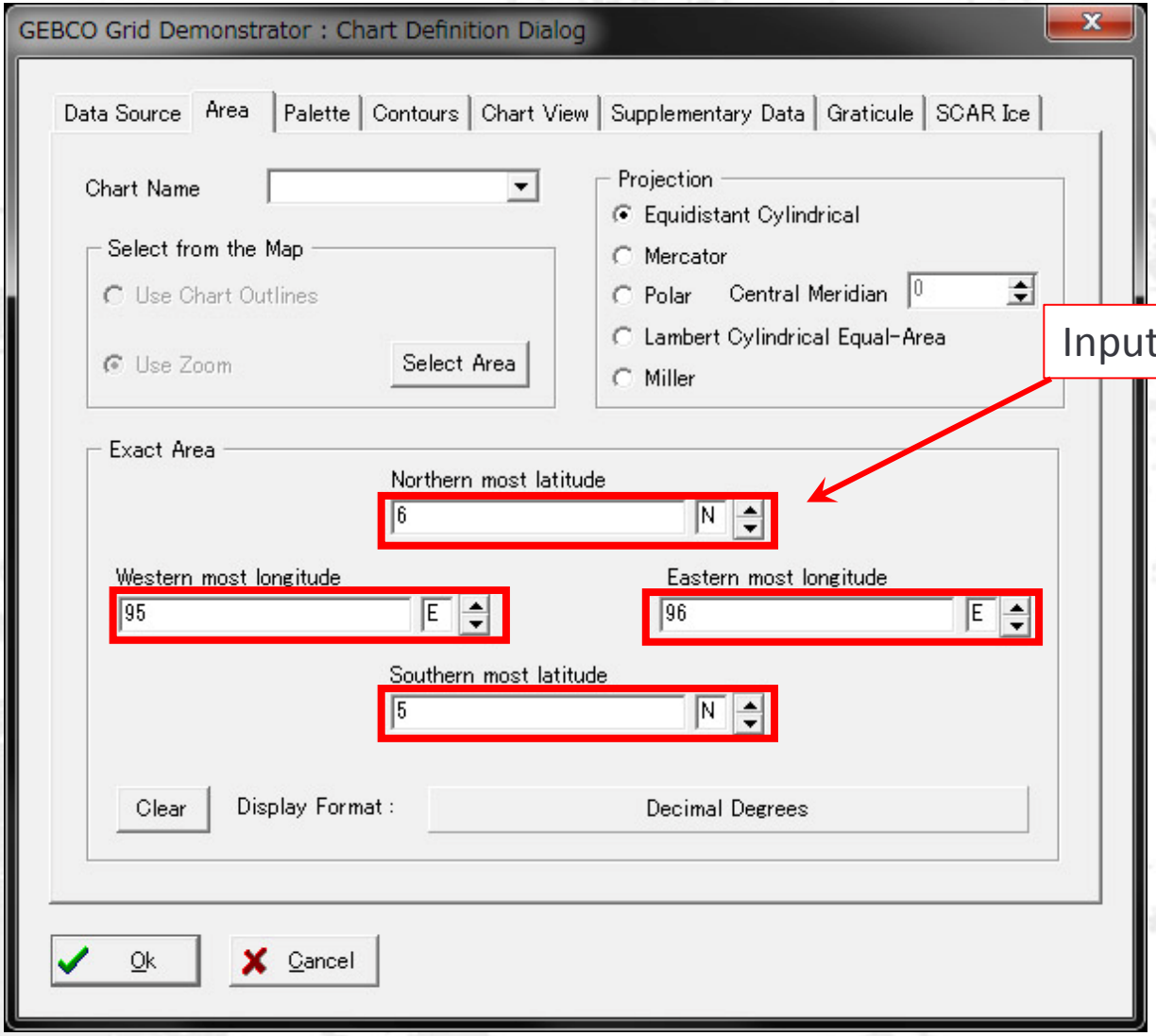



Execute the GridViewer.exe



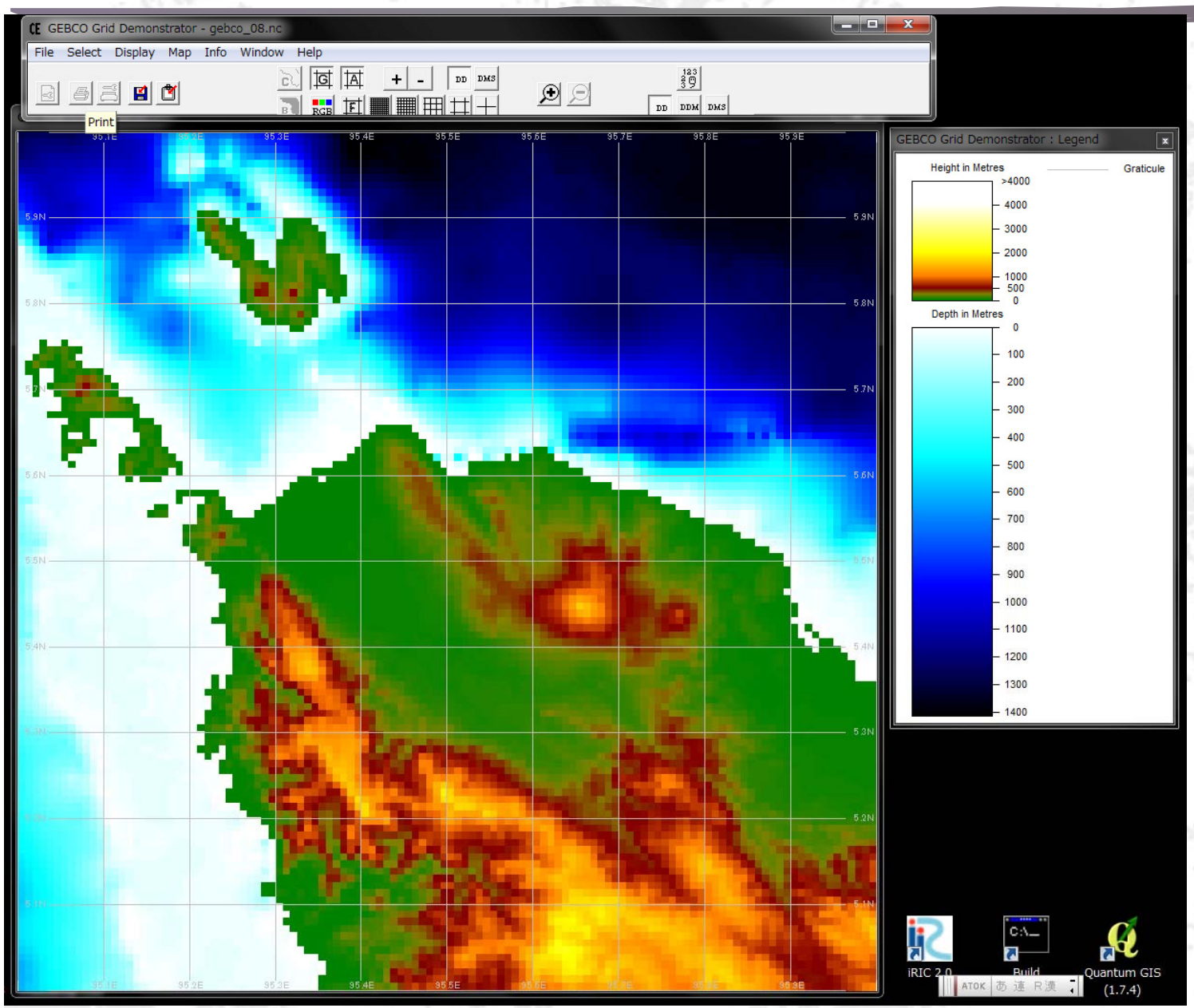

Click “Continue”

# Region settings

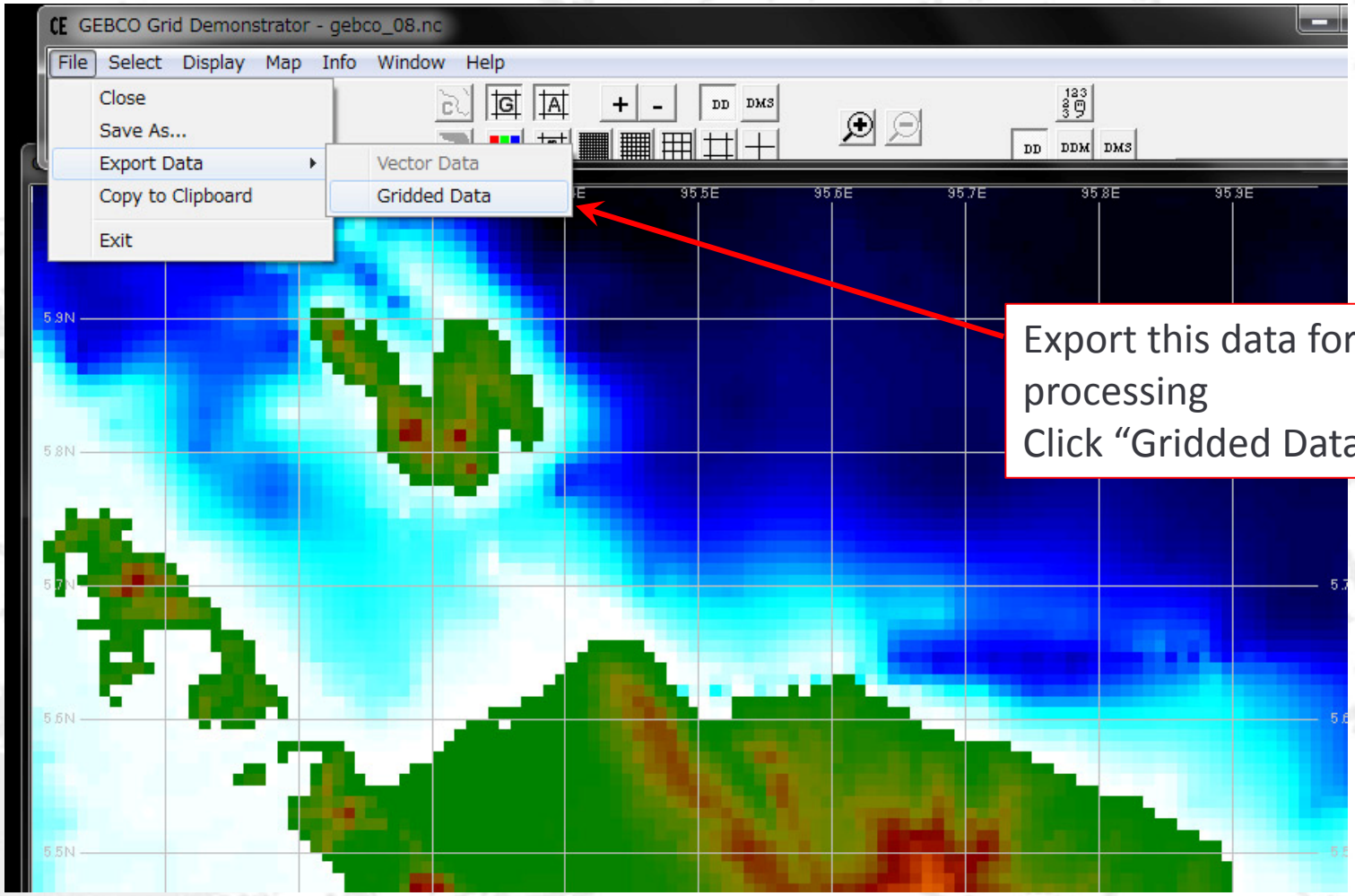



Input the region of interest

# Aceh BODC data

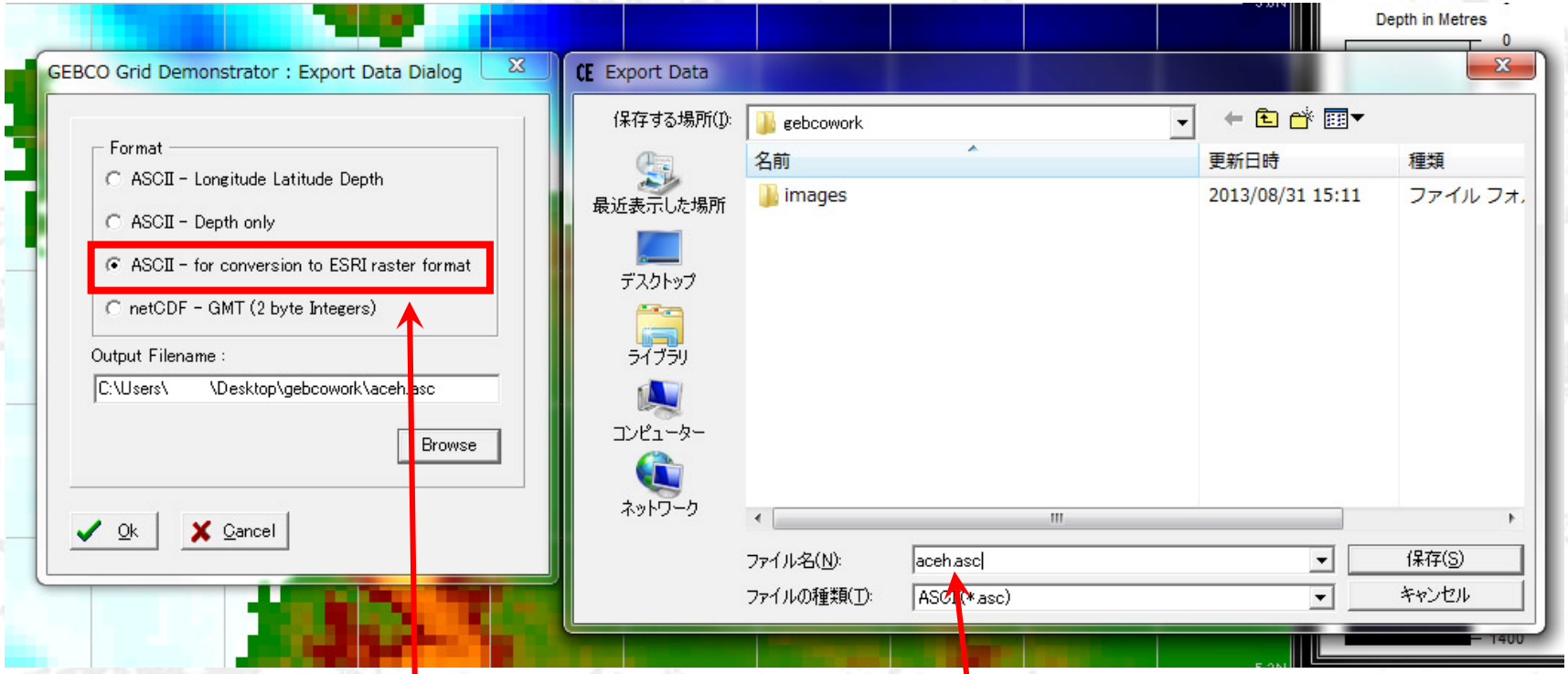


# Data export




Export this data for QGIS processing
Click “Gridded Data”

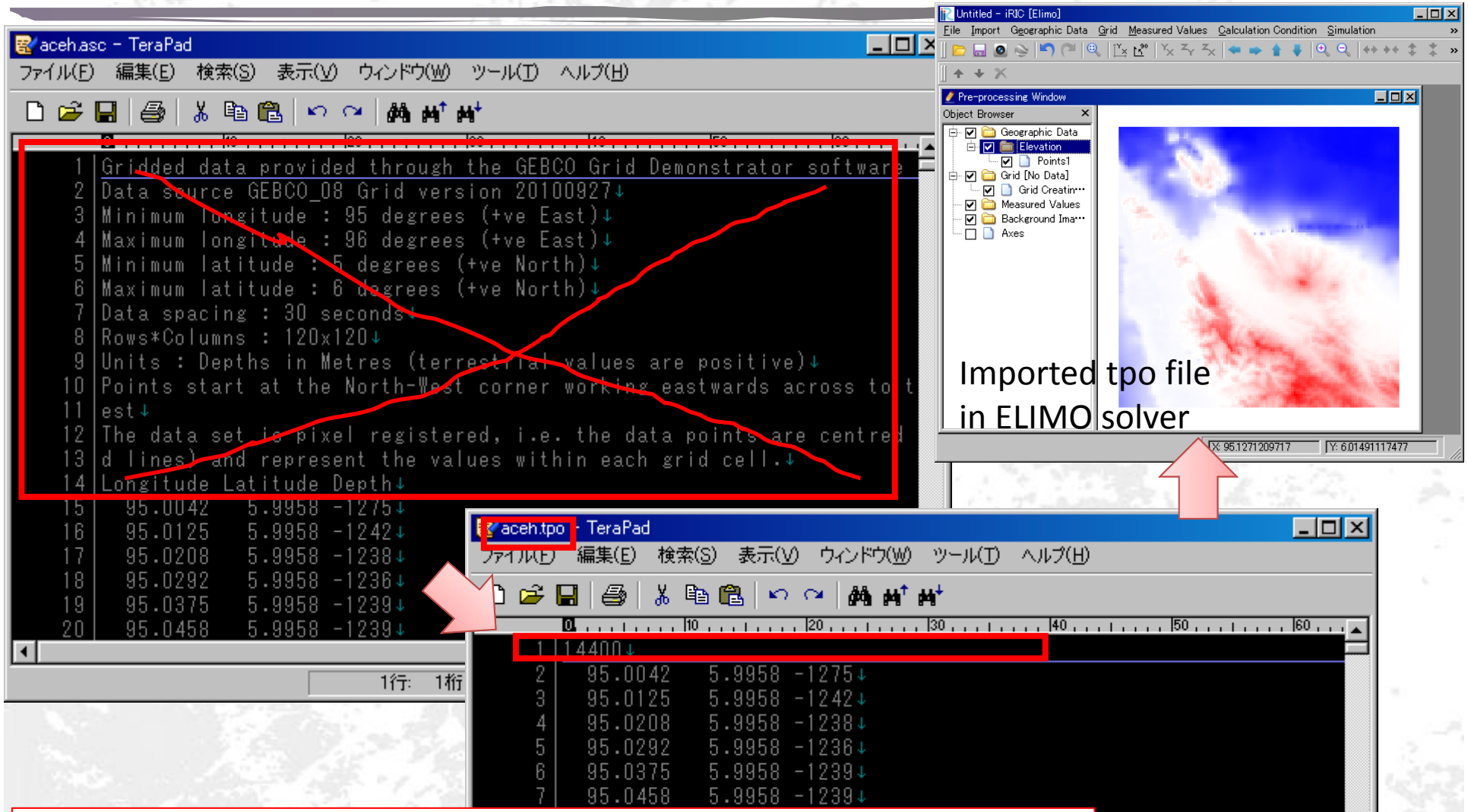
# Export options




Select “ESRI raster format”

Input name as “aceh.asc”

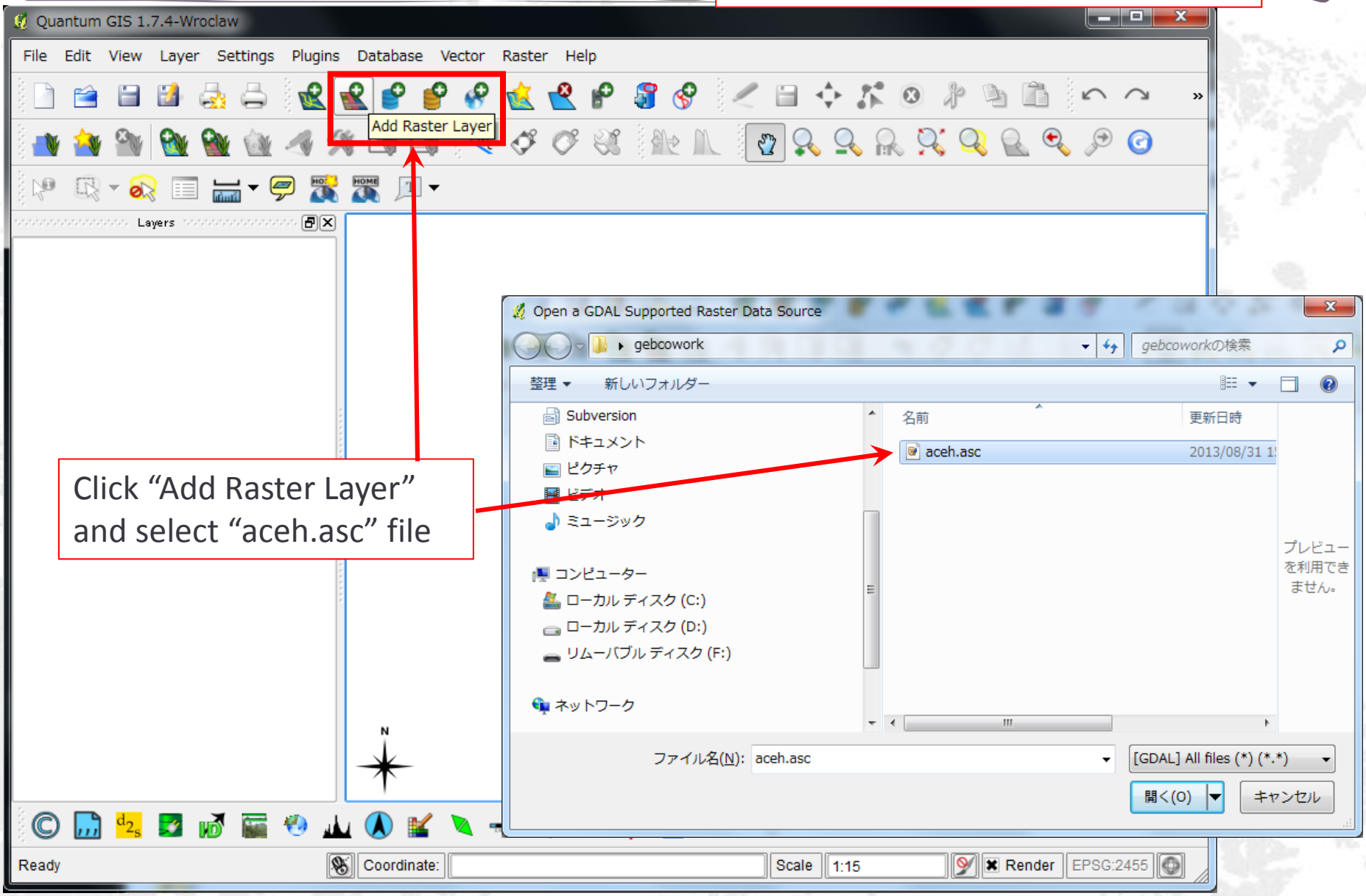
# tpo file preparation for ELIMO solver (optional)




The ELIMO solver needs longitude and latitude data in tpo file. Open aceh.asc in your text editor (or Excel), delete the header information in the file (14 lines from the top), count the number of data points, add it in the first line and save as tpo file with .tpo extension like “aceh.tpo”

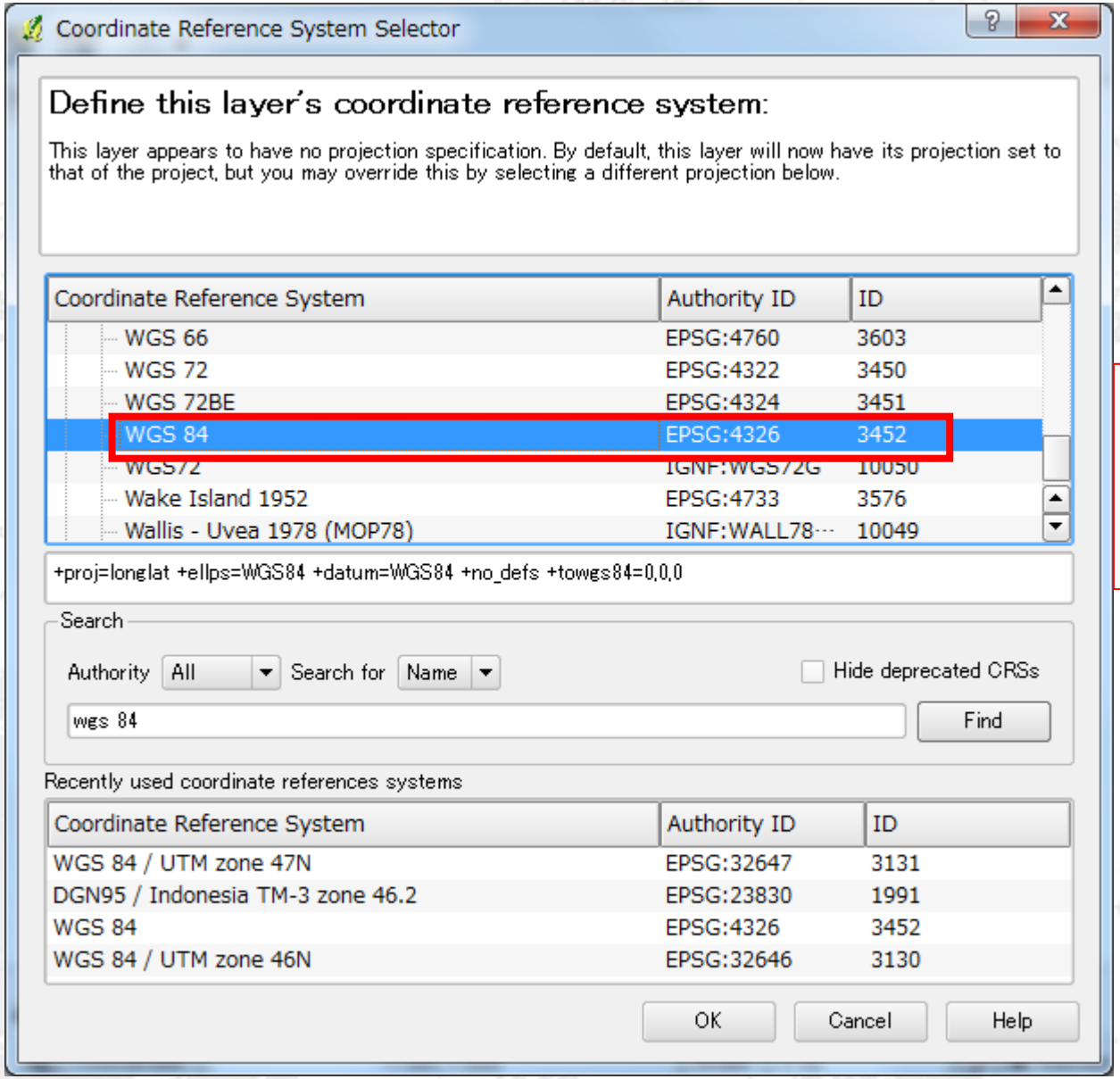
# Open raster layer

If you are going to use other solvers, following procedures are needed.



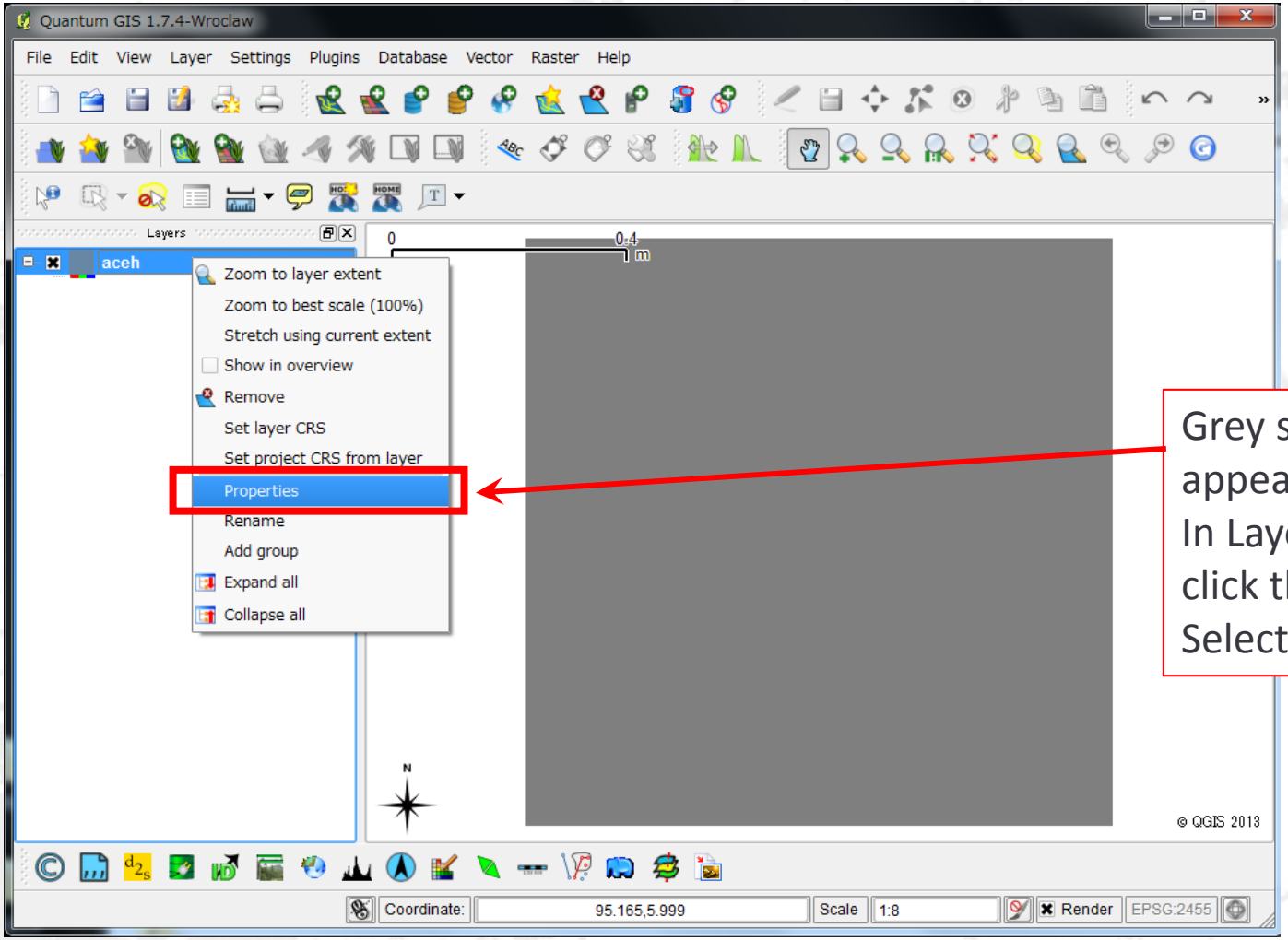

Click “Add Raster Layer” and select “aceh.asc” file

# Define CRS



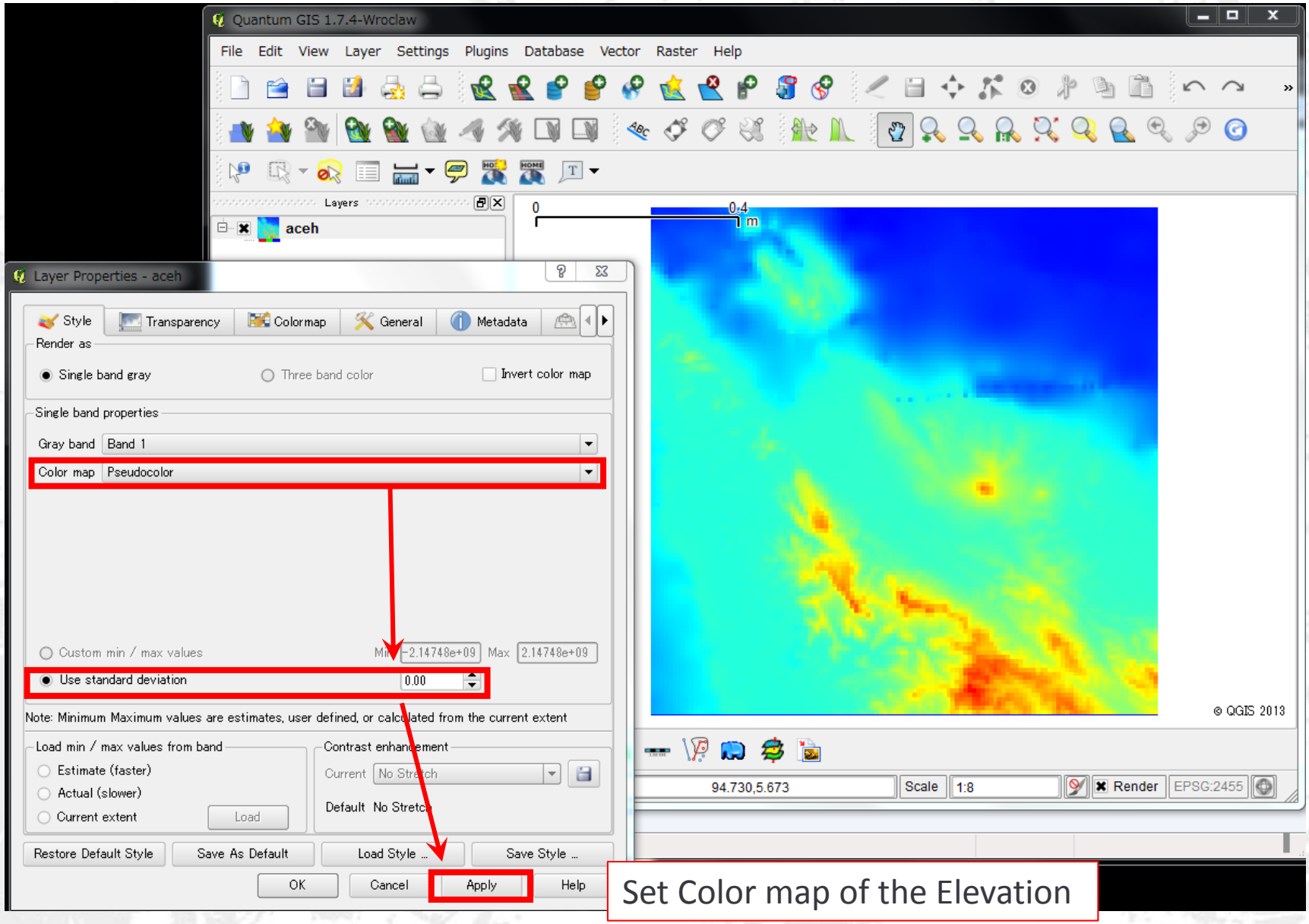

Define the CRS (Coordinate Reference System) as "WGS 84" (EPSG:4326 or ID:3452)

# Raster layer added



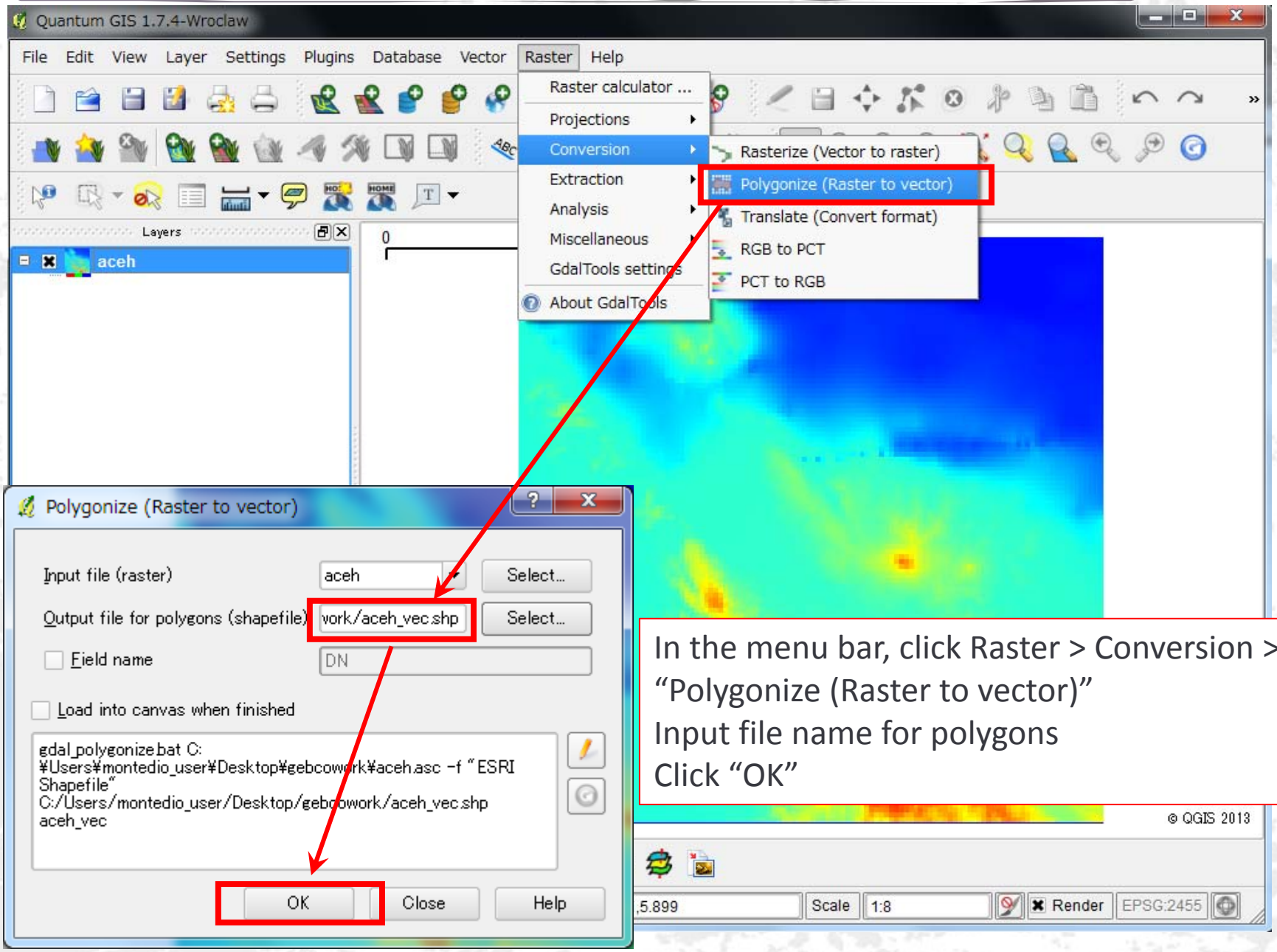

Grey square region will appear
In Layers window right click the aceh layer
Select “Properties”

# Set color map



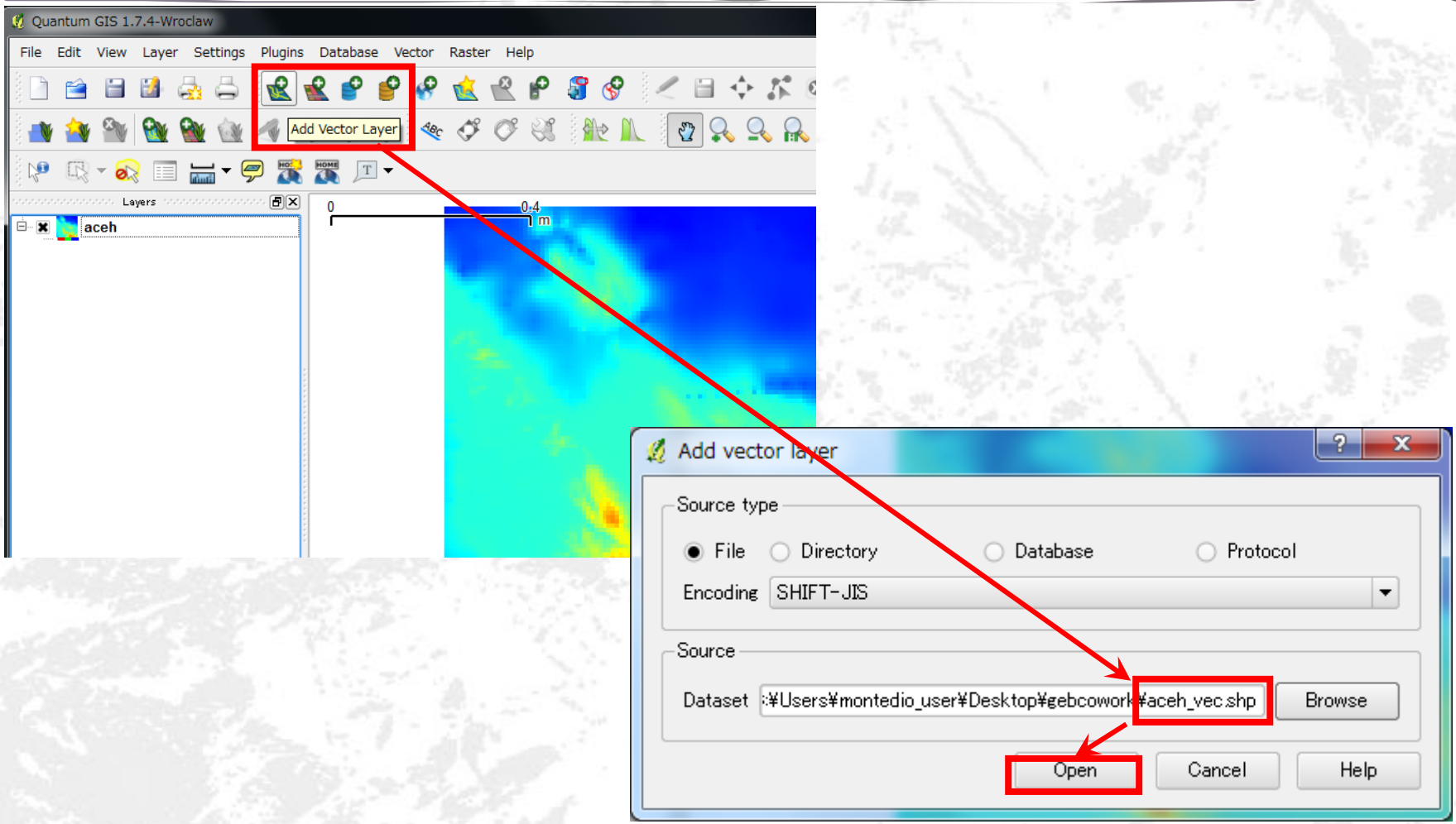

Set Color map of the Elevation

# Convert raster to vector

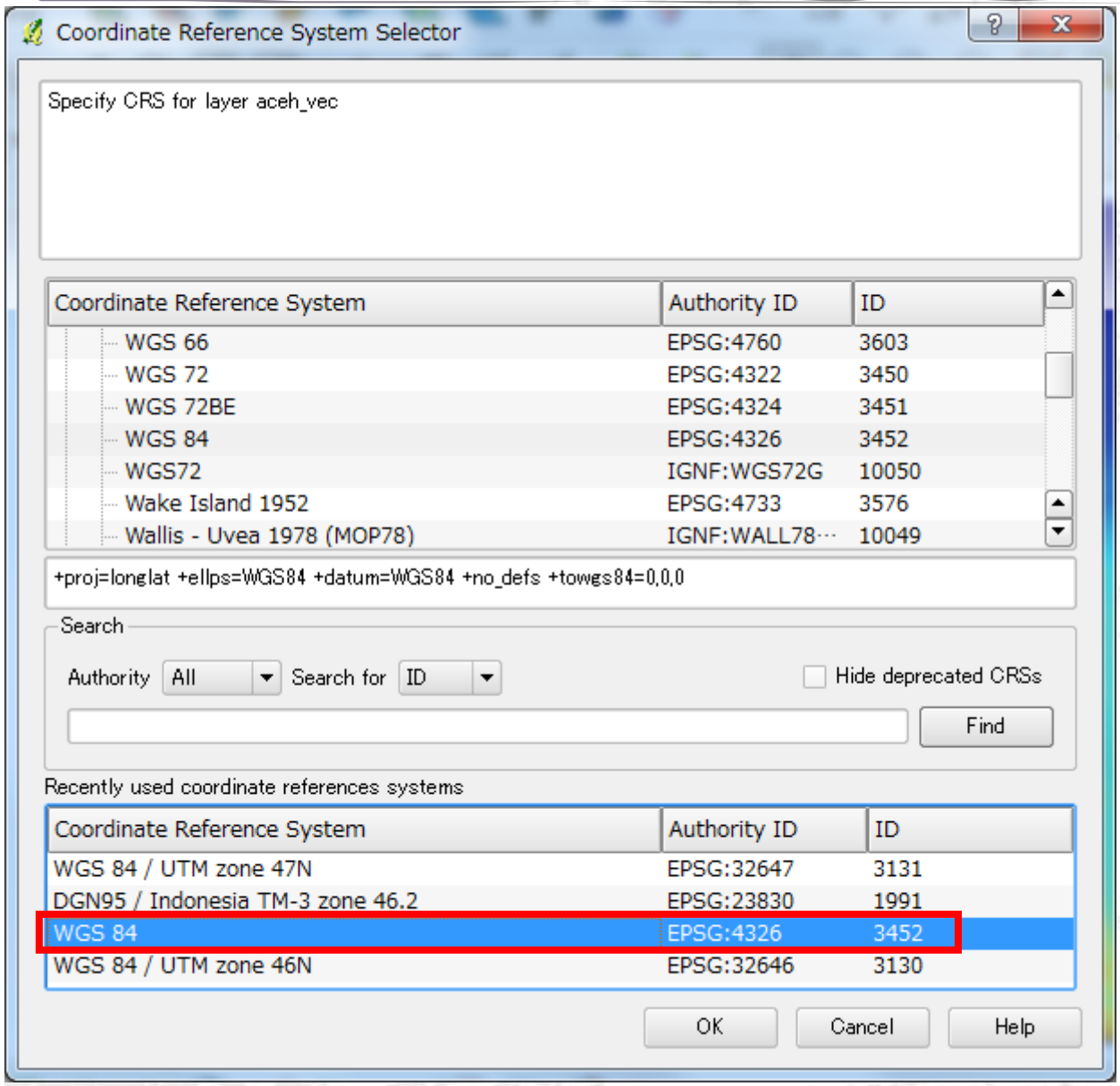



In the menu bar, click Raster > Conversion > "Polygonize (Raster to vector)"
Input file name for polygons
Click "OK"

# Add vector layer



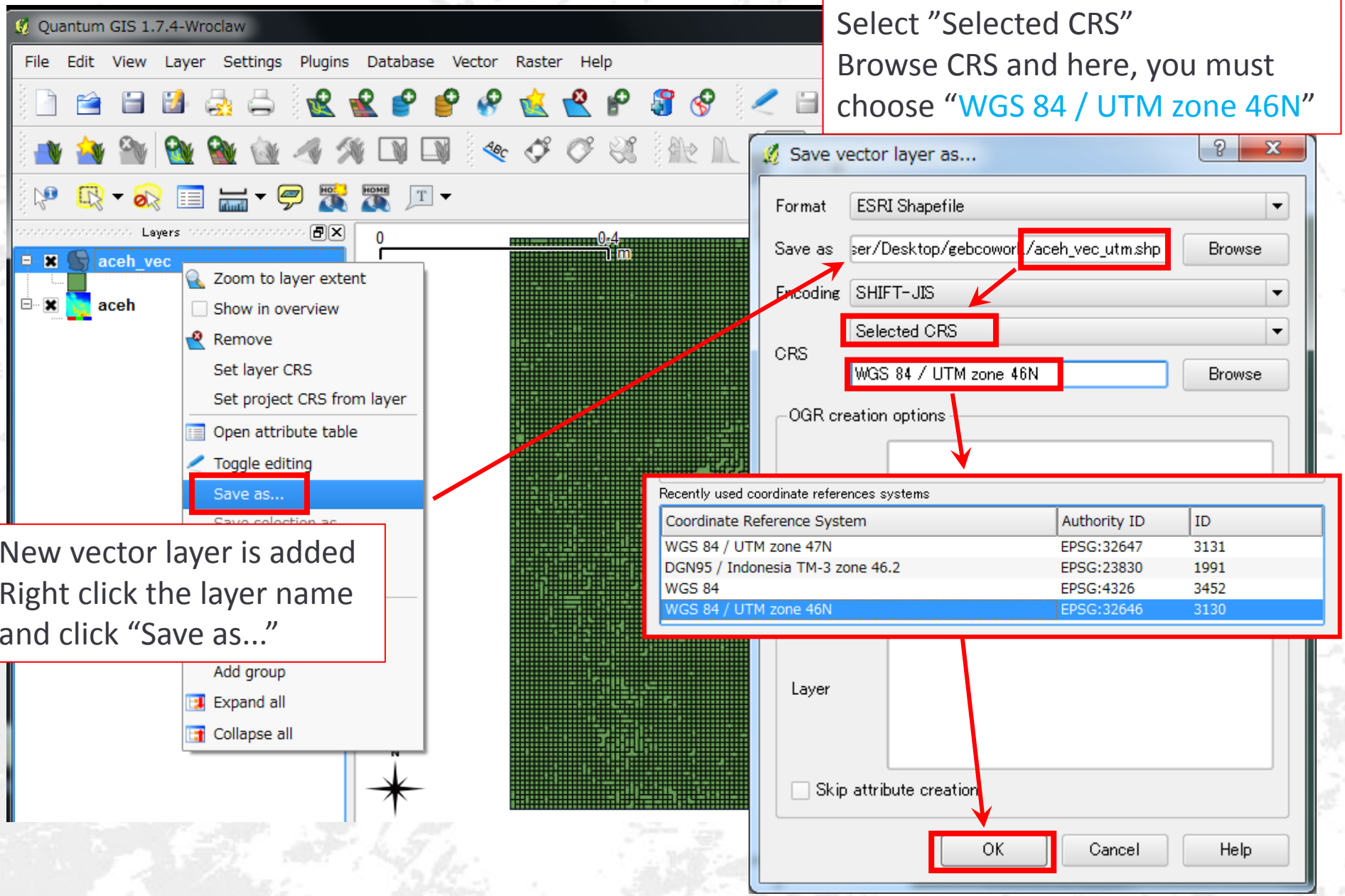
# Specify CRS




Again, define the CRS (Coordinate Reference System) as “WGS 84” (EPSG:4326 or ID:3452)

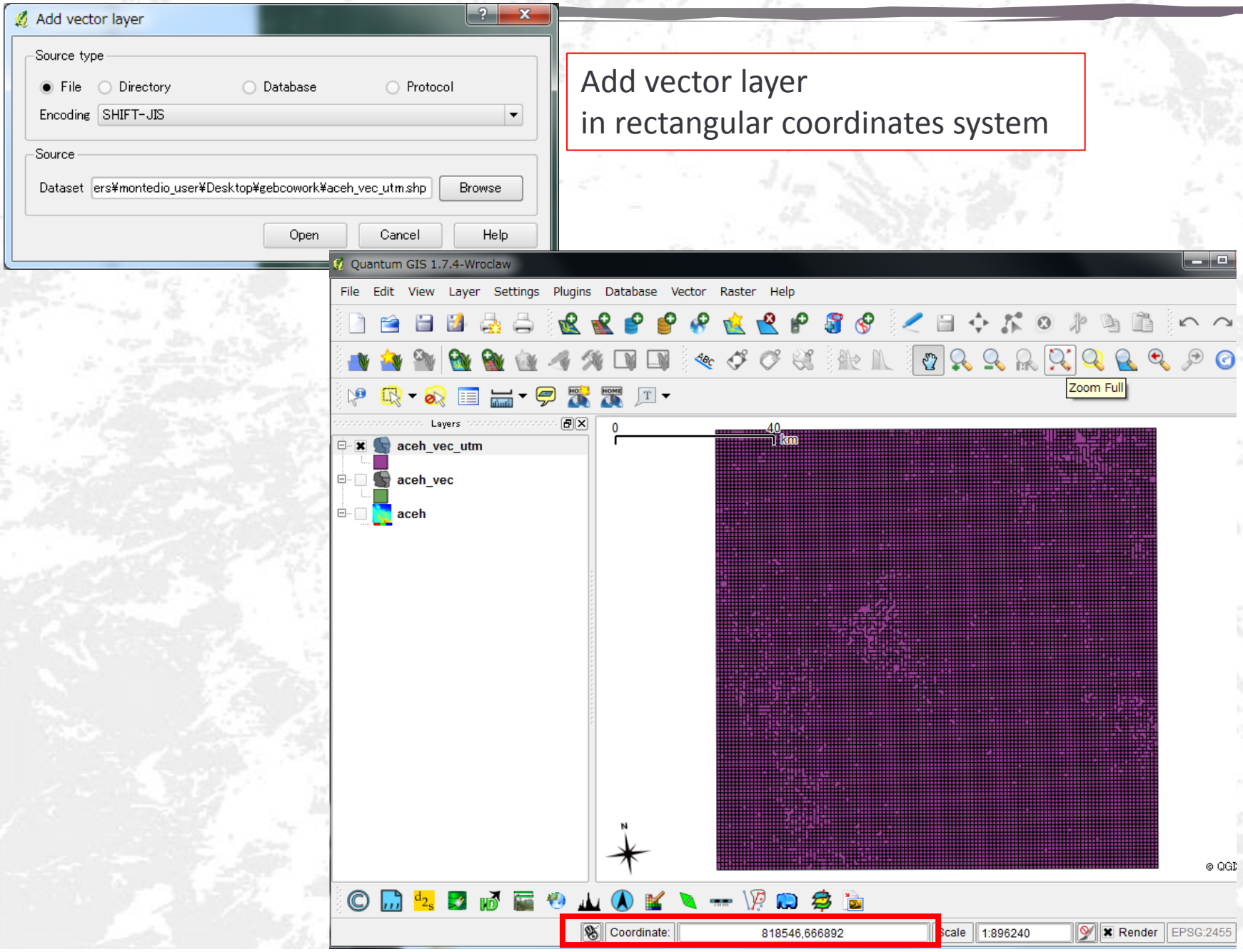
# Save vector layer as UTM

Input the name for output
Select "Selected CRS"
Browse CRS and here, you must choose "WGS 84 / UTM zone 46N"



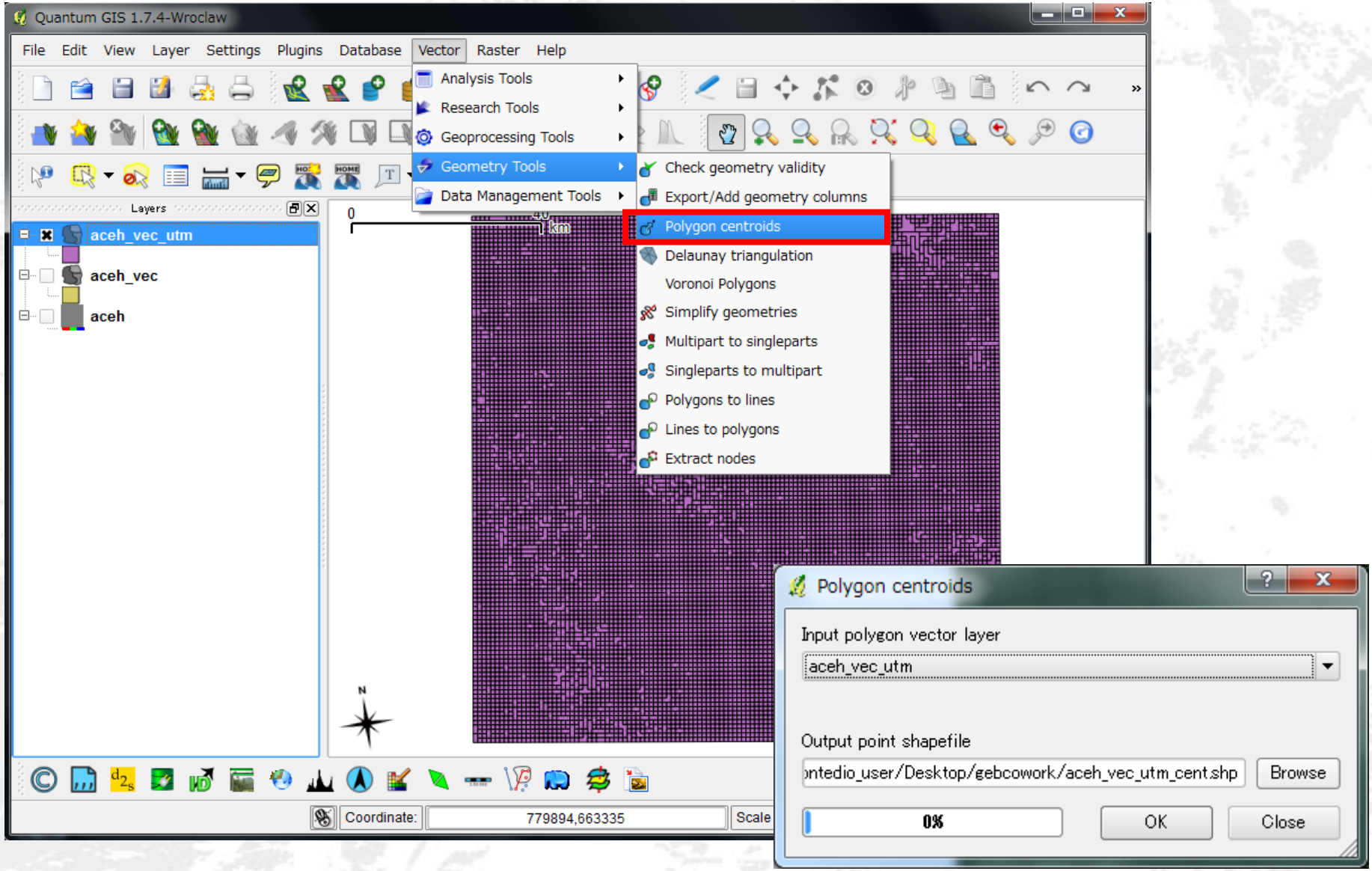

New vector layer is added
Right click the layer name and click "Save as..."

# Add vector layer

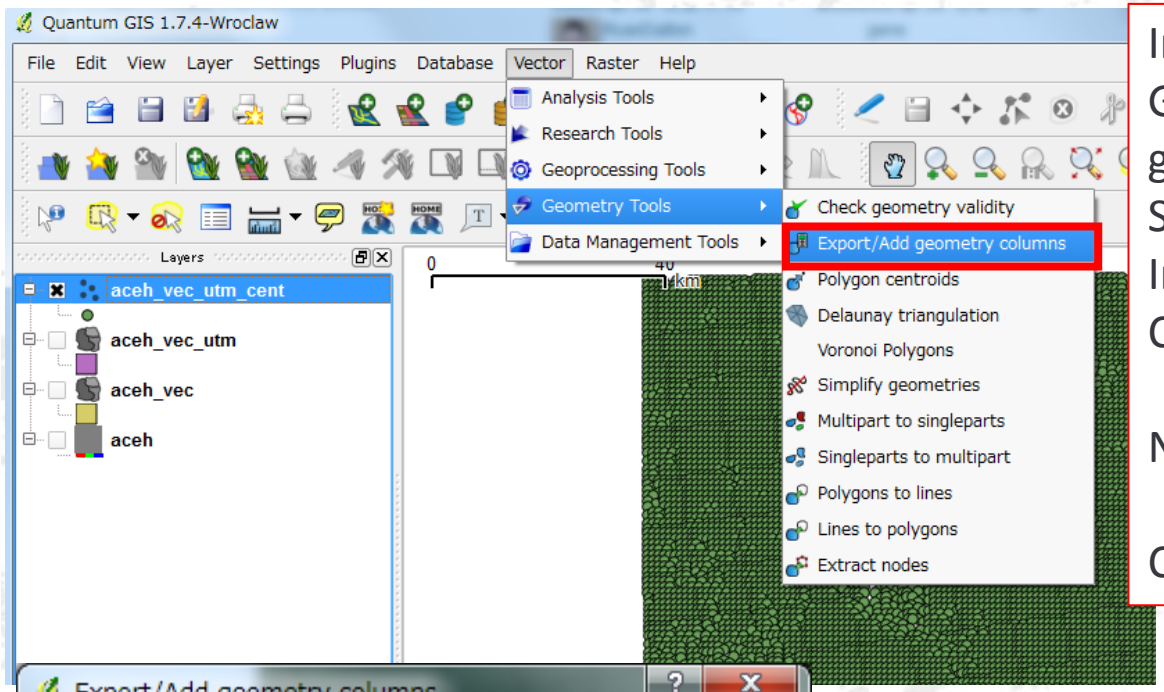



Add vector layer
in rectangular coordinates system

# Convert polygon to point data



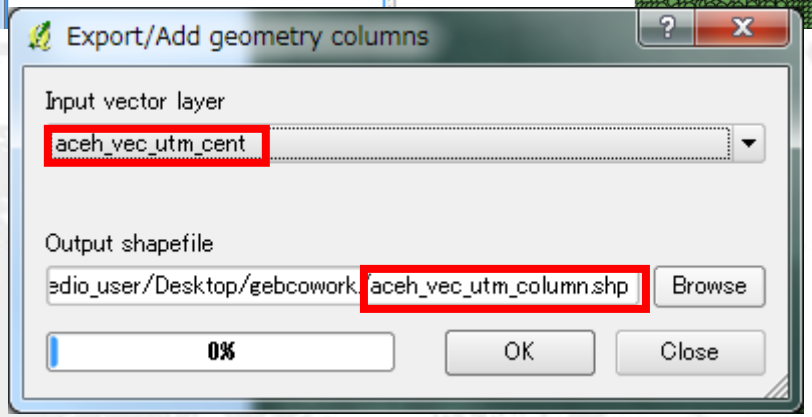
# Add geometry columns

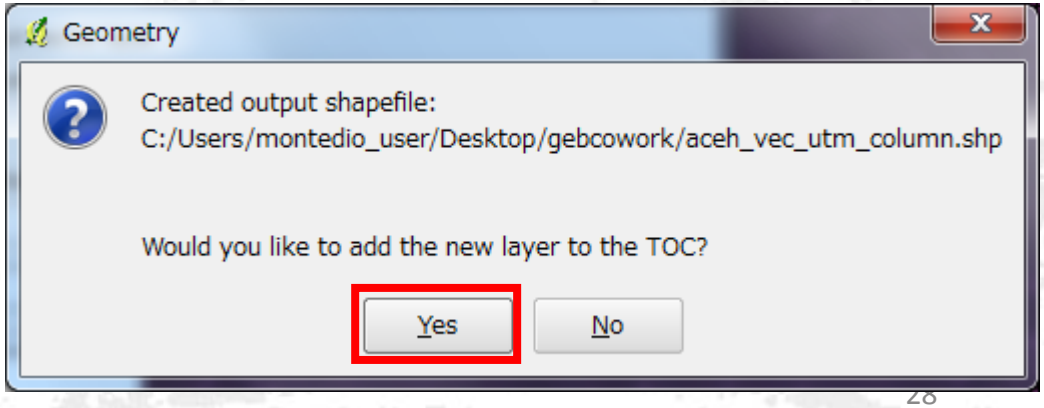



In the menu bar, click Vector > Geometry Tools > "Export/Add geometry columns"
Select Input vector layer
Input "Output shapefile name"
Click "OK"

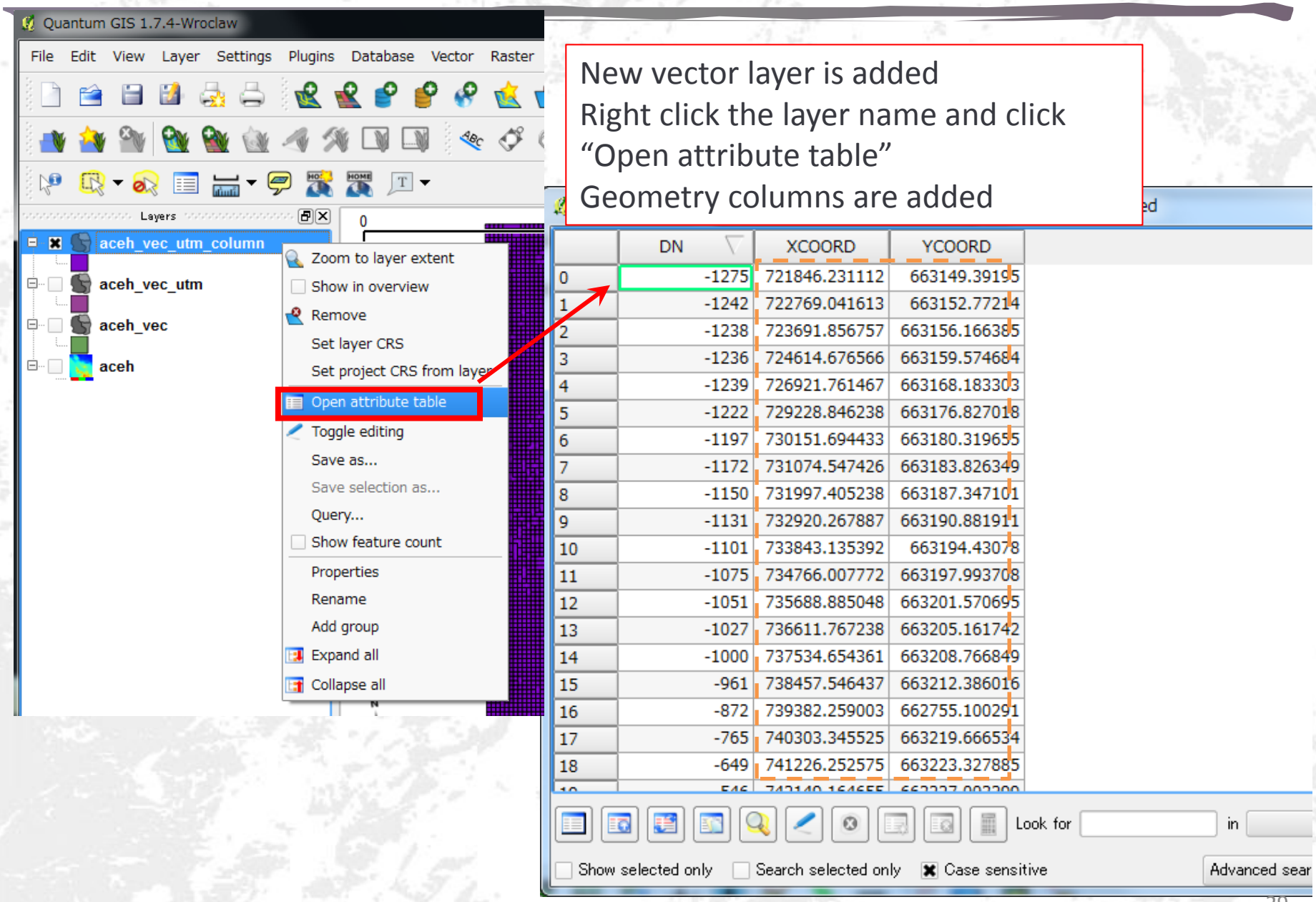
NOTE: It may take several minutes

Click OK and add the new layer



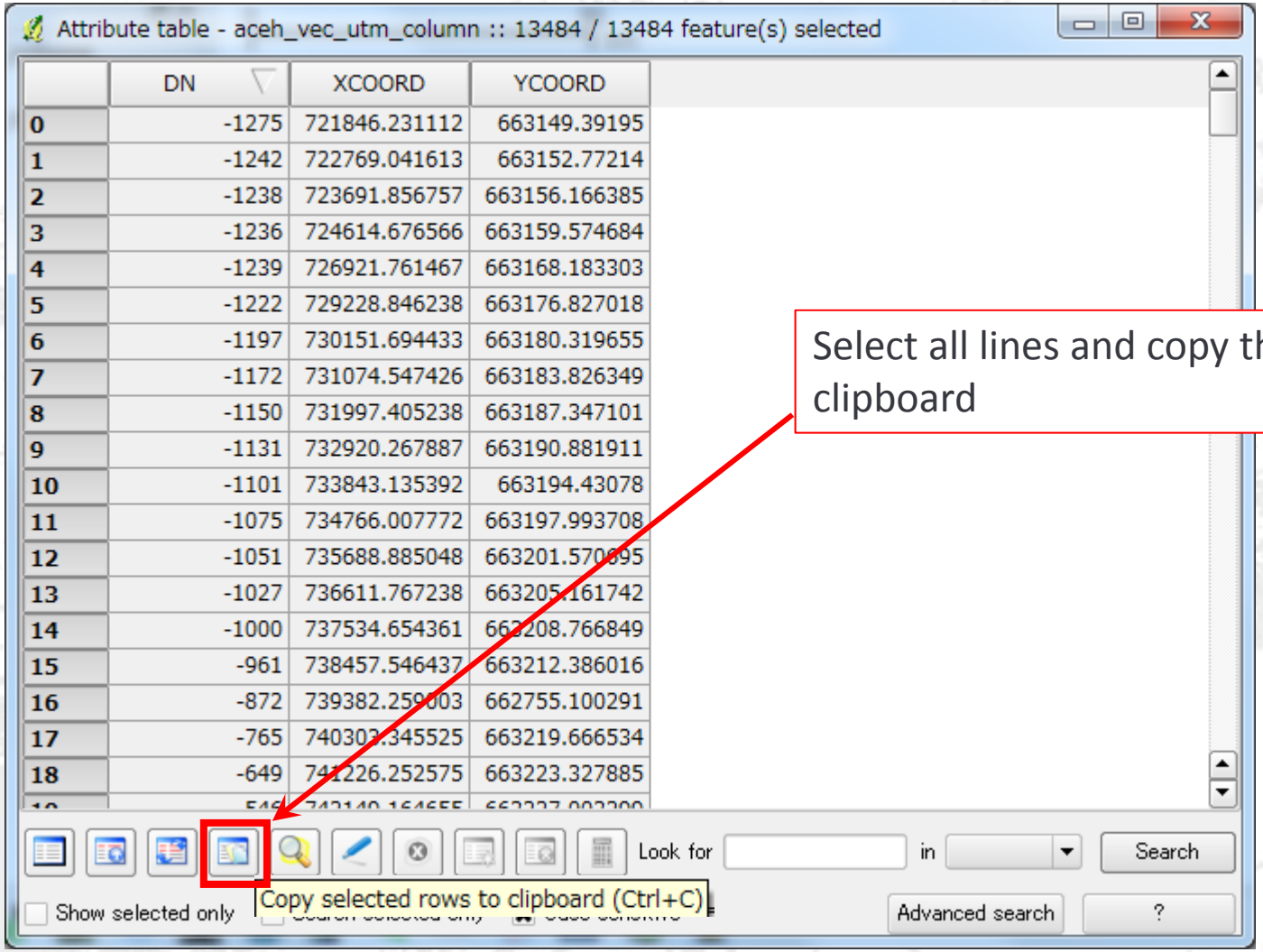
# Geometry column table




New vector layer is added
Right click the layer name and click "Open attribute table"
Geometry columns are added

| | DN | XCOORD | YCOORD |
|---|---|---|---|
| 0 | -1275 | 721846.231112 | 663149.39195 |
| 1 | -1242 | 722769.041613 | 663152.77214 |
| 2 | -1238 | 723691.856757 | 663156.166385 |
| 3 | -1236 | 724614.676566 | 663159.574684 |
| 4 | -1239 | 726921.761467 | 663168.183303 |
| 5 | -1222 | 729228.846238 | 663176.827018 |
| 6 | -1197 | 730151.694433 | 663180.319655 |
| 7 | -1172 | 731074.547426 | 663183.826349 |
| 8 | -1150 | 731997.405238 | 663187.347101 |
| 9 | -1131 | 732920.267887 | 663190.881911 |
| 10 | -1101 | 733843.135392 | 663194.43078 |
| 11 | -1075 | 734766.007772 | 663197.993708 |
| 12 | -1051 | 735688.885048 | 663201.570695 |
| 13 | -1027 | 736611.767238 | 663205.161742 |
| 14 | -1000 | 737534.654361 | 663208.766849 |
| 15 | -961 | 738457.546437 | 663212.386016 |
| 16 | -872 | 739382.259003 | 662755.100291 |
| 17 | -765 | 740303.345525 | 663219.666534 |
| 18 | -649 | 741226.252575 | 663223.327885 |

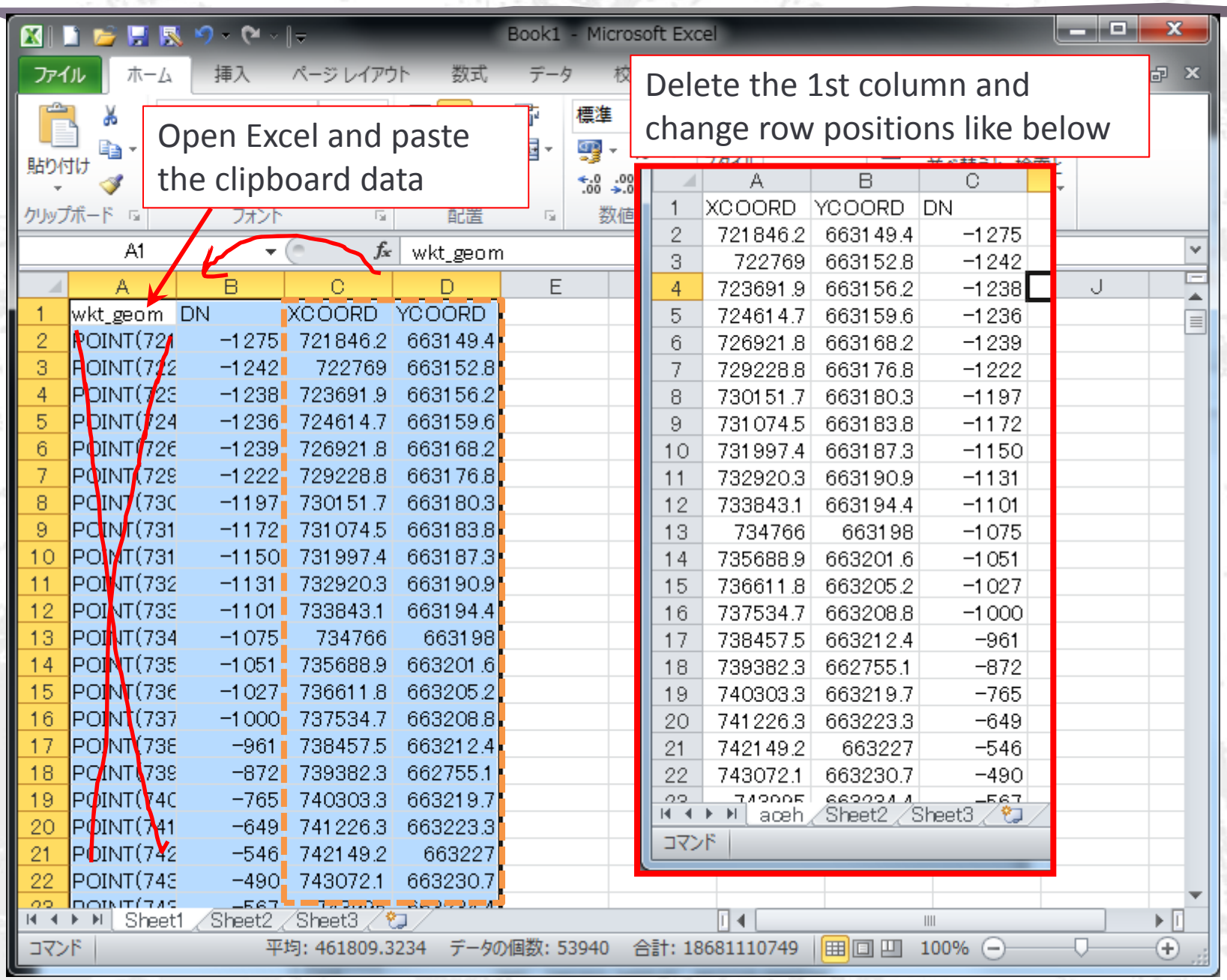
# Copy attribute table




| | DN | XCOORD | YCOORD |
|---|---|---|---|
| 0 | -1275 | 721846.231112 | 663149.39195 |
| 1 | -1242 | 722769.041613 | 663152.77214 |
| 2 | -1238 | 723691.856757 | 663156.166385 |
| 3 | -1236 | 724614.676566 | 663159.574684 |
| 4 | -1239 | 726921.761467 | 663168.183303 |
| 5 | -1222 | 729228.846238 | 663176.827018 |
| 6 | -1197 | 730151.694433 | 663180.319655 |
| 7 | -1172 | 731074.547426 | 663183.826349 |
| 8 | -1150 | 731997.405238 | 663187.347101 |
| 9 | -1131 | 732920.267887 | 663190.881911 |
| 10 | -1101 | 733843.135392 | 663194.43078 |
| 11 | -1075 | 734766.007772 | 663197.993708 |
| 12 | -1051 | 735688.885048 | 663201.570695 |
| 13 | -1027 | 736611.767238 | 663205.161742 |
| 14 | -1000 | 737534.654361 | 663208.766849 |
| 15 | -961 | 738457.546437 | 663212.386016 |
| 16 | -872 | 739382.259003 | 662755.100291 |
| 17 | -765 | 740303.345525 | 663219.666534 |
| 18 | -649 | 741226.252575 | 663223.327885 |

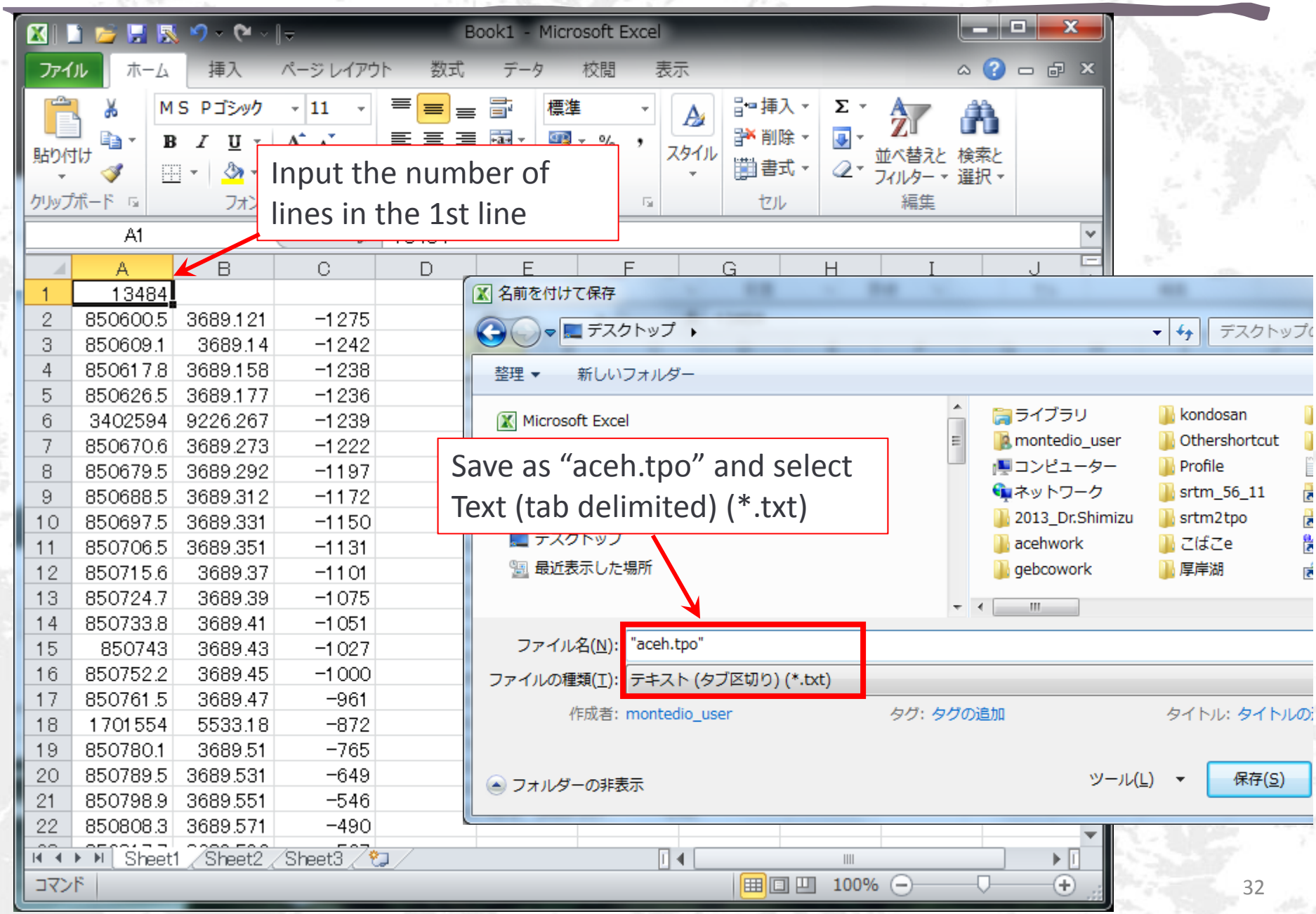
Select all lines and copy them to clipboard

# Convert to X[m],Y[m],Z[m] data



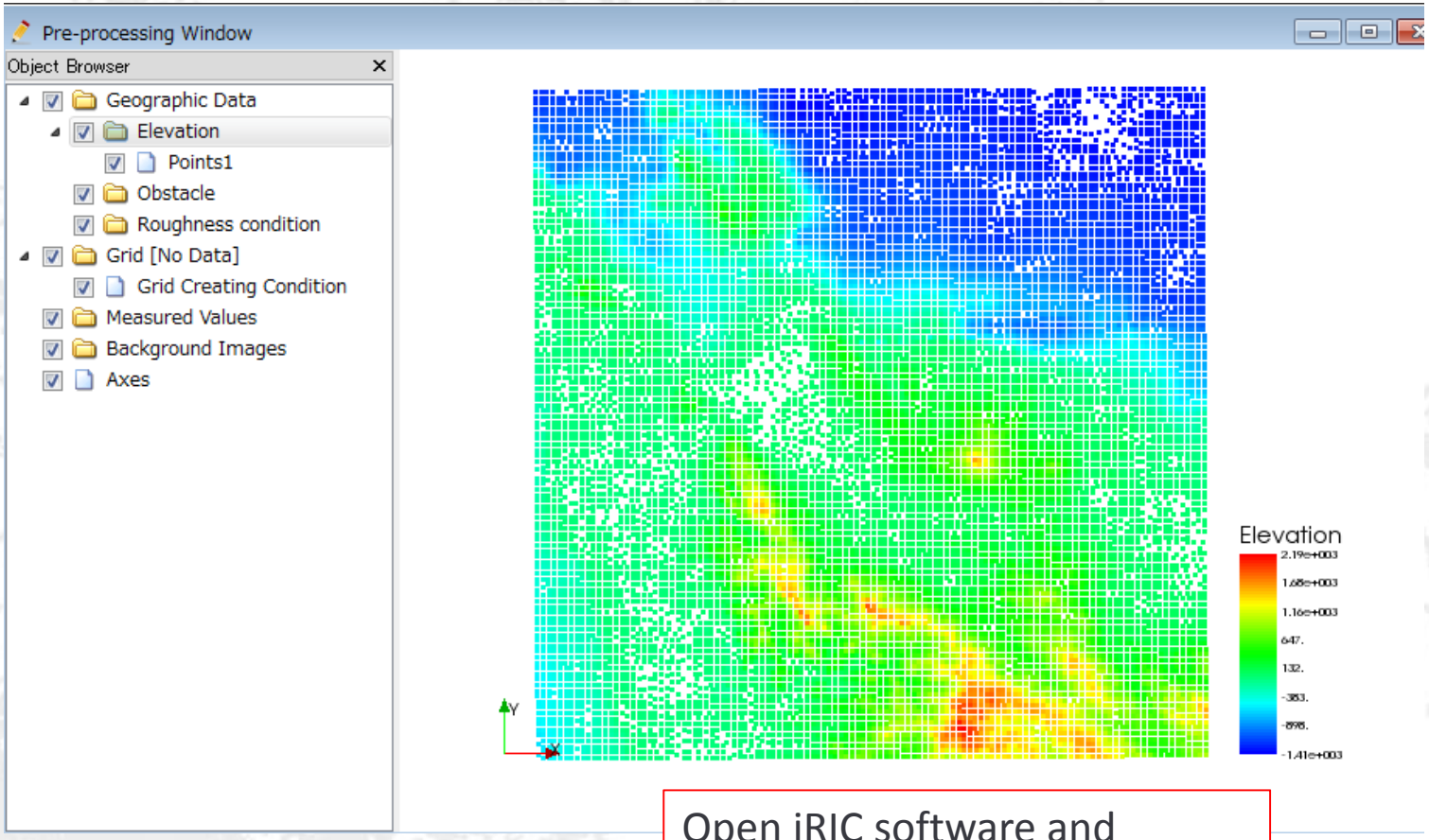

| | A | B | C |
|---|---|---|---|
| 1 | XCOORD | YCOORD | DN |
| 2 | 721846.2 | 663149.4 | -1275 |
| 3 | 722769 | 663152.8 | -1242 |
| 4 | 723691.9 | 663156.2 | -1238 |
| 5 | 724614.7 | 663159.6 | -1236 |
| 6 | 726921.8 | 663168.2 | -1239 |
| 7 | 729228.8 | 663176.8 | -1222 |
| 8 | 730151.7 | 663180.3 | -1197 |
| 9 | 731074.5 | 663183.8 | -1172 |
| 10 | 731997.4 | 663187.3 | -1150 |
| 11 | 732920.3 | 663190.9 | -1131 |
| 12 | 733843.1 | 663194.4 | -1101 |
| 13 | 734766 | 663198 | -1075 |
| 14 | 735688.9 | 663201.6 | -1051 |
| 15 | 736611.8 | 663205.2 | -1027 |
| 16 | 737534.7 | 663208.8 | -1000 |
| 17 | 738457.5 | 663212.4 | -961 |
| 18 | 739382.3 | 662755.1 | -872 |
| 19 | 740303.3 | 663219.7 | -765 |
| 20 | 741226.3 | 663223.3 | -649 |
| 21 | 742149.2 | 663227 | -546 |
| 22 | 743072.1 | 663230.7 | -490 |

# tpo file export




| | A | B | C |
|---|---|---|---|
| 1 | 13484 | | |
| 2 | 850600.5 | 3689.121 | −1275 |
| 3 | 850609.1 | 3689.14 | −1242 |
| 4 | 850617.8 | 3689.158 | −1238 |
| 5 | 850626.5 | 3689.177 | −1236 |
| 6 | 3402594 | 9226.267 | −1239 |
| 7 | 850670.6 | 3689.273 | −1222 |
| 8 | 850679.5 | 3689.292 | −1197 |
| 9 | 850688.5 | 3689.312 | −1172 |
| 10 | 850697.5 | 3689.331 | −1150 |
| 11 | 850706.5 | 3689.351 | −1131 |
| 12 | 850715.6 | 3689.37 | −1101 |
| 13 | 850724.7 | 3689.39 | −1075 |
| 14 | 850733.8 | 3689.41 | −1051 |
| 15 | 850743 | 3689.43 | −1027 |
| 16 | 850752.2 | 3689.45 | −1000 |
| 17 | 850761.5 | 3689.47 | −961 |
| 18 | 1701554 | 5533.18 | −872 |
| 19 | 850780.1 | 3689.51 | −765 |
| 20 | 850789.5 | 3689.531 | −649 |
| 21 | 850798.9 | 3689.551 | −546 |
| 22 | 850808.3 | 3689.571 | −490 |

# Tpo file import to iRIC preprocessor




Open iRIC software and import “aceh.tpo” file

# End.