

# SimpleDEMViewer 8.5

## SimpleDEMViewerAS 3.5

### User Manual



AS ( Mac App Store ) version has some limitations because sandboxing programing is required.  
<AS note> denotes those limitations and differences in each features. Last section lists up all of them.

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## **39. Limitations of AS Version**

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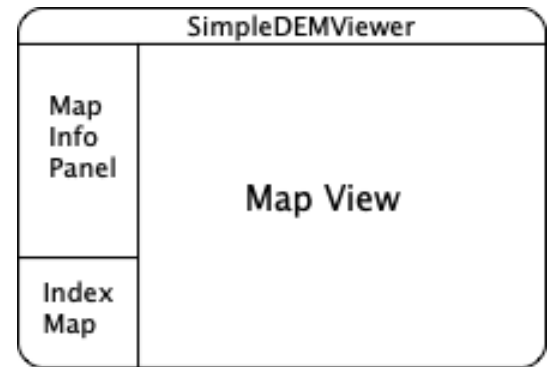
# 1. Introduction

## Main window

Main window contains Map View and Side Bar. Map View draws colored elevation map depends on Digital Elevation Model (DEM) data. Side Bar contains Map Info Panel and Index Map. Map info panel shows kind of DEMs, scale, Color Set and others. Index Map shows current range of the Map View displaying.

You can change some map settings in Map Info Panel for convenience.

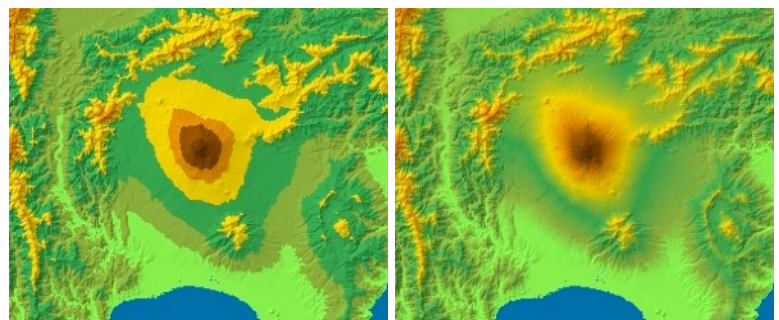
Main window always exists on the screen during SimpleDEMViewer running. You can hide Side bar anytime or hide Index Map only.



## Draws maps colored by elevation

Reads various DEM data, and makes map colored by elevation with or without shading. It supports gradation color also.

- Draws Parallels and Meridians.
- Shows latitude, longitude and elevation of the mouse point.
- Draws contours calculated using DEMs.
- Support various DEM data available at on-line sites.
- The projection method on the Map View is Equidistant Cylindrical projection. Can make maps with several projection methods.

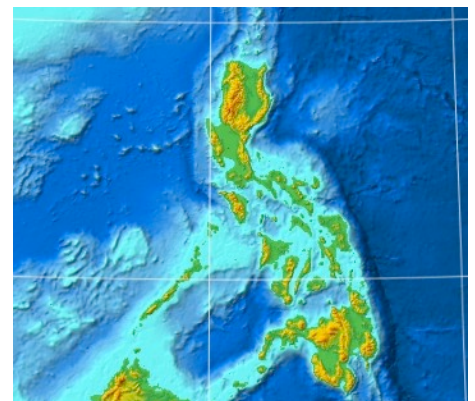


No gradation

With gradation

Two pictures at right show maps around Mt. Fuji in Japan using SRTM 3 seconds mesh DEMs with shading.

You can use DEMs having sea depth such as ETOPO and GEB-CO. Picture at right is Conical Projection map around Philippine using ETOPO2.



## Supported DEM files

Following DEMs are supported. Refer next section.

- GTOPO30 ( 30 sec. )
- ETOPO1 ( 1 minute. having sea depth, Treated as BIL form )
- ETOPO2 / 5 ( 2 min. / 5 minutes. having sea depth )
- ETOPO 2022 ( 60 / 30 / 15 seconds. having sea depth. Treated as GeoTiff )
- GLOBE ( 30 sec. )
- SRTM ( 1 sec., 3 sec. )
- SRTM DTED ( 1 sec., 3 sec. )
- USGS ascii ( Geo and UTM )
- USGS SDTS ( Geo and UTM )
- 1km / 250m / 50m / 10m / 5m / 2m DEMs from GSI of Japan
- **<AS note>** No support of 10m / 5m / 2m DEMs those have file extension 'LEM'.
- BIL form DEM ( with of without address )
- ASTER GDEM ( 1 sec. / GeoTiff )
- JAXA ALOS ( 1 sec. / GeoTiff )
- GeoTiff DEM
- netCDF DEM (GMT compatible format. Old GEBCO e.g.)
- PDS DEM ( Planetary Data System form NASA. File extension is 'IMG' )
- ArcAscii DEM files ( Geo and UTM )
- HYDRO1k ( no-addressing data )

## Customizable items

- Elevation colors and its boundaries.
- White Antarctica and Greenland.
- Gradation colors.
- Lakes. Its color.
- Shading method, light direction, shade strength.
- Shrink or expanding rate ( between 2000% and 5% )
- Color, line width and intervals of Parallels and Meridians.
- Adjust horizontal scale depending on latitude, so that horizontal and vertical scale will be the same.
- Others.

## Other functions

- Making lake data.
- Drawing contours.
- Coloring by slope degrees.
- Texture Mapping.
- Drawing bird's-eye View pictures.
- Drawing stereograph pictures.
- Drawing SRVC relief maps.
- Drawing panorama view pictures.
- 3D movie, that goes through landscape.
- Drawing visible region.
- Drawing geo-profile pictures.
- Drawing grayscale map pictures.
- Drawing Orthographic projection maps.
- Drawing Conical projection maps.
- Drawing Mercator projection maps.
- Drawing Equidistant projection maps.
- Drawing Equi-area projection maps.
- Drawing Universal Transverse Mercator ( UTM ) projection maps.
- Drawing Lambert Conformal Conic projection maps.
- Saving pictures as picture files in various formats.
- Creating and drawing memos, routes and areas on maps.
- Reading some external format data and draw them as user memo, route and area data.
- Export user data to text file and import them.

## Datum

Always WGS84 is used except Planetary DEMs, but calculations of distance and direction are based on a sphere its radius is 6371 km.

Even if DEMs stand on other than WGS84, SimpleDEMViewer uses WGS84 always, therefore you should aware of the datum of your DEMs. One exception is Tokyo datum of older DEM files from GSI of Japan, their addresses are converted to WGS84 automatically.

## Projection method

Projection method depends on DEM data type. When multiple type of DEMs are read, projection method of the narrowest pitch DEM is used.

### Geo DEMs

Longitude / Latitude coordinate ( Equidistant Cylindrical projection ). You can adjust horizontal axis to reduce distortion of the map depending on latitude.

### UTM DEMs

UTM of course.

### XY plane of Japan DEMs

Rectangular Plane Coordinate system defined in Japan.

## Other plane DEMs

Here, "Other plane" means any Transverse Mercator projection plane other than UTM and plane of Japan. You can define worlds local plane coordinate system such as NZTM2000 and CH1903+, etc.. They should be in accordance with Transverse Mercator Projection like as UTM. It is applicable for BIL and ArcAscii DEMs. See "[Manage Projection Planes](#)"

GeoTiff DEMs using other planes are also supported. To determine coordinate system of the DEMs, SimpleDEMViewer access internet site.

If you do not know the coordinate system of your DEMs, you can use them without addressing, called General Plane DEM in this program. Such DEMs can be arranged in the Map View, but can not link with any other data including other DEMs, User Data and texture maps.

## No addressing DEM

No projection. No link with latitude and longitude. Only one DEM file can be shown on the Map View.

## Planets and the Moon

Supports DEMs for planets and the Moon using PDS, GeoTiff and bil form DEMs. Refer [BIL form DEM data](#) section for BIL form DEMs.

PDS format DEMs only supports those with IMG file extensions. If file information is attached as a separate file with the file extension LBL, it should be in the same folder. The planet is treated as a true sphere with a specified radius, and only the geo-referenced DEM is supported.

In the case of GeoTiff, if the radius is specified, it is considered as celestial data. However, it is an exception if it matches the radius of the Earth. If the data pitch is specified in meters, it will be treated as no addressing DEMs. However, when it can be determined that it covers the entire surface of the planet, it will be automatically converted to the geo-referenced DEMs. In this case, the left edge of the data is treated as -180 degrees and the right edge is treated as 180 degrees, so when combined with other data, it may mismatch (for example, 180 degrees).

If the radius of bil format or the major radius in GeoTiff is within 1% of the following values, it is considered as each. They are treated as a sphere with a specified (major) radius. Other than that, it will be an unknown planet.

Moon : 1737.4km, Mercury : 2439.7km, Venus : 6051.8km, Mars : 3391km.

Following functions are not supported for planet DEMs.

- Drawing UTM projection map.
- Drawing white Antarctica and Greenland.
- Drawing sea and the Sun in panorama views.
- Fill land of zero meters or less with a color just above zero meters.



## 2. Elevation Data

You should prepare at least one of following elevation data (DEM) separately.

All DEM data are treated as datum is WGS84 except older DEMs from GSI of Japan.

### GTOPO30, HYDRO1k

Their data interval is 1 km nominally. GTOPO30 is bounded by Latitude and Longitude. HYDRO1k requires header file (it's file extension is HDR).

You can download both at Elevation data site of USGS.

### ETOPO/60/30/15 and GLOBE

They are 60, 30, 15 seconds and 30 seconds mesh data. ETOPOs have bathymetry data, and 60 and 30 seconds DEMs cover whole world by one file.

ETOPOs are provided as GeoTiff or netCDF format, but SimpleDEMViewer supports GeoTiff only.

You can download them at National Geographical Data Center (NGDC).

There are old data such as ETOPO1 / 2/ 5, their data pitches are 1, 2, 5 minutes each.

### SRTM 3sec/1sec

This data is obtained by Space Shuttle. It is bounded by Latitude and Longitude. Its data interval is 3 arc seconds or 1 arc seconds. Refer to Shuttle Radar Topography Mission (SRTM) site.

You can download them from <https://srtm.csi.cgiar.org/> for free 3 sec DEMs.

### SRTM DTED level 0/1/2 ( 30 sec / 3 sec / 1 sec )

"Finished" data derived from SRTM. Sea surface and some lake surfaces are flattened. You can order data SRTM site on DVDs.

### SRTM30plus

30 seconds mesh DEM derived from SRTM, and has bathymetry data. First 7 characters of the file name should be same as those of GTOPO30, and file extension should be "SRTM".

### 1km / 250m / 50m / 10m / 5m / 2m DEMs from GSI of Japan

Sold in CD-ROM only for Japanese region. You can purchase from Japan Map Center (JMC).

<AS note> No support of 10m / 5m / 2m DEMs.

### ASTER GDEM

One of GeoTiff form DEM. The data pitch is 1 arc-second.

You can download data from [https://gdemdl.aster.jspacesystems.or.jp/index\\_en.html](https://gdemdl.aster.jspacesystems.or.jp/index_en.html)

Now, Version 3 includes ASTER Water Body Dataset (ASTWBD)..

<AS note> You should select the folder that includes both data to recognize ASTWBD files.

### JAXA ALOS World 3D-30m

One of GeoTiff form DEM. The data pitch is 1 arc-second. Paired mask file has sea area information. If no mask file exists in the same folder, the file is treated as general GeoTiff DEM.

<http://www.eorc.jaxa.jp/ALOS/en/aw3d30/>

<AS note> You should select a folder instead of a file.

### GeoTiff DEM

Supports 16 bits integer and 32 bits floating point numbers. Elevation unit is meter or feet. Supports geo-referenced, UTM and other plane DEMs. If its plane is listed in the table of Plane Manager, it is recognized automatically. If it is not listed, it will be registered there with temporary name.

If the projection method is not Transverse Mercator or cannot be recognized, a dialog will appear to ask you which projection plane should be taken. In that case, you should select "General" usually.

If DEM has EPSG code with no detail information, SimpleDEMViewer accesses internet site to determine projection method. Once it is recognized, it will be saved and no more internet access required.

Datum is ignored, all are treated as WGS84. Be aware of it if use them with other data.

DEMs for other than The Earth, refer "[Planets and the Moon](#)" in the previous section.

<AS note> You can select any tiff format file by Open panel, error message will be shown after closing the panel if those are not DEM files.

## USGS ascii

You can download various elevation data in this format from USGS or some other data centers. Supports geo and UTM data. File extension should be "DEM". Almost these data are old data.

## USGS SDTS

You can download various elevation data in this format from USGS or some other data centers. File extension is always DDF. One DEM data consists of several files, although open dialog can select xxxxCELO.DDF file only.

<AS note> You should select a folder instead of a file.

## BIL FORM DEM

Supports 8 or 16 bits integer and 32 bits floating point numbers. Supports geo-referenced, UTM and other plane projections. Supports elevation values in meters and feet. Refer next section.

You can download various elevation data in this format from USGS and other GIS data sites.

## Arc Ascii DEM

Arc/Info's exported text format DEMs. Supports geo, UTM and other plane DEMs. If UTM or other plane DEMs, will ask zone number or what plane. Elevation value should be in meters. File extension should be 'ASC'.

If you specify 0 for zone number, the DEM will be treated as "General plane DEM", that means no link with latitude and longitude.

## netCDF DEM

GMT compatible netCDF format DEM files are supported. File extension should be 'GRD'.

<AS note> You can select any file that has file extension 'GRD' by Open panel, error message will be shown after closing the panel if those are not DEM file.

## PDS DEM

Planetary Data System DEMs are derived from NASA space data. The Moon, Mercury, Mars and some other celestial bodies data are provided as DEM files. File extension should be 'IMG'. In case a separate label file, its file extension is 'LBL', is attached, it should exist in the same folder.

<AS note> You can select any file that has file extension 'IMG' by Open panel, error message will be shown after closing the panel if those are not DEM file.

## DEMs for KASHMIR

Dedicated format for KASHMIR 3D with the file extension 'dcm'. ( KASHMIR 3D is a program for MS Windows. )

## BIL form DEM data

### Requirements

- Each elements should be 16 or 8 bits integer with sign bit, or 32 bits floating point numbers. Supports Motorola and Intel byte order which is specified in header file. Default is Motorola format.
- Elements are stored in row major order (all the data for row 1, followed by all the data for row 2, etc.).
- Data interval is in degrees or seconds. Always in meters for UTM or other plane DEMs and no addressing DEMs.
- Each elevation value should be in meters or feet.
- No LF nor CR characters.

- File extension should be BIL DEM or FLT. If FLT, data element should be 32 bits floating point numbers.
- File size should be equal to "number of columns" times "number of rows" times 2 if 16 bits element, times 4 for 32 bits floating point numbers.
- Header file must be exist in same folder. Its file name should be same as elevation data. Its file extension should be HDR.
- Optionally BLW file is used to determine boundary addresses. Its file name is same as elevation data but file extension is BLW.

## HDR file (text file)

This file should describe following items. Other items are ignored. Specify one item in each line. Each line has a key and a value pair. Result has no guarantee if conflicted items are specified.

Keys	Values
NROWS	Number of rows
NCOLS	Number of columns
NBITS	Number of bits per element, 8 or 16 for integer, 32 for decimals. Can be omitted if file extension is FLT.
<following items are optional>	
BYTEORDER	If 'I' or 'LSBFIRST' is specified byte order is Intel, otherwise Motorola.
UTMZONE	UTM zone number between 1 and 60, or -1 and -60 for south. Specify only if addresses are based on UTM.
XYPLANE	Plane ID defined in <a href="#">Manage Planes panel</a> , or plane number of Japanese 19-rectangular plane coordinate system. If Plane ID contains space, enclose them with double quotation marks. If 0 is specified, it means general plane coordinate system.
ULXMAP	Longitude in degrees at the center of the north-west corner cell of the DEM file. UTM Y address in meters. X address in meters for other plane coordinate system.
ULYMAP	Latitude in degrees at the center of the north-west corner cell of the DEM. UTM X address in meters. Y address in meters for other plane coordinate system.
XLLCORNER	Longitude in degrees at the lower-left corner of the south-west corner cell of the DEM. UTM Y address in meters. X address in meters for other plane coordinate system.
YLLCORNER	Latitude in degrees at the lower-left corner of the south-west corner cell of the DEM, UTM X address in meters. Y address in meters for other plane coordinate system.
XLLCENTER	Longitude in degrees at the center of the south-west corner cell of the DEM. UTM Y address in meters. X address in meters for other plane coordinate system.
YLLCENTER	Latitude in degrees at the center of the south-west corner cell of the DEM. UTM X address in meters. Y address in meters for other plane coordinate system.
XULCORNER	Longitude in degrees at the upper-left corner of the north-west corner cell of the DEM. UTM Y address in meters. X address in meters for other plane coordinate system.
YULCORNER	Latitude in degrees at the upper-left corner of the north-west corner cell of the DEM. UTM X address in meters. Y address in meters for other plane coordinate system.
XULCENTER	Same as ULXMAP
YULCENTER	Same as ULYMAP
(Notes)	Above five sets (ULXMAP/ULYMAP, XLLCORNER/YLLCORNER, XLLCENTER/YLLCENTER, XULCORNER/YULCORNER, XULCENTER/YULCENTER) are exclusive. If mixed, result is undefined.
XDIM	Horizontal data pitch in degrees or seconds. If it is greater than or equal to 0.1, it is in seconds. For UTM and other plane DEMs, value should be in meters.
YDIM	Vertical data pitch. value is same form as XDIM.

CELLSIZE	Data pitch for horizontal and vertical. Don't specify XDIM and YDIM when this item exists.
SEALEVEL	If data has special value for sea area, specify it. If this item is not specified and NODATA is not -9999m, -9999m is assumed.
NODATA	If DEM file has no-data ( void )-value, specify it.
NODATA_VALUE	Same as NODATA.
ELEVATIONUNIT	Specify 'F' if elevation is in feet, otherwise omit this item.
SKIPHEAD	If data has extra bytes in the beginning of the file before elevation elements, specify number of bytes to skip.
SKIPBYTES	Same as SKIPHEAD
RADIUS	Specify radius of the Moon or a planet other than the Earth in kilometer. Instead of radius you can specify planet name for Moon, Mercury, Venus or Mars. If this item is specified, coordinate system should be geo-referenced, otherwise DEM file is ignored. Even if you specify radius of the Earth, program assumes some planet other than the Earth.

If addressing values are outside of geo address range ( i.e. -180 to 180 and -90 to 90 ) and both UTMZONE and XYPLANE is not specified, 'XYPLANE 0' is assumed.

If four lines from ULXMAP to YDIM are not specified here and no BLW file is found, the DEM data will be treated as no-addressing.

#### <Example 1>

```

BYTEORDER      I
NROWS          3600
NCOLS          3600
NBITS          16
ULXMAP         -115.000138888
ULYMAP         35.999861111
XDIM           1.00000
YDIM           1.00000

```

#### <Example 2>

```

byteorder      lsbfirst
nrows          3601
ncols          3601
nbits          32
cellsize       1.0
xllcorner      -114.99986111
yllcorner      35.99986111

```

### BLW file (text file)

This file should describe following data in this order. Each line should have only one floating point number in text format.

Lines	Values
1	Same as XDIM value.
2	( Ignore )
3	( Ignore )
4	Same as YDIM value, but always minus.
5	Same as ULXMAP value.
6	Same as ULYMAP value.

#### <Example> 1 second mesh

```

0.000277777777778
0.0

```

0.0  
-0.000277777777778  
110.000138888889  
39.999861111111

### 3. Read Elevation Data

#### Read data

Select Open under File menu to show file selection panel. You can read DEM files by selecting individual files or folders through the panel. If you select a folder or folders, program reads all readable files in them. If files to be read are not compatible with files already read and showed in the Map View, an alert prompts you to dispose read data or cancel new reading.

If “Read two levels when folders selected.” is checked, read files in folders those are in the folder you selected.

SimpleDEMViewer reads DEM files when you double-click DEM files in Finder, or drop them on to application icon. Application icon accepts folder that contains DEM files.

Different format DEMs can be read and be laid in the Map View as described in next section. UTM and other plane DEMs can be read at the same time if they are belong to the same UTM zone or plane.

<AS note> You should select folder instead of individual files to read SDTS and JAXA ALOS.

#### Coexistence of different kind of DEMs

If several kind DEMs are read, map scale is based on the smallest pitch DEMs. The coordinate system is also determined by them. If it is UTM or other plane DEMs, whole map will be UTM or other plane coordinate. UTM DEMs cannot coexist with DEMs of other plane coordinate. In addition, even all DEMs are the UTM, they cannot coexist if their zones are different.

If the coordinate system is UTM or other managed planes, map covers up to 667 km horizontally. If location leaves far from center meridian more than 6 degrees, accuracy getting worse.

DEMs of different planets cannot coexist.

#### Restoration at start up

As a default, program restores DEMs and settings at starting if previous session ends without removing data. Refer “[Save and restore working set](#)” section.

To skip restore feature, start program while shift key pressing.

#### Read as named working set

You can read DEM data set previously defined with various settings. Refer “[Save and restore working set](#)” section.

#### Remove DEMs

To remove read DEMs, select "Remove data" under File menu, and select data to remove. Refer “[Remove Data](#)” section.

If you read new DEMs without removing current DEMs, and they are not compatible, you will be prompted to remove current DEMs or cancel new reading.

## 4. Map Operation

### Scaling

From scale menu or context menu, you can select scale between 2000 and 5% or specify values directly in "other" menu. If you change the scale using Scale menu, center of the Map view keep its position. If you change it from context menu, mouse point will move to center of the Map view.

You can scale up or down by pinch action on a track pad, in this case place at the mouse point retain its position in the Map view.

Map is centered in the Map view if scale is small enough to show whole world, or all the DEMs in case of UTM or other plane DEMs

### Other Scale menu

If you select "other scale" menu, a dialog will be displayed and you can specify any scale as follows in the dialog.

- Any percentage between 5 % and 2000 %,
- Specify distance in meter, km, yard or mile for a pixel, cm or inch on the map.
- Specify scale by fraction directly like as 1 / 1000000.

For second and third case, click calculate button after entering value, so that result scale will be set to the percentage field. In this case although only three decimals are displayed in the field, more decimals are kept internally.

### Reposition map by address ( Jump to )

You can reposition the map to any place specified by latitude and longitude. Select "Jump to..." under "Find&Jump" menu to display a dialog, and specify latitude and longitude. You have an option to draw a mark at the place after repositioning.

You can save the address with a name, they will appear in a place menu of the dialog.

You may copy latitude and longitude from any web pages and paste it to address field here. Picture at right from USGS earthquake information page shows an address consists of latitude and longitude. Any non-numeric characters are ignored, but N, S, E, W are exception. Refer to "[Copy / Paste latitude & longitude](#)" section.

[M 4.9 - 11km WSW of Palora, Ecuador](#)

III  
DYFI?

Time 2017-11-19 21:42:12  
(UTC)

Location 1.726°S 78.035°W

Depth 152.9 km

Earthqu

### Reposition map by searching user data string

You can search a user data by string in title, node comment or Memo content, and reposition the map so that the found data is positioned in the center of the window. Refer to "[Find user data on the map](#)" section.

### Reposition map using Index Map

You can reposition map to any place specified in Index map by dragging showing frame or double-clicking at any place in the Index map. Refer "[Index Map](#)" section.

### Scrolling

Supports dragging and scrolling by mouse, also supports scroll gesture on a track pad. You can scroll one dot distance by pressing arrow keys. If retina display is used, scroll two pixels. Key repeat is ignored for scrolling.

If DEM based on geo address, you can rotate map around the world .

## Resize map window

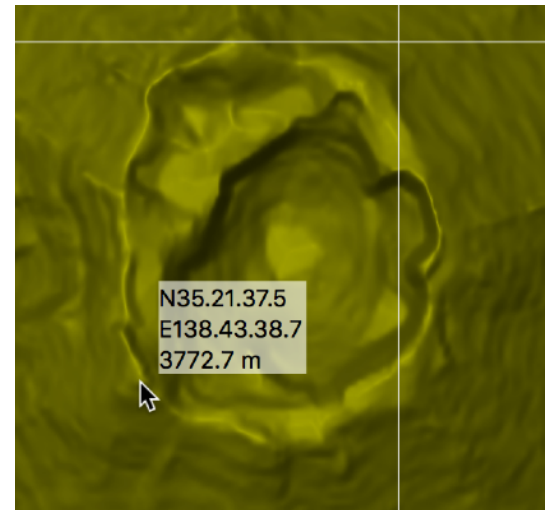
You can set Map view size by pixels. Select "Window size..." under "View" menu to display a dialog, specify width and height. Those values are applied to the Map View without window frame, title bar and side bar.

You can drag one of edges to change window size as usual.

## Showing address and elevation value

Move mouse on the Map View while option key pressing to show latitude, longitude and elevation of the mouse point. Showing elevation value is nearest cell value or interpolated value. You can select to show which in Preferences panel.

Elevation value is shown in integer if DEM format is integer, otherwise one decimal digit will be shown.. Instead of elevation value it shows "sea" for sea, "void" for void value, "n/a" for out range of DEM.



## DEM information

Select "Show Info" under File menu to show informations about read DEMs. If there are multiple types of DEMs are read, their types / data pitches / number of files will be shown for each. It also shows the scale and address of the center of the map region.

Base DEM kind	usgs ascii (utm) 10 m		
UTM Zone	10		
Data pitch	N-S 10 m W-E 10 m		
Number of files	9		
Other DEM kind	GeoTiff 3 sec		
Data pitch	N-S 3 sec. W-E 3 sec.		
Number of files	18		
<hr/>			
Scale at the center	N - S	1 /	85,000
	W - E	1 /	85,000
Center address	N46.11.49 W122.11.13		
<div>OK</div>			



## 5. Map Info Panel

Map Info Panel shows current DEM data type, scale, shading type and color set. You can change shading type, strength and color set from here and it affects the map instantly. You can change some settings about contours and texture maps also.

### Showing items

**DEM data type** Type of DEMs used currently. If they are UTM zone number will be shown. Plane ID will be shown for DEMs defined in "Manage Planes" panel. Radius will be shown for Planets and Moon.

**Scale** Percentage of extending or shrinking rate of map in the Map View. Showing one cell of DEM to one pixel ( if retina screen, to 4 pixels ) is 100 %.

Also shows fraction style scale, assuming that screen has 72 pixels per inch or 144 pixels per inch if retina display.

Click > mark on the right to show or hide Scale Panel.

**Base latitude** Base latitude for geo-referenced DEMs.

You can change base latitude here by clicking > mark at the right, popup menu shows "Reset to defaults", "Center latitude of Map View" and "Enter latitude".

**LL lines** Menu to select intervals of Meridians and Parallels.

To specify different interval for Parallels, click > mark at the right, menu for Parallels will be appear.

**Lon / Lat** Intervals of Meridians and Parallels. If they are same value, shows only one.

**Shading** Shows shading type. You can change it by menu.

Click > mark at right to show or hide following strength menus.

**Strength** Shows shading strength. You can change it from menu.

**Strength of light** Shows strength of light when shading type is "Slope + light". You can change it from menu.

**Color set** Shows current color set with color set menu. You can select color set here.

Click > mark at right to show or hide color table.

**Edit color set** Click this button to edit Color Set. Edit window will appear.

**Use gradation** Set to on to apply gradation.

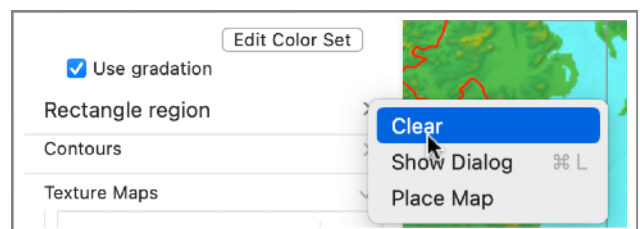
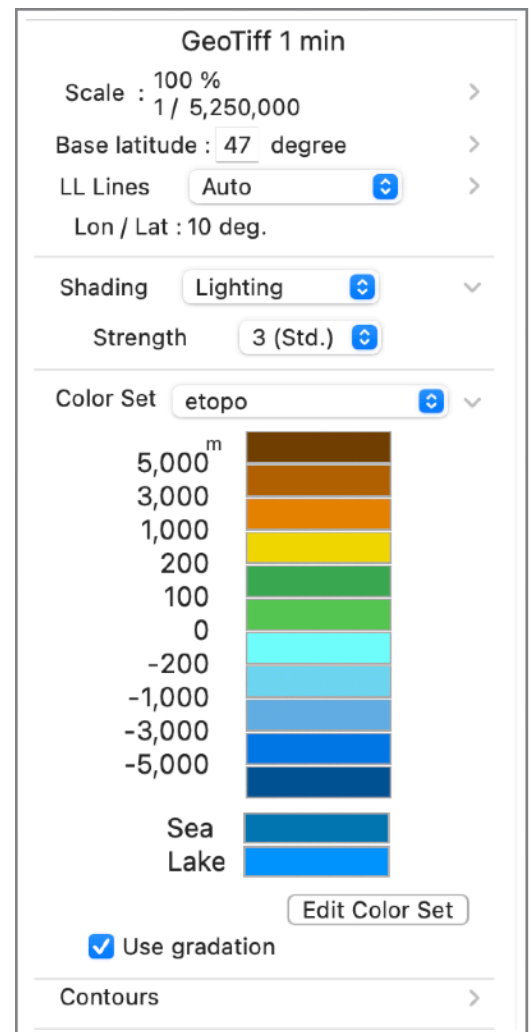
**Rectangle region** Showed only when Selected Rectangle is set on the Map. Click > mark and execute following operation from menu.

**Clear** Set Selected Rectangle to none.

**Show Dialog** Shows dialog to check addresses of rectangle region.

**Place Map** Reposition map as the selected rectangle is placed at the center.. If rectangle region is too big, shrink map scale until edge of the region will appear.

**Contours** Click > mark to show setting items like as the figure at right, and you can select from the menu or change some items to draw on the Map View. To change other settings not shown here, click edit button and edit in separate dialog window.



You can create new contour set there, and its name will be included in contour set menu.

To draw contours, you should click Draw button. If interval is changed, the Map View should be redrawn previously.

Refer "[Contours](#)" section.

**Texture Maps** Shows only when texture maps exist. Click > mark to show setting items like as the figure at right. Reading, removing texture maps and setting each texture information should set in separate dialog window.

You can set use or not use for each texture maps. Three check boxes are applied all texture maps.

All setting changes affects Map View immediately.

Refer "[Texture Mapping](#)" section.

The screenshot shows a settings panel with two main sections: 'Contours' and 'Texture Maps'.

**Contours Section:**

- Contour Set:** A dropdown menu set to 'Default'.
- Interval:** A text input field containing '20' and a unit dropdown set to 'm'.
- Draw index lines for each:** A checked checkbox.

**Texture Maps Section:**

File Name	Use
Holland1.png	<input checked="" type="checkbox"/>
Holland2.png	<input checked="" type="checkbox"/>
Holland3.png	<input checked="" type="checkbox"/>

Below the table are three checkboxes:

- ☒ Use antialiasing.
- ☒ Apply shading on texture maps.
- ☐ Apply on the sea and lakes.

At the bottom is a button labeled 'Set up texture maps'.

## Operations

- "Show / Hide Side Bar" under the "View" menu shows or hides side bar of the main window including Index map. "Show/Hide Index Map" menu shows or hide Index Map only.
- Changing settings in this panel affects Map View immediately except contour lines.
- Changing settings here affects Preferences settings also.

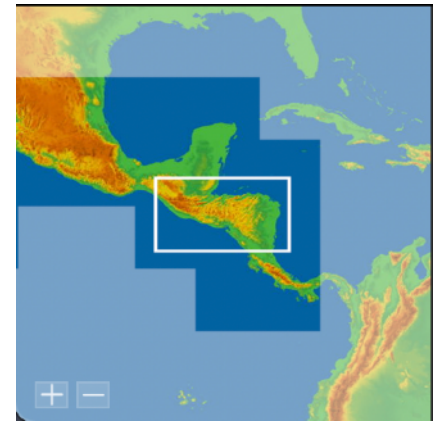
## 6. Index Map

### Content

Index map resides at the bottom of the side bar. Index map displays part of world map, and shows area displayed in the Map View. White rectangular frame shows area displayed in the Map View. Deep color shows the area that DEMs exist, and pale color shows area that DEM not exist. When index map is enlarged, it shows international borders.

You can make the height of Index Map view to half size. To do so drag upper edge of the view.

Index Map is not available for DEMs those have no addressing.

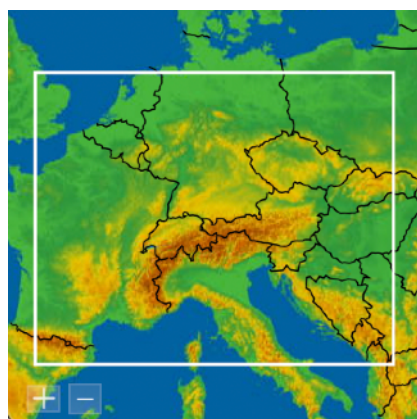
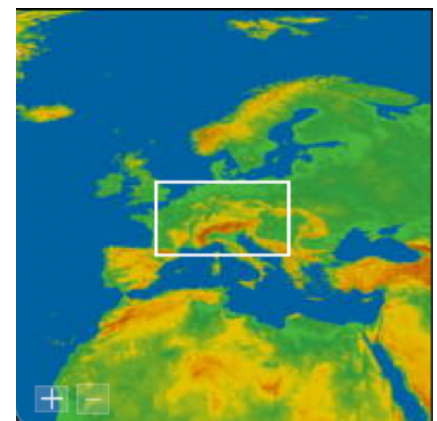
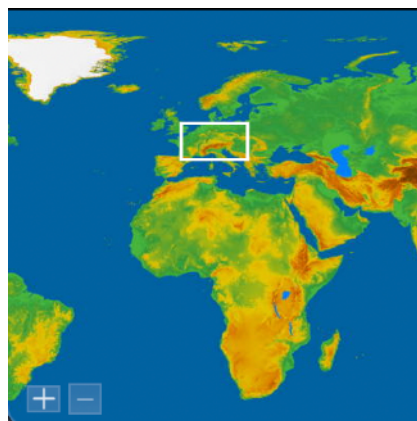
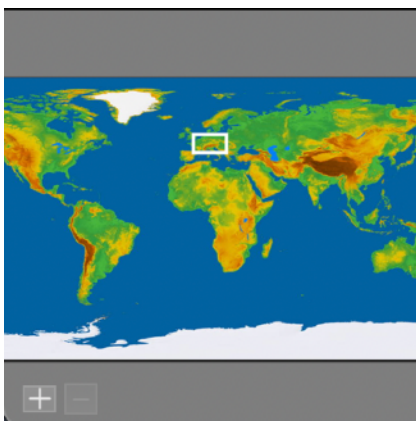


### Scale of the Index Map

Depends on displayed region in the Map View, Index Map shows almost whole world or smaller area. Based on smallest map, it can be expanded up to 64 times, or up to 256 times near Japan. Projection method is Equidistant Cylindrical projection always. If Index Map is expanded 8 or more times, map is shrunk horizontally to compensate distortion depends on center latitude. It is done up to 70 degrees. International borders will be drawn in expanded map larger than 8 times.

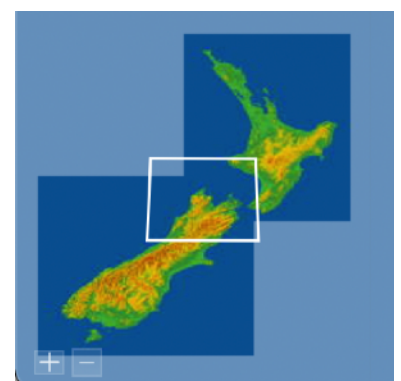
Although scale of the index map is automatically adjusted, you can change it temporarily by pressing [+] or [-] button, [+] button zooms in twice scale and [-] button zooms out half.

Following five pictures are 1, 2, 4, 8 and 16 times scaled Index Maps.



### DEM range and Map View range

Like as pictures at top and at right, read DEMs region is drawn in deep color. Each DEM region is defined with four corner addresses. It includes void region of the DEM also. White frame represents region that Map View shows currently. It is always rectangle for geo-referenced DEMs, but trapezoid for UTM or other plane DEMs like as picture at right, even so, DEM area is rectangle for each always.

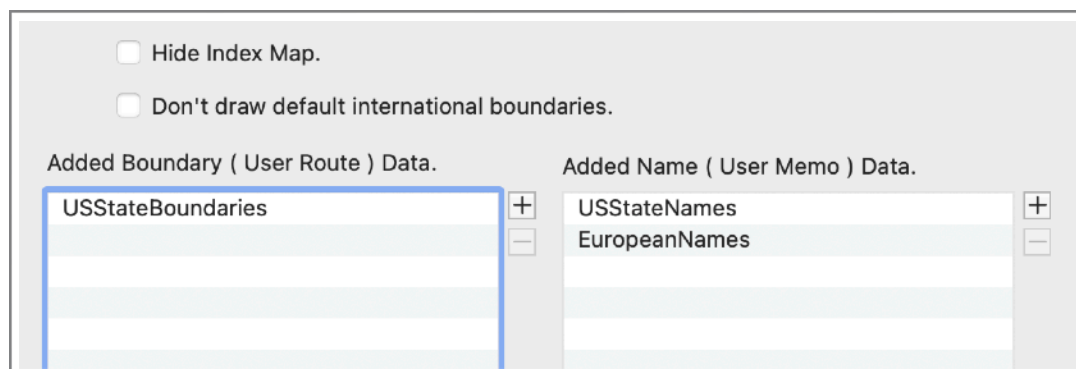


Index Map will be rescaled and repositioned automatically so as white frame always be placed at the center of the Index map, when the Map View is rescaled or repositioned. If white frame is small enough, Index Map will be enlarged automatically, but maximum scale is 64 or 256 so that frame may seem like a dot.

## Adding Regional Boundaries and Names

In a state of 16 times or more expansion, the border will be displayed, but in vast countries such as the United States and China, the border line will often not be visible, to avoid such situation, you can add regional boundaries.

You can also add country names and other names. Nothing is prepared as defaults, but it can be easily prepared as User Route Data or User Memo Data. In the "Index Map" tab of the Preference Panel, You can add or remove User Route Data and User Memo Data. Click [+] button to add new data, it shows file open dialog. [-] button removes data.



Prepare the Route Data as simple and light as possible. It is recommended to make the whole country into one file. You can combine multiple countries, but it is necessary that the east-west width do not exceed 90 degrees.

The display timing depends on the layer. Data with a layer of 0 is drawn when index map is expanded 16 times or more, data of layer 1 is drawn from 32 times, and if the layer is 2 or larger, it is drawn only when it is 64 times (or more) expanded. Any attributes are ignored except layer.

Memo Data also is the same as the Route Data that it should be within 90 degrees from east to west. The display timing according to the layer also be the same. Comment and any attributes are ignored.

The maximum number of files of route data and memo data is 20 each. The file is copied into the library, so the original data is not required. In the library, it is managed with a file name, so if you read the data with the same file name, it will be replaced.

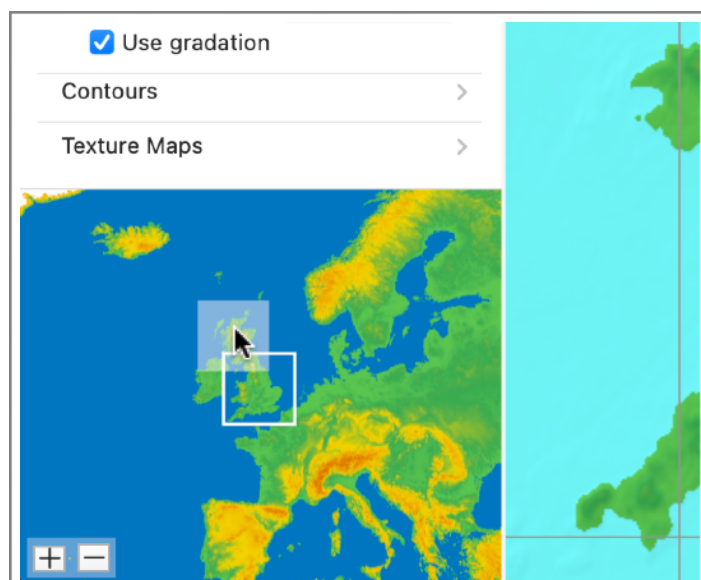
## Operations on Index Map

Show / Hide Index Map under the "View" menu shows or hides Index Map from Side Bar.

You can move Index map content temporarily by dragging. To do it, place mouse cursor outside of the white frame and drag it. It will be reset to default state when the Map View is redrawn.

You can enlarge index map temporarily up to 64 / 256 times. [+] button expands twice and [-] button shrinks to half.

You can change the Map View display position using Index Map. To change map position, place mouse pointer inside the white frame and drag it, release button where you want to show in the the Map View. Double clicking any place in the index map redraw map view as the clicked place will be the center of the map view.





## 7. Map Settings ( Preferences )

You can specify colors, shading and other settings in "Preferences" panel. Select "Preferences..." under the application menu to show the panel. Some settings can be changed also in the side bar of the main window. Almost changes in the side bar redraw Map View immediately, but changes here are delayed until Preferences panel is closed or move behind main window with some exceptions.

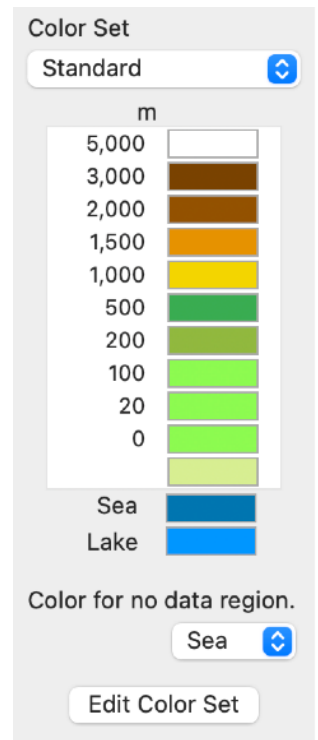
### General

#### Color set

- Elevation color table is like a picture at right. Color set menu has three preset member that are "Standard", "etopo", "WikiColor". You can create new color sets and add them into the menu. Default three sets can not be changed and removed.

(Note) "WikiCoor" is created with referencing Wiki Project web site.

- To create and edit color set, click "Edit color set" button. It will display editor panel. Refer to "[Edit Color Set](#)" section.
- Color sets created by user can be exported as a file and copy to other Macs. Refer to "[Manage Color Sets](#)" section.
- Elevations are boundaries between colors in same row and below.
- Maximum number of colors in a color set is 30 and minimum is 3, except sea and lake colors.
- Any place has elevation between boundaries are colored with its color. Places having elevations equal to boundary elevation, take upper side color when elevation is greater than 0 m, otherwise take lower side color.
- Sea color applied when elevation value is specified as sea. Many DEMs treat -9999 m as sea. No sea color applied to ETOPOs ,SRTM plus and GEBCO since no sea level data exist.



#### Color for no data region

Color for the region where no elevation data. "No elevation data" means both outside of DEMs and void region in DEMs.

Select from white, black or sea color. Sea color varies depending on color set.

#### Use gradation

Set to on if you want to draw elevation colors with gradation.

If gradation is on, colors are changed gradually from one elevation color to next elevation color. Take specified color when the elevation is mid of two boundary elevations. Gradation will not be applied if boundary elevation is 0 meter. Highest and lowest part are also exception.

#### Draw lakes

Set to on if you want to draw lakes with lake color.

Since DEMs have no lake data ( except GDEM ) you should create lake data for each DEM kinds. Refer to section "[Drawing lakes](#)".

☒ Use gradation.

☒ Draw lakes.

☒ Draw lakes and rivers of GDEM.

☒ Fill some lands of zero meter or lower with a color just above zero meter.

☒ White Antarctica and Greenland.

☐ Treat sea as no data region.

☐ Treat zero meter as sea, if DEM does not specify sea level.

Base latitude for map width calculation  deg. ( 0 - 70 )

☒ Draw map by double density in Map View, when retina display is used.

Restore working status ☒ always.  
☐ when saved manually.

Show elevations ☒ value of the nearest cell of DEM.  
☐ interpolated value.

Unit of distance. ☒ km ☐ mile ☐ n. mile

Address format to copy ☐ D.M.S.  
☒ Two doubles.

Lake data folder

VData > MapData > Lakes

When saving pictures to file ☐ Create world file if available.

Reset to defaults  
except lake folder.

## Draw lakes and rivers of GDEM

GDEM version 3 has not only sea information but lakes and rivers also. This option draw both lakes and rivers with lake color. This works independently from above "Draw lakes" option.

## Fill land of zero meters or less with a color just above zero meters.

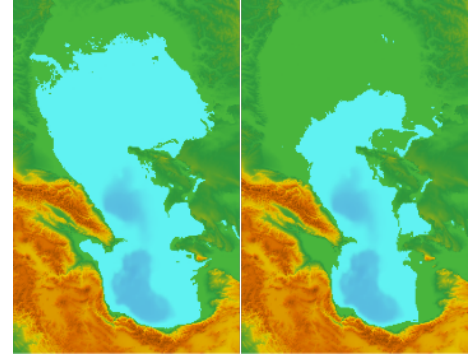
When using a color set having seabed color like "etopo" color set, draws the color of the land lower than the sea level with the color just above 0 meter. However, in the case of the Caspian Sea it is applied only for area shallower than 28 meter, deeper area will be drawn with original elevation color.

Targets are the following places.

Caspian sea. Dead sea. Northern lower land of Egypt, Libya and Algeria. Eritrea. England ( about 120 km north of London ). Salton Sea and Death valley U.S.A. . Lake Eyre Australia. Turpan Basin China. Tokyo, Nagoya and Niigata Japan.

Do not set this option to on if you use color set which color of zero meter or less is land color.

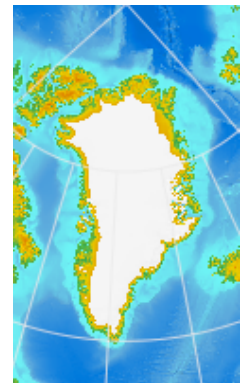
Picture at right is a sample drawing of Caspian Sea using ETOPO1 and "etopo" color set.



## White Antarctica and Greenland

Make Antarctica to be white. Low elevation area near the edge of the continent depends on color set.

Region over 1300 meter elevation on Greenland to be drawn with white color. Picture at right is Greenland using ETOPO1 and etopo color set.



## Treat sea as no data region

Some DEMs have void area within their rectangle range. SimpleDEMViewer searches other DEMs to fill those region. If you set this option to on, sea area is treated as vacant area, so that you can draw land part of GTOPO30 and sea part of ETOPO1 for example. Set to off usually because of performance.

## Treat 0 meter as sea if DEM does not specify sea level

Some types of DEMs have 0 meter for sea area.

Be aware that inland 0 meter area also be treated as sea.

This option applied to DEMs when they are read when this option is on, no effect to DEMs already be read.

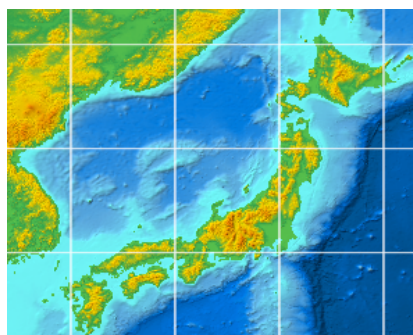
GDEM version 3 has ASTWBD file and this program refers the sea information from that, then this function is not applied when ASTWBD file is available.

## Base latitude

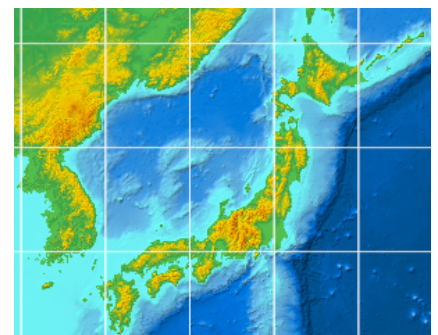
By default, each pixel of map has same size in degrees for horizontal and vertical dimensions. Therefore pixels apart from equator are stretched horizontally. If you want to look around small area in high latitude region, you can specify "Base latitude" to compensate this effect. Aspect ratio will be normalized at specified "Base latitude".

If you use SRTM 3 seconds data and draw in 100%, each pixel represents 3 arc seconds in both height ( latitude ) and width ( longitude ). It will be 6 arc seconds in longitude when you specify 60 degree as "Base latitude". You can specify "Base latitude" between 0 and 70 degree.

"Adjust Base Latitude" under the View menu sets base latitude to latitude of Map View center, but still restricted to 70.



Base is the Equator.



Base is 36 degree.

## Draw map by double density in Map View

When using Mac with retina display, you can specify to create high density map to fit retina display. It makes map drawing little slower. Contour line get thinner and its drawing takes time almost four times. Also drawing Visible Region is same as such.

You should specify 144 dpi when saving picture, if you want a high density Map View picture.

## Restore working set

Specify whether always restore status at start-up or only when user save the status manually at previous session.

Refer to [“Save and restore working set”](#) section.

## Showing elevation

You can show latitude, longitude and elevation value at the mouse point on the Map View by moving mouse while option key pressing. You can select elevation value from nearest DEM element value or interpolated value. Interpolated value may exceed data value and actual elevation for peaks.

## Unit of mileage

Specify unit of mileage ( or distant ) from "km", "mile" or “nautical mile”.

Scale panel, Mileage measuring, Route data mileage, Geo-profile and Panorama view support it.

## Address format to copy

Select address format to copy from D.M.S or degrees. It affects copying address on the Map View and address view in every dialogs.

D.M.S    LW N12.34.56.789 W123.45.54.321

DD        12.58244414 -123.7650892

## Lake data folder

- Specify a folder to save lake data.

Default folder is "~/Library/Application support/jp.jizoh/SDVr8/Lakes/".

<AS note> "~/Library/Containers/jp.jizoh.SDVrAS/Data/Library/Application support/jp.jizoh/SDVrAS/Lakes/".

- If you want to add lake data, you should have right to update the folder, otherwise you can share the lake data with other users.

## Create world file

Specify to create a world file when saving grayscale map or stereograph as a file if available. See [“Save pictures”](#) section for conditions and file format.

## Shading

- Select one of “No shading”, “By light”, “By slope” and “Both”.
- Strength has eight levels. 8 is most strong.
- You can select light direction from 8 direction menu when “By light” or “Both”. The angle of incident is always 45 degrees.
- If “Both” you can select strength of shading by light between 1 and 5.
- If no addressing DEM is used, assumes that the upward direction is north.

The picture below shows sample of each effect, left one is by light, center one is by slope, right one is by both. DEM is 1/3 seconds NED of Grand Canyon.

Shading

☐ No shading

☐ By light

☐ By slope

☒ Both

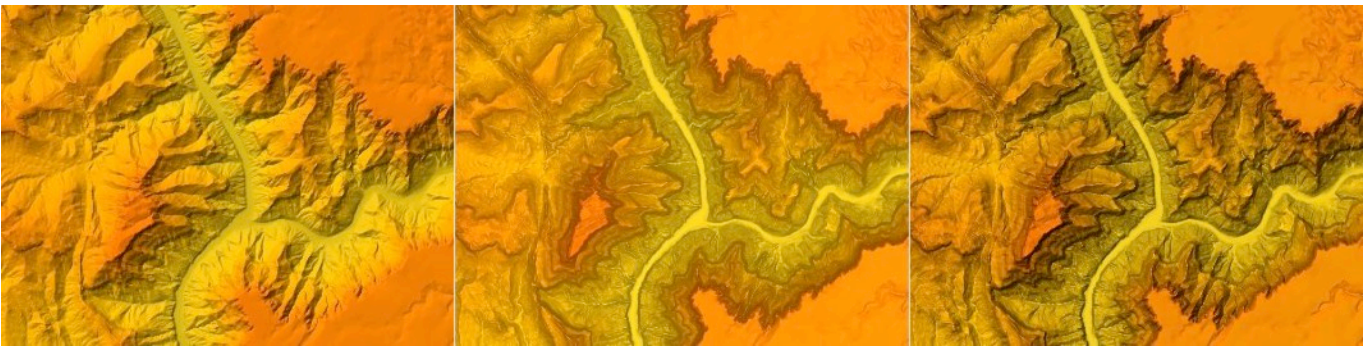
Strength    3 ( standard )

Light from    North-West

Strength of shading by light when both.

2





## Parallels and Meridians

- Select line interval between 30 degrees and 1 minute or automatic. Default is automatic. You can select different intervals for Parallels and Meridians.
- Select line color using Color Picker. Default is black.
- Specify line width in points. Default is 1 point. Floating point number is acceptable.

If the coordinate system is UTM or other managed planes, meridians will be drawn up to 10 degrees from base meridian for both side, but location accuracy getting worse if it leaves more than 6 degrees.

## Planes

Define world's planar coordinate systems which use Transverse Mercator Projection like as UTM. Those systems should be based on WGS84. Some coordinate systems are registered here automatically when you read GeoTiff DEMs. Coordinate systems defined here are identified by "Plane ID" you specified. You can refer Plane ID when reading some kind of DEM files.

Two systems are predefined as samples, you can delete them, but if no systems registered here these two will appear again at next activation.

Refer "[Manage Projection Planes](#)" section.

## Index Map

"Hide Index Map" hides Index Map from side bar. This is linked with the "Show / Hide Index Map" of View menu.

You can add any boundaries and names to Index Map by reading User Route data and User Memo data. You can remove default borders, and show any boundaries you provided instead.

Refer to "[Index Map](#)" section.

## User Data

### Memo Data

Refer to "[User Memo Data](#)" section.

### Destination to display pictures and web pages

- Shown in own window.
- Shown by web browser if web site is specified.
- Always shown by default application. "default application" is determined from file name extension by system such as Safari, Preview, etc.

If "Don't show web site" is checked, just show Memo content window as if web site is not specified.

### Data library folder for user memo

A folder for files referred by Memo data content field, and for custom marks. Default is no library.

"MemoMark" folder containing custom marks should reside directly under this folder. Memo content files may be placed in this folder with-

### Memo Data

When memo content points a file or web site.

☐ Show in own window.  
☒ Show by web browser if web site is specified.  
☐ Show by default application always.  
☐ Don't show web site.

Memo Data library.

Volumes > VData > MapData > jp.jizoh > Memo Library

Default for memo created by drag & drop.

Kind

layer

### Area Data

☒ Do not draw if area is small enough.  
☒ Do not draw title if area is small enough.



out folder structural restrictions.

### **Defaults for Memo data created by drag & drop**

Select a kind and layer number as default values for new Memo data creation by drag & drop a picture file. If you want different kind other than "Photo", you should register it in User Data preferences panel previously.

### **Area Data**

Refer to "[User Area Data](#)" section.

- Do not draw if area is small enough.  
If area size is small enough on the Map View, it will not be drawn.
- Do not draw title if area is small enough.  
Area is drawn but no title if area is not big enough to draw tile.

## 8. Manage Projection Planes

Define world's planar coordinate systems which use Transverse Mercator Projection like as UTM. Those systems should be based on WGS84.

Coordinate systems defined here are identified by "Plane ID" you specified. You can refer Plane ID when reading some kind of DEM files.

### Settings

Show Preferences panel and select Planes tab.

There are two predefined planes, "CH1903+" of Swiss and "NZTM2000" of New Zealand as examples. You can remove them if you want.

**Plane ID** Any character strings to identify planes.

**Origin Address** Origin address of the coordinate plane in latitude and longitude.

**False Northing** Y coordinate address at the origin.

**False Easting** X coordinate address at the origin.

**ScaleFactor** Scale factor at the central meridian, between 0.9990 and 1.0.

**Comment** Any comment. It will be shown in selection dialog when reading DEMs.

### How to use

#### ArcAscii DEMs

Select from the plane menu in the selection dialog at reading time.

#### Bil form DEMs

Specify XYPLANE item with Plane ID in the HDR file.

XYPLANE CH1903+

If Plane ID includes spaces, use double quotation marks.

XYPLANE "Swiss Projection"

### Automatic registration by GeoTiff

When reading GeoTiff DEM files, if their projection method is Transverse Mercator but not UTM, and not exist in this table, its projection plane will be registered here. In that case, it has temporary name as "Temp\_Plane-n", n is serial number here. EPSG code and its name will appear in comment field.

It is temporary registration, and will disappear after quitting program. If you want to keep it, change the Plane ID to your desired name.

If projection method is Oblique Mercator but both axes are at right angle, it will be registered here as it is same as Transverse Mercator practically, such as "EPSG:2056, Swiss Oblique Mercator 1995".

## 9. Edit Color Set

You can create new color set and retain it with unique name. It will appear in color set menus. You can change existing Color Set and save it with new name or replace it. You cannot remove or change default three Color Sets.

"Edit Color Set" button in Map Info Panel or Preferences panel shows this dialog,. "Edit in separate window" in Panorama View dialog shows this dialog also.

You can save Color Sets as a file, and import it. Refer "[Manage Color Sets](#)" section.

### Dialog

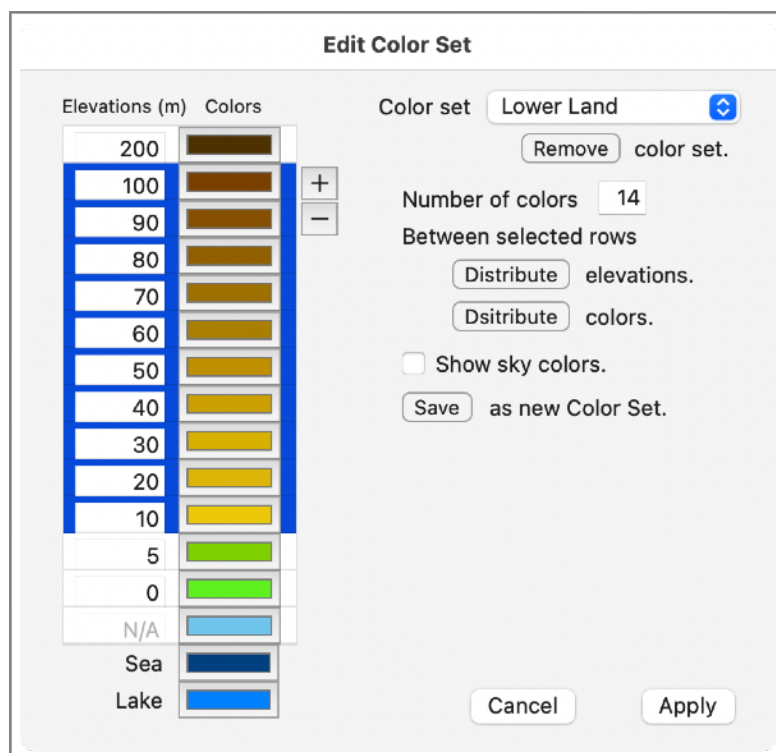
#### Content at beginning

Dialog shows the Color Set that is shown in caller dialog at the beginning, but you can refer any Color Set by selecting Color set menu. If caller is Panorama dialog, sky colors are shown also.

Elevations are boundaries between colors in same row and next.

#### Number of colors

- Maximum number of colors is 30 except sea, lake and sky colors. Minimum is 3.
- [+] button adds a row above selected row. Its elevation and color are set to new row. If more than one row selected, the row clicked last is the target.
- [-] button removes selected rows except bottom row.
- You can specify number of colors directly in the text field at right named "Number of colors". If number of colors is increased, it works as [+] button clicked required times, if decreased, remove selected top most row and following rows.



#### Change boundary elevations

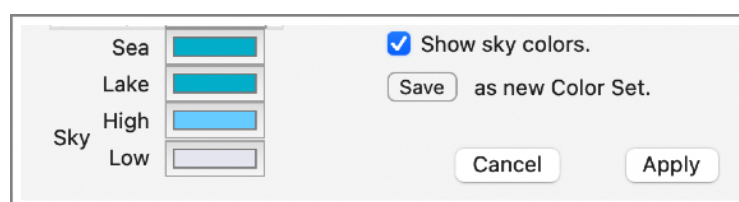
- Select a row and click elevation field you want change, and enter value.
- If you want to enter elevations to many rows with regular intervals, enter elevations to top and bottom rows of the range, select those rows and click "Distribute elevations" button.
- Elevations should be arranged in descending order.

#### Change colors

- Click each color box to show color picker panel.
- if you want to change colors gradually row by row, you can use "Distribute colors" button. Change colors of top and bottom rows in range first, then select those rows and click "Distribute colors" button. Each RGB color components are arranged in equal intervals between top and bottom rows in selected range.

#### Sky colors

- All Color Sets have Sky colors for using by Panorama View. To show sky colors, set "Show sky colors" check box.to on
- If this dialog is called from Panorama View dialog or type of referred Color Set is Panorama type, sky colors are shown automatically.



#### Save new color set or remove color set

- You can create new Color Set with name, they will appear in color set menu. If this dialog was called from Panorama View dialog, type of Color Set will be Panorama type, otherwise Main window type.

- You can remove Color Set showed in color set menu if it is created or imported by user.

## Result

- Click Apply button returns editing result to the dialog who called this dialog. If it is Map Info panel, Map View will be redrawn.
- Cancel button does not cancel creation or removal of Color Sets.

## 10. Manage Color Sets

You can manage ( rename, remove, ordering in menu, export and import ) color sets. You can import Color Set files exported by other user or other Mac.

### Manage color sets

Dialog shows color sets other than standard three sets.

Select one color set shows its content in the right table.

To rename a color set, double click its name in the left table.

Select one and drag it to appropriate position to change order in the Color Set menu.

To remove color sets, select one or more color sets and click remove button.

### Exporting

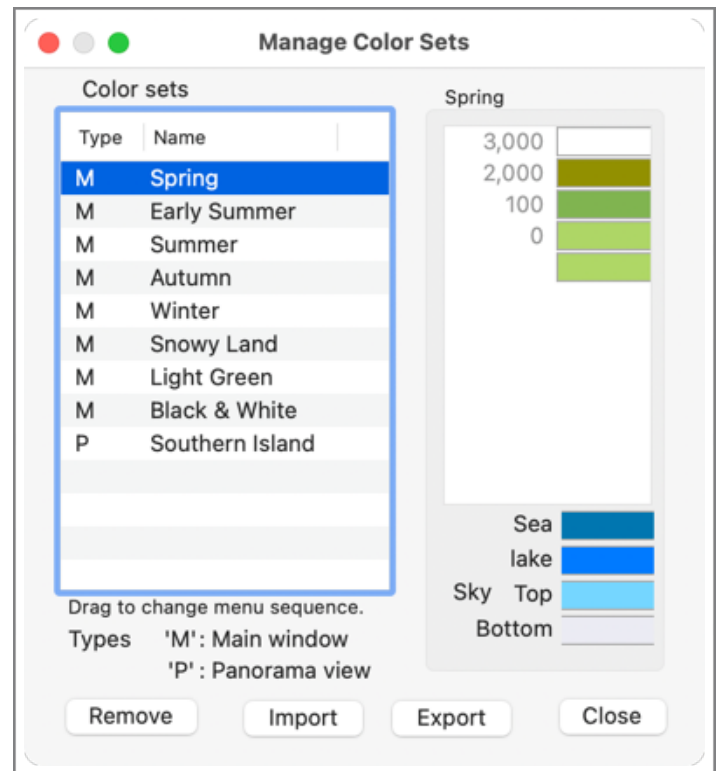
You can write several color sets to a file to reuse them in other mac or in new system later, or pass it to your friends.

Select one or more color sets in the above dialog and click export button, and specify place and name of saving file. File extension is always 'jzcolor'.

### Importing

To read Color Set files, click "Import" button and select files in the file navigation dialog.

If the same name exists, a dialog will appear and you can replace it or enter new name. Even if



Lake name	Any name is acceptable. There is no need of uniqueness but preferable.
Base point	Address of mouse point that is clicked at first.
Surface elevation	Current lake's surface elevation.
Register	Finish one lake data.
Clear	Clear fields. If data is creating, it will be canceled.
Edit library	Display lake data table and you can delete, rename or update lake data. Refer next paragraph.
Finish	Finish creating lake data and save them.

same name exists, if their contents are identical, it is skipped with no message.

# 11.Drawing Lakes

You can create lake data to draw lakes if lake area is flat in the DEM. Lake data are created for each DEM types and be saved as separate files.

To create lake data, lake should cover more than 100 elements of DEM. If a lake consists of several elevation regions, you should make separate lake data for each elevations. Picture at right is Lake Baykal using ETOPO2. It has different elevations for its northern and southern part. It requires you to make two lake data for one lake.

If several type of DEMs are read, you can create lake data for base DEMs only.

You cannot create lake data for DEMs those have no addressing.



## Create lake data

Select "Create lake data..." under "Tools" menu after reading DEM files. "Creating lake data" panel appears and the cursor changes to a water bucket.

If you click any point in the lake region on the Map View, program checks around it whether any lake data can be created there or not. If it can do, click point address and elevation value are shown in the panel, and lake region is drawn by lake color. If not all lake region is drawn, click again remaining portion in the lake. After all available lake region is drawn, enter lake name and click "Register" button. You can continue to create next lake data.

To finish creating lake data, click "Exit" button in the panel. Lake data are saved as lake data files for each kind of DEMs.

Cretaing Lake Data

Click on the map to create lake.

Lake name

Base point S01.26.56 E033.01.14

Surface elevation 398.00 m Register

Edit library Clear Finish

## Edit lake data

You can delete individual lake data, rename data, change the bounding rectangle of lakes.

Program uses only surface elevation and boundary rectangle to determine lake region, therefore some places that has same elevation are drawn as lake, even if it is outside of the lake. To avoid it, you can create several lake data for one lake, and adjust each bounding rectangles. If elevations of lake and its shore are equal, you may adjust rectangle to limit lake region.

Edit lake data

Show lakes for DEM type BIL(float) 1 min Address is the center of bounds rectangle.

Lake name	Latitude	Longitude	Elevation
Tanganyika	S 06.04.00	E 030.06.30	767.00 m
Victoria	S 01.08.30	E 032.55.30	398.00 m
Malawi	S 11.59.00	E 034.35.00	476.00 m
Baikal	N 53.40.00	E 106.49.30	449.00 m
Eyre	S 28.25.30	E 137.14.30	-15.00 m

lake name

Surface elevation 398.00 m

Bounds North-West corner South-East corner

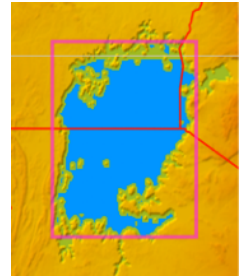
N 0.12.00.000 S 2.29.00.000

E 31.38.00.000 E 34.13.00.000

Update Remove Close

If one of the lakes is selected in the table, its bounding rectangle is shown in Map View like a picture at right. It reflects changing bounding rectangle immediately, so that you can adjust easily.

If you change its name or bounding rectangle, do not forget to click Update button.



## Lake data files

Lake data are saved as a file for each DEM data types. Those files are saved into a lake data folder specified in the preference dialog. If you change it, SimpleDEMViewer replaces all the lake data by the data in the new folder.

You can copy it from another Mac if it is created by version 4 or newer.

## Notes

- In the edit dialog, boundary rectangle of each lake data is shown by latitude and longitude, even if they are determined by UTM address for UTM DEMs. Such a case, latitude and longitude for north-west corner and south-east corner are shown in the dialog. It's the same for other-projection plane DEMs.
- Lake surface is not flat in SRTM DEMs usually, use SRTM DTED instead.
- If you want to flatten lake region, you can use [DEM Inspector](#).



## 12. Save and Restore Working Set

There are two situations to save working set.

One is for the automatic restoration at the start-up. You can choose restoration occurs always, or occurs only when you had saved intentionally during previous session.

Another is the restoration when you want. Save named Working Set, and restore it anytime. You can save many named working sets. E.g. one is for world wide map, another is for local maps; You can change maps easily between them, those can be prepared with settings appropriate to DEM files.

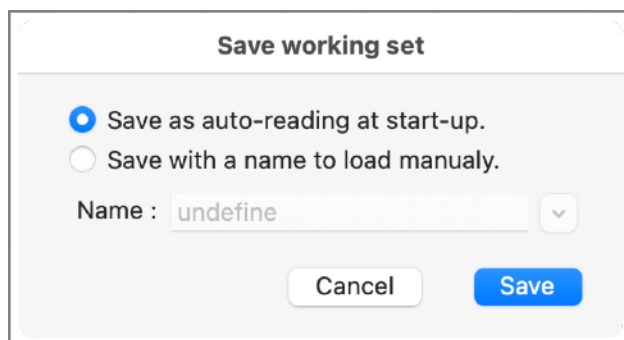
You can start this program with specifying a named Working Set from the Dock menu.

### Restoration at start-up

Specify this feature's behavior in "General." tab of Preferences panel. Select one of "Always" or "When saved manually". If "Always", working set is saved automatically before you quit program.

If not "Always", select "Save working set..." under "File" menu to show the dialog, save working set and quit program, or you can continue the work without quitting.

Restoration will be activated automatically at next start-up if working set was saved. If you want to skip restoration, start SimpleDEMViewer during shift key pressing. In this case, if not "Always", restoration will be deferred to next time.



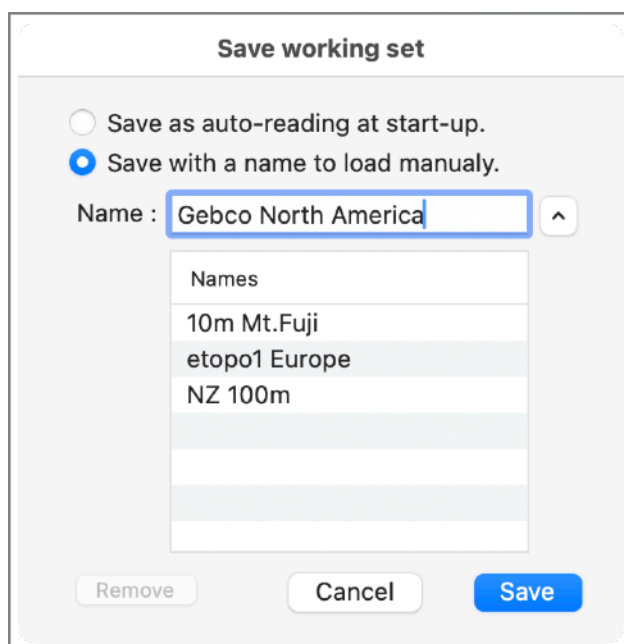
### Named saving and restoration

To save the Working Set, select "Save Working Set" under "File" menu, enter any name to refer later, and click Save button.

Click little triangle at the right to show existing names. If you select one of names in list, it will be copied to input field. Use it to overwrite, or edit it to other name. When a name in the list is selected, you can remove it.

Saved names are listed in sub-menu of "Load saved Working Set" under the "File" menu.

Before loading saved Working Set, all DEMs, texture maps and user data are removed and panorama view settings are reset to defaults. All data files will be reloaded even if same data files are used.



### Objects to restore

Save read files and map drawing status, and restore them at next time. Data and setting information to be restored are followings.

- DEM files
- Texture maps
- User data
- Map position
- Map scale
- Selected rectangle

Following items are saved in named working set.

- Settings in the preference panel's General, Shading and Lat/Long tab pages.excluding "Draw map by double density ~" and items below it in General tab page.
- Contour line settings.
- Layer settings of user data.



## Notes

- Settings in the preference dialog are not restored for start-up restoration, but always remain between sessions.
- Only file pointers are saved for DEMs and texture files, they are read again at restoration time. They should reside in the system, otherwise will be ignored.
- User data are saved as user data files for each Memo, Route and Area. Even if there are new or updated data not saved yet, program quits without alert. Those data also restored in next time, but you'd better to save those data to files before quitting to avoid losing updated data.
- The Dock menu is displayed as a recently used folder. The maximum number of menu depends on the number of "Recent Documents" in the system settings.

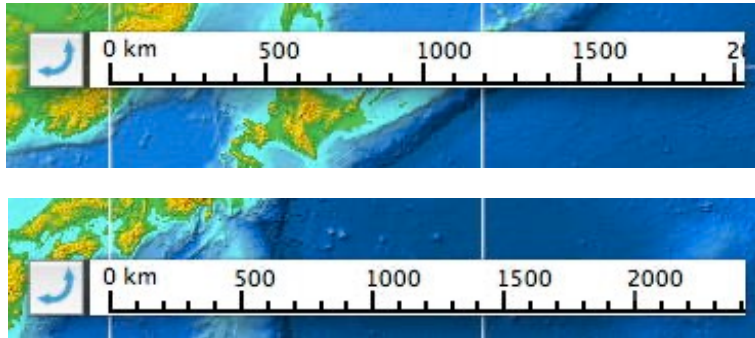
## 13. Scale Panel

When main window is front most, a scale panel can be displayed.

Scale panel has two states, horizontal and vertical. If it is in horizontal state, the scale varies depends on latitude at bottom edge of the scale panel, and it shows distance along latitude line. Horizontal scale is not available over 85 degree or under -85 degree area.

You can change state by click arc-arrow icon in the scale panel. You can show / hide scale panel by "Show / Hide scale panel" under "View" menu.

Scale unit can be changed among "km" "mile" and "nautical mile" in the Preferences panel.



## 14. DEM Inspector

### Showing cell values of DEM files

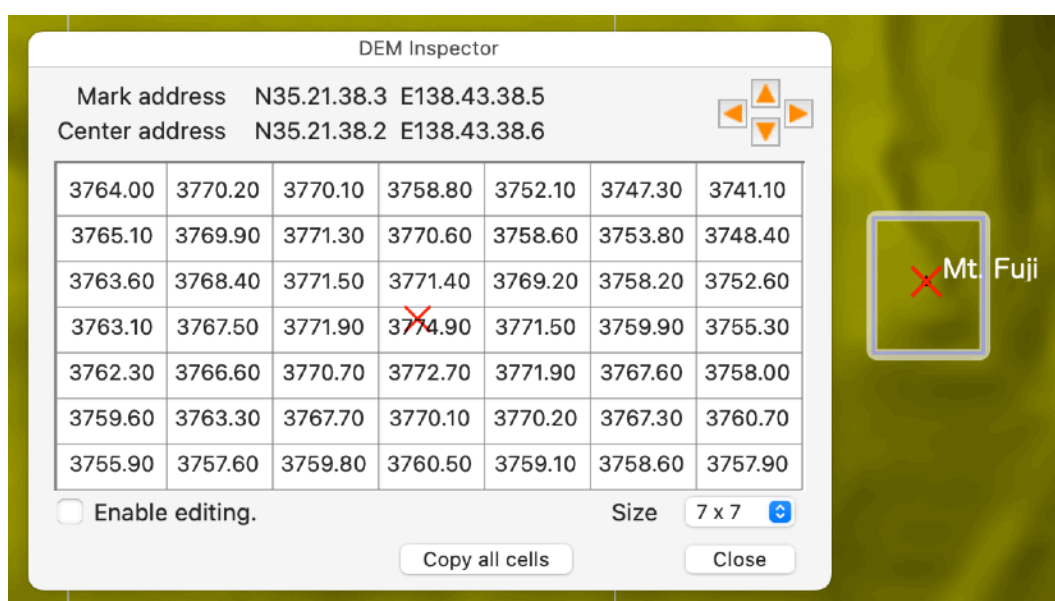
DEM inspector panel shows elevation values of 7 by 7 ( or 9 by 9, 11 by 11 ) cells around the address that started inspector. The address is shown as "Mark address". You can move range of showing cells by arrow keys or red arrow buttons on the panel. White rectangle frame appears on the Map View, its inside area represents showing cells.

The size of the showing area can be changed at any time from 7x7, 9x9, 11x11 by the menu at the bottom right of the panel.

Red X on the panel and on the Map View represent mark address.

Each cell shows one of followings.

- number Elevation value. Integer or floating point number depends on DEM format.
- sea Sea area.
- void Void area.
- (n/a) Out of DEM extent.



### Change elevation values

You can change elevation values of DEM data to flatten sea or lake region, or to amend invalid values. Check "Enable editing" to do it. Changed values are applied to image of the Map View immediately.

Changes are temporary. They will be lost when quit program or remove DEMs from program. Restore function does not maintain them. If you want to retain them for future use you should export DEM as new DEM file.

#### Edit individual cell values

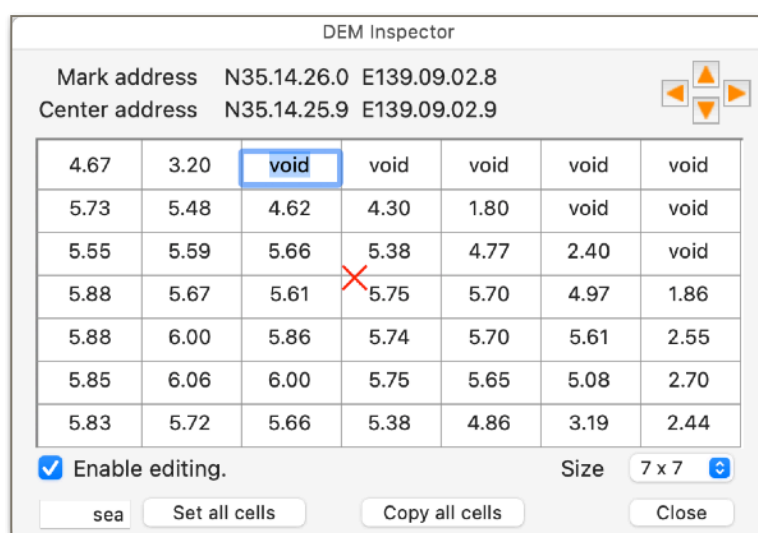
Click or double click a cell in the panel to change an elevation value. To fix changed value, enter tab key or return key, or click other cell.

Elevation value should be between -15000 and 15000 meters. You can enter "sea" or "void" instead of elevation value.

#### Set all cells to the same value

You can set all cells to same elevation values. To specify the value, double click bottom left field, enter some elevation value and click "Set all cells" button.

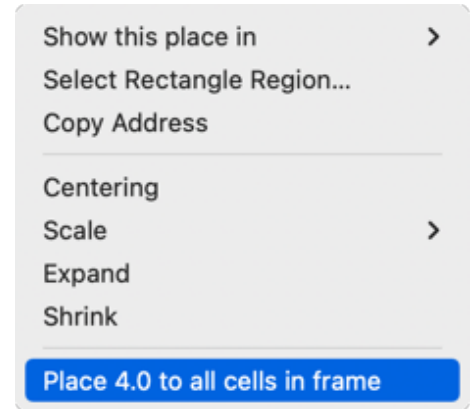
You can enter "sea" or "void" instead of



elevation value.

### Set all cells in the selected rectangle region on the Map View

You can select rectangle region on Map View during Inspector working, and you can set all cells in it to same elevation value. After selecting rectangle region, right click in it to show popup menu. It should show "Place nnn to all cells in frame" menu. "nnn" is the value of bottom-left text field of the Inspector panel.



### Copy all cell values

Copy all cell values as string data. It has tab separator, so that you can paste to 7 by 7 ( or 9 by 9, 11 by 11 ) cells in the sheet of Numbers.app.

### Notes

- Only base DEM is supported when several kinds of DEMs are read.
- Elevation values are shown as floating point number in meters even if DEM file elevations are in feet.

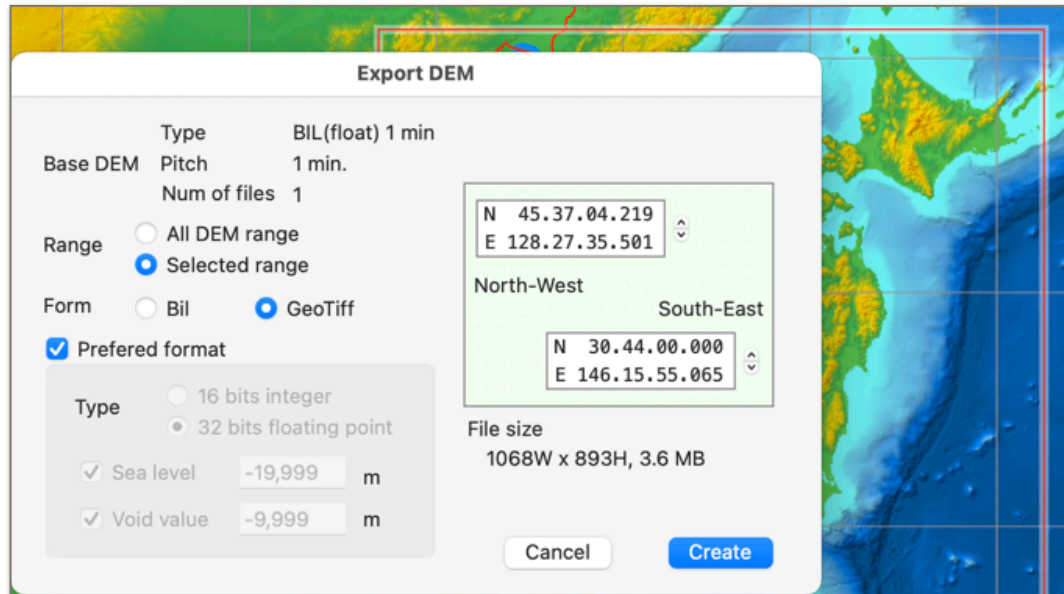
# 15. Export DEM File

## Create new DEM file

Create a new DEM file from read DEMs. You can select range from whole DEMs or some rectangle portion of DEMs. You can create new large DEM file from many small DEMs, or create smaller DEM from part of large DEM. Also, you can save DEMs changed in DEM Inspector. Output DEM file format is BIL or GeoTiff. GeoTiff can be selected if original DEMs are based on geo-referenced, UTM or other planes.

Only base DEMs can be used to create new DEM file. DEMs should be based on WGS84 or no addressing. That means you cannot save old DEMs from GSI of Japan ( those file extensions are one of TEM / SEM / MEM / LEM ).

Output DEM file format depends on source DEM, but you can change bit width, that is 16 bits integer or 32 bits floating point number.

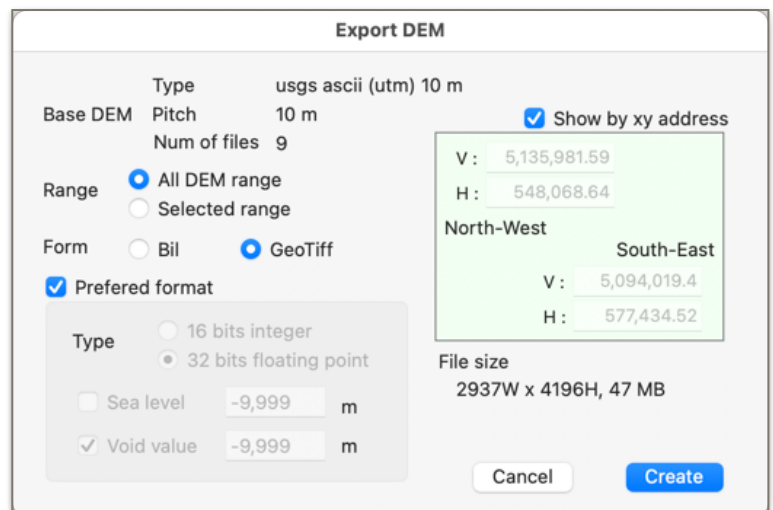


If DEM is based on UTM or other planes, you can specify range by XY address like as the picture at right. If no-addressing DEM is used, range shows only by XY addresses.

## Operations

To show the dialog, select “Export DEM” menu under the “File” menu.

If you have selected rectangle region previously, “Selected range” is on at the beginning, otherwise “All DEM range” is on. You can change it anytime.



Base DEM Showing base DEM type.

Range

All DEM range Includes all base DEMs.

Selected range Includes rectangular region bounded by latitude and longitude or XY addresses.

Preferred format Set items in the box to source formats.

Type Select bit width of output DEM file.

Sea level Specify elevation value treated as sea.

Void value Specify elevation value treated as void data.

North-West / South-East

Shows rectangular region to create DEM file. 180 degree meridian should not be inside.

File size                Shows calculated output file size. If the size exceeds 2 Giga bytes limit, letters will be red.

Click "Create" button to show save panel, specify name and select place to save. File extension is "bil" or "tiff". If BIL format was selected, HDR files will be created also.

## Notes

- 180 degree meridian should not be inside.
- Byte order is Intel form ( LSB ) always.
- If specified range address does not match with DEM's boundary address, they are adjusted automatically.

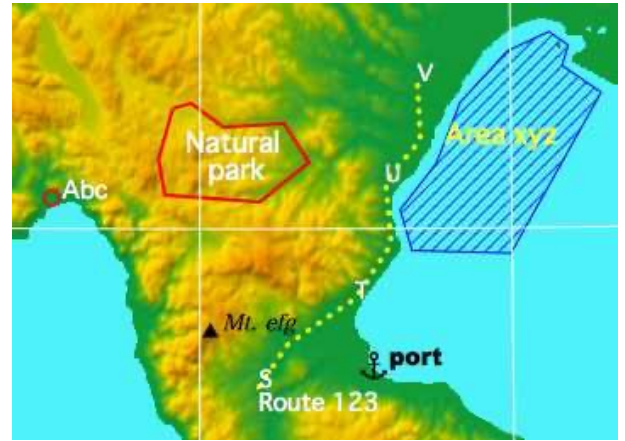
## 16. User Data

You can make Memos, Routes and Areas on the map. To create User Data, show context menu on the Map View, and select "Create User Data" menu.

You can save them as files, and use them later. You can pass those files some other people, so that they can see your Memos and other User Data.

User Data are classified by "Kind" and "Layer". 10 Layers are provided, and they are identified by numbers 0 to 9. You can create any Kind identified by character strings. You can control visibility of each user data by Layer and Kind combination

User data cannot be shown and handling on the map that use no-addressing DEMs.



### Memo data

Memos have a mark, title, address and comment. Mark and title are shown on the map. If you double click on the memo, its contents will be shown in a separate window. You can configure the Memo data to display a picture or web page instead of contents dialog. 41 ready-made marks are provided, and you can provide custom marks up to 50.

### Route data

You can create any route connecting place to place. Routes have a polyline, a title and node comments. You can set line kind ( solid line, dashed line, etc. ), colors and width.

### Area data

Area data is a polygon. Area type can be selected from frame only, translucent, hatching, etc.. Title is shown in the center of the area.

### Import external data

You can read Placemarks as User Data from KML files.

You can read ArcInfo's exported file (e00 format) as user Route data.

You can read GPX format GPS data file to create user Memo or Route data.



## 16.1. Memo Data

### About Memo data

You can create Memos that link to an address ( latitude and longitude ). A Memo consists of title, kind, mark, address, contents and elevation. Memos are shown on the map as a mark and title. You can make titles maximum 3 lines, and can set font and style.

Mark is drawn at the address and title are drawn at the right of the mark. If Memo has no mark, title is placed where bottom-center of the title points the address.

Memos have "Kind" and "Layer". Visibility of Memos on the map can be controlled by Kind and Layer

**Kind** You can create new kind with any string

**Layer** A number, 0 – 9

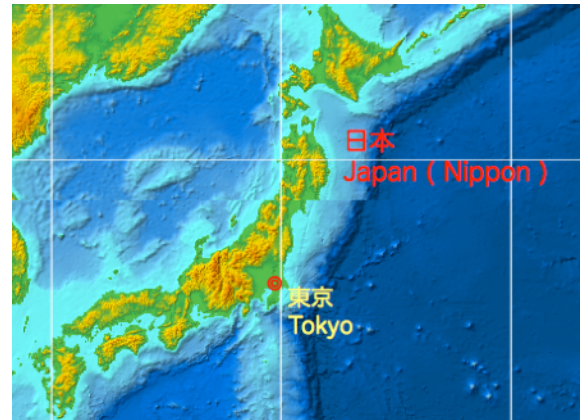
**Mark** Select one from prepared set. You can add user marks up to 50.

If mark or title string is double-clicked, Memo content will be shown like as the picture at right.

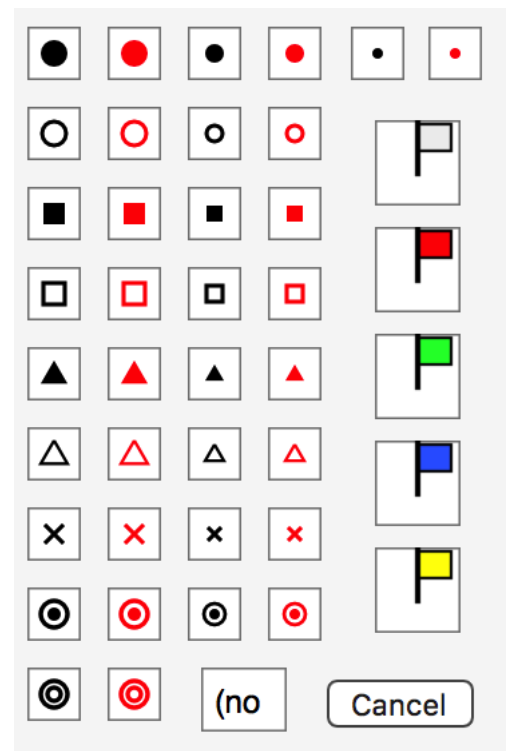
If URL string is placed in the beginning of the contents field like as picture below, referenced data ( html document, a picture or a movie file ) will be shown instead of above dialog when double-clicked. To show web page, you should allow in the Preference panel in advance.

If DEM is no-addressing type, you can't use Memo data.

You can format strings in comments field with HTML tags. Refer to "Formatting contents with HTML tags" section.



```
<http://www.metro.tokyo.jp/ENGLISH/index.htm> size=( 800, 700 )
Capital city of Japan.
Reside at central Japan on Honshu island.
```



Standard marks

## Create new Memo

Place the mouse cursor somewhere in the Map View, and control+click to show context menu, select "Create User Data / Memo". You can specify following items in the dialog.

Kind	Select from menu, or input any words to make new Kind.
Layer	Select one between 0 and 9 from menu.
Mark	Select one from popup panel.
Defaults button	Set mark, layer and string attributes to defaults, if "Kind" is exists already.
Title	Any string to be shown on the map up to 3 lines. If title exceeds 3 lines, remains will be included in the 3rd line.
Address	Latitude and longitude at the mouse point is set. Can be modified to any address.
Elevation	Elevation gotten from DEM data with the above address is set. Can be modified to any value. If elevation has no meaning or uncertain, specify -20000.
String attributes	Specify font, size, style, text color and background color for title string.
Comment	Any comment strings. If URL string enclosed with '<' and '>' exists at the beginning, referenced data ( html documents, pictures or movies ) will be shown when Memo is double-clicked.

When dialog appear, Kind, Layer, Mark and string-attributes fields are copied from those of previous dialog.

## Create Memos directly from picture files with GPS information

Drop picture files on the Map View to create Memos. If those picture files have exif GPS information, Memo data are created automatically. Those Memos are created as followings.

- Kind and Layer are set to those specified in Preferences panel. Refer "[Defaults of Memos](#)".
- Title is set to file name without extension.
- Mark and string attributes are set to defaults for the Kind.
- Latitude, longitude and elevation are extracted from GPS information of the picture. If picture has no GPS information, latitude, longitude and elevations are set to those of dropped place in the Map View.
- Comment field contains URL of the file and creation date from exif information. GPS address's datum should be WGS84.

**<AS note>** Pictures should exist in Memo Library. Even if pictures reside outside of Memo Library, Memo data will be created and those pictures can be shown until program terminates. Saved such Memo data will not show pictures later.

## Update Memos

You can update each Memo, or update common attributes of Memos.

### Update one Memo

there are three ways to call dialog to update each Memo.

- Double-click a Memo on the Map View during option key pressed.
- Click "Edit" button on the Memo-content-window displayed by double-click Memo on the Map View.
- Select "Edit user data" under "Tools" menu. Select one Memo in the list and click "Edit" button.

### Update common attributes

Select "Edit user data" under "Tools" menu. Select Memos and click "Set all" button. You can update following attributes of every selected Memos to same values.

- Kind
- Layer
- Mark
- String attributes

## Show picture or html page

If URL string enclosed with '<' and '>' is placed at the beginning of content field of Memo, referenced data ( html document, a picture or a movie file ) will be shown when Memo is double-clicked.

You have options to select way of displaying those pictures or web pages. Options are

- Always in SimpleDEMViewer window.
  - By web browser if those Memo points web pages.
  - Always by default application of the file to display such Memo data.
- "default application" is determined by its file extension. It may be "safari" or "Preview".

In the [User Data tab of Preferences panel](#), you can select above option.

Web site access is not allowed in default for security purpose. To allow it remove check from "Don't show web site" in Preferences panel.

## URL forms

"http:", "https:" and "file:" forms are available for URL string. To point files in the library folder, specify only sub portion under the library folder. Followings are examples. "Photos", "movies" and "hawaii.rtf" are placed at top level in the Memo library folder.

Web page	<https://www.abcd.co.jp/pages/123.html>
Local picture file	<file:///User/Name/Picture/abc.jpg>
Files in the Memo library folder	<Photos/Fujisan.jpg> <movies/Cities/tokyo.mov> <hawaii.rtf>

## Getting URL from files

Although you can enter URL string directly, it is easier that dragging file icon to the Memo dialog. If the dialog accepts file icon, its URL string will be written as above second or third form depending on where the file from.

If you drag and drop internet location file, the dialog takes contained URL instead of location file itself.

If dropped picture file has GPS information, latitude / longitude / elevation are taken for the dialog items. Also picture creation date ( not the GPS time ) will be copied in Memo content.

ex) <file:///photo001.jpg> Date(2023.12.01 15:20:30)

## Window size

If pointed file is a picture or a movie file, SimpleDEMViewer get the appropriate window size from the file, although you can specify window size with form of size= ( width, height ).

ex) <http://www.xyz.com/123park.html> size=( 700, 600 )

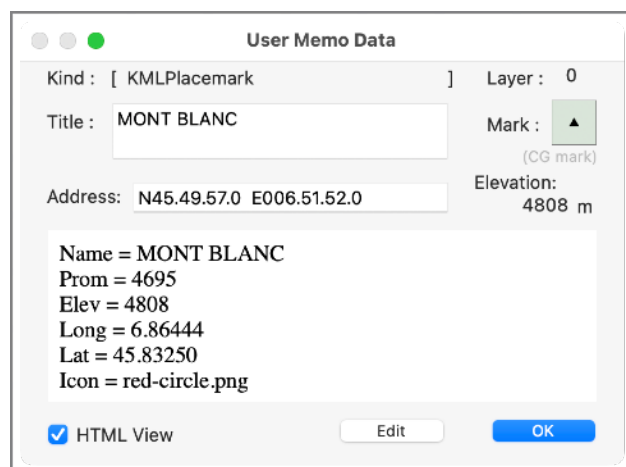
## Formatting contents with HTML tags

You can use HTML tags to format strings in contents field. For example, <br>, <b></b>, <i></i>, <h1></h1>, <p></p>. Any other HTML tags are acceptable also, but external reference to file or web site are ignored, and hyper links do not work.

Memo contents display panel ( such as a picture at right ) shows "HTML view" check box when contents strings include HTML tags. Uncheck it to display full text including tags.

User Memo Edit Dialog shows full text of contents field always. No WYSIWYG editing function available, so you should enter tags manually, or copy from some HTML editor.

If contents field text includes '<' and '>' characters, and its not includes HTML tags nor external reference, some text may disappear. In such a case uncheck "HTML view" check box.



## Pass Memos to someone

If you place Memo content files in the Memo Data library, you can pass Memo data with content data files to anyone using other Macs. If you place them outside of the library, it is difficult to pass Memo data to other users to see your Memo data on other Macs.

It is no problem to pass Memo data to other users if URL points internet site or no URL string specified.

## Move Memos

Memo can be moved from original place. You can change Memo address in the update dialog, or simply drag Memo Mark on the Map View. If drag Memo title, only the display position of title string will change without updating Memo address. This display position of title string can not be saved.

In a picture window ( such as Conical projection map ), Memo Mark can not be moved but title string can. If you drag title string to outside of the window, it is removed from the picture.

## Tilt the title / Write vertically

You can tilt (rotate) the title string of the Memo on the Map View. Drag the end of the string while holding down the shift key. The rotation center is at the lower left corner, or if no Mark, it is at the center of the lower side. In the case of vertical writing, it is the upper left corner or the center of the left side respectively. This rotation angle will be included when saving the Memo Data and is maintained when it is read later. Older version program ignores this information.

If you rotate it to the range of  $\pm 10$  degrees downward vertical, it will change to vertical writing in the case of Japanese, Chinese, etc.. To return it to horizontal writing, rotate it to the range of  $\pm 10$  degrees in the horizontal direction. Vertical writing will not work if vertical fonts are not available even Japanese.

To eliminate the tilt, click the string while holding down option key and shift key, it will be reset horizontally (vertically in the case of vertical writing).



## Custom marks

Any PNG pictures can be used as a Memo Mark.

First, create a folder named "MemoMark" in the "[Memo Data library folder](#)". Place your PNG pictures there. Those pictures will be read by SimpleDEMViewer when it starts or library is selected, and will be displayed in the mark selection dialog.

PNG picture file can have any file name but its file extension should be 'png'.

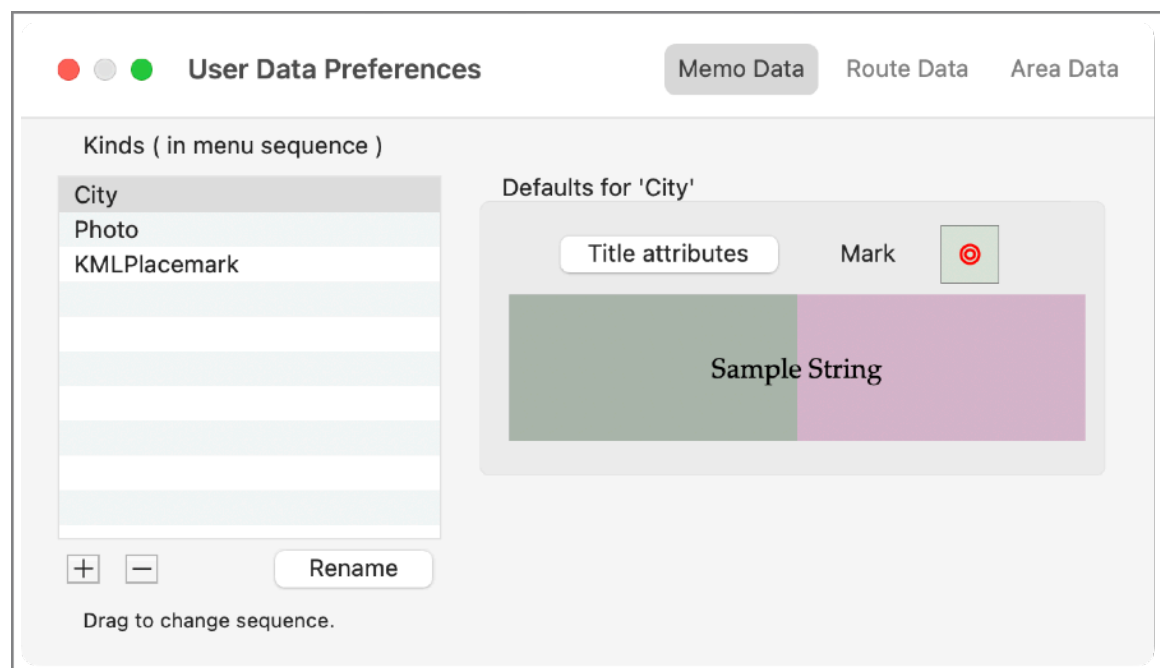
Picture size has no restriction, however size of 64 x 64 pixels are recommended, because marks are always drawn in the 32 x 32 points square.

Maximum number of custom marks is 50.

## Defaults of Memos

Define Kinds, and set defaults for them. Open "Preferences for User Data Kind..." under "Tools" menu to show the dialog. Order of the Kinds in the list affects Kind menu of the Memo creation/update dialog.

- |        |   |
|--------|---|
| [+]    | Add new Kind.   |
| [-]    | Remove a Kind. Kinds used by Memos cannot be removed.               |
| Rename | Rename a Kind. If Memos using the Kind exist, they will be updated. |



String                      Set title string attributes for each Kind.

attributes

Mark                      Click Mark icon to change Mark for each kind.

You can define defaults including string attributes and mark for each Kind, when only one Kind is selected in the list. These defaults will be referred when "defaults" button in the create/update Memo dialog is clicked or when creating new Memo first after program started.

## Read KML file as Memo Data

There are many type of data exist in KML ( and KMZ ) file, only simple Placemark with one Point is converted to one User Memo Data. Refer to [KML Data](#) section



## 16.2. Route Data

### About Route data

You can plot a route on the Map View. A Route has a polyline, title and node comments. You can specify line type, color and width. Title and node comments can have 3 lines. Font, size, style and color for those strings can be set.

If line segment length between nodes is longer than 150 km, it is drawn as a great circle, otherwise it is drawn as straight line on the screen.

Picture at right shows sample Route data on an Orthographic projection map using ETOPO1.

Line types are solid line, broken line, chain line, dotted line. Any colors are applied to lines. Line width can be set between 0.5 and 30.0 points.

Routes have "Kind" and "Layer". Visibility of each Route on the map can be controlled by Kind and Layer.

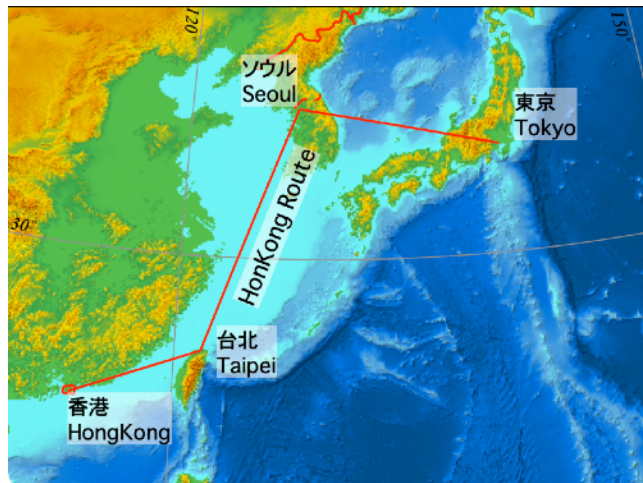
Kind You can create new kind with any string.

Layer A number, 0 - 9.

You can create any Kinds, and can delete them. They will be in Kind menu.

If DEM is no-addressing type you can't use Route data.

Route data is not restricted to route, but can be used as rivers, administrative boundaries, etc..



### Create new Route data

To begin plotting new route, move mouse to start point of the route on the Map View. Show context menu there and select "Create User Data / Route", then a red line will be drawn from start point to mouse. Click mouse at middle points, to stop creation double click at the end point. You can cancel last node by Esc key.

If you make click on a string ( any user data string ) node address is set to the string's address instead of mouse position. If you are holding option key at the time, the string itself is set in node comment.

Creation dialog appears after double-clicking. Select Kind and Layer, enter title, line attributes and string attributes. You can modify each node address and comment, and even add or delete nodes in the dialog. Click "Create" button to finish creation.

You can reverse the order of nodes of Route data. You can combine two Route data to one also. It can be used to organize route data created in small pieces or route data imported from external files.

User Route Data

Kind Air Line

Layer 0

Default

Set mark and font attributes to kind's defaults.

Title HongKong Route

Line attributes

Color

Type Solid line

Width 1.5 pt

Title attribute

Comment attribute

Num of nodes : 4

Mileage : 3477 km

Go

top

prev. commented

prev. node.

last

next commented

next

Node information

1 th node

東京 Tokyo

Addr.

N 35.40.00.000

E 139.44.00.000

Elevation

no data m

Add node after this node.

Delete this node

Reverse nodes

Combine another route

Cancel

Create

Kind	Select from menu, or input any words for new "Kind".
Layer	Select one between 0 and 9 from menu.
Defaults	Set layer, line and string attributes to defaults for "Kind".
Title	Any string to be shown on the map up to 3 lines. If title exceeds 3 lines, remains will be included in the 3rd line.
Line attributes	
– Color	Any colors from color picker dialog. Click color pane to show color picker panel. You can specify opacity.
– Type	Select a line type from menu.
– Width	Enter width value in points between 0.5 and 30.
Title attributes	String attributes for title on the map. Refer String attributes.
Comment attributes	String attributes for node comments on the map. Refer String attributes.
Number of nodes	Showing number of nodes in the Route, including both ends.
Mileage	Showing total length of the Route calculated on the assumption that the earth is ideal sphere with radius of 6371 km.
Node selection	Select a node to display details.
– top	Show start node.
– prev. commented	Show previous node that has comment. If there is no commented node, show start node.
– previous	Show previous node.
– last	Show end node.
– next commented	Show next node that has comment. If no commented node exist, show end node.
– next	Show next node.
Node information	
– ( comment )	Any string to be shown on the map up to 3 lines. If comment exceeds 3 lines, remains will be included in the 3rd line.
– Latitude & Longitude	Showing node address of each node. Value can be modified.
– Elevation	Elevation obtained from DEM data at the above address is set. Can be modified to any value. If elevation has no meaning or uncertain, specify –20000.
Add node after this node	Create new node between current node and next node. New node will be shown.
Delete this node	Delete current node. Previous node will be shown. Cannot delete first and last node.
Reverse nodes	Reverse the order of the nodes.
Combine another Route	Combine with another Route data to make up long Route. Refer to following section.
Cancel	Cancel creation of this Route data.
Create	Create this Route data. Created Route data will be shown on the map.

When dialog appears, kind, layer, tile attributes and comment attributes fields are set to those of previous dialog.

## Update Route data

You can update each Route, and update common attributes of Route.

### Update one Route data

There are two ways to show dialog to update each Route data.

- Double-click Route title or node comment on the Map View during option key pressed. If it is done on a node comment, the node will be selected on the dialog.
- Select "Edit user data" under "Tools" menu. Select one Route data in the list and click "Edit" button.

You can drag each node on the map to update its position. To start drag-editing mode, double click one of the string on the map with pressing option-key and shift-key. You can drag little black dot shown at each node. To finish drag-editing mode, click any point on the map other than those dots. Without entering drag editing mode, you can drag any node directly while holding option key pressing.



## Update common attributes

Select "Edit user data" under "Tools" menu. Select Routes and click "Change all" button. You can update following attributes of every selected Routes.

- Kind
- Layer
- Line attributes
- Title attributes
- Comment attributes

## Combine Route data

You can combine two Route data to one Route data. Those two data should have the same Kind, and their start or end points required to be near each other. The range of "near" is within 1/100 of the whole length of the Route data being edited. However, it is up to 1 km.

Click "Combine Route data" button of the editing dialog to show candidate list. then select one. Nodes of the selected Route data are added to Route data that is editing currently. Selected Route data will be removed after dialog is closed, but if dialog is canceled it will be retained. After combining, the dialog shows joint node.

If joining occurred at both start nodes or both end nodes, added node's order will be reversed.

## Tilt the title and node comment / Write vertically

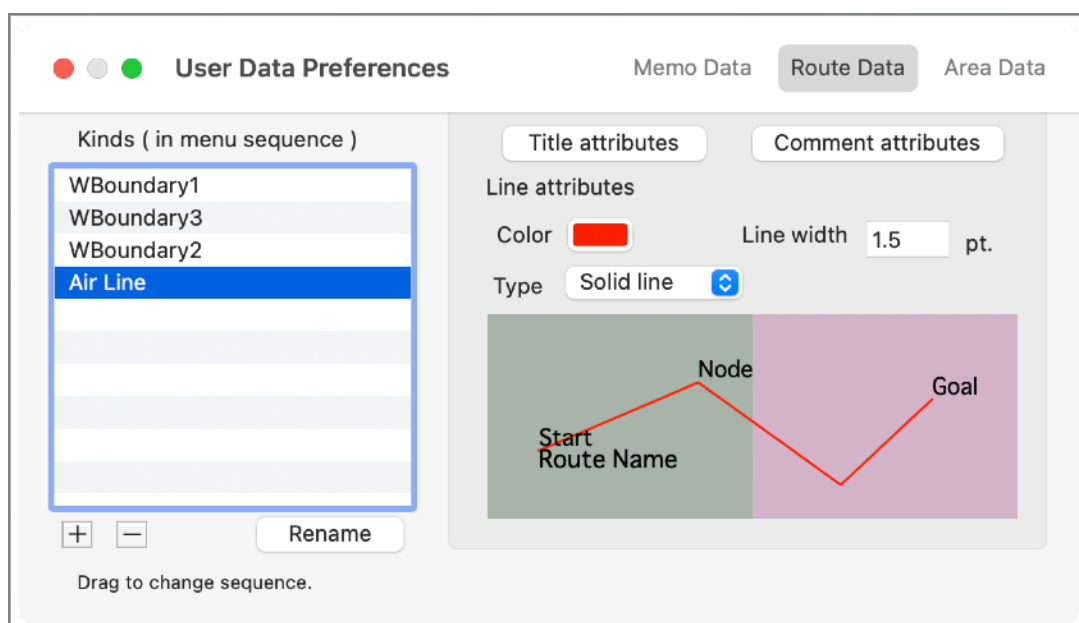
You can tilt (rotate) the title string and node comment of the Route on the Map View. Drag the end of the string while holding down the shift key. The rotation center is at the lower left corner for node comment and upper left corner for title. In the case of vertical writing, it is the upper left corner or upper right corner respectively. This rotation angle is included when saving Route data and is maintained when it is read later. Older version program ignores this information.

If you rotate it to the range of  $\pm 10$  degrees downward vertical, it will change to vertical writing in the case of Japanese, Chinese, etc.. To return it to horizontal writing, rotate it to the range of  $\pm 10$  degrees in the horizontal direction. Vertical writing will not work if vertical fonts are not available even Japanese.

To eliminate the tilt, click the string while holding down option key and shift key, it will be reset horizontally (vertically in the case of vertical writing).

## Defaults for Route data

Define Kinds, and set defaults for them. Open "User Data Preferences..." under "Tools" menu. Order of the Kinds in the list affects Kind menu of the Route creation or update dialog.



[+]

Create new Kind.

[-]

Remove a Kind. Kinds used currently by Route cannot be removed.

Rename	Rename a Kind. If Routes using the Kind exist, they will be updated.
Attributes	Following attributes are set as defaults for each Kind. Title attributes, Comment attributes, Line color, Line width, Line type.

You can define defaults for each Kind when only one kind is selected in the list. These defaults are referred when "defaults" button in the create/update Route data dialog is clicked.

## Read e00 files as Route data

e00 file contains Arc/Info interchange form data. SimpleDEMViewer reads e00 file and extract line data as User Route data.

To read e00 file, do "Open" under "File" menu. Its file name will be "Kind" of the Route data. Each line in the e00 file becomes one Route data.

Data names have letters "Arc" follows by sequence number. All line and string attributes are fixed values, although you can change any attributes after reading with User Data editing functions.

- SimpleDEMViewer ignores all e00 file if it has no ARC data.
- Even if e00 file contains area data, only boundaries are treated as Routes.
- Datum should be WGS84.

## Read KML file as Route Data

There are many type of data exist in KML ( and KMZ ) file, simple Placemarks with "LineString" will be converted to Route data. Refer to [KML Data](#) section.

## 16.3. Area Data

### About Area data

Area data is a region on the surface of the earth, bounded by points with addresses. Each Area data has pattern and title, they will be shown on the map. The pattern is one of frame only, translucent, hatching ( vertical, horizontal, right up, right down lines ). Any color can be used for those patterns. Title string has maximum 3 lines, and font, size, style and colors are specifiable.

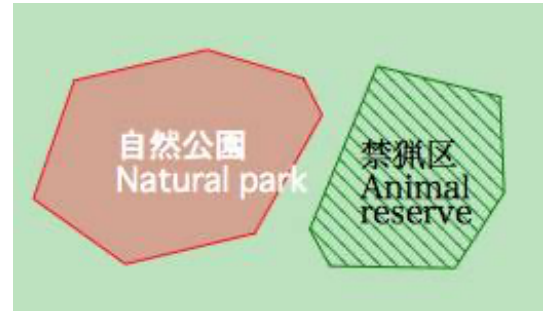
Area data have "Kind" and "Layer". Visibility of each Area data on the map can be controlled by Kind and Layer.

Kind : You can create new Kind with any words.

Layer : A number between 0 and 9.

If DEM is no-addressing type you can't use Area data.

Area data with holes are supported only when creating from external files such as KML. Can not create new Area data with holes by this program, and can not edit holes edge position.



### Create new Area data

To begin plotting new Area, move mouse to some point on the map. Show context menu there, and select "Create User Data / Area", then a red line will be drawn from start point to mouse. Click mouse at the points, and double-click at last. If you make click on a string ( any user data string ) edge address is set to the string's address instead of mouse position. You can cancel last click point by Esc key.

Creation dialog will appear after double-clicking. Select or enter following items.

Kind	Select from menu, or input new Kind.
Layer	Select one between 0 and 9 from menu.
Defaults	Set layer, pattern and string attributes to defaults for "Kind".
Title	Any string to be shown on the map in 3 lines. If title exceeds 3 lines, remains will be included in the 3rd line.
Pattern	Select a pattern from menu. Frame only, Translucent, Dots, Hatchings ( Horizontal, Vertical, right up, right down )
Color	Set any colors using color picker panel. Click color pane to show color picker panel.
Title attributes	String attributes for title displayed on the map. Refer <a href="#">String attributes</a> .
Area size	Calculated area size will be shown. Calculation is based on the assumption that the earth is ideal sphere with radius of 6371 km.
Cancel	Cancel creation of this Area data.
Create	Create this area data. Area data will be shown on the Map View.

When dialog appears, Kind, Layer, area type, color and title attributes fields are set to those of previous dialog. Addresses show edges of surrounding rectangle.

### Update Area data

You can update each Area, or update common attributes of Area data.

#### Update one Area data

There are two ways to call update dialog of Area data.

- Double-click an Area tile on the map during option key pressed.
- Select "Edit user data" under "Tools" menu. Select one Area data in the list and click "Edit" button.

You can drag an node of the Area data on the Map View to update its position. To start drag-editing mode, double click title string on the Map View while option and shift key pressing. You can drag little black dot shown on each node. To finish drag-editing mode, click any point on

the map other than those dots. Without entering drag editing mode, you can drag any node directly while option button pressing.

## Update common attributes

Select "Edit user data" under "Tools" menu. Select Area data and click "Set all" button. You can update following attributes of all selected Area data.

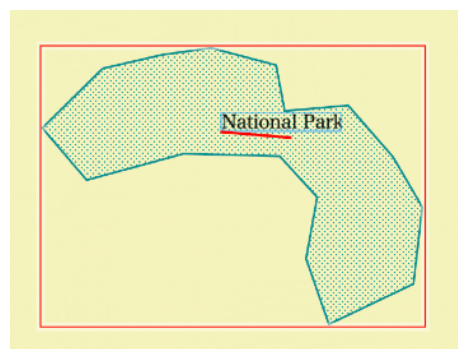
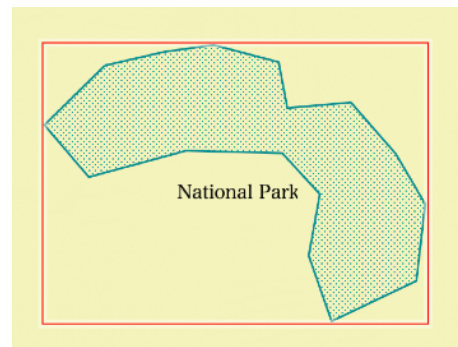
- Kind, Layer, Area pattern, Color, Title attributes

## Reposition title string

As a default, Area title is drawn at the center of the surrounding rectangle. Sometimes it is drawn outside of the Area like as picture at right. You can drag the title string anywhere you want, but it depends on the scale. If scale is changed, it may be drawn at unacceptable position.

Do the following actions to fix the position to specified longitude and latitude. Hold down the ⌘ key and drag the title and stop dragging at the intended place, and release the ⌘ key after the red line indicating movement disappears. The reference position will be changed to the lower center of the rectangle surrounding title string at this time. If you drag it as shown in the second picture, you can see that the reference position has been changed.

When you save the Area data, this information also be written, so it will be reflected when it is imported later. Older program ignores this information.



## Tilt the title / Write vertically

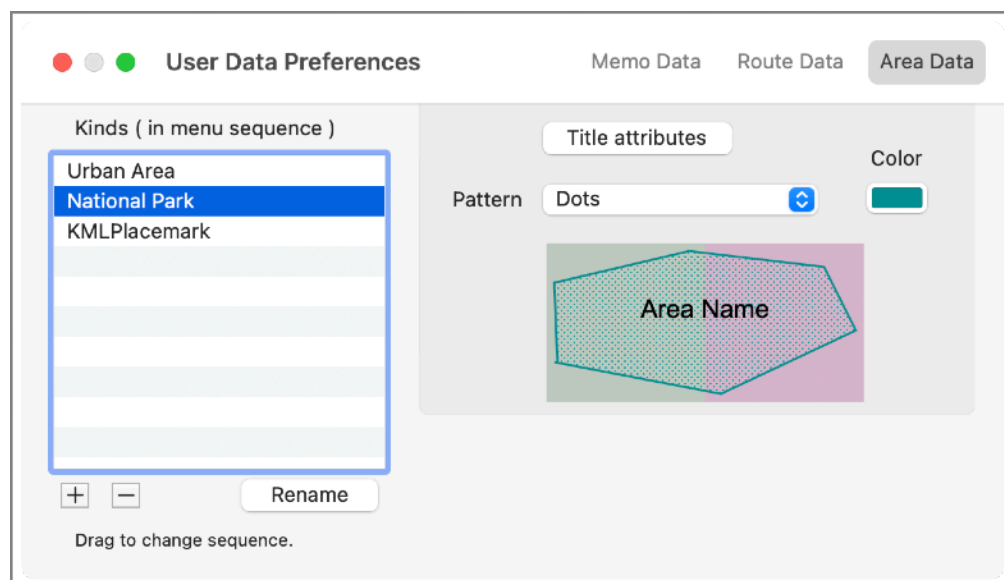
You can tilt (rotate) the title string of the Area on the Map View. Drag the end of the string while holding down the shift key. The rotation center is at bottom center. In the case of vertical writing, it is the center of the left side. This rotation angle is included when saving Area data and is maintained when it is read later. Older version program ignores this information.

If you rotate it to the range of  $\pm 10$  degrees downward vertical, it will change to vertical writing in the case of Japanese, Chinese, etc.. To return it to horizontal writing, rotate it to the range of  $\pm 10$  degrees in the horizontal direction. Vertical writing will not work if vertical fonts are not available even Japanese.

To eliminate the tilt, click the string while holding down option key and shift key, it will be reset horizontally (vertically in the case of vertical writing).

## Defaults for Area data

Define Kinds, and set defaults for them. Open "User Data Preferences..." under "Tools" menu. Order of the Kinds in the list affects Kind menu of the Area creation or update dialog.



[+]

Create new Kind.

[-]

Remove a Kind. Kinds used by Areas cannot be removed.

Rename	Rename a Kind. If Areas using the Kind exist, they will be updated.
Attributes	Following attributes are set as defaults for each Kind. Title attributes, Area pattern, Color

You can define defaults for each Kind when only one kind is selected in the list. These defaults will be referred when "defaults" button in the create/update Area data dialog is clicked.

## Read KML file as Area Data

There are many type of data exist in KML ( and KMZ ) file, simple Placemarks with Polygon will be converted to User Area data. Refer to [KML Data](#) section.

## 16.4. GPX Data as User Memo and Route

GPX format GPS data includes waypoint / route / track data. Reading GPX file to create User Memo or Route data depends on them. Read the file using 'Open' under the File menu.

Addresses always be treated as WGS84. If altitude is included, it will be copied as each point elevation. Its unit should be meter.

Kind of user data is set to "GPX" always. If it is not exist already, one created automatically. If exists, all attributes of user data are copied from it. Layer is set to 0 (zero) always. If you want to use different marks depends on data, you should change individually or change all in Edit User Data dialog. Save them as user data file if needed.

### Memo data

Convert waypoint (WPT) data to Memo data. Kind is always "GPX". You can change the kind anytime after reading to any kind as normal User Memo data.

Waypoint's name attributes is copied to title field of Memo data. If no name attributes, title will be set to file name plus serial number.

<time>, <magvar>, <cmt>, <desc> attributes are copied to content field.

### Route data

Convert route (RTE) data and track (TRK) data to User Route data. Kind is always "GPX". You can change the Kind to any other Kind as normal Route data anytime after reading.

If it is track data, each segment is converted to one Route data.

Name attributes is copied to title field of Route data. If no name attributes, title will be set to file name plus serial number.

When "RTE", if each point has "name" attribute, it is copied to node comment field. If no "name", copy "cmt" or "time" attribute.

When "TRK", if each point has "time" attribute, it is copied to node comment field. If no "time" attribute, copy "name" or "cmt" attribute.

## 16.5. KML Data as User Memo / Route / Area Data

There are many type of data exist in KML ( and KMZ ) file, only simple Placemarks are supported, other data are ignored. Convert “Point” data to User Memo data, “LineString” to User Route data, “Polygon” to User Area data. Referring some style attributes for label, line and polygon, but may not all attributes are converted to user data attributes. For example, polygons are treated as region on the earth surface always, extrude option is ignored.

### Common items

- User data kind will be set to “KMLPlaceMark” always. It will be created automatically if not exist. If it exists, its attributes will be applied.
- Title field will be set to name field of KML file. If one Placemark contains many LineStrings or Polygons, all Route or Area data have same title.
- Layer of user data is 0 always.
- If altitudeMode is ‘clampToGround’, elevation value will be ‘none’. If altitude is 0 elevation value will be set to ‘none’ even altitudeMode is other than ‘clampToGround’. For polygons altitude and extrude option are ignored always.
- Supports KMZ file that has only one KML file. If cannot read, unzip it previously and read it.
- You can change any attributes of imported data, and save them as user data file for later use.

### Memo data

- One point data is converted to one Memo data.
- Kind of Memo is “KMLPlacemark” and layer is always 0. If kind “KMLPlacemark” exists already, mark and title string attributes are taken from it. If the kind is created automatically, mark will be White Flag.
- If label style exists color and size are taken for title attributes.
- Content field of Memo data is set to strings of “description”. If ‘description has “CDATA”, its content is copied to Memo content field, so that if it contains HTML structure, its formatting is applied, but hyper link will not work.
- Icon style is ignored always.

### Route data

- One 'lineString' data is converted to one Route data.
- Kind of Route data is “KMLPlacemark”. If Route kind “KMLPlacemark” exists already, title string attributes, comment attributes, line-type, line-width, line-color are taken from it. If Label style and line style are set in KML file, label color, label size, line width and line color are taken from it.

### Area data

- One polygon data is converted to one area data.
- Kind of Area data is “KMLPlacemark”. If Area kind “KMLPlacemark” exists already, title string attributes and Area-color are taken from it. If Label style exists in KML file, label color, label size are taken from it. Area pattern is “Translucent” if fill option is set in KML file, otherwise it will be “Frame only”.
- Alpha value of polygon color is ignored.
- Extrude option and altitude are ignored always, since User Area data clamps to earth surface always.



## 16.6. Common Features of User Data

### Show / Hide user data

You can control visibility of each user data on the Map View using Kind and Layer. You can set each Layer's visibility depending on map scale.

To set visibility control, display dialog by "Show/Hide user data" under "Tools" menu. You can set visibility for Kinds and Layers independently. Each user data will be shown on the map when its visibility is set to "show" for both Kind and Layer.

#### by Kind

Following object's visibility can be set for each kind of data type.

- Data itself
- Title
- Node comment for Route

#### by Layer

Layer setting is applied to all memo, route and area data. Two types of setting are available. One is just show / hide each layer, another is depending on map scale. Latter is optional. User data are visible when both are set to "show".

Visibility range is set by slider, drag edge of each slider and set it desired scale on the dialog.

### String attributes

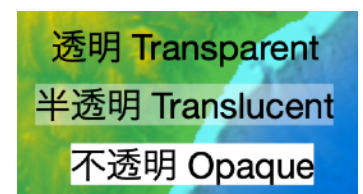
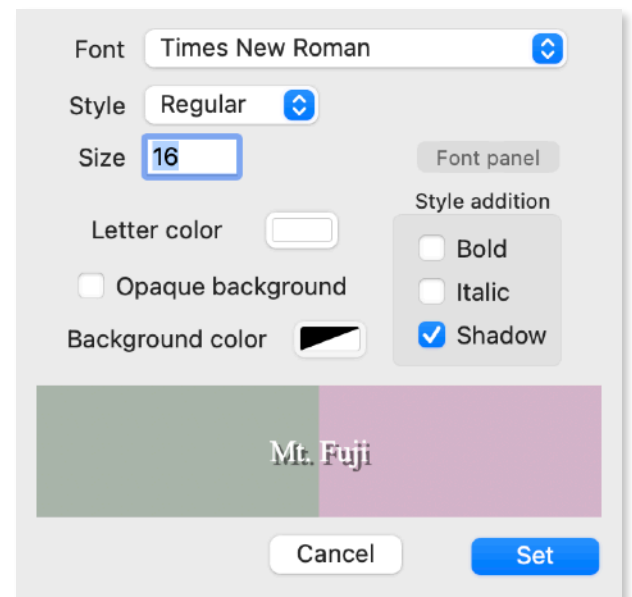
Specify following attributes in separate dialog. Defaults for each Kind can be set by Preferences ( [Memo / Route / Area](#) ) for each User Data type. These attributes applied to whole string always.

Font	Select a font from menu.
Style	Select a style supported by font.
Size	Specify font size between 5 and 256 points.
Style addition	Specify bold, italic and shadow attributes. You can set them regardless of whether the font supports those styles or not. If font supports bold and italic, it will be thicker and more inclined.
Letter color	Specify any text color using Color Picker panel.

Background transparency      Specify whether background is transparent or opaque

Background color      Specify color of opaque background. You can specify opacity in Color Picker panel.

You can use 'Font Panel' to specify font, style and size.



### Save / Read user data

#### Saving

You can save all Memos, Routes or Areas ( created or read in the session ) or data of selected kinds as a file. Select "Save user data" under "File" menu to save them with any name anywhere you want. File extension will be set to "jzmemo", "jzrout" or "jzarea".

Alert dialog will appear when attempt to quit program or load working set without saving new or updated user data. However if "Restoration working set" function is set to "Always", no alert appears before quitting and those changes are saved automatically, and will be preserved next activation time.

Moving of title or node comment will not save, then no alert appears, but repositioning of Area title is exception.

Saving user data always creates new file, not update. You can make new file has same name as existing file to replace it.

## Reading

To read user data file, select "Open..." under "File" menu. You can select folders to read plural files. You can read them and DEMs at the same time. You can double click user data file, or drop them on to application icon or main window to read them.

Even if you attempt to read same file twice, no alert will appear. You may delete all and read again.

If "Kind" of read data are new for you, they will be registered automatically. In such a case, attributes of data first occurrence for each "Kind" are registered as defaults.

## Edit User Data

You can edit individual data or group of data selected from a table, and also remove a data or group of data. You can edit any fields of a data, or common fields of a group.

### Show data in a table

Select "Edit user data..." under "User Data" menu to display the table filled with user data. Table shows Kind, Layer, Title, Latitude and Longitude. Data order is selectable by any fields. For Route and Area data, latitude and longitude show center address of the bounding rectangle.

You can select data group appearing in the table using menus.

- Show Memo, Route or Area data.
- Show all Kinds or one Kind.
- Show all Layers or one Layer.

### Change all

Select one or plural data and click "Change all" button. You can edit following fields.

Memo	Kind, Layer, Mark, Title string attributes.
Route	Kind, Layer, Line attributes, Title and Comment string attributes.
Area	Kind, Layer, Pattern attributes, Title string attributes.

### Edit individual data

Select one data and click "Edit" Button. Edit dialog will appear and you can edit any fields. You can double-click on the data in the table to invoke editing.

### Remove data

Select one or plural data and click "Remove" button to remove them. Alert dialog shows count of data to remove. This operation is just removing them from memory, no effect to the file on a disk or SSD.

### Search data

Enter some string into search field, then those user data that include the string in the title field will be shown in the table.

### Check the location on the map

Select one data and click "Map" Button, then round arrow will point it on the Map View. If it is out of the Map View, map will be repositioned.

### Export data

Export User Data currently shown in the table, depending on Data Type,.Kind, Layer and search result. Output file has text format, so that some application can process it. Refer next section.

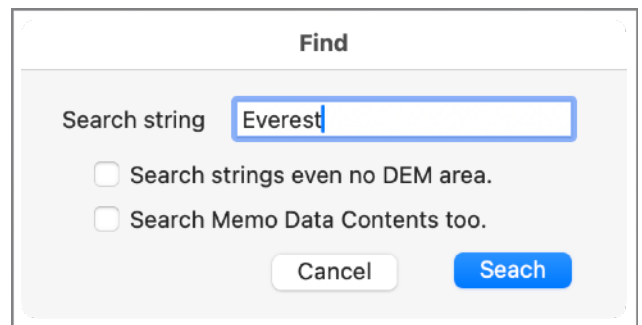
## Find user data on the map

You can search and locate it on the Map View by sub-string of title or node comment shown on the Map View. Content field of User Memo also can be searched. Found user data will be positioned at center of the Map View.

User data those are controlled to not display at the beginning of the search are not target for search. Also, except for the content of the memo, strings that are controlled to not displayed on the map are not target for search.

To search user data, select "Find..." under "Find&Jump" menu, enter some string to find and click "Search" button. To search next data that has same string, execute "Find next" under "Find&Jump" menu.

Even user data its position is out of the DEM data range can be searched, but cannot search when no DEM data is read.



## 16.7. Export / Import User Data to / from Text File

You can export User Memo / Route / Area Data to text files, and import from text files. Those text files make available to use User data by other programs, and vice versa.

Memo Data text file format is TSV ( Tab Separated Variable ), so that you can check and edit them in table layout with application “Numbers”. Other two are normal text files. TSV is also just a text file using tab character as a field separator.

String attributes are not exported nor imported. When importing, if “Kind” is predefined in the User Data Preferences, those predefined attributes are applied. If you want, you can set string attributes by “Change All” function in the Edit User Data dialog.

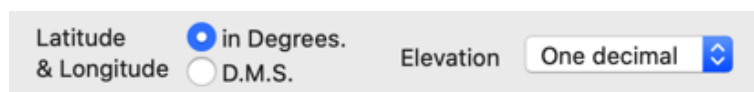
### Export

Press Export button in the User Data Edit Table described in the previous section. All data shown in table are written into one file. File extensions are fixed to "tsv", "rout", "area" for each Memo, Route and Area data respectively.

You have following options in the file saving dialog.

Address form                                      In degrees or in degrees, minutes and seconds.

Number of Decimals for elevation      integer, 1 or 2 decimals.



### Import

Select “Import User Data...” under the "Tools" menu to read text user data file. File extensions should be "tsv", "rout" or "area" for each Memo, Route and Area data respectively.

### Text file format

All files should match followings.

- Text encoding is always UTF-8.
- Ignore lines as comment if first character in the line is semi-colon (;).
- If title or comment in Route and Area data include spaces, enclosed them with double quotation marks.
- If any string such as title and content has line break characters, change them to \r or \n.

### User Memo Data

Text file includes following items separated by tab character.

Title                      Copy except line break character replaced by \n.

Kind                      Copy.

Layer                    Integer number, 0 ~ 9.

Mark                    Number or mark name. Numbers for standard marks showed in Mark selection panel as tips. Flags are Flag1 ~ Flag5. User marks are their file names.

Latitude and longitude

Latitude and longitude use each field, if D.M.S form is specified degrees, minutes and seconds use each field.

Elevation              Integer or decimals in meters. “(n/a)” is written if data has no elevation value. -20000 is acceptable as no value for input.

Content                Copy except line break character replaced by \n.

Example. ( → is tab character. )

```
;Title→Kind→Layer→Mark→Latitude→Longitude→Elevation→Contents
```

```
Tokyo\n東京→City→0→35→35.68333333→139.75000000→(n/a)→Capital city of Japan.\nPopulation: 9 millions.
```

```
London→City→0→51.50000000→0.00000000→(n/a)→Capital of United Kingdom.\nPopulation: 7 millions.
```

;Title	Kind	Layer	Mark	Latitude	Longitude	Elevation	Contents
Tokyo\n東京	City	0	35	35.68333333	139.75000000	(n/a)	Capital city of Japan.\nPopulation: 9 millions.
London	City	0	35	51.50000000	0.00000000	(n/a)	Capital of United Kingdom.\nPopultion: 7 millions.

Picture below is screen shot of Numbers.app.

## User Route Data

- First line except comment should specify address form.
- Datum is WGS84 always.
- One route data consists of a header line, a node header line, many node lines and a node trailer line. One file contains many routes data.
- The header line should begin with the key word "Route=", and specify route data attributes such as Title, Kind, Layer, Line attributes. Title and kind are required for every route data. If any other item is omitted, it will be the default values. If Kind is defined already in User Data Preferences, omitted items and string attributes are set to those predefined values.

## < Examples >

; Running courses

AddrForm= D

```
Route= "Our city marathon", Kind= "Running course", LineColor= red, Width= 1.5
```

Nodes\_Begin

Addr= ( 36.0123456, 139.33333 ), Elev= 456, Comment= "Start"

Addr= ( 36.0123456, 139.33375 ), Elev= 467 )

...

Addr= ( 36.0123444, 139.3340 ), Elev= 499 Comment= "water"

...

Addr= ( 36.0123400, 139.33433 ), Elev= 555, Comment= "Goal"

Nodes End

## Address forms

AddrForm= form

The form is one of followings.

D	in degrees	ex.) 145.3254028
---	------------	------------------

D.M.S separated by period ex.) 145.25.31.45

## Route header line forms

## Key words

Route= Kind= Layer= Line= LineColor= Width=

First two key words are required. Route= should be the first item and Kind= is the second. Other items can be specified in any order.

Route= Specify the title of this route, enclosed in double quotes. This will be shown in the map.

Kind= Specify kind, enclosed in double quotes.

Layer= Specify layer number between 0 and 9.

Line= Specify line type with following key words.

normal / dashed / dotandline / dots

Width= Specify line width in points between 0.5 and 30.0.

**LineColor=** Specify line color on the map by RGBA color components or color name. For RGBA color components, specify each red, green, blue, alpha values between 0 and 1.0 enclosed in parentheses. The alpha value 1 is opaque, 0 means transparent. Supported color names are white, black, red, green and blue.

ex.)     Color= ( 1, 0, 0, 1 )  
           Color= white

### Node header line forms

Specify "Nodes\_Begin" only.

### Node line forms

Key words

Addr= Elev= Comment=

Addr= is required and should be the first item. Others are optional.

Addr=            Specify latitude and longitude in this order putting parentheses around them. If south latitude, or west longitude, put minus sign before the value.

ex.)     Addr= ( -41.0123, 173.5000 )

Elev=            Specify elevation in meter. If elevation is not available or applicable, specify less than -19999 meter. If omit this key word, it will has no elevation instead of copy previous one.

Comment=        Specify node comment, enclosed in double quotes.

ex.)     Comment= "Check point 1"

### Node trailer line forms

Specify "Nodes\_End" only.

### Defaults

If Kind is predefined in the User Data Preferences, Line=, Width= and LineColor= are set to those predefined values.

Layer=            0

Line=             normal

Width=            1.5

LineColor=        red

Elev=             No elevation value for the node.

### User Area Data

- First line except comment should specify address form.
- Datum is WGS84 always.
- One Area data has a header line, a node header line, many node lines and a node trailer line.
- The header line should begin with the key word "Area=", and specify Area data attributes such as Title, Kind, Layer and Pattern. Title and kind are required for every Area data. If any other item is omitted, it will be the default values. If Kind is defined already in User Data Preferences, omitted items and string attributes are set to those predefined values.
- Node header line has a key word "Nodes\_Begin" only.
- Node lines specify each node address only.
- Node trailer line has a key word "Nodes\_End" only.

< Sample >

; User Area Data

AddrForm= D

Area= "ABC National Park", Kind= "National park", Pattern= translucent, AreaColor= red

Nodes\_Begin

Addr= ( 36.012456, 139.33333 )

Addr= ( 36.012344, 139.3340 )

Addr= ( 36.012400, 139.33433 )

Addr= ( 36.012302, 139.33421 )  
 Nodes\_End

## Address forms

AddrForm= *form*

The *form* is one of followings.

D            in degrees                      ex.)    145.3254028  
 D.M.S      separated by period          ex.)    145.25.31.45

## Area header line forms

Key words

Area= Kind= Layer= Pattern= AreaColor=

First two key words are required. Area= should be the first item and Kind= is the second. Other items can be specified in any order.

Area=            Specify the title of this Area data enclosed in double quotes. It will be shown in the map.  
 Kind=           Specify Kind enclosed in double quotes.  
 Layer=          Specify Layer number between 0 and 9.  
 Pattern=        Specify Pattern by key word below.  
                   frame, translucent, dots, horizontal, vertical, rightUp, rightDown  
 AreaColor=     Specify color on the map by RGBA color components or color name. For RGBA color components, specify each red, green, blue, alpha values between 0 and 1.0 enclosed in parentheses. The alpha value 1 is opaque, 0 means transparent. Supported color names are white, black, red, green and blue.  
                   ex.)    AreaColor= ( 1, 0, 0, 1 )  
                   ex.)    AreaColor= green

## Node header line forms

Specify Node\_Begin only.

## Node line forms

Specify one address in each line.

Addr=           Specify latitude and longitude in this order putting parentheses around them. If south latitude, or west longitude, put minus sign before the value.  
                   ex.)    Addr= ( 34.333333, -145.233333 )

## Node trailer line forms

Specify Node\_End only.

## Defaults

If Kind is predefined in the User Data Preferences, Pattern= and AreaColor= are set to those predefined values.

Layer=           0  
 Pattern=        dots  
 AreaColor=      red



## 17. Texture Mapping

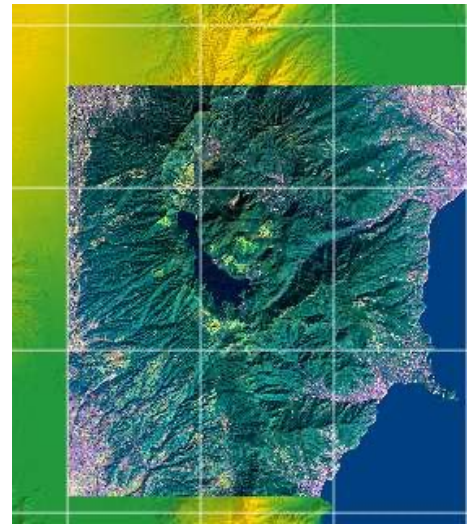
Any images can be used as texture of geo-surface, not only for the plane map but also for Bird's-eye views, StereoGraphs, Panorama views and Projection maps. Assumed images are satellite images, aerial photographs, land use maps, topographic maps and others. The picture at right uses a Landsat image.

To use texture, show a dialog by selecting "Texture maps..." under the "Tools" menu. In this dialog you can

- Read any image file to use as texture.
- Remove those images.
- Define addresses of four corners.
- Set transparency.

If read image is GeoTiff, world file is attached or topographic maps from GSI of Japan, corner addresses are set automatically. Those texture are treated as "has native address". World file should be in Latitude and Longitude.

<AS note> Topographic maps from GSI of Japan is treated as normal picture, because program can not recognize control file.



## Setting Dialog

### List of texture

File names of textures are listed.

If texture's coverage overlapped each other, the texture upper in this list is used. Names can be dragged to change its order. If one of the texture is applied, other texture is not applied even if its opacity is less than 100 %.

Turn "Draw" check box to off to suspend use of the texture.

### Read

Read a image file to use as a texture.

### Remove

Remove selected file from texture list.

### Show Pict

Show selected texture in a separate window temporarily to check image.

### Corner addresses

If a texture is selected in the table, its contents are shown here.

Only north-west and south-east corners can be set when the check box "Parallel to Latitude and Longitude" is checked.

Specify Latitude and Longitude even if the image has UTM addresses.

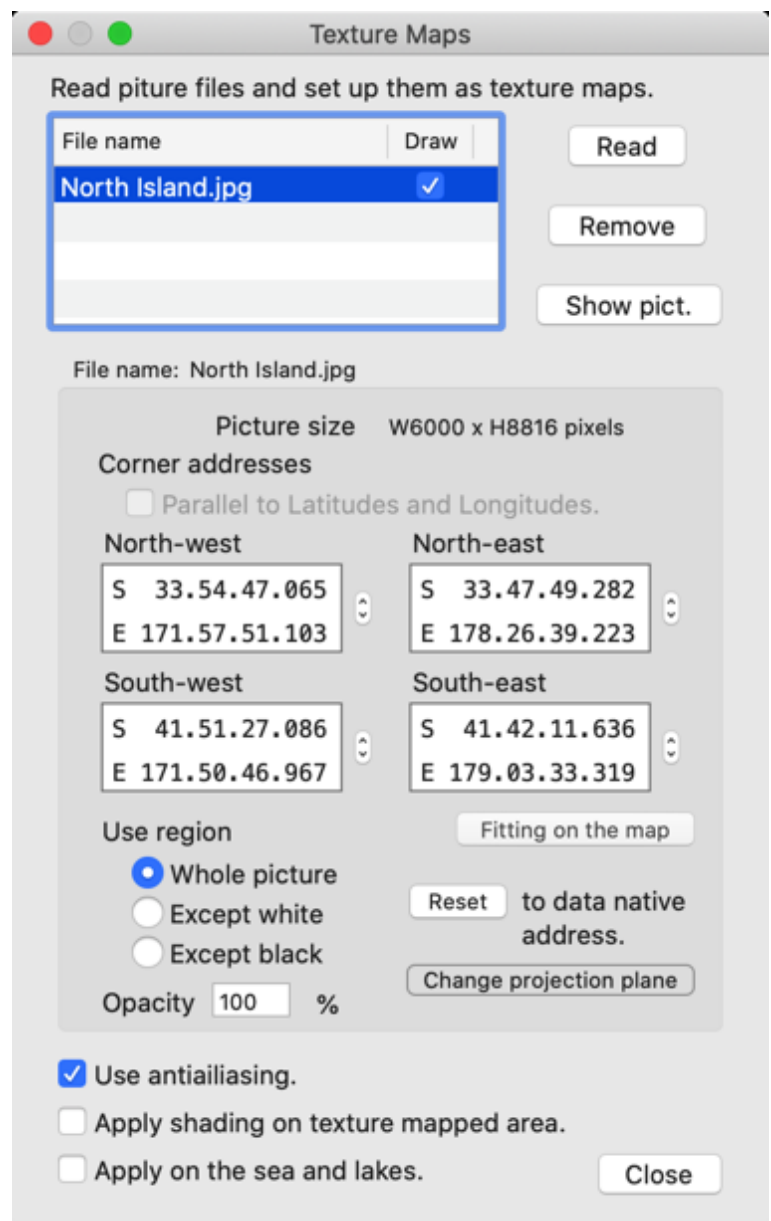
You cannot define the texture range that contains south pole or north pole inside.

### Parallel to Latitudes and Longitudes

Set to on if bounds are parallel to each axes to faster drawing. If the texture has UTM or other plane address, cannot set this to on.

### Use region

Specify texture is full opaque or having transparent portion.



Select white or black when the satellite image has margin around it in black or white. In other case you want to treat the white background of the topographic map as transparent. If you specify to exclude a white or black area those texture map will not be applied to the relevant area.

### Opacity

Specify opacity in percentage. If 100 %, color of the texture is taken to draw. If it is less than 100 %, mixed with the elevation color.

### Fitting on the map

You can drag whole or each corner, can extend or shrink whole image.

Show picture on the Map View and place it manually to appropriate position.

See below for operations.

### Reset to data native address

Ignore any change to the corner addresses and set native addresses if the texture has them.

### Change projection plane

If the texture map has address specified by world file or GeoTiff and it is based on UTM or other planes, you can change zone number anytime after reading for correction.

### Use antialiasing

Set to on to use antialiasing for every texture mapping.

### Apply texture on the sea and lakes

Set to on to apply texture mapping on the sea and lake surface.

### Apply shading

Set to on when applying the shading to the area where the texture was drawn. It may be better set to off when an image such as an aerial photo contains a shadow.

## Fitting on the Map View

If you feel it difficult to enter four addresses directly, you can show texture on the map temporarily and place it correct position by dragging.

When you click "Fitting on the map" button, the dialog disappear and texture will be placed at the center of the Map View, or at accurate place if addresses are already set. You can drag whole texture or drag each corner independently. You can expand or shrink texture coverage by clicking buttons in console panel.

Though main menu are inactive during this operation, you can expand, shrink or move the map by context menu, and can drag or scroll it.

You can do following operations from console panel.

### Expand / Shrink

Expand the coverage of texture 1.1 times or shrink it by 1.1.

### Transparency ( Slider )

Set texture's translucent rate during this operation to make easier the positioning.

Transparent portion of the texture is drawn as translucent black.

### Cancel

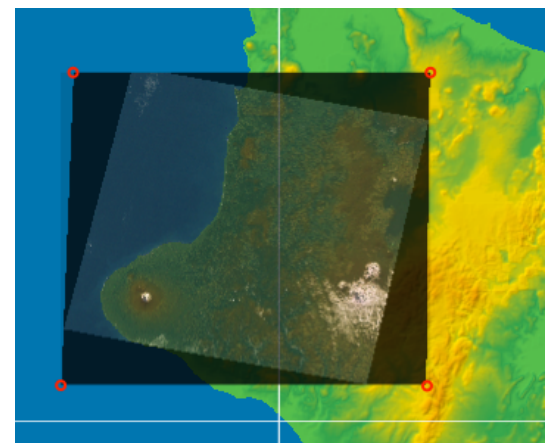
Cancel the positioning operation.

### Done

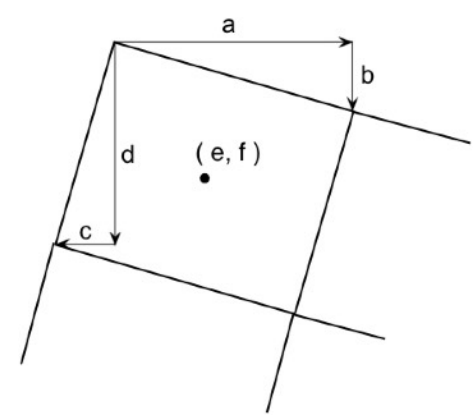
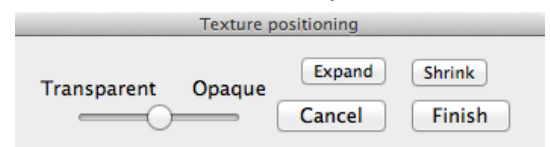
Quit positioning operation and apply result.

## World file

World file for texture map uses all 6 lines unlike DEM's. Letters a to f in the figure at right represent value of each line. The frame in the figure represents top left corner pixel.



Console panel



- Line 1. ( a ) : Horizontal offset to right pixel.  
 Line 2. ( b ) : Vertical offset to right pixel.  
 Line 3. ( c ) : Horizontal offset to pixel below.  
 Line 4. ( d ) : Vertical offset to pixel below.  
 Line 5. ( e ) : Horizontal coordinate of the center of the top left pixel.  
 Line 6. ( f ) : Vertical coordinate of the center of the top left pixel.

'a' has plus value always.

'b' and 'c' have minus value when slope down to right as this figure, have plus value when down to left. Both are zero when figure is parallel to the axes.

'd' has minus value always.

All six values are in degrees or seconds if Geo addressing, otherwise in meters.

## Sample

A sample at right is a image of letters with white background and red frame. Image below is a Panorama View, using above image as a texture map. If you use texture maps with white space like this sample or topographic map, use tiff or png format, otherwise letters and lines are not clear, especially when using jpeg image.

**Mt. Fuji**



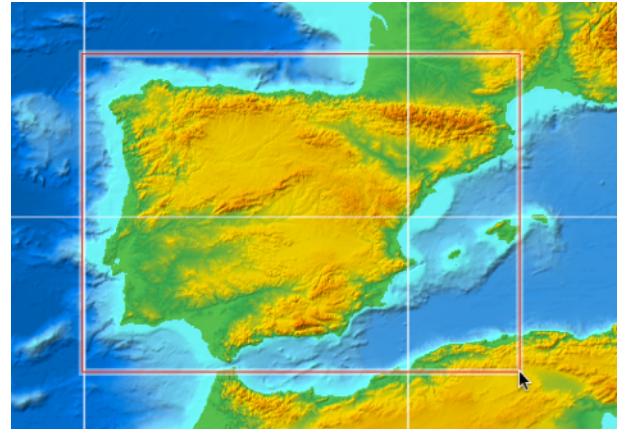
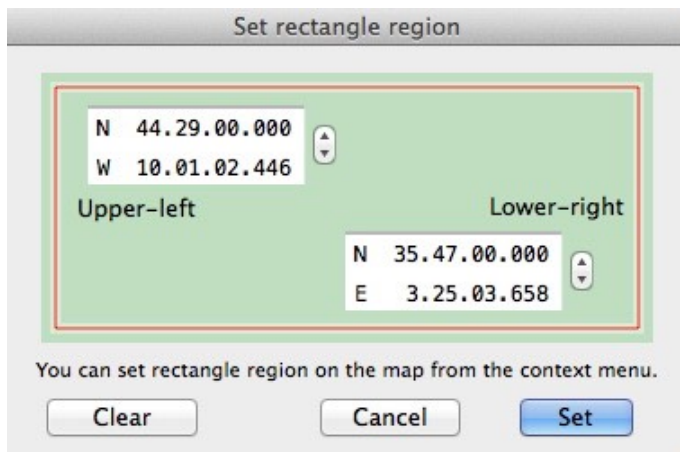
## Notes

- Always specify addresses by Latitude and Longitude even if its native address is UTM or other planes.
- Alert will be display and cannot quit the dialog if you have not set addresses for all textures. If you cannot set them, remove them, or set temporary addresses using fitting-on-the-map feature.
- Datum of GeoTiff is ignored,.always assumed as WGS84.
- Specified information will be saved with file name. When reading a texture file, stored information will be shown. If information exists for the name but picture sizes are different, they are treated as different file, and old information will be cleared.
- If a texture map has named planeID addressing, saved information may be changed invalidly if you manage several named plane IDs and change sequence or add plane IDs. Such a case, you should select plane ID again.

## 18. Selected Rectangle Region

Any rectangle region on the Map View can be specified for making bird's-eye views, stereo-graphs, and saving map picture, or set range to search highest / lowest elevations. During DEM Inspector running, you can set same elevation value to the rectangle region.

- Select "Select rectangle region..." from the context menu on the map, and move mouse cursor to make rectangle and click to define it.
- You can drag the frame of selected rectangle on the Map View to adjust it.
- You can specify rectangle region by longitude and latitude. Select "Rectangle region..." under "Tools" menu to show setting dialog.
- To clear the selection, show above dialog and click clear button.



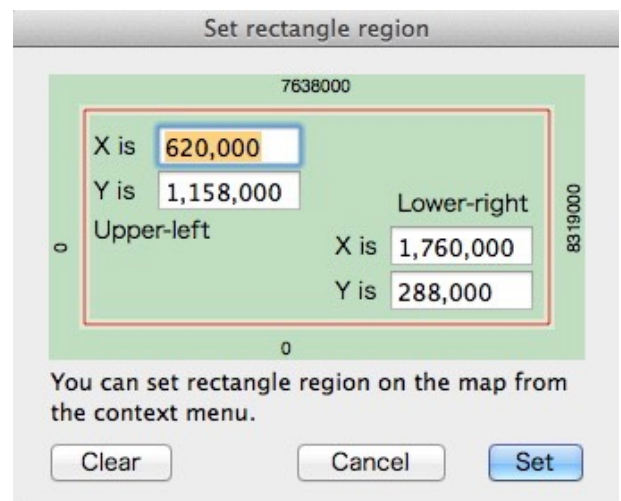
Picture at right is dialog for no-addressing DEMs. All values are set in meters.

Four numbers outside of red rectangle show range of whole DEM(s).

### Menu in the Map Info Panel

When rectangle region is selected, "Rectangle region" line appear in the Map Info Panel. Click '>' mark at right and select following features from menu.

- Clear rectangle selection.
- Show dialog.
- Reposition map so that rectangle region will be placed in the center of the Map View. If rectangle region is too big, the map will be shrunk until edge of rectangle region can be recognized.



## 19. Copy / Paste Latitude and Longitude

When address field is focused in various dialogs. you can copy address ( latitude and longitude ) from it or paste address to it. Copied object is a simple text string so that you can copy it into text field in any program, and vise versa. Also you can copy mouse point address on the Map View, To do it use context menu.

You can select text format for exporting from proprietary and two floating point numbers in Preferences panel. For importing, many formats are supported as followings.

All text format addresses are treated as "WGS-84" .

### Text format

#### Proprietary format

- 'LW ' at start, latitude and longitude follow it.
- First character of latitude is 'N' or 'S' for north or south, 'E' or 'W' for longitude.
- Periods separate degrees, minutes and seconds.

ex)

LW N30.15.25.0 E111.10.30.0

LW S23.10.0 W44.50.10

#### Two floating point numbers

±dd.dddd ±ddd.ddd

+ sign can be omitted. Latitude first.

ex)

38.33333 141.0123333

+42 142.666666

-65.3333 -23.456666

#### ISO 6709

±DD.DDDD±DDD.DDDD

degrees

±DDMM.MMM±DDDMM.MMM

degrees and minutes

±DDMMSS.SS±DDDMMSS.SS

degrees, minutes and seconds

ex)

+26-110

-45.66666+15.25

-4540+1515

-4540.000+1515.000

+364533.000-1293636.333

#### Two floating point numbers and direction characters

Cdd.dddd Cddd.dddd or dd.ddddC ddd.ddddC

C is one of 'N' or 'S' for latitude, 'W' or 'E' for longitude. Any characters between them are ignored.

ex)

N33 E123

33N 123E

S5.11111 W99.5

E133.5678 N23.45678

Latitude 36.3333N Longitude 111.2345E

#### Two number strings each has tow or three periods

Parts separated by period are treated as degrees, minutes and seconds from left.

e.g.

33.26.30 137.40.15, 33.26.30.123 137.40.15.789

These are translated to

33 26 30 137 40 15, 33 26 30.123 137 40 15.789

After this translation, they are treated as six numbers as described in next section.

### Various strings that contain some numbers

If it has three numbers, ignore third number and apply one of above rules.

If it has four or six numbers and various characters, following steps are applied.

- Replace words 'North', 'South', 'West', 'East' to a character N, S, W, E respectively.  
Replace characters 北, 南, 西, 東 to a character N, S, W, E respectively.
- Replace all characters other than numbers, +, -, . (period), N, S, W, E, to space ignoring case.  
Control characters ( such as return code ) are replaced to space also.
- Separate four or six numbers at the center to two groups. Each group are treated as an address of degrees and minutes or degrees, minutes and seconds.
- If there are characters of N, S, W or E, which one is latitude or longitude depends on their position. If no those characters is found, first group should be latitude.

e.g.

+23.456789 -123.456789 2345.6 m

N34°19'06.8" E131°34'05.0"

34:12:55 West 35:46:12.123 South

緯度34°19'06.8" 經度131°34'05.0"

東經135度1分2.567秒 北緯33度21分33.4秒

## 20. Show Place on External Map

You can show the place, that is pointed in the Map View, by Apple's "Maps", or show on "Google map" with Safari ( or other web browser ). Internet connection is required.

In the Map View, show context menu at any place and select "Show this place in Maps.app" or "Google map", then the place is shown on them. Maps or Safari is activated automatically if not active.

### Show by "Maps"

Activates Maps if not started, and set center to the place. Set appropriate scale depends on scale of SimpleDEMViewer.

### Show by Google map

Activate Safari ( or your default browser ) if not started, access Google map and set center to the place. Set appropriate scale depends on scale of SimpleDEMViewer.



## 21. Measuring Mileage

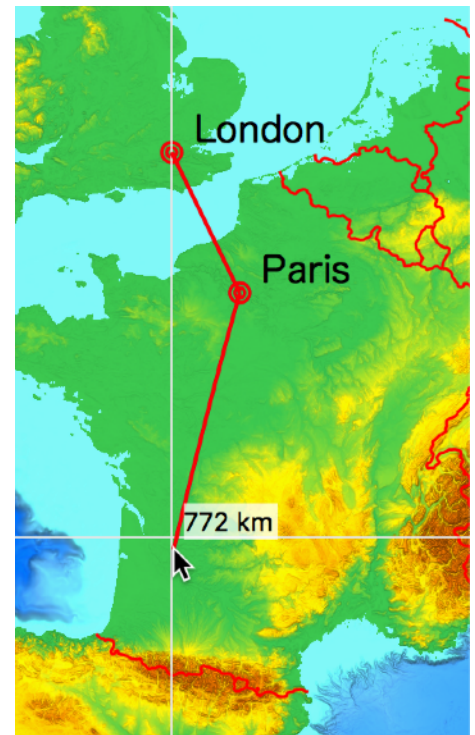
You can measure mileage between two place along any route on the Map View.

To begin measuring, position mouse to start point on the Map View. Show context menu and select "Measure mileage", and then a red line will be drawn from start point to mouse cursor and show mileage near the cursor.

Click mouse button at some points to fix the route, and double-click to finish measuring. If you click on any user data string, the string's base address will be used instead of mouse position. You can cancel last node by Esc key.

Unit of mileage is one of kilometer, mile and nautical mile, which is selected in General pane of Preference panel. If it is short, unit is meter or yard.

Shows direction to the mouse point from the start point during first section only. It is in degrees from north clockwise. Because calculation assumes the earth is a true sphere, the error will be larger in the case of a long distance such as more than a few thousands kilometers.



## 22. Find Highest or Lowest Elevation

Find highest or lowest elevation point among the read DEMs. You can select search range from "Selected rectangle", "Window area", or "Whole DEMs". Result are shown in a small information panel and a red-round-arrow points the place on the Map View. You can copy address and elevation value as a text string from the information panel.

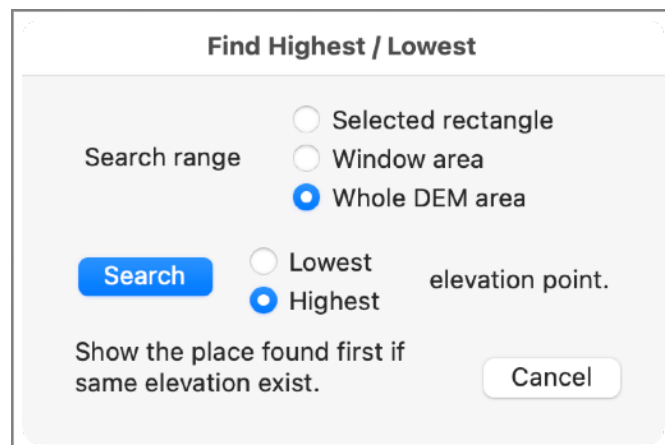
Result elevation is raw value in the DEM file, not interpolated one.

Sea and void portion are ignored always.

### Operation

- Choose "Find highest / lowest..." under "Tools" menu to show dialog.
- Select highest or lowest, select range and click "Find" button.
- Found point is pointed by red-round arrow on the Map View, and information panel displays details.

If the point is out side of the window, map will be reposition, so that the point sits in the center.

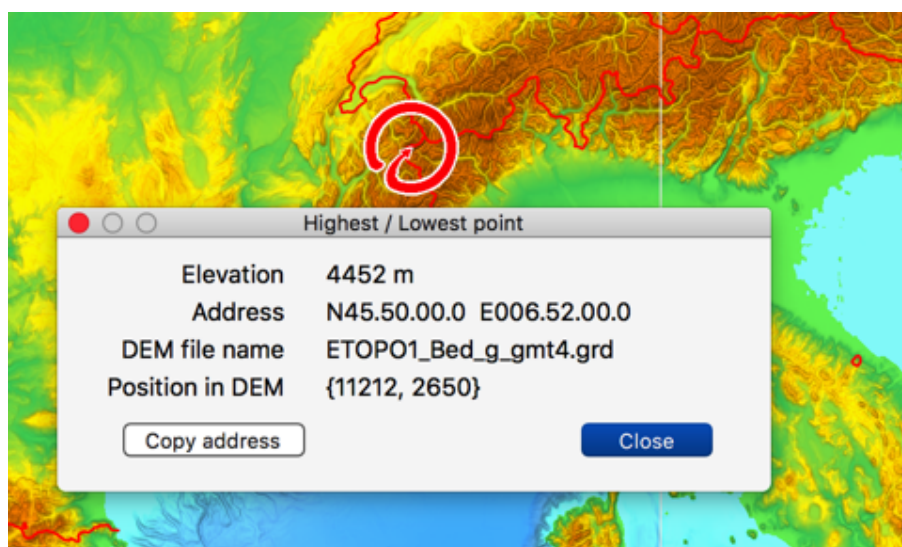


### Results

Elevation	Shows raw value in the DEM in meters.
Address	Shows Latitude and Longitude. If there are many same elevation points, address of first found point will be set. If the DEM is no-addressing type, this field will be blank.
DEM file name	Name of the DEM that includes the point.
Position in DEM	XY coordinate in the DEM file. The upper left corner is ( 0, 0 ).

Click "Copy address" in result panel to copy strings to clip board includes the address and the elevation. Address format is DMS or DD depends on setting in Preferences panel.

	String example
DMS	LW N33.10.15.33 W100.55.11.01 3770 m
DD	25.1234567 -96.8765432 1234 m



## 23. Contours

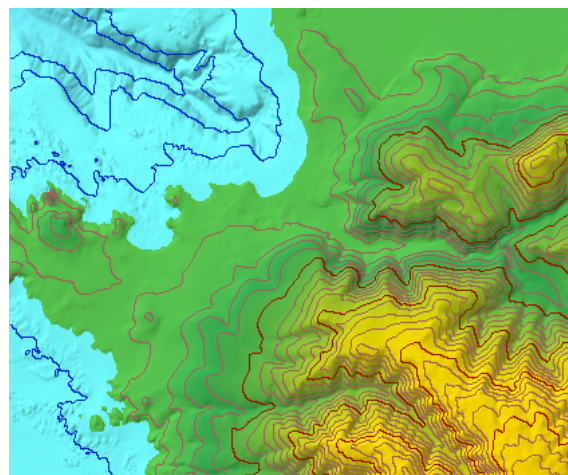
You can draw contour lines on the map of the Map View. You can select interval, line colors, indexed line interval. Contour lines are drawn on the map when you click the "Draw" button. It will disappear when map is redrawn or scrolled.

If using retina screen and specifying double density for drawing Map View, line width will be half, and drawing takes four times longer.

You can draw contour lines on Projection Maps and saved picture of the Map View. In those cases, contour line settings are the same as for Map View.

Contour lines on the Map View is drawn as dot by dot always. You can select line mode at creating Projection Maps and saving Map View images, so that some draw software, such as Adobe Illustrator, can treat contours as lines. In this case you can specify line width. Line mode drawing takes time much longer. Refer "Line mode" section below.

You can save contour settings with name, so that you can refer it later.



## Settings

Select "Draw contour lines" under the "Tools" menu to show the dialog. Also you can click "draw" button in Contour section of the Map Info Panel of the Main window. In the dialog, you can specify followings and draw contour lines.

**Contour set** Load saved contour line settings with name from the menu.

**[Save] with name.** Save current settings with name. Its name will be listed in the menu.

**Remove** Remove contour set showed in above menu. You cannot remove Default set.

**Interval** Enter any integer value in meters or feet. Minimum is 1 meter or 1 ft.

**Draw index lines for each** Set to on and select index pitch to draw index lines.

**Color set** Select prepared color set for main and index lines.

**Main, Index** Color for main and index lines. Click color box to change them individually.

**Use different intervals and colors for under [ 0 ] m.** Set to on if you want to use different colors and intervals for under sea level. You can specify depth and color for each line. Two colors can be used for sea depth. Not only for under sea levels, you can use this table for lower land near sea level. You can set elevations up to 1000 meter.

**Color 1, Color 2** Colors for sea depth. Click color box to change them.

**Depth / Elev.** Specify depth or elevation for each line in meters or feet. Unit is the same as above interval field.

**Color** Color for each line. Select from Color1, Color2, Main or Index color.

**[+] [-]** Add or remove a line.

**Default button** Reset all settings of "Use different intervals and colors ..." to defaults.

Don't draw above sea level.

Set to on when you do not want contour lines on the land above sea level.

Don't draw sea level.

Set to on when you want no contour lines on seashore. Inland contour lines of 0 meter also disappear.

Don't draw under sea level.

Set to on when you do not want contour lines under sea level.

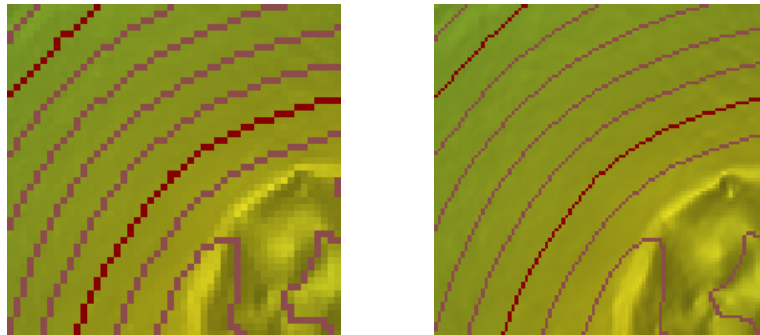
Draw button Click to draw contour on the Map View.

## Line mode

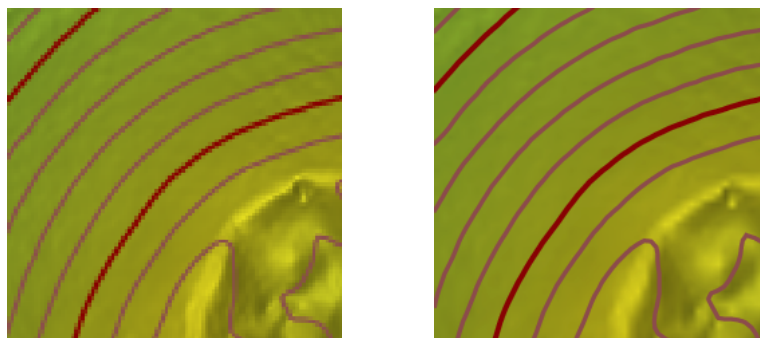
You can select line mode when saving picture of Map View or creating projection maps. In line mode, you can specify line width for main lines, index lines and sea depth lines each. Other settings are the same as ones to the Map View. If line color for under sea is Main or Index, Main or Index line width will be applied for them.

Following images show results of various settings. They are extended using graphic software. First three images are saved as PNG and last one saved as PDF. All line width and color settings are default values.

First one was drawn in dot mode and 72 dpi. Second one was drawn in dot mode and 144 dpi.

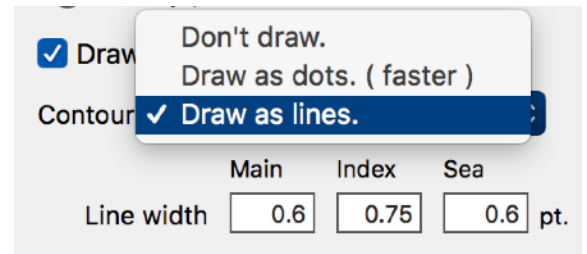


Third one was drawn in line mode and 144 dpi. Last one was drawn in line mode and 144 dpi. Last one was saved as PDF, and extended by PDF Viewer.



## Notes

- Draw button does not erase previous drawing, so that if you changed the interval, you should erase previous contour lines by refreshing Map View.
- When saving image of the Map View or creating Projection Maps, last contour settings used to draw on the Map View will be applied.



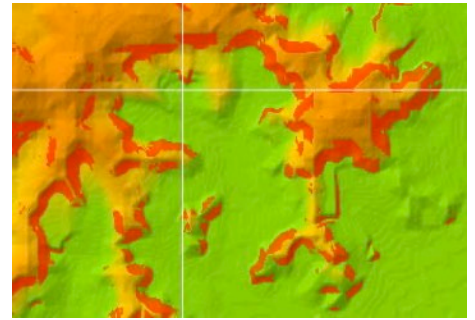


## 24. Coloring According to Slope Degree

Draw map with colors according to slope degree. You can specify seven slope degrees and colors to them.

Colors drawn by this feature will disappear when the map is redrawn.

In the right image, red part shows steep slope over 30 degrees.



### Settings

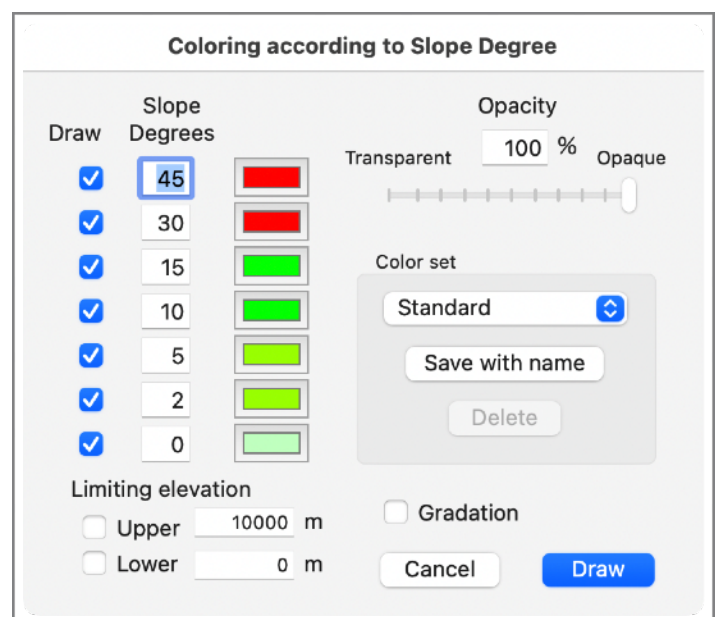
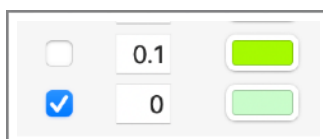
Select "Slope Degree..." under the "Tools" menu to show the dialog. You can specify degrees, colors and which part to draw.

Draw ( check box )	Select band to draw.
Slope degrees	Specify lower limit in degrees for each band.
Color	Colors for each band. Click on the color pane to change it. Colors can be copied by drag & drop.
Limiting elevation	Set drawing range by elevation.
Opacity	Specify opacity for drawing colors override the map. 100% override completely. You see no slope colors on the map when 0%.
Color set	Save settings with name and show it in the menu.
Gradation	Colors are changed gradually band to band.
Draw	Draw slope colors.

Click draw button after setting those.

### Notes

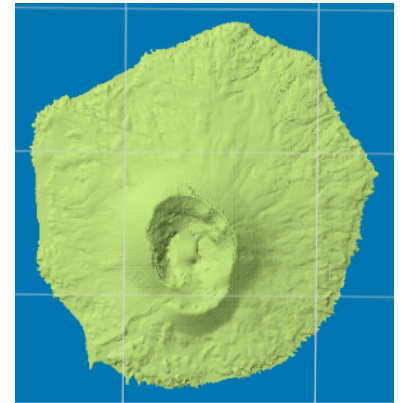
- Because slope colors override current map without refresh, you need to refresh the map before redrawing slope colors.
- If you want to save map image with coloring by this feature, specify it in the Save Map dialog. Before showing save map dialog, set this dialog and check result.
- To find flat area ( such as lakes ), you can set dialog as figure below.



## 25.Measure Volume

You can get a volume above a certain elevation in a specified region (window, selected rectangle region, User Area data) , or a volume below a certain elevation. The former is to find the volume on the sea surface of the island, or the volume of mountains and hills above a certain height. The latter can be used to calculate the volume of the planned dam site. The area size is also shown.

They are calculated according to the size of the cell of the DEMs regardless of the scale on the Map View. The result area will be pink. In addition, the elevation data in that range can be set to a certain elevation value. It may be used to flatten the planned land of the dam lake.



### Settings

Select "Measure Volume..." under the "Tools" menu to show the dialog.

**Target region** Select one of Selected rectangle, Window and User Area Data. First and last one can be selected when they exist. When you select User Area Data as a target, an User Area Data will be selected if there is only one Area Data, other wise you should select one using selection dialog.

**Select Area Data button**

Showed when User Data Area is selected as a Target. Click to show selection dialog.

**Compare sign menu**

select one of  $\geq$ ,  $>$ ,  $\leq$ ,  $<$ . Former two means to measure volume of islands or mountains. Latter two means to measure capacity of valleys. Specify elevation in meters.

**Go button** Click to start measuring. After completion, calculated volume and area size will be shown, and result area is drawn with pink on the Map View.

**Close button** Close the dialog and finish this function.

**Cancel button** During measuring, you can cancel it.

Also you can cancel changing operation of next line.

**Set all elevations~ button**

Set the all elevation values in the detected range to the specified value. If you set -19999, it will be the sea, and -20000 means no data.

This change is valid until you exit the program or delete the elevation data. If you want to retain the change, you should save as New DEM files. Refer "[Export DEM File](#)"

This field will be shown only when result area is found.

### Notes

Sea and no-data region are excluded from measuring. It is not included in area size also.

The calculation is based on the cell value of the DEM, not the interpolated one. The area and volume are calculated by multiplying the difference between the specified value and cell value of the DEM and size of the cell.

When several type of DEMs are included, if the base DEM is no-data, the value is picked up from other DEMs and included in the result area, but only the base DEM can be changed with the Set button. In this case no-data cell will also be changed.

## Sample of Dam Lake

Create user area data where the edge passes through the planned dam site. The part other than the dam should be set appropriately to surround the part above the elevation of the lake. Refer figure at right.

**Measure Volume**

Target region

☐ Selected rectangle  
☐ Window  
☒ User Area Data

Select Area Data

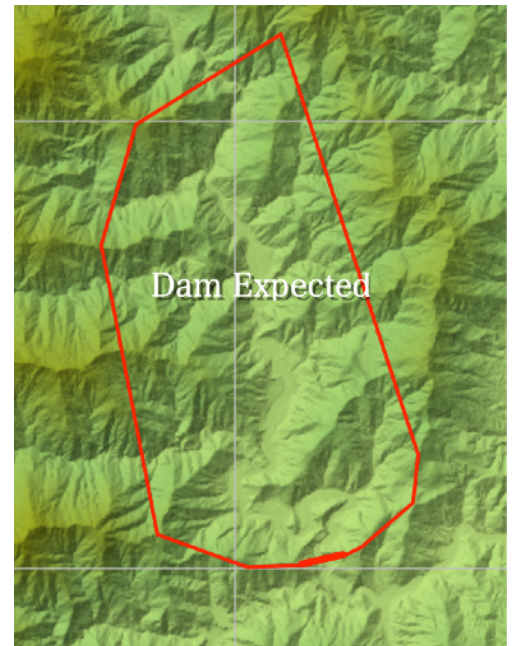
Dam Expected

Measure area and volume where elevations are <= 550 m in the target region. Do

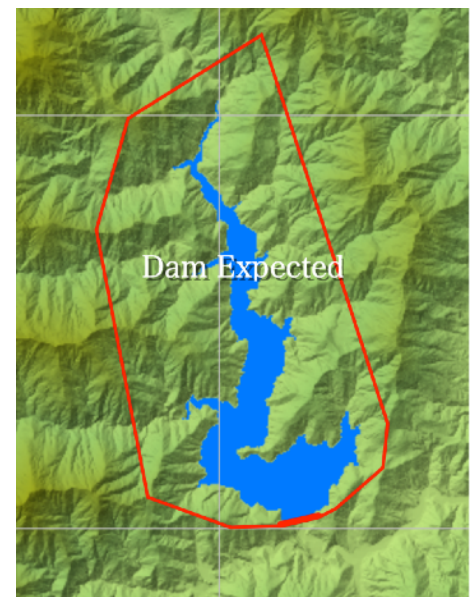
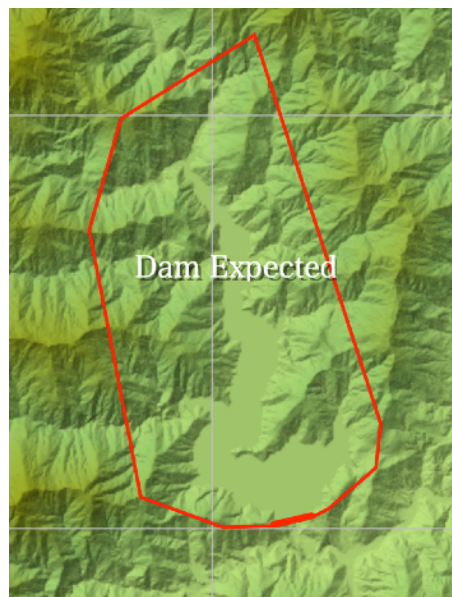
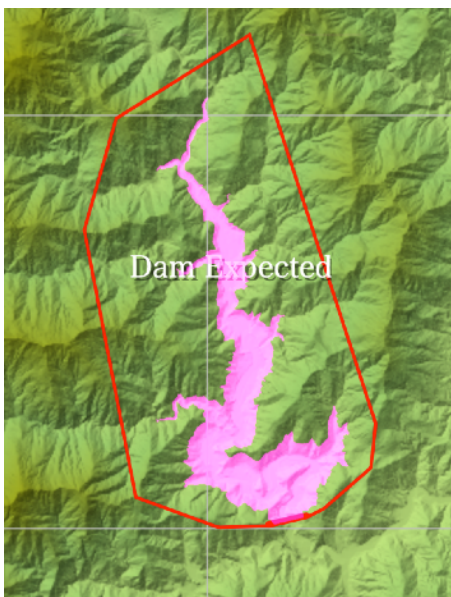
Area : 10.1 square kilo meters

Volume : 974 million cubic meters Close

Set all elevation values in the found area to 550 m.



The result region is colored in pink as shown in the left figure below. The center figure below shows the result of changing the elevation value of that range to 550m. The figure at right below is the result of creating the lake data.





## 26. Bird's Eye View

Make an image of the terrain from DEM data. The image is based on a flat plate ignoring roundness of the Earth. If DEM has latitude and longitude, aspect ratio is optimized automatically based on center latitude of the range.



### Settings

Show dialog by selecting “Bird's eye view...” under “Pictures” menu.

#### Target area

There are three options, selected rectangle, window and whole data.

If whole data is selected, minimum rectangle that includes whole data is assumed. This rectangle doesn't stretch over meridian of 180 degree. If data exist both side of 180 degree meridian, the rectangle goes around the earth.

When no addressing DEMs are used, window range doesn't include outside of the whole data range.

#### Face to

You can specify any direction in azimuth. Enter number values directly or use direction dial. Click tick mark or drag arrow head. Click N/E/S/W letters to face each.

#### Shading

Select shade type like as shading for the Map View.

Light direction is one of eight directions. Elevation angle ( angle of incidence ) is always 45 degrees.

Strength has 8 levels. 1 is most pale ( weak ).

#### Angle

Specify angle of depression in degrees between 0 and 90. 0 means looking horizontally.

#### Height emphasizing

Select rate to emphasize elevation from menu. All elevations are multiplied by this rate.

#### Picture scale

Select shrink or expand rate from menu in percentage.

Picture size is defined by target area size, azimuth, depression angle and rate.

Maximum picture width and height are 65,500 pixels each.

#### Coloring according to slope degree

Settings for the Map View are applied.

#### Use texture mapping

Set to on if you want to use texture mapping. Settings for the Map View are applied.

#### Insert a color table

Insert a color table into the picture. Select position and size.

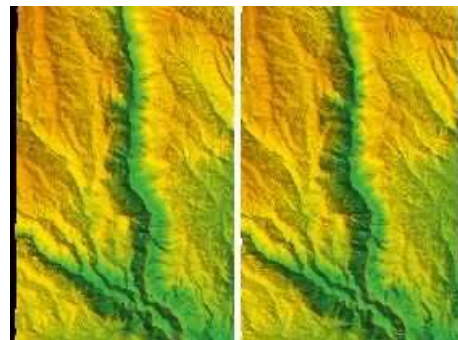
### Add text strings in the picture

You can add any simple text on the image. Show the context menu on the picture, and select “add string”. In a dialog you can enter string and its attributes. Show context menu on a existing text string, you can update it. You can remove string by dragging it outside window. You can tilt ( rotate ) those strings. Refer ["Picture Windows"](#) section.

## 27. Stereographs

### Stereograph

This feature makes a pair of images in a window to see 3D image. There are three types, parallel, cross-eyed and anaglyph.



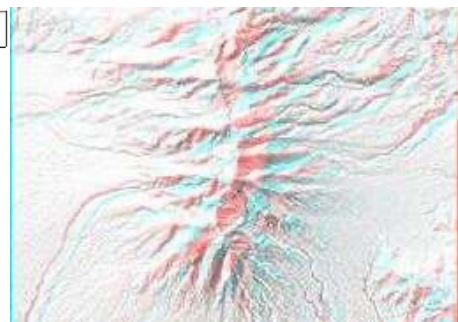
#### Parallel and cross-eye

Two images are slightly different perspectives of same area. In parallel mode, left eye looks at left image and right eye at right image. In cross-eye, left eye looks at right image, and right eye at left one.

Image can be full colored, but restricted rather small picture size, especially for parallel. Some skill is required to look as 3D.

#### Anaglyph

Red color from picture for right eye, green and blue from picture for left eye compose an anaglyph image.



To see terrain as 3D, it is mandatory that elevation colors contain both red and green or red and blue. It is better to set all elevation colors to white or other bright colors.

To see anaglyph, prepare a pair of glasses with red glass in left, blue or green glass in right.

### Settings

Show dialog by selecting "Stereograph..." under Pictures menu, or select "Create stereograph..." from the context menu on the Map View.

#### Target area

There are four options. They are "Selected rectangle", "Window", "Whole DEM area" and "Center address and size". If activated from context menu, last one is selected.

If whole data is selected, Minimum rectangle that includes whole data is assumed. This rectangle can not extend over both side of meridian of 180 degree. If data exist both side of meridian of 180 degree, the rectangle covers around the earth.

When no addressing DEMs are used, window range doesn't include outside of the whole data range.

#### Direction

You can specify any direction in azimuth field. Enter number values directly or use direction dial. Click tick mark or drag arrow head. Click N/E/S/W letters to face each.

#### Shading

Select shade type like as shading for the Map View.

Light direction is one of eight directions. Elevation angle is always 45 degrees.

Strength has 8 levels. 1 is most pale ( weak ).

Stereograph

Parallel

Cross

Anaglyph

Type

Selected rectangle region

Window

Whole DEM area

Center address and size

Target

N

E

S

W

Direction

Azimuth

0

Emphasizing

2

(1.0 - 20)

Shade type

by Light

Shade strength

3

Light from

NW

Scale

100%

Picture size

1752W x 800H (10.7 MB)

Make

Left eye pane

right angle projection.

Coloring according to slope degree.

Use texture mapping

Cancel

Make

## Height emphasizing

Specify values between 1.0 and 20.0. 1.0 is similar to actual image, but it is difficult to recognize the terrain unless it is a bumpy land.. If too much emphasizing applied to mountainous area, getting difficult to recognize its image.

## Scale

Select scale rate from menu in percentage. You can not select larger scale that picture width or height exceeds 65500 pixels.

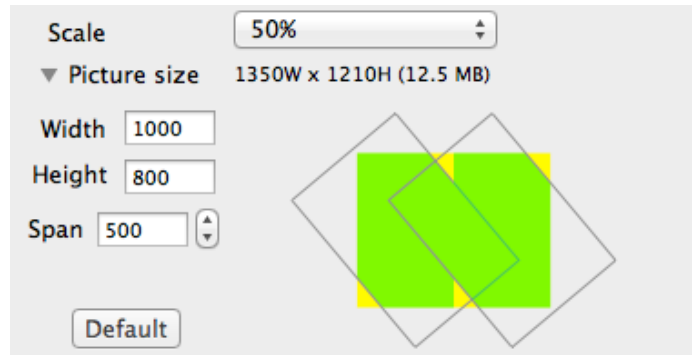
## Picture size

Although default picture size is determined by target area size, direction and scale rate, you can set final picture size and distance of two pane in pixels for parallel and cross. No size option for anaglyph.

Click triangle aside "Picture size" to show layout and input fields.

Enter width and height of final picture size.

Span is the distance between centers of two panes.



In layout picture, two black framed rectangles represent selected range. Yellow rectangle represents final picture. Relief maps will be drawn in each green part.

"Default button reset width, height and span to defaults.

Maximum picture width and height are 65,500 pixels each.

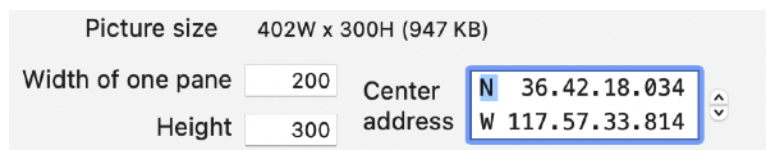
(note) If direction is not right angle, recommend to use "Center address and size" for target.

## Center address and size

If "Center address and size" is selected, fields like a picture at right will appear in the dialog.

If activated by context menu, clicked address is set as center address. If changed from Window range or others, center address of each target is set.

In this case, target area is drawn as white frame on the Map View.



## Make one pane right angle projection

To get accurate address of the image, make one of two panes set to right angle projection. Select left or right pane.

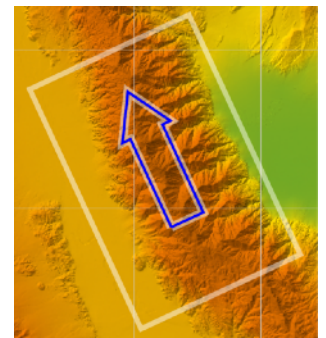
You can select to draw Meridians and Parallels on it.

## Coloring according to slope degree

Settings for the Map View are applied.

## Use texture mapping

Set to on if you want to use texture mapping. Settings for the Map View are applied.



## Add text strings on the picture

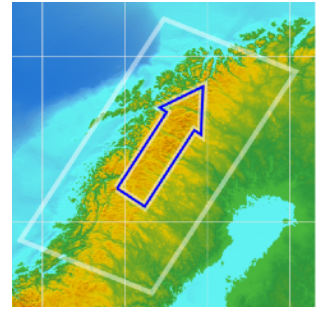
You can add any simple text on the image. Show the context menu on the picture, and select "add string". In a dialog you can enter string and its attributes. Show context menu on a existing text string, you can update it. You can remove string by dragging it outside window. You can tilt ( rotate ) those strings. Refer "[Picture Windows](#)" section.

Added text strings have no stereo effect.

## Notes

- When viewing parallel stereograph on the screen with the naked eye, it is difficult to see big picture. Less than 300 pixel width for one pane maybe acceptable. No such limitation for Cross-eye and Anaglyph.
- Direction arrow is shown at center of the target area. If it is out of the Map View, it is drawn at the center of the Map View.

- White frame of target area is not rectangle if geo-referenced DEM is used and direction is not right angle. Distortion is larger when its position is far from base latitude.





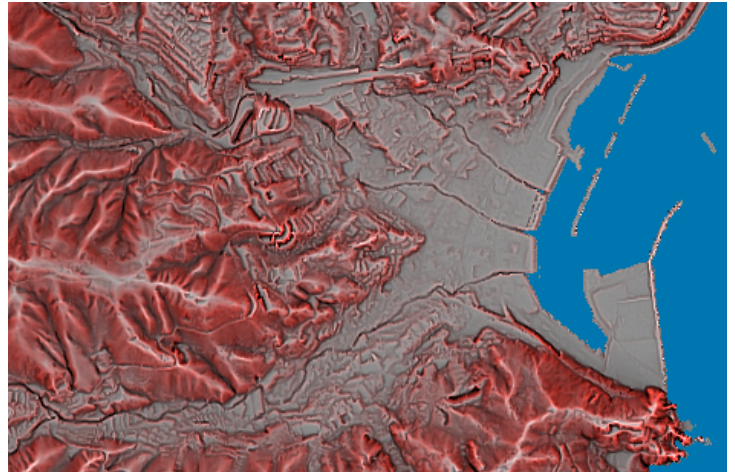
## 28. SRVC Relief Map

### What is SRVC Relief Map

New relief map formed with slope degrees, ridge–valley degrees and surface curvature. It is independent from light direction, different from normal shading relief map. Furthermore, it is easy to recognize landscape image without any tools nor skills like as stereographs.

“SRVC” is an acronym of Slope, Ridge, Valley and Curvature.

- Land colors are automatic. Colors of sea and void region depend on Preferences setting.
- No lake is recognized. It is drawn as flat land.
- Image width is adjusted so that horizontal and vertical scale are the same at the center of the map. Therefore, even if you select window range, image width may differ from window width.
- You can draw Meridians and Parallels, User Memo / Route / Area Data, and Contour. Their drawing conditions are depends on each settings on the Map View.



### Dialog

Show dialog by selecting “Create SRVC Relief Map...” under “Pictures” menu.

**Target** There are four options, selected rectangle, window, whole data and specified picture size. Last one extends around the center of the window.

If whole data is selected, Minimum rectangle that includes whole data is assumed. This rectangle doesn't stretch over meridian at 180 degree. If data exist both side of meridian 180 degree, the rectangle goes around the earth.

When no addressing DEMs are used, window range doesn't include outside of the whole data range.

**Picture scale** Select shrink or expand rate from menu in percentage.

**Picture size** Determined by target type and scale. If target type is the last one, you can specify width and height freely. Both should be less than or equal to 65500 pixels.

**Emphasizing slope**

Default value is 3, select between 2 and 4 usually. If you want to draw flat area such as sea bed, select bigger value.

**Curvature** Specify degree of applying surface curvature to the picture. Larger value enhances contrast of ridge and valley. See sample images on next page.

**Draw Meridians and Parallels.**

Set to on if you want to draw Meridians and Parallels on the picture. Interval, color and line width are the same as those of the Map View.

**Print latitudes and longitudes**

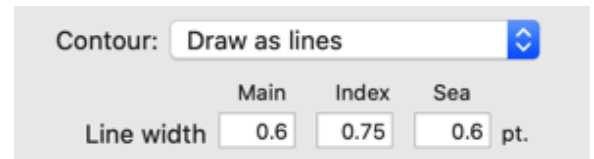
Add latitude and longitude values to each line. To change font, click [A] button at right. You can change font, size and color.

**Draw User Data** Set to on if you want to draw user data on the projection map. All settings are the same as those of the Map View.

**Contour** Select one from the menu "Don't draw", "Draw as dots", "Draw as lines". If line mode, you can set line width. Line intervals and colors are same as those of the Map View.

If you select line mode and save as PDF, you can edit contour with some draw software, such as Adobe Illustrator, later.

Line mode takes time much longer, maybe more than ten times than dot mode.



[Copy] four corner addresses.

Copy addresses of four corner to scrap. It consists of four lines, first line contains address of north-west corner, south-west, north-east, south-east follow it. Each address format depends on setting in Preferences.

[Defaults] Reset to defaults all settings in this dialog.

## Add text strings in the picture

You can add any simple text on the image. Show the context menu on the picture, and select "add string". In a dialog you can enter string and its attributes. Show context menu on a existing text string, you can update it. You can remove string by dragging it outside window. You can tilt ( rotate ) those strings. Refer "[Picture Windows](#)" section.

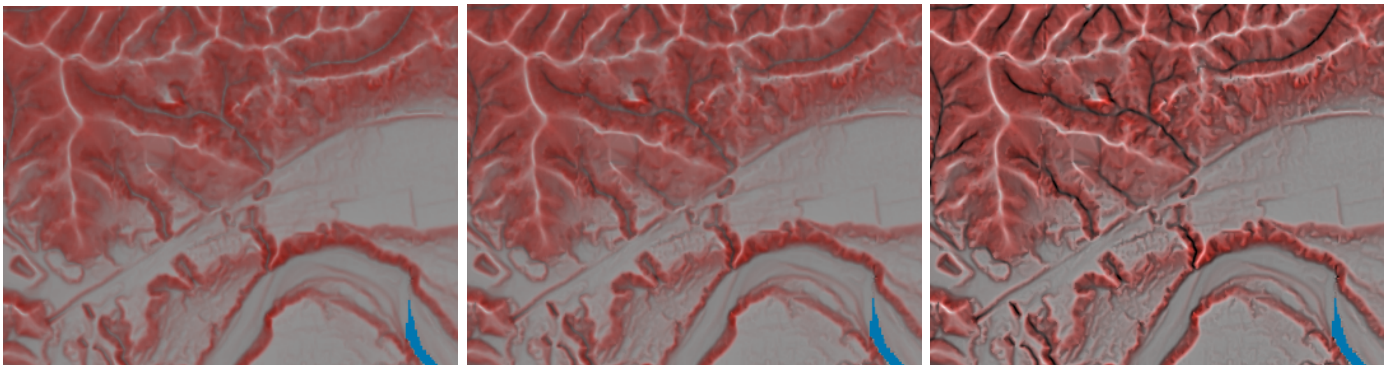
## Sample images

Emphasizing slope value is 3

Curvature value is 1

Curvature value is 3

Curvature value is 5



## 29. Panorama View

### What is panorama view

Panorama view represents your view from some place on land surface or in the air. You can create 360 degrees panorama view as one image and can rotate it.

Parameters are eye point address, elevation, eye direction, elevation angle, view angle, haze effect, colors and others. Default color set is same as the Map View, but can create any independently.

You can use a target point instead of eye direction and elevation angle. If User Data exist, you can set the target to any User Data string point.

Strings of Memo data and Route data, lines of Route data can be drawn on the panorama image, but no Memo mark. Route is always drawn as simple line, line type and width are ignored.

Textures are applied to the land surface as such as in the Map View.

You can specify drawing clouds in the sky and waves on the sea.

Shading is the same as it of the Map View, no shadow of mountains. Although you can draw the sun, it has no relation with shading direction.

If using planet or moon DEMs, no drawing of sea and sky.

#### Projection method

Coordinate system in the panorama view is azimuth and elevation angle, so that near view ( bottom of the picture ) will be drawn wider. If target elevation angle is not level ( not zero degree ), automatically adjust horizontal axis so that distortion of the picture will be minimum at specified elevation angle.

### Creation

There are tow ways to start creating panorama view as follows. Panorama view start drawing after you set fields of the dialog and click "Draw" button. A window appears and the panorama view will be drawn left to right. If picture width is longer than screen width, it scrolls during drawing.

#### Start from context menu

On the Map View, at the place where you want to set as eye point, show context menu and select "Create Panorama View". An arrow and pink colored fan will appear toward mouse cursor. Move mouse toward target point, angle of the fan changes depending on cursor distance from the eye point. Arrow direction is eye direction and angle of the fan will be view angle. Click somewhere to show creation dialog. If the mouse point is very near the eye point, view angle will be 360 degrees and direction will be set to north.

If the target point was set previously, direction restricted to it.

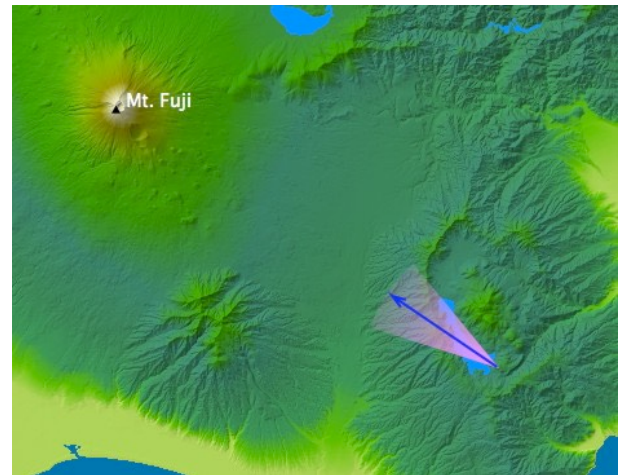
If you start on a string or memo mark, its address and elevation are used as eye point, otherwise mouse point address and its surface elevation will be taken.

#### Start from Pictures menu

Select "Create Panorama View" from the Pictures menu, creation dialog appear instantly. All settings are the same as previous session. If it is the first time, center address of the Map View will be eye point and towards north, view angle is set to 60 degrees.

#### Cancel during drawing

Drawing Panorama View may take very long time depends on settings. If you want to cancel it, click close button of the picture window.





## Settings

### Eye position

Eye position consist of latitude, longitude and elevation. Elevation can be specified as surface elevation and lift above there, or elevation from sea level.

**Eye position** Shows the mouse point address or string's base address when start by context menu,.otherwise address set by previous session remains. You can change to any address. If address is changed, surface elevation will be changed to that of changed address.

#### Elevation at surface

Shows calculated elevation from the specified address or elevation value of string data when start by context menu. Elevation value of string data maybe includes lift from surface already. You can enter any value here, but if you change the address it will be replaced with calculated one.

Even if elevation of string data is set originally, it will be changed as address changed. If address return to original, original elevation will be restored.

#### Above surface / Above sea

"Above surface" means final eye elevation is "Elevation at surface" + value specified here. Eye elevation is value specified here when "Above sea" is selected. Although you can enter minus value here, if eye elevation is lower than surface elevation calculated from DEM, final Panorama View maybe invalid.

**Eye point name** User data title string is set to here when the dialog started by context menu on the string. You can change eye point by searching user data string. Click "Search" button to search user data and set its address and elevation. You can set new name even no user data exist in search dialog. Refer "Name search dialog for eye or target" section.

### Direction

**Azimuth** Eye direction between 0 and 359.9 degrees. North is 0 and clockwise. If "Fix on target" is checked, this value is set automatically and not editable.

**View angle** View angle in degrees. Between 0.1 and 360. 360 degrees means whole circumference of the eye point, and panorama view can scroll through.

View angle limited to 120 degrees or less if stereograph is set or "Elevation angle" is lower than -45 degrees or higher than 45 degrees.

**Elevation angle** Upward or downward angle between 60 and -60 degrees. If higher than 45 or lower than -45, "View angle" limited to 120 degrees. If "Fix on target" is checked, this value is set automatically depends on eye elevation.

**Target name** User data title string is set to here when target is specified previously by context menu on a string. You can change target by searching user data string. Click "Search" button to search user data and set its address and elevation as target. "Fix on target" will be checked and "Azimuth" and "Elevation angle" are calculated automatically. You can set new name even no user data exist in search dialog. Refer "Name search dialog for eye or target" section.

**Fix on target** If target is set, you can check or uncheck here. If checked, "Azimuth" and "Elevation angle" are calculated automatically.

## Color setting

Like as Color Set for the Map View, you can change colors, boundary elevations and save settings, in addition you can set sky color.

Color set menu Default is "Same as Map View". Same list of color set as color set menu in Preferences dialog appears here.

Elevations Specify in meters in descending order.

Color box Click to set each color. You can copy color to another color box by dragging.

Sky color Specify colors at top sky and horizon. Sky between them will be filled with gradation color. Actual colors depends on eye point elevation and haze effect settings. If haze effect is stronger, every colors anywhere converges toward horizon color.

Save with name Create new color set with colors and elevations. The name will appear in color set menu.

Remove Remove a color set created by user shown in menu.

Edit in separate window

You can use separate window to edit color set, even though you can edit it here. Refer "[Edit Color Set](#)".

## Other settings

Max. distance The scene will be drawn up to this distance. Earth surface farther than this distance will be drawn as sea. If "Fix on target" is checked, "Max distance" should be longer than the distance between eye point and target plus 5 km.

Min. distance The landscape farther than this distance will be drawn in scene. Land closer than this distance will be drawn as sea. If you specify 0 km, it is treated as 2 meters.

Picture size ( Width x Height pixels )

Width and height each should be less than or equal to 65500 pixels.

Quality It is trade off between speed and quality. Usually "Normal" is good for quality and speed. Use "Preview" to check composition if normal drawing takes longer time. Use "Fine" if result is bad quality. It may require "Fine" if you use small pitch DEMs or draw steep mountain scene.

Emphasizing Specify value to multiply elevations by, between 1 and 10. Mountains become higher, sea become deeper. Eye point elevation also will be multiplied.

Apply air refraction

Distant mountains look higher because of light refraction in the air. The default value 0.133 is at the sea level and in standard atmosphere. Although the value differ depends on altitude, there is no much difference in scene. There is much difference depends on local weather conditions, especially local air temperature, such as a mirage in extreme case..

Specify value between 0 and 0.3. 0 (zero) means no effect.

Shading Light direction applied to everywhere, that means ignore time difference among the place. Even if the Sun is drawn, it has no relation with shading.

– Shade strength Select between 1 and 5. Larger number gets deeper shading.

– Light from Select one from 8 direction menu. Default is east.

– Light angle Select elevation angle ( angle of incidence ) from menu between 10, 30, 45, 60 degrees. Default is 45 degrees.

**Use texture mapping**

Set to on if you want to apply texture mapping when texture map exist. Settings are the same as to the Map View.

**Draw azimuth indexes**

Draw azimuth indexes and their values on the panorama view pictures. Numbers represent degrees and minutes. Pitch and others are automatic.

They appear just below upper edge, landscape may overwrite them.

**Draw user memo data**

Set to on if you want to draw user memo title string on the scene when Memo data exist and visible. All settings are the same as those of the Map View, except t.no mark drawn and strings always be drawn vertically. String's attributes can be changed on the picture window later. Refer following sections.

No draw if stereograph is specified.

**Draw user route data**

Set to on if you want to draw user route on the scene when Rout data exist and visible. All settings are the same as those of the Map View, except only color is applied from line attributes, no line type, no line width Strings are the same as user memo.

No draw if stereograph is specified.

**Treat void area as sea**

Set to on if DEM's sea area defined as void value. When steep cliff exists at sea shore, cliff may be drawn as facing to no DEM area. This option avoid this effect. Do not set on if DEMs have inland void region.

**Apply haze effect of distance**

Because of haze effect, distant mountains getting dim.

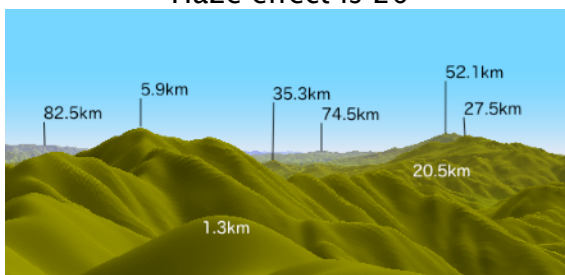
☒ Apply haze effect of distance

Thickness  0.1 - 99.9 Min. distance  km

**- Thickness**

Specify strength of haze effect between 0 and 99.9. 0 (zero ) means no effect. Default value 20 fits to Japanese atmosphere conditions. Smaller value fits to dry air. Dimmed color converges to sky ( bottom ) color.

Haze effect is 20



Haze effect is 30

**-Minimum distance**

Apply haze effect farther than this distance. Default is 0 km.

**Apply mist effect of lower land**

Dim lower land just as mist or cloud cover them. Lower elevation gets more density.

**- Upper limit elevation**

This effect is applied under this elevation. Effect is zero at this elevation, and lower elevation getting more dense towards lower limit elevation.

**- Lower limit elevation this**

Land lower than this elevation is drawn with sky ( bottom ) color, so that if lower limit is 0 meter sea is

☒ Apply mist effect of lower land

Upper limit elevation  m Thickness  (0.1 - 99.9)

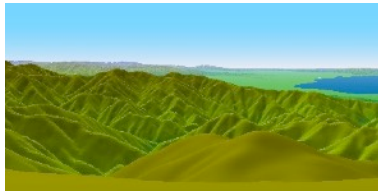
Lower limit elevation  m

drawn as sky ( bottom ) color always. To draw sea and sea shore in pale color, set lower limit to minus elevation value.

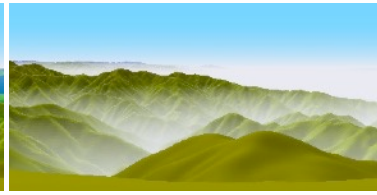
#### - Density

Specify strength of effect between 0.1 and 99.9. Default value is 90. Dimmed color towards sky ( bottom ) color as number becomes larger.

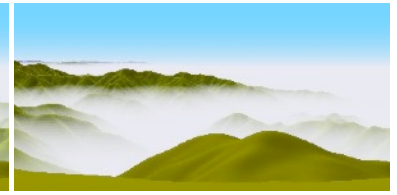
Lower land mist effect, elevation limit is 1500 m, eye point elevation is 2420 m.



No effect



Density is 90



Density is 98

Draw clouds

Draw waves

Draw Sun

Draw the Sun or suns at specified date and time at the eye point. Refer "Draw the Sun" section below.

This option is not available on planet DEMs.

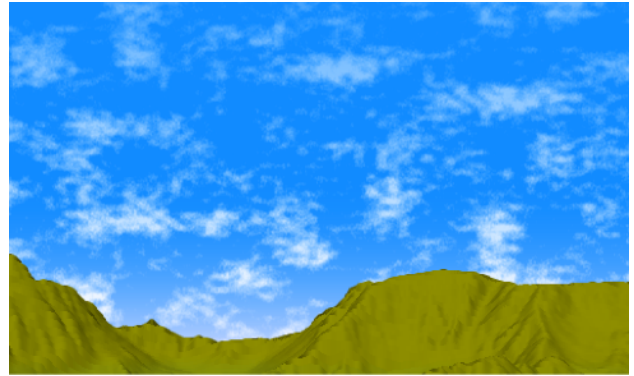
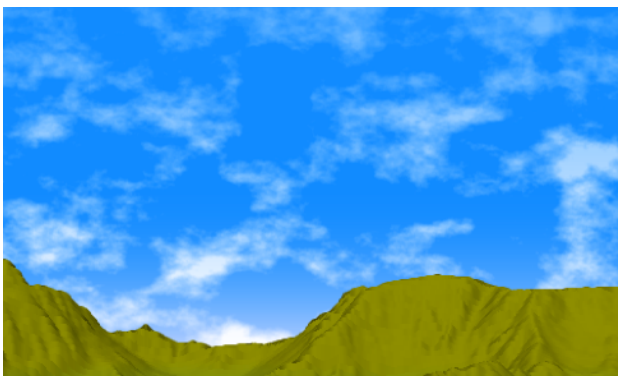
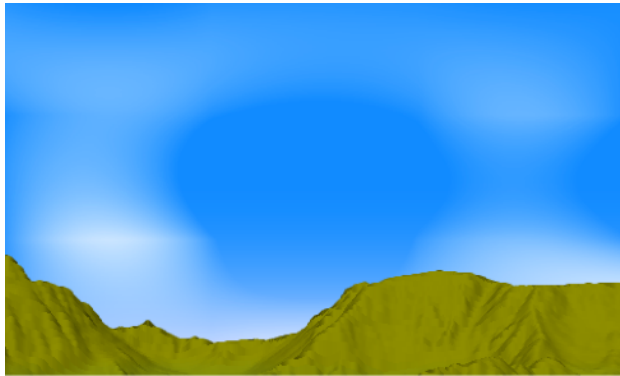
### Draw clouds and waves

You can draw clouds in the sky and waves in the sea. You can only specify the rough size, there are no detailed settings. Also, even if you have the same settings, clouds and waves will change randomly every time you draw.

<input checked="" type="checkbox"/> Draw clouds in the Sky	Type	4	<input type="button" value="v"/>
<input checked="" type="checkbox"/> Draw waves on the sea	Type	2	<input type="button" value="v"/>

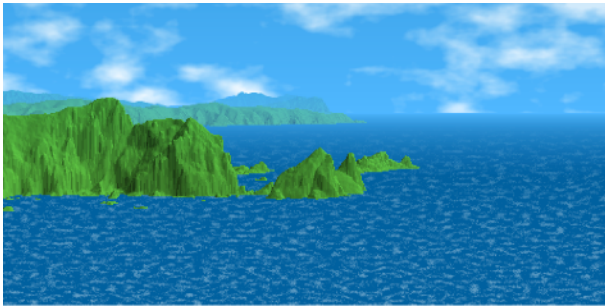
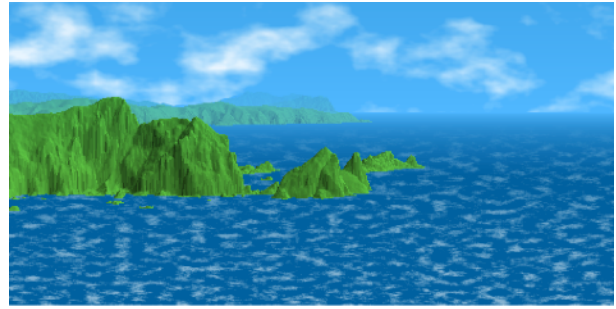
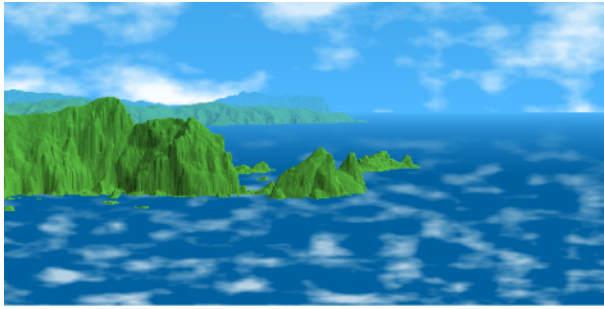
You can select type in the range of 1 to 10 each. 1 is a large or rough, and as the number increases, it becomes a fine cloud or wave. The darker the blue of the sky tends to look better. Waves are not drawn at a distance of more than 50 km.

Samples of clouds. Their types are 1, 4, 6 and 10 .in order.





Samples of the waves. Their types are 1, 5, 10 in order.



## Draw the Sun

You can draw the Sun or suns of the specified time between 1 Jan. 1990 and 31 Dec. 2099.

This program treat the Earth as an ideal sphere. Therefore, the position of the sun will be laterally shifted by up to 0.2 degrees from the actual position on a scene. To reduce this error, the position of the sun is adjusted to the terrain, but error remains. It is less than one arc minute vertically and less than a few arc minutes horizontally.

Despite actual diameter of sun varies in season it is always drawn as 32 arc minutes in diameter.

**Time zone** Menu list up Greenwich Mean Time, your Mac's system time zone and time zones near the eye point. It shows the nearest time zone but may not exact one.

**GMT** Time difference between selected time zone and Greenwich Mean Time.

**Draw the sun at the time**

Set the time you want to draw.

**Draw (n) suns ... with (t) minutes interval**

Draw n suns before the time and n suns after the time. If you specify 5, 11 suns will be drawn, but some of them may be behind the landscape.

**Draw date and time**

Set on to draw date and time next to suns on the picture

**Color of the sun** Click color box to set color of the sun.

☒ Draw the Sun

Time zone Japan Standard Time GMT +9

Draw the Sun at the time 2021/03/10 9:15

Draw 0 suns on both side of above time with 2 minutes intervals

☒ Draw date and time. Color of the Sun  Defaults



## Stereograph

Create two panorama view from both side of specified eye point, one is for left eye, another is for right. Stronger emphasizing makes distance between left and right eye point longer, then eye point may goes underground if specified point is in a narrow valley. In such a case add some value to eye point elevation. Another way, you can cut near scene by setting "Minimum distance" to some appropriate value.

☒ Stereo

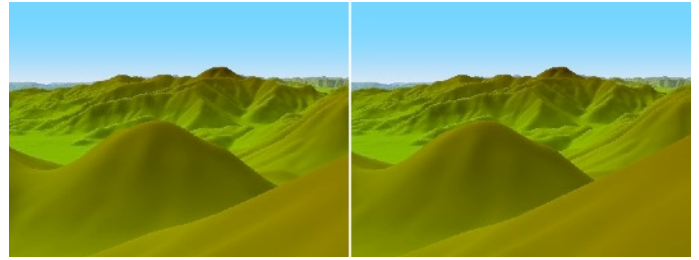
Type Parallel Emphasizing 2 (Standard)

Type	Select one of parallel, cross or anaglyph.
Emphasizing	Select between 1 and 5 from menu. If distant view you may want to select larger number.

Picture at right is parallel stereograph.

Picture size field specify width and height for one view. If parallel or cross eye, picture width should be less than 32750.

View angle should be less than or equal to 120 degrees.



## Reset All

Set all values to default except eye point and target. If “Fix on target” is on, azimuth and elevation angle are set to calculated value.

## Name search dialog for eye point or target

Dialog will appear as sheet when one of “search” buttons clicked. The table in the dialog shows all strings from user data those can be shown on the Map View.

You can select one in the table. You may enter name, address and elevation directly, so that even no user data exist, eye point or target is treated as named point.

Table	List up user data strings those can draw on the Map View.
– type	Memo, Route, Area or Node. Node means node comment of Route data, others are title string for each user data.
Name	Select one from table or enter directly.
Address	Select one from table or enter directly.
Elevation	Select one from table or enter directly.
Search string	Search data by substring of the “Name” field. Table will show only the data those include substring typed here.

## Handling after completion

### Scrolling

Supports mouse wheel scrolling, drag scrolling, scroll gesture on track pad,  
If view angle is 360 degrees, you can rotate picture horizontally.

### Auto scrolling

Panorama view can scroll automatically if picture width is greater than or equal to 3000.

Pressing left or right arrow to key start scrolling. More key down makes speed up or down, or change scrolling direction. If view is not 360 degrees, scrolling direction will change at both end. Space bar stops autoscrolling.

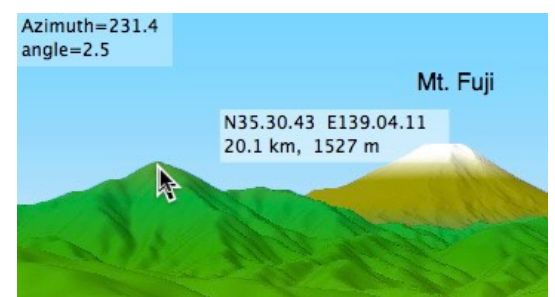
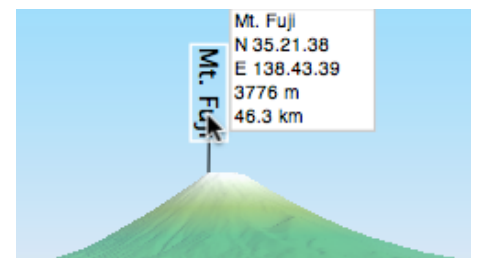
### Show place information

If you move the mouse on the picture, azimuth and elevation angle are shown at upper-left corner of the window.

If you move mouse to any string on the picture, string information appear aside it. It shows string itself, address, elevation and distance from eye point. Distance unit depends on setting in Preferences.

If you move mouse on the landscape with holding ctrl-key or option-key pressing, information of the place appears near the mouse cursor.

First and last information will disappear in six seconds if mouse doesn't move.



## Handling strings

You can move text strings by dragging them, and remove them by dragging them out of the window.

You can change attributes of any string on the view. Show context menu on the string and select "Update string..." to do it. Refer next section "String dialog".

You can add a new string anywhere on the view. Select "Add string..." from context menu. It has address if added on landscape, no address in the sky.

## String dialog

String ( Text field ) Original string is set. You can change to any string.

Apply following attributes to all strings

Set to on to apply attributes to all string on the picture.

**Vertical** String is written vertically if this is set to on, otherwise horizontally.

**Leader line** Draw straight line to string from its base point.

– Line width Specify line width between 0.1 and 3.0.

– Line color Click color box to set any color.

**Font** Select font from menu.

**Style** Select a style supported by font.

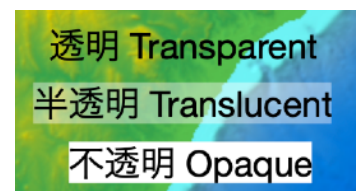
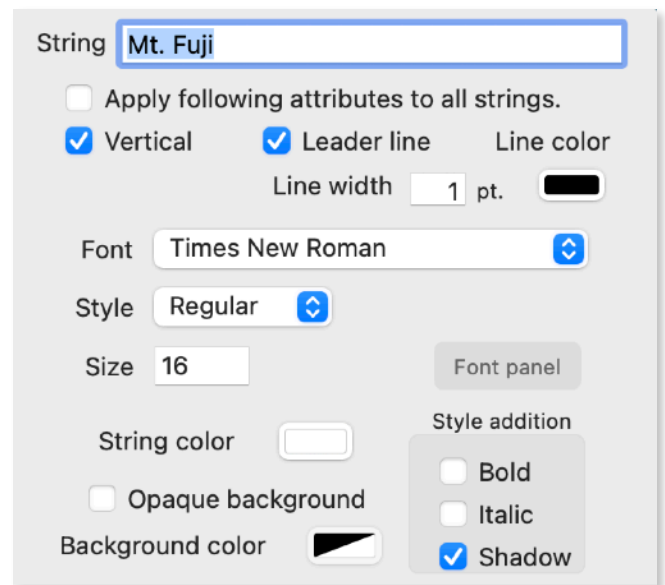
**Size** Specify font size between 5 and 256 points.

**Style addition** Specify bold, italic and shadow attributes. You can set them regardless of whether the font supports those styles or not. If font supports bold and italic, it will be thicker and more inclined.

**String color** Click color box to set any color.

**Opaque background** Set on to make back ground opaque.

**Back ground color** Click color box to set any color.



You can use 'Font Panel' to specify font, size, style.

## Set eye point or target point from context menu on the picture

Set new target or eye point using context menu.

**Set to Target** Set target to the place where context menu is shown.

**Set to Eye Point** Set eye point to the place where context menu is shown, and show Panorama View creation dialog.

**Set to Eye Point and Look back**

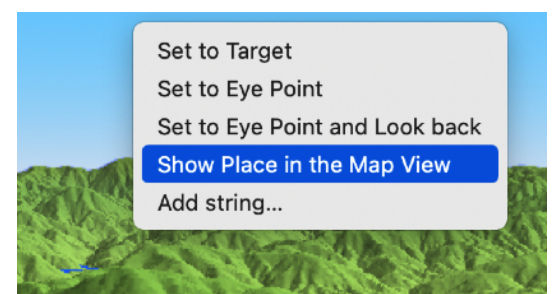
Set eye point to the place where context menu is shown, target will be set to current eye point, and show Panorama View creation dialog.

## Reposition map from a point of picture

Reposition the Map View as its center will be specified place of the picture. Show context menu at somewhere on the landscape, select "Show Place in the Map View".

## Show info

Select "Show info" under the File menu to show setting information. A panel will appear and shows all settings of creation dialogs except colors and sun.





Click “Show creation dialog” button to show dialog having same settings with current view, colors and sun settings also set as same.

Click “Export settings” button to save all settings. Refer next section.

## Export and import settings

Saving all settings of a Panorama View to a file, to refer later or to pass it other users. Click “Export settings” button in the info panel of a panorama view window to save settings to a file. Saved settings includes colors and sun settings. The file extension is ‘jzpano’.

Use ‘Open’ under the File menu to read this settings file. After the file is read, creation dialog will be shown. Required DEMs should be read previously, as exported file has no DEM file information. You can double click a settings file, or drop it on to application icon or main window to show Panorama View dialog.

## Notes

- Region that no DEM exist is drawn as sea, except planet DEM.
- To check visibility of strings, program uses elevation belong to them. If it is lower than calculated elevation from DEMs, program uses calculated one instead. If a string has no elevation, calculated one is used.
- When result picture is saved as jpeg, tiff or png file, GPS information will be attached. They are eye point address, elevation and azimuth.
- Antialiasing is applied to the skylines automatically except preview mode.

## 30. 3D Movie

### About 3D Movie

You can rotate landscape, or go through landscape at real time or faster speed. There are following three modes. You can control speed and direction by keyboard.

- Rotation mode. Rotate landscape around a point.
- Flight mode. Flight like a plane in landscape.
- Boat mode. Cruise by boat on the sea or a lake.

The movie window may not show landscape correctly depending on your Mac's power. If your Mac's power is not enough to treat large data, try smaller data.

### Functions

#### Common

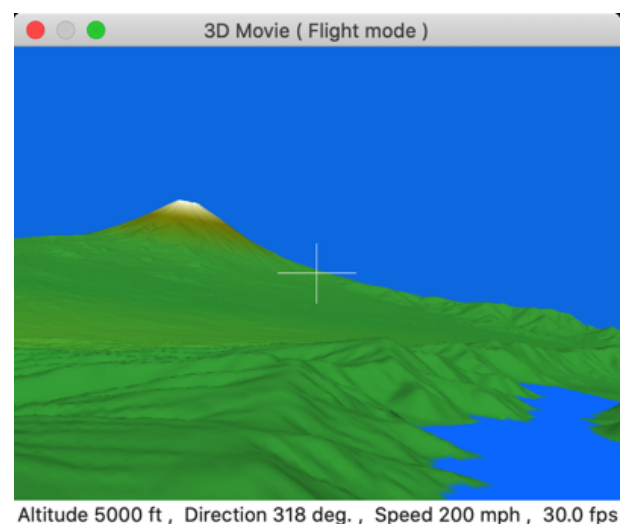
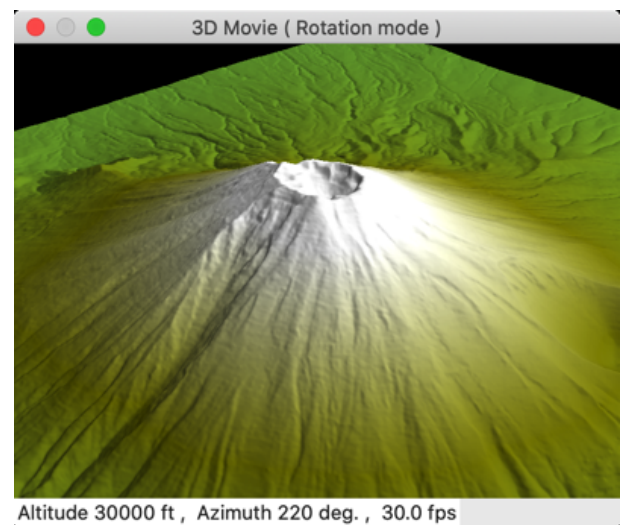
- Start 3D movie using selected data range.
- Treat all data as they are on a flat plate.
- You can set window size at start and can change it anytime during playing.
- Support full screen mode. You can change anytime during playing.
- You can set view angle at start and can change it during playing.
- Maximum viewable distance is determined by DEM data pitch automatically.
- Can display eye altitude in a movie window.
- Can display speed in a movie window except rotation mode.
- Colors are same as elevation colors of Map View, although shading can be specified independently.
- You can select meters or feet for altitude unit.
- You can select speed unit from kph (kilometer per hour), mph (miles per hour) and knots (nautical miles per hour).

#### Rotation mode

- Automatically rotating 3D landscape around a specified point.
- Before start you can set eye altitude and distance from center point.
- During playing, you can change direction and speed of rotation, can change eye altitude also.

#### Flight mode

- You can go through landscape like as flying by a plane. Even though simulate some of planes behavior including bank angle, this is not a flight simulator. There is no gravity, no aero dynamics and no cockpit equipment.
- You can start flight with specifying place, altitude, speed and direction.
- You can go upward, downward, turn left, turn right, get slower or faster speed during playing.
- You can set start place and direction on the Map View using context menu.
- Without changing going direction, you can see left front, right front or under front with angle of 45 degrees diagonally.
- Can apply fog or mist effect.
- Show current place on the Map View.

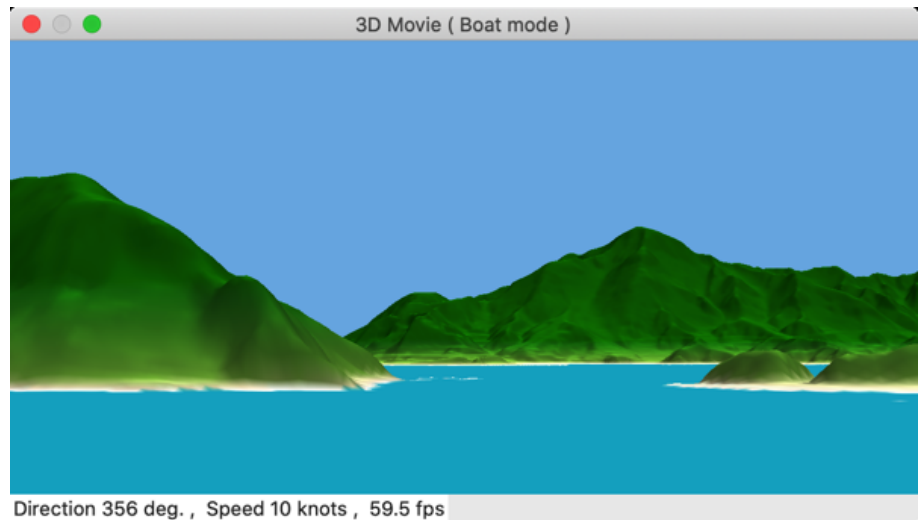


## Boat mode

Differences from flight mode are follows.

- Altitude is fixed at start up setting.
- No bank angle during turn.
- Eye elevation angle can be specified between 0 and 20 degrees, and can change it during playing.
- No under front view.

Activate boat mode on the flat surface, sea or lake.



## Dialog

To display start up dialog, select "Start 3D movie..." under the Pictures menu. If you start from context menu on the Map View, the dialog shows flight mode or boat mode, in spite of that you can select rotation mode also.

All elevations and altitudes are based on sea level.

### Common

**Target** Select DEM data range in it you want to flight, cruise or rotate it. There are three options. They are selected rectangle, window range and whole DEM data range.

**Data size** Showing data size for selected range. When several type of DEMs exist, shortest data pitch is used for whole region. If the usage ratio to the maximum buffer size supported by the GPU is large, numbers will be displayed colored with orange or red. When data size is too big, the "Run" button will set to off. Even if the letters are black, it may be very slow or not draw correctly depending on the power of the GPU. In such a case, reduce the amount of data.

**Window size** Set starting window size. You can change to any size during playing. Minimum is 400 by 300. Should not exceeds screen size.

**Shade strength** Select one between 1 and 5. Bigger will be darker ( deeper ).

**Light from:** Select light direction for shading.

**View angle** View angle in degrees between 10 and 120. You can change it during playing.

### 3D Movie

☐ Selected rectangle region  
**Target** ☒ Window  
☐ Whole DEM area

Data size      Width    Height  
                  3,231 x 2,400    = 7.8    millions  
                  Red color goes slow motion or may not draw.

Window size    Width  x Height  dots

Shade strength

Light from

View angle  deg.     frames / sec.

Rotation mode     Elevation unit

Target elevation  m  
 Surface elevation at center  m

Eye position    ( South at start )  
 Distance from the center  m  
 Start altitude  m

- Elevation unit** Select unit of elevation and altitude from meter or feet. Selection is applied in the dialog and view information.
- frames / sec.** Select number of frames per second between 10 and 60. Default is 30. If data size is large, movie's frame rate may be slower than specified rate.
- Mode selection** Select one of mode from menu. If this dialog is called from context menu on the Map View, flight mode or boat mode is selected, yet you can change to rotation mode.

### Rotation mode

- Target elevation** Specify elevation value of rotation center. It is set to surface elevation at the beginning. If target is mountain peak it is better to specify lower elevation than surface elevation.
- Surface elevation at center**  
Surface elevation of the center position of the selected range is set.
- Eye position** Determined by distance from the center and altitude. Start at south of the center point.
- Distance from the center**  
Specify distance in meters. It is fixed value during playing.
- Starting altitude** Specify altitude in meters or feet. You can change it during playing.

### Flight mode

- Starting position** Latitude and longitude of the start point. If DEM is no-addressing type, XY address in meters are shown. When you activate this function from the Pictures menu first, the start position is bottom center of the selected target area.

**Altitude** Specify starting altitude, should over surface elevation.

**Surface** Surface elevation of the starting point is set.

**Direction** Set starting direction as an azimuth in degrees clockwise from the north.

**Speed** Set starting speed in kph ( kilometer per hour ), mph ( miles per hour ) or knots ( nautical miles per hour ).

**Apply fog effect** Specify if you want to apply fog effect. Linear fog model of OpenGL is taken, it is different from panorama view function.

**Reset** Reset settings to defaults. Starting position, view angle, direction, speed and fog effect are affected.

### Boat mode

**Position at start** Same as flight mode.

**Altitude** Same as flight mode, but fixed during playing.

**Surface** Same as flight mode.

**Direction** Same as flight mode.

**Speed** Same as flight mode.

**Elevation angle** Upward angle between 0 and 20 degrees for looking up.

**Apply fog effect** Same as flight mode.

**Reset** Reset settings to defaults. Starting position, view angle, direction, speed, elevation angle and fog effect are affected.

## Run time operations

### Common

- Window size can be changed like as usual windows.
- Click zoom button to go full screen mode. 'esc' key return to normal window.
- '[' key extend view angle ( to show wider scene ), ']' key narrows view angle. Click once widen 10 percent or narrower by 10 percent. 10 degrees minimum and 120 degrees maximum.
- 'A' key shows or hides altitude, speed and other information on the information bar at the bottom of the window.
- Space key pauses or restarts the movie.

### Rotation mode

- Rotating to left or right with the left or right arrow keys. While pressing, the turning speed getting changes.
- '/' key stops rotation.
- Up and down arrow key change eye altitude. Minimum altitude is 100 meters, maximum is 10 times of distance from the center.
- During paused by space key or stoped by '/' key, you can rotates the landscape by mouse wheel,

### Flight mode

- Turn left or right with the left or right arrow keys. During pressing, the turning speed changes continuously.
- Use the up and down arrow keys to rise and fall. While pressing, changing rate goes up continuously.
- '.' (period) key gets slower speed, ',' (comma) key gets faster speed. Speed changes continuously during pressing.
- Pressing '/' key returns to going straight and level flight.
- Pressing '/' key and control key returns to straight flight.
- 'c' key shows or hides white cross that points moving direction.
- 's' key shows left front scene, 'd' key shows right front scene, 'x' key shows down front scene. 'e' key returns to front scene. Each scene is apart from 45 degrees from front scene.

### Boat mode

- Turn left or right with the left or right arrow keys. During pressing, the turning speed changes continuously.
- Up and down arrow keys ups or downs eye direction between 0 and 20 degrees..
- '.' (period) key gets slower speed, ',' (comma) key gets faster speed. During pressing speed changes continuously.
- '/' key returns to going straight.
- 'c' key shows or hides white cross that points moving direction.
- 's' key shows left front scene, 'd' key shows right front scene, 'e' key returns to front scene. Each scene is apart from 45 degrees from front scene.

## Save as movie file

You can make a movie file with capturing 3D movie window using system's screen recording function ( shift+⌘+5 ).

- First activate 3D movie, stop playing by pressing space bar at appropriate scene.
- Set up system's screen recording function, and start recording.
- Restart 3D movie by pressing space bar.

## Notes

- To quit SimpleDEMViewer, you should close 3D movie window first.
- If your Mac's fan rotates faster and noisy, play with smaller data size, or pause the 3D movie by pressing space bar temporarily until Mac will be cooled.
- In the 3D movie landscape is projected to a plane, differ from Panorama view that project it on a cylinder or cone, then projected landscapes are differ each other.

## 31. Visible Region

### What is Visible Region

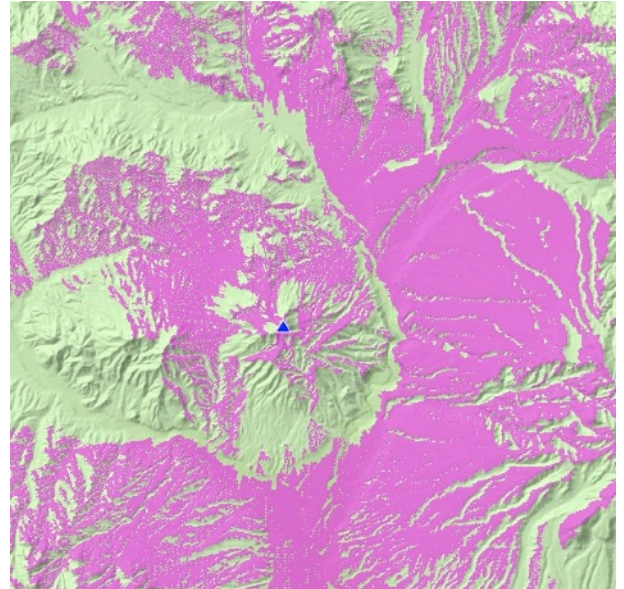
Visible Region is area from where can see a certain place, or can be seen from there. This “certain place” called “Target” is any place on the land or any object such as mountain peaks or buildings

Result area will be colored on the Map View.

To check the visibility, the eye point is set to one meter high from the surface and look target from there.

### Show dialog

Select “Visible region...” under the “Tools” menu to show dialog, or select “Draw visible region...” from the context menu on the Map View. Latter case, the place where context menu shown is set to the target.



Visible region from or to an antenna that is 20 m high at the peak of the mountain.

### Settings

- |                          |   |
|--------------------------|---|
| Target                   | Name is shown if it has name.   |
| - -(Address)             | Shows the mouse point address or string's base address when start by context menu, otherwise address set by previous session remains. You can change to any address.  |
| - Elevation              | Shows calculated elevation from the specified address, or elevation value of string data when start by context menu.  |
| - Search button          | Click this button to show name search dialog. Select a name from the table that lists user data titles and node comments. Name search dialog is the same as it of Panorama View.                            |
| Range                    | Select one from "window" and "selected rectangle"., Even if you select latter, result will be limited to range of window.   |
| Quality                  | Select “Faster” or “Fine”. Usually “Faster” is appropriate for speed and quality. If DEM data pitch is short ( maybe less than 10 meters ) and region of interest is affected by steep mountains, use Fine. |
| Draw on sea              | Set to on if you want to draw on sea area also.   |
| Color for visible region | Click color box to change color to draw. If opacity is less than 100 %, actual color is different.  |
| Transparent / Opaque     | Specify opacity in percentage.  |
| Air refraction factor    | Same as in Panorama View . Use default value 0.133 usually.   |

### Notes

- To clear this drawing do “Redraw map” under “View” menu.
- If you do this function twice with translucent color for two different target, area from where you can see both target is drawn thickly.
- To save result as picture file, specify window range, same scale and dpi as the Map View in saving dialog.



## 32. Topographic Profiles

You can make profile along User Route data. You can configure its appearance after creating it. If User Route data has node names, profile shows them with names, elevations, distances from the start node. You should read all DEMs underneath the Route before creating the profile.

### Creation

You should provide [User Route data](#) before creating profile. Select "Topographic Profile..." under the Pictures menu. Select one Route data and click "Make" button to make profile along it. Profile picture window appears with default settings. You can configure appearance in settings panel.

### Settings

Elevation range	Specify display range with upper and lower limit in elevation. This determines height of result picture.
Level lines interval	Select from 10/20/50/100/200/500/1000/2000/5000m/Auto, or enter directly.
Elevation unit	Select meter or feet. This affects above two items.
Height emphasizing	Select from 1/1.5/2/3/4/5/10/20 times, or enter directly.
Body color	Select one of white ( only profile line ), Gray ( top is dark, lighter to bottom ), Elevation colors. Elevation colors and gradation depend on Preferences settings.
Draw	Set show or not show for each items.
– levels	Level lines and their altitude.
– names	Node names for named node of User Route data.
– elevations	Elevations for each named node.
– mileages	Distance from start point. Select one of named nodes or pitch.
– Route data"	Draw straight line between each nodes of Route data. If nodes have no elevations, result is the same as the outline.
Base at right edge	Position start point of route to right edge in profile window. ( flip horizontally )
Profile line width	Specify line width of outline of profile.
– Line color	Click color pane to change color of outline.
Title	Any title string to show at top center position in the picture. Default is route data title.
Apply	Redraw profile image to reflect above settings.
<b>profile window setting items</b>	
Scale menu	Select from Auto/200/100/50/20/10/5%. If auto is selected, scale depends on window width.
Panel	Show or hide configuration panel.

Always two level lines are drawn above the highest elevation.

Set higher elevation for upper limit when names are intersect profile.

You can reflects new elevation color settings by clicking "Apply" button after changing elevation colors in preference dialog.

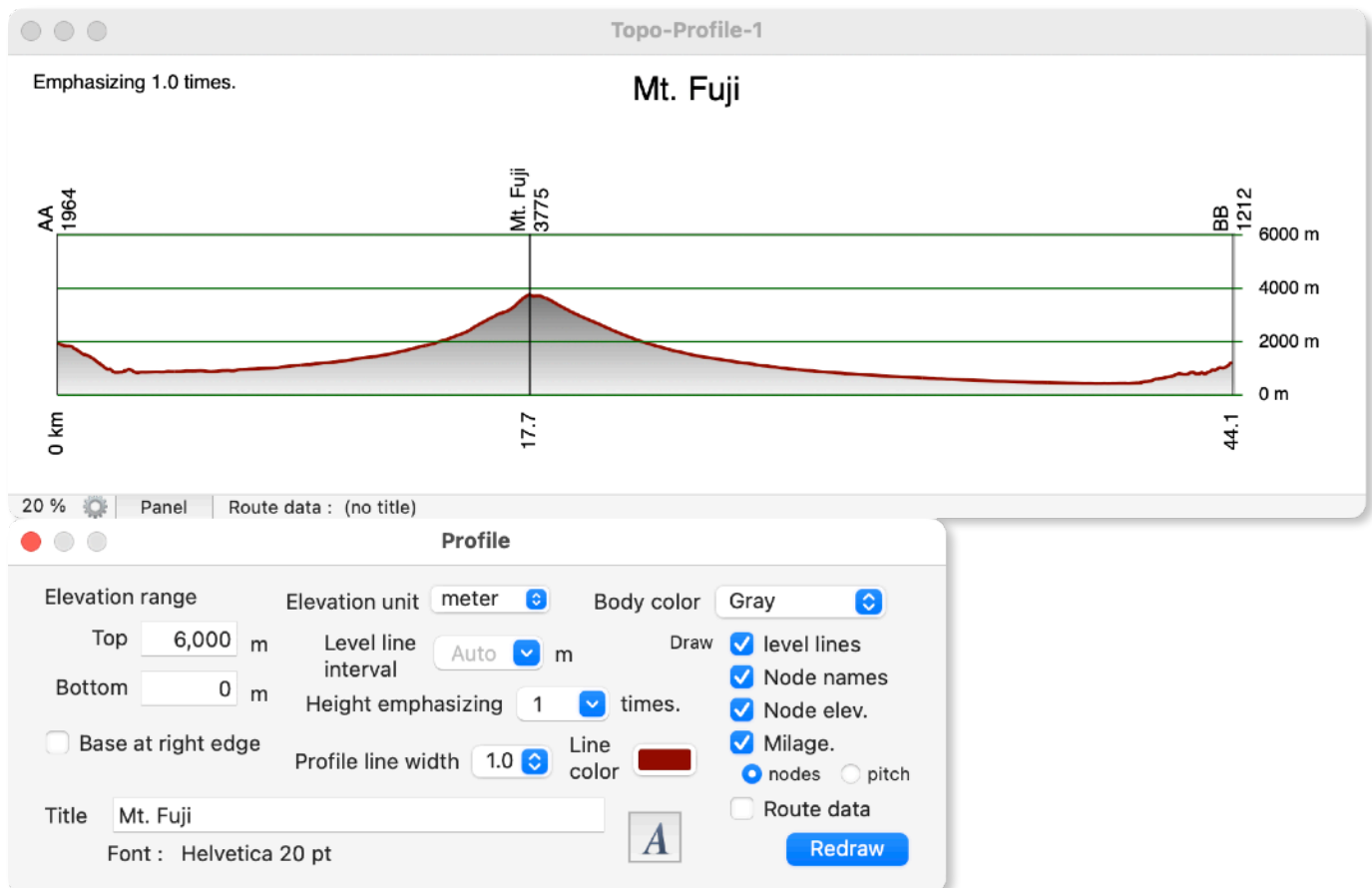
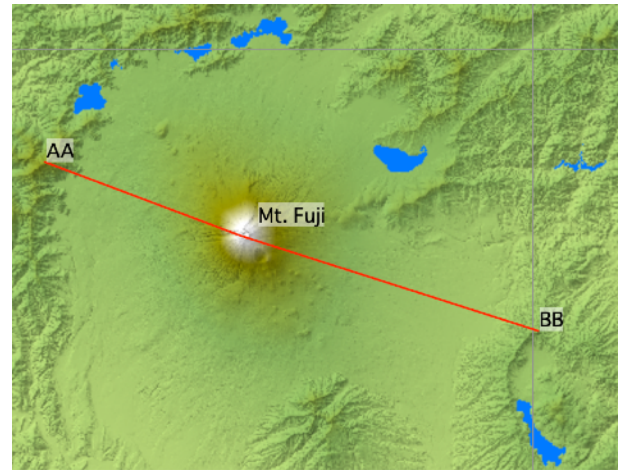
### Save as

You can save the profile as a picture file. Saved picture depends on current configurations. Whole picture will be saved ignoring current window size.



## Notes

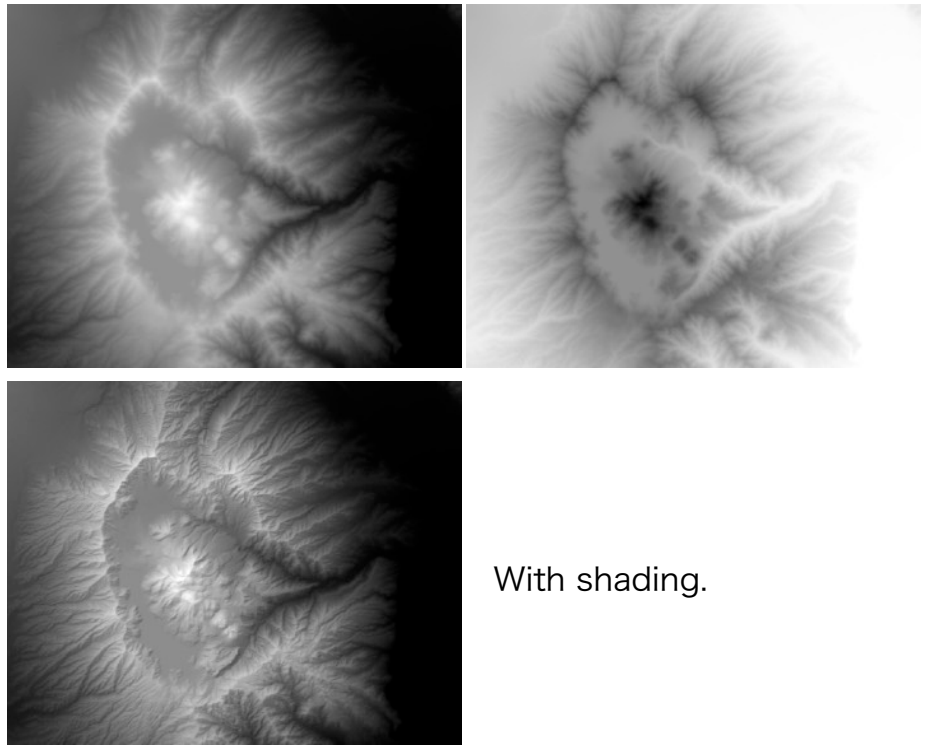
- Data interval of profile is same as DEM data north-south interval, e.g. 10 meters for 10 meter DEM, about 93 meters for 3 sec. mesh DEMs. If the map is extended in the Map View, data interval is shorten in same rate of map scale.
- If a distance between route nodes is long enough, intermediate points are calculated as they are on the great circle.
- Elevations in the route data are ignored. Always elevations calculated from DEMs are used



## 33. Grayscale Maps

You can create 8 bits or 16 bits grayscale map. It may be imported to some 3D rendering software.

Grayscale direction, high-white or low-white, is selectable. You can choose shading also.



With shading.

### Dialog

Select "Grayscale Map..." under the "Pictures" menu to display the dialog. You can specify following fields, and click "Make" button to make grayscale map.

**Target** Select target area to create grayscale map, from selected rectangle region, window, whole data or specified size. If select last one, center point of the Map View will be center of the grayscale map.

**Picture scale** Select picture size as percentage to the original data.

**Picture size** Width and height should be less than or equal to 65,500 pixels each.

**Bits per pixel** Select 8 bits or 16 bits. Select 16 bits if you want the result to use in 3D rendering software.

**Range of grayscale** Map elevations to grayscale 0 to 255 or 65535.

- Use max. and min. of data  
Highest and lowest elevations of DEM are used.

- Use max. of data, 0 m for min.  
Highest elevation value of DEM and 0 meter are taken. If lowest elevation is below 0 meter, it will be used.

- Use below  
Specify both limit elevations. If highest or lowest elevation of DEMs is out of limits, it will be used.

**Direction** Select high-white or low-white.

**Add ... m ...** Add specified number of meters to the elevations other than sea area to make clear seashore in 3D software. Do not use this function if DEM has no sea info, such as ETOPO and SRTM.

- Do shading      Set to on to apply shading.
- Light from      Select one from eight direction.
  - Strength        Select one between 1 and 5.

[Copy] four corner addresses

Copy addresses of four corner to scrap. It consists of four lines, first line contains address of north-west corner, south-west, north-east, south-east follow it. Each address format depends on setting in Preferences.

## Add strings in the picture

You can add any simple text on the image. Show the context menu on the picture, and select "add string". In a dialog you can enter string and its attributes. Show context menu on an existing text string, you can update it. You can remove string by dragging it outside window. You can tilt ( rotate ) those strings. Refer "[Picture Windows](#)" section.

## Save as image file

You can save grayscale map as a image file as same as other pictures. You can select any image format for 8 bits grayscale map, but only tiff or png format for 16 bits.

## 34. Projection Maps

### About projection maps

Supports creating Orthographic, Conical, Mercator, Azimuthal Equidistant, Azimuthal Equi-area, Universal Transverse Mercator and Lambert Conformal Conic projection maps. Those maps are drawn in separate windows and can be saved as picture files in various format.

You can set center address of the map and size of the picture. Map scale will be the same scale of the Map View. Also elevation colors and shading parameters will be the same those of the Map View.

You can set projection center apart from map center except Mercator and UTM projection maps. In this case, equidistant circles will be drawn around the projection center not the map center. There is a sample picture at the last of this section.

To display the creation dialog, select "Projection map..." under the "Pictures" menu or from the context menu on the Map View. If context menu used, mouse point address is set to center address field, otherwise center address of the Map View is set.

To create projection maps require geo referenced DEMs, UTM DEMs or managed plane DEMs. No UTM projection with planet DEMs.

### Settings

Type menu      Select projection method.

Center address      Set center address of the map. It is set to center address of the Map View if called from Pictures menu. It is mouse point address if called from context menu.

Latitude should be between 80 degree north and 80 degree south for Mercator, Conical and UTM projection maps, for Lambert conformal conic projection maps it should be between 80 and 20 north or between 20 and 80 south. This limitation is not applied if separate projection center specified.

Use separate projection center

Projection center address

You can set projection center to any address, but it should be inside the picture and latitude should be inside above limitation.

You cannot use separate projection center for Mercator and UTM projection maps.

If this address is specified, equidistant circles will be drawn around it. Scale at this place instead of picture center will be the same scale of the Map View.

Picture size      Default is the size of the Map View. Width and height should be less than or equal to 65500 dots each.

Set to main window size

Set picture size to the size of the Map View.

Draw Latitude / Longitude lines

Orthographic

Center address N 25.00.00.000 E 120.00.00.000

☒ Use separate projection center.

Projection center address N 35.46.00.000 E 139.45.10.000

Picture size Width 1000 x Height 1000 (3.8 MB)

to main window size.

2291 dots cover whole world.

☒ Draw Latitude / Longitude lines

☐ Print latitudes and longitudes. 33° 30' A

☒ Draw User Data.

Contour : Draw as lines.

	Main	Index	Sea
Line width	0.6	0.75	0.6 pt.

☒ Draw equidistant circles.

Interval 500 km

Line color

Line width 1.5 pt.

☒ Insert color table.

Top left 
Small
Big

Set to on if you want to draw latitude and longitude lines on the projection map. Interval, color and line width are the same as those of the Map View.

#### Print latitudes and longitudes

Add latitude and longitude values to each line. To change font, click [A] button at right. You can change font, size and color.

**Draw user data** Set to on if you want to draw user data on the projection map. All settings are the same as those of the Map View.

**Contour** Select one from the menu "Don't draw", "Draw as dots", "Draw as lines". If line mode, you can set line width. Line intervals and colors are same as those of the Map View.

If you select line mode and save as PDF, you can edit contours with some draw software, such as Adobe Illustrator, later.

Line mode takes time much longer, maybe more than ten times of dot mode.

#### Draw Equidistant circles

Set to on if you want to draw equidistant circles. This field will appear only for Orthographic, Azimuthal Equidistant, Azimuthal Equi-Area projections.

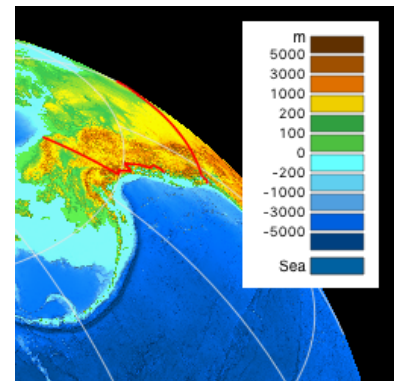
– Interval Specify interval of the equidistant circle in unit of kilo-meter, miles or nautical miles.

– Line color Click color box to change line color.

– Line width Specify line width between 0.5 and 10.0 points.

**Insert color table** Insert a color table into the picture. Select position and size.

Lake color will appear when "Draw lakes" is set to on in Preferences. Sea color is shown always.



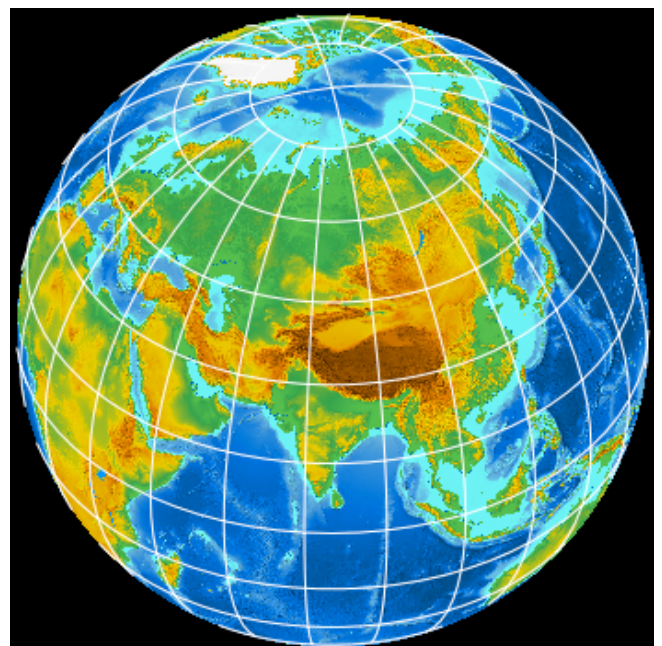
## Orthographic projection map

The orthographic projection is azimuthal parallel projection. If scale is small enough hemisphere of the earth is drawn in a circle like the picture at right. Picture at right is drawn as in the smallest size (5%) using ETOPO2.

You can specify projection center and picture size. The scale and latitude and longitude line interval are the same as those of the Map View.

The North pole is upper side always. If the North pole is the center, meridian of specified longitude is drawn downward. If the South pole is the center, meridian of specified longitude is drawn upward.

You can draw equidistant circles around the projection center.



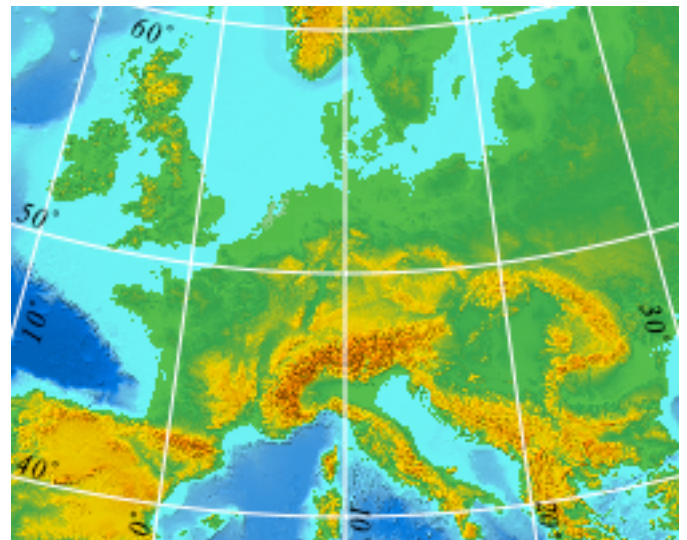


## Conical projection map

The map is projected to a cone that's apex is North pole or South pole depending on center latitude. The cone surface contacts with the globe surface at center latitude. If center latitude is equal to the Equator, the map projection method turn to cylindrical projection instead of conical projection.

Center latitude is limited between 80 degree south and 80 degree north.

Picture at right uses ETOPO1, and scale is 15%. Projection center and map center are 50 degree.north and 10 degree east.

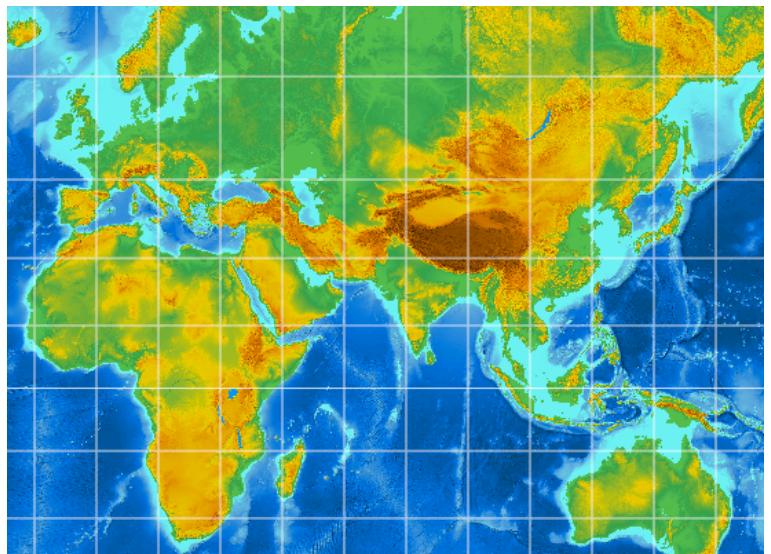


## Mercator projection map

You can specify map center and picture size. Scale on the Equator is same as the scale of the Map View. Picture size you specify in the dialog defines drawing range, not affect to scale.

Picture at right is drawn in the smallest size (5%) using ETOPO1, and is shrunk more here.

Center latitude is limited between 80 degree north and 80 degree south.



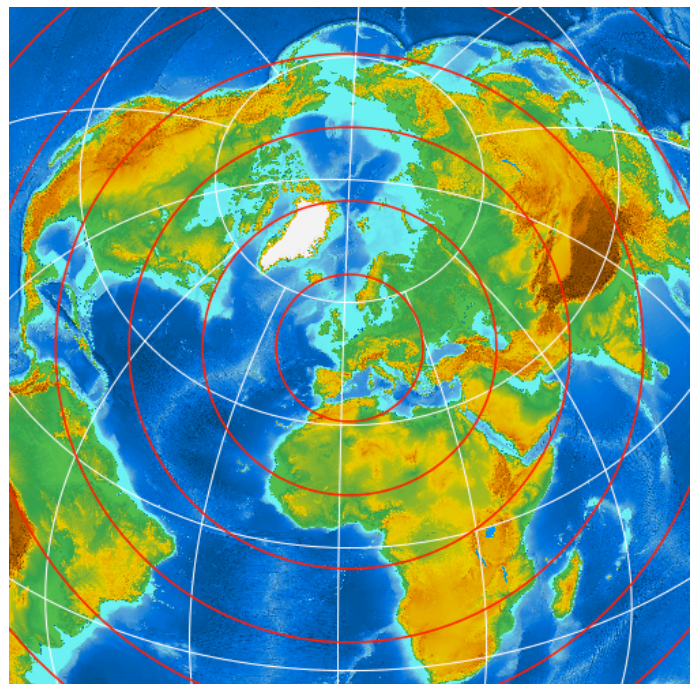
## Azimuthal Equidistant projection map

You can create Azimuthal Equidistant projection map around the specified center location. You can specify projection center separately. Scale at the center location will be same as the scale of the Map View.

Picture size you specify in the dialog defines drawing range, not affect to scale.

You can draw equidistant circles around the projection center.

Picture at right is drawn in the smallest size (5%) using ETOPO2, centered to Paris, France. Interval of equidistant circle is 2000 km.





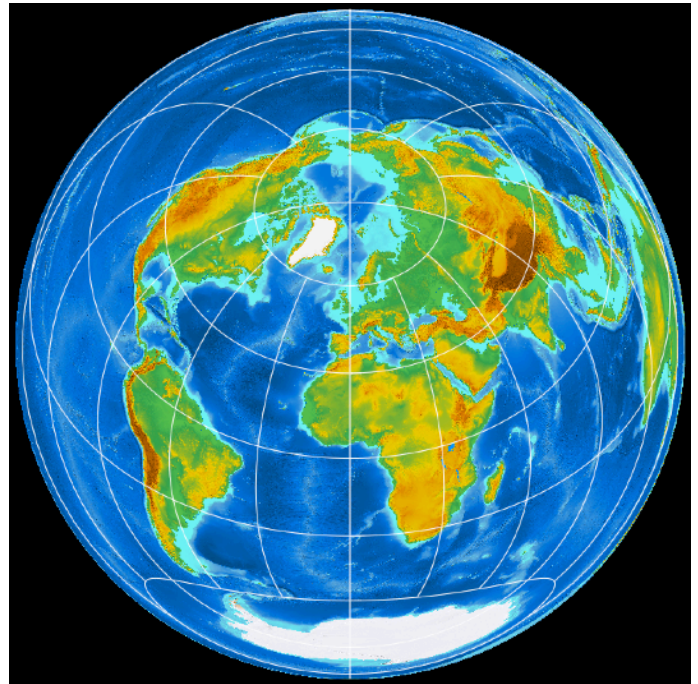
## Azimuthal Equi-area projection map

You can create Azimuthal Equi-area projection map around the specified center location. You can specify projection center separately. Scale is same as the scale of the Map View at the projection center.

Picture size you specify in the dialog defines drawing range, not affect to scale.

Picture at right is drawn at 10% scale using ETOPO5, centered to Paris.

You can draw equidistant circles around the projection center.

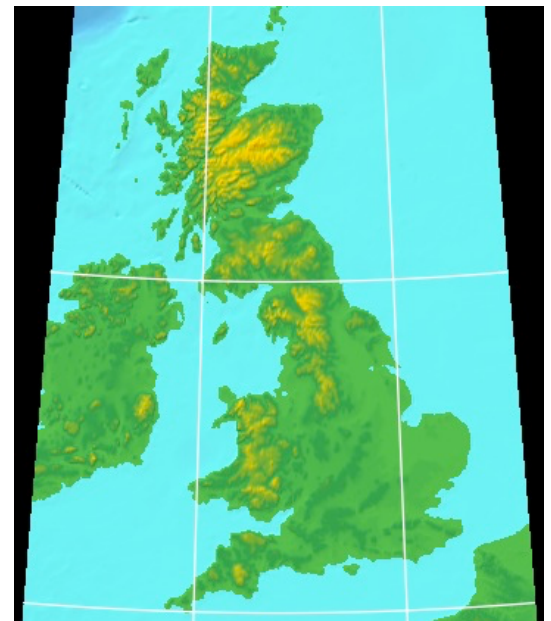


## Universal Transverse Mercator (UTM) projection map

You can create Universal Transverse Mercator (UTM) projection map around the specified center location. UTM zone number is determined by center location. If just equal to boundary longitude, smaller zone number will be taken.

Both side of center meridian will be drawn up to 6 degrees wide. North and South pole can be drawn, but center latitude is limited between 80 and -80 degree.

Zone number of the picture at right is 30, center meridian is 3 degree west.

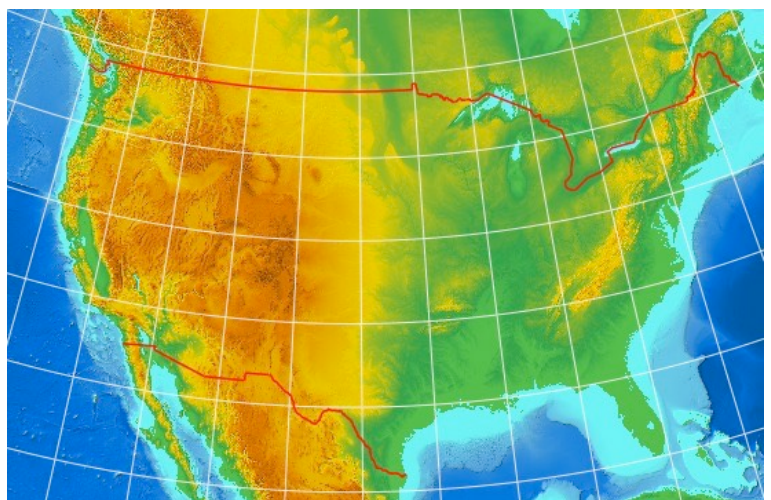


## Lambert Conformal Conic Projection map

You can create Lambert Conformal Conic projection map around the specified center location. Although standard projection method has two Parallels touched surface of the earth, only one Parallel at the center touch the surface here. Scale at the center location will be same as the scale of the Map View.

Center latitude is limited between 80 and 20 degree north, or between 20 and 80 degree south.

Sample picture at right is created using ETOPO1 in 20 % scale centered at 40 degree north and 100 degree west.



## Text strings in the picture

Strings ( of User data ) are draggable and removable. To remove strings, drag them outside of window.

You can add any text on the picture. Click on the picture with control key pressed, and select context menu "add string". In a dialog you can enter any string and its attributes. Strings ( includes User data ) are editable. To update existing strings, show context menu on a string, and select "Update string".

Strings rotated on the Map View are copied as is. You can tilt ( rotate ) any strings. Refer "[Picture Windows](#)" section.

## Save as a picture file

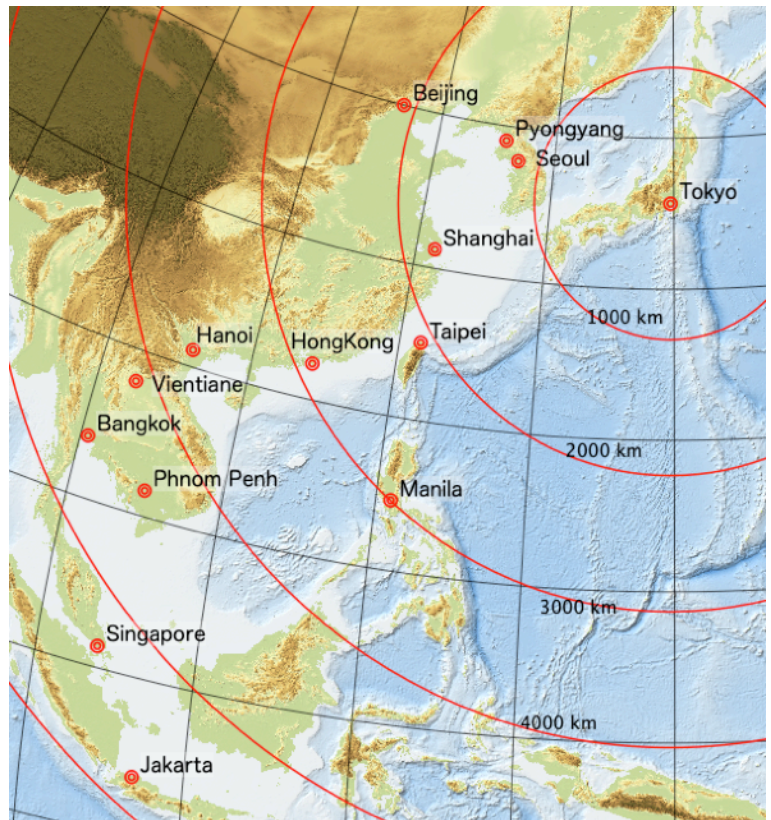
You can save projection maps as picture files as same as other pictures. If picture format is jpeg, tiff or png, center address is written in the file as GPS information.

If you want to print the picture, save picture as pdf file. Strings and lines are maintained vector information in pdf file. If contours are drawn as lines, it also maintain vector information.

## Sample picture with separate projection center

This is Orthographic projection map centered on Tokyo.

Distance strings has been added after completion of drawing as usual strings.





## 35. Picture Windows

This section describes handling windows of Bird's eye view, Stereograph, Grayscale map, SRVC relief map and projection maps. For main window, Panorama view and Topographic Profile refer each section.

### Compact view

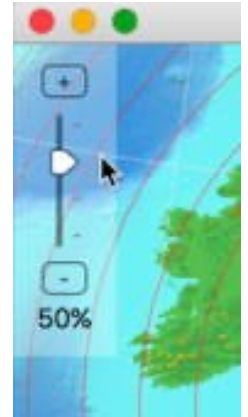
When the picture size is very large, you can shrink it to view whole picture. You can select one of 50%, 33.3%, 25%, 20%, 10%, 5%, 2% and 1% as small enough to see. If picture height becomes less than 600 pixels, no more shrinking available.

⌘+[ get smaller, ⌘+] get bigger. ⌘+0(zero) return to original size ( 100% ).

As shown in picture at right, if cursor position is at top left corner of the picture window, a slider and buttons will appear. You can change percentage by them.

During being shrunk, editing and moving string are not available.

Latitude and longitude lines, equidistant circles and user data are not drawn if picture is shrunk smaller than 20%.



### Add and update text strings

You can add any text on the picture. Click on the picture with control key pressed, and select context menu "add string". In a dialog you can enter any string and its attributes. Strings ( includes User data ) are editable. To update existing strings, show context menu on the string, and select "Update string". Any string can be moved, and can be removed by dragging outside of window.

Any text string manipulation works when the picture is in full scale.

Apply following attributes to all strings

Same attributes will apply to all strings in the picture.

Font Select a font from menu.

Style Select a style supported by font.

Size Specify font size between 5 and 256 points.

Style addition Specify bold, italic and shadow attributes. You can set them regardless of whether the font supports those styles or not. If font supports bold and italic, it will be thicker and more inclined.

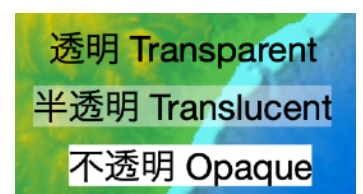
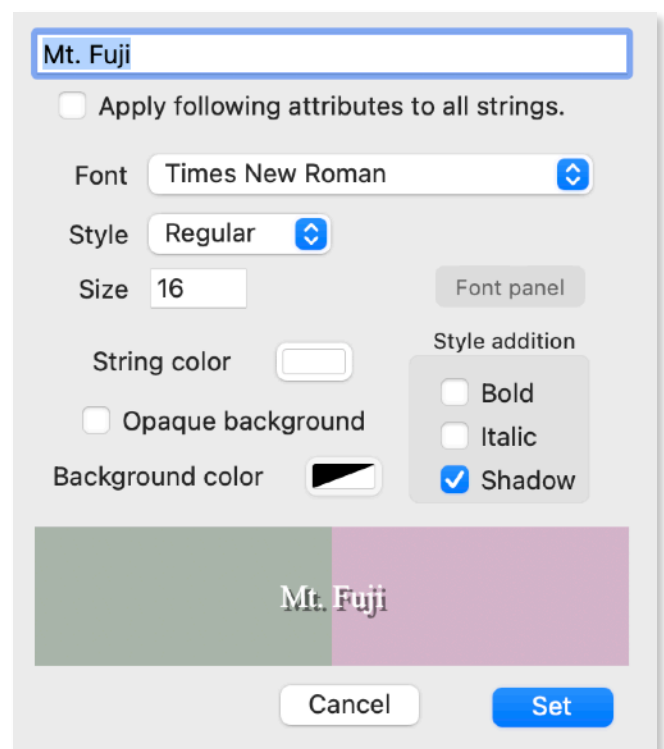
Letter color Specify any text color using Color Picker panel.

Background transparency Specify whether background is transparent or opaque

Background color

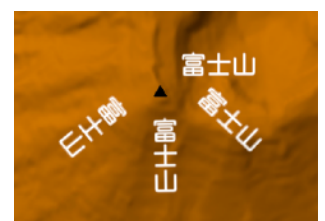
Specify color of opaque background. You can specify opacity in Color Picker panel.

You can use 'Font Panel' to specify font, style and size.



### Tilt text strings / Write vertically

You can tilt (rotate) any text string in the picture. Drag the end of the string while holding down the shift key. The rotation center is at the lower left corner. If Memo title without mark, or Area title, it is at the center of



the lower side, if it is Route title, rotation center is top-left corner. In the case of vertical writing, they are the top-left corner, the center of the left side, top-right corner respectively.

If you rotate it to the range of  $\pm 10$  degrees downward vertical, it will change to vertical writing in the case of Japanese, Chinese, etc.. To return it to horizontal writing, rotate it to the range of  $\pm 10$  degrees in the horizontal direction. Vertical writing will not work if vertical fonts are not available even Japanese.



To eliminate the tilt, click the string while holding down option key and shift key, it will be reset horizontally (vertically in the case of vertical writing).

## Show picture info

You can show information of pictures, such as size, address and some of settings. After selecting a picture window, select "Show info" under the File menu.

These are some samples.

Grayscale image		16 bits
Picture size	806W x 714H (1.1 MB)	
Scale at the center	N-S	1 / 131,000
	W-E	1 / 134,000
Address at the center	N35.21.38.14 E138.43.38.65	
Height rage	64 - 3770 m	
Scale direction	High white	
Added height other than sea	0 m	
		<a href="#">Close</a>

Bird's eye view	
Picture size	823W x 394H (1.2 MB)
Scale at center	1 / 131,000
North-west corner	N35.30.33.64 E138.31.01.73
South-east corner	N35.12.42.64 E138.56.15.57
Face to	0 degrees
Elevaton angle	25 degrees
Height emphasizing	1
Shade strength	3
Light from	NW
<a href="#">Close</a>	

Orthographic projection map	
Picture size	1000W x 1100H (4.2 MB)
Center address	N20.00.00 E120.00.00
Projection center	N35.41.00 E139.45.15
Scale at the projection center	1 / 15,800,000
Circle pitch	1000 km
<a href="#">Close</a>	

Stereograph (Parallel)	
Picture size	1230W x 500H (2.3 MB)
Scale at the center	1 / 105,000
Address at the	
North-West corner	N35.19.21.3 E138.54.35.3
South-East corner	N35.09.21.3 E139.09.36.8
Up side to	north
Height emphasizing	2
Shade strength	2
Lighting from	NW
<a href="#">Close</a>	

## Save picture

Do "Save" under "File" menu when target picture window is in front. Whole picture saved as 100% size anyway even if it has shrunk.

You can select picture file format and options. For 16 bits grayscale map, only tiff and png are available. If you want to print the picture, select pdf file so that strings and lines are printed finely.

Refer next section also.

## 36. Save Pictures

You can save map image or other picture window images. Many picture file format is available those QuickTime supports. You can select pdf also.

If you want to save pictures to print, select pdf format especially when pictures include strings and lines.

### Saving Map View picture

Select "Save" under file menu when main window is most front except scale panel. A sheet dialog prompts you to select target area and scale. After clicking save button, you can specify file name and file format in the file navigation dialog.

**Range** Select range for creating picture. If you select "Size by pixel" specify width and height. In this case, picture center is set to the center of the Map View.

**Scale** Specify scale by percentage to the DEM data. Initially, it is set to the same scale of the Map View.

**Picture size** Specify width and height of the picture if range is "Size by pixel", otherwise it is set automatically. These values are in points, actual pixels is twice when 144 dpi is selected. MB or GB value is size in the program, actual picture file size in the disk storage is vary depends on file format.

**Resolution** Select 72 or 144 dot per inch. When 144 dpi is selected, string size and line width are doubled to maintain balance with landscape

**Draw user data** Set to on to draw User Memo / Route / Area data.

**Contour** Select one from the menu "Don't draw", "Draw as dots", "Draw as lines". If line mode, you can set line width. Line intervals and colors are same as those of the Map View.

If you select line mode and save as PDF, you can edit contour using some draw software, such as Adobe Illustrator, later.

Line mode takes time much longer, maybe more than ten times than dot mode.

**Coloring according to slope degree**

Settings previously used to draw in the Map View will be taken.

**Create world file** Specify to create a world file. See below.

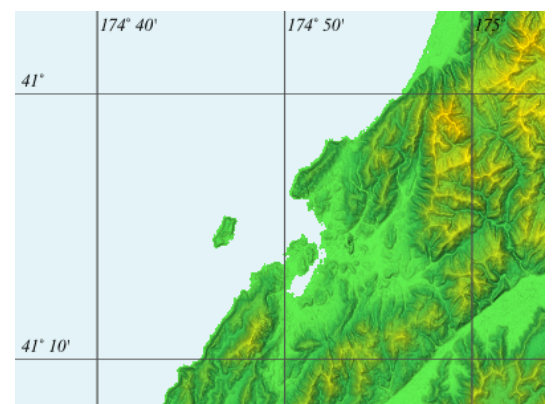
**Print latitudes and longitudes**

Set to on to add latitude and longitude value strings. No minus sign is added to west longitude and south latitude.

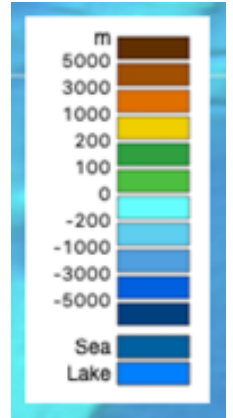
To change font, click [A] button at right. Font panel will appear and you can change font, size and color.

**Insert color table** Insert a color table into the picture. Select position from four corners and select size. Lake color will appear if "Draw lakes" is set to on in Preferences. Sea color is shown always.

[Copy] four corner addresses



Copy addresses of four corner to scrap. It consists of four lines, first line contains address of north-west corner, south-west, north-east, south-east follow it. Each address format depends on setting in Preferences.



## Saving other window pictures

You can save images of windows such as Bird's-eye view, Stereograph, Projection maps, etc.. Select "Save" under "File" menu when target window is in front. You can specify file name and file format in the file navigation dialog.

Saving pictures creates new files always, not update.

If the picture is 16 bits grayscale, you only can select one of tiff or png.

## Create world file

You can create world files to use pictures with some GIS software. You can specify creation in the saving dialog for Map View picture. Other pictures refer setting of the Preferences panel.

Pictures satisfying following three can attach a world file.

- DEMs should be one of Geo, UTM or other plane coordinate.
- Map View pictures or grayscale pictures.
- File type is one of TIFF, JPEG, JPEG2000 or PGN.

Format is the same as the HDR file for BIL form DEMs.

First line	Horizontal data pitch in degrees or in meters.
Second line	0
Third line	0
4th line	Vertical data pitch in degrees or in meters. Always minus value.
5th line	Longitude at the center of the north-west corner cell of the data in degrees, or coordinate address of UTM or other planes.
6th line	Latitude at the center of the north-west corner cell of the data in degrees, or coordinate address of UTM or other planes.

Extensions for world files are set as follows.

TIFF – tfw, JPEG – jgw, JPEG2000 – j2w, PNG – pgw

Note. : Many GIS software supports tfw but not other extensions.

## Save as GeoTiff

If you specify tiff format for saving map picture, it will be GeoTiff automatically when DEMs are geo-referenced, UTM or other planes. Some GIS programs do not understand world file but Geo-Tiff.

Grayscale map and SRVC relief map can be saved as GeoTiff. Also anaglyph can be saved as GeoTiff if it faces to north and one pane is right angle projection.

You should aware that datum of this GeoTiff file is saved as WGS84 always, even if used DEMs are not based on WGS84.

## Add GPS information

GPS information ( Latitude, Longitude and datum ) are added in the picture as exif GPS information, when saving following pictures. Picture type should be jpeg, tiff or png. Latitude and longitude are of the center of the picture.

Map View, Bird's-eye view, Stereograph, Panorama view, Grayscale and projection maps.

Eye direction and elevation are also attached to Panorama views

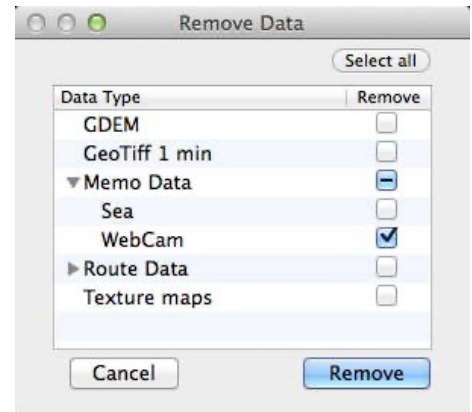


## 37. Remove Data

### Remove DEMs and User Data

You can remove the data read by this program in a dialog like the image on the right. Select “Remove data...” under the “File” menu to show the dialog. “Remove data” means just remove from the program memory, not delete from disk storage.

The dialog lists removable data such as DEMs, User Memo data, User Route data, User Area data and texture maps in this order.



#### DEMs

You can select each kind of DEMs to remove them. No individual file is selectable.

#### User Memo / Route / Area data

You can select kinds or select all for each data type. If you want to remove individual data, you should go Edit User Data dialog.

If new or updated data exist and not saved yet, an alert message will appear.

#### Texture maps

Remove all texture maps currently read. Individual texture map file can be removed through Texture Map dialog.

“Select all” button selects all items to remove all data. You can use ⌘A shortcut key.

### Remove Individual DEMs

To remove individual DEM files, separate dialog is provided. When you read too much DEMs and some of them are unnecessary or obstacle to your job, you can remove them instead of rereading whole DEMs.

Select “Remove Individual DEMs...” under the “File” menu to show the dialog.

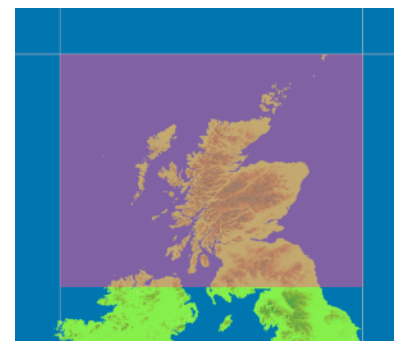
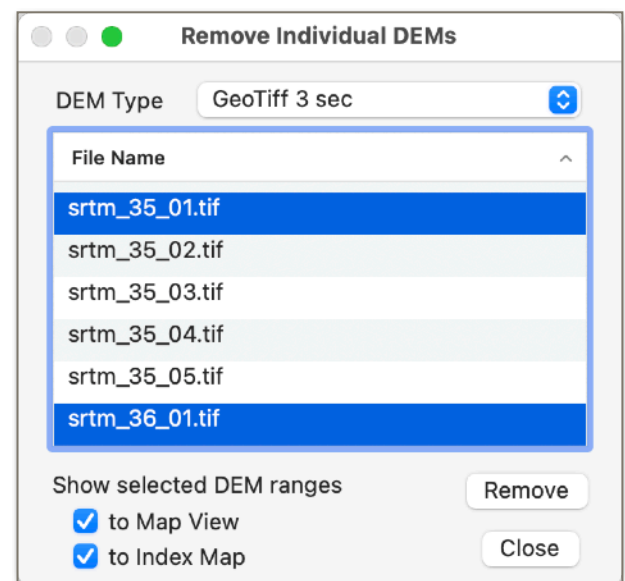
Selected DEM file will be shown on the Map View like as picture below, so that you can select the target file easily. If it is out of the Map View, double click the file name in the dialog, then it will be placed at the center.

They will be shown on the Index Map also, but DEMs that cover very small area are unrecognizable.

#### Notes:

If a DEM file covers 360 degrees, it will not be shown in the Map View nor Index Map.

If base DEM is UTM or other plane, geo-referenced DEM that cover large region may not shown in the Map View, especially at high latitude region. It will be shown on the Index Map though.



## 38. Menus

### Main Menu Bar

SimpleDEMViewer	
About SimpleDEMViewer	Show about dialog.
Preferences..	Show preferences dialog.
Quit SimpleDEMViewer	
File	
Open...	Read DEMs and user data files.
Close	Close picture windows and some panels.
Remove data...	Remove DEMs and / or user data.
Save Picture As...	Save the Map View or picture window as picture file.
Save Working Set...	Save data and settings with or without name.
Load Working set	Load named Working set. Saved names are listed in sub-menu.
Export DEM...	Create new DEM file from DEMs already read.
Manage color sets...	Rename, remove color sets. Arrange color set menu items.
Show Info	Export color sets as external file.
Edit	Show information panel for DEM or pictures.
Undo	(only Copy and Paste have custom functions)
Redo	
Cut	
Copy	Copy address from address control.
Paste	Paste address to address control.
Delete	
Select All	
Special Characters...	
View	
Refresh	Redraw map.
Expand	Zoom in map.
Shrink	Zoom out map.
Scale	
2000% ~ 5%	Apply new scale to Map View.
Other (nn%)...	Specify custom scale to apply.
Adjust Base Latitude	Set base latitude to center latitude of current Map View.
Window Size...	Specify Map View size.
Show (Hide) Side Bar	Show / Hide Map Information panel and Index Map.
Show *Hide) Index Map	Show / Hide Index Map from side panel.
Show (Hide) Scale Panel	Show or hide scale panel.
Change to Vertical (Horizontal)	Scale
	Swap scale panel between vertical and horizontal.
Find&Jump	
Find...	Find a string in user data and reposition map.
Find Next	Find next occurrence of the search string.
Jump to...	Reposition map to the specified address.
Pictures	
Bird's Eye View...	Show a dialog to create Bird's-eye view picture.
Panorama View...	Show a dialog to create Panorama view picture.
Reset Panorama View	Reset Panorama View settings to defaults.
Stereograph...	Show a dialog to create Stereograph picture.
Topographic Profile...	Show a dialog to create geo-profile picture.
Projection Maps...	Show a dialog to create projection maps.
Grayscale Map...	Show a dialog to create Grayscale map.
SRVC Relief Map...	Show a dialog to create SRVC relief map.
3D Movie...	Show a dialog to start 3D movie.
Tools	
Preferences for User Data Kind	Show dialog to set defaults attributes for each User Data kind.
Show/Hide User Data...	Show dialog to set show / hide conditions.

Edit User Data...	Show dialog with list of user data for editing.
Import Text User Data...	Import text format User Data.
Texture Maps...	Read and set texture map.
Rectangle Region...	Set or clear rectangle region on the Map View.
Find Highest/Lowest...	Find highest or lowest elevation point in the DEMs.
Contour...	Show a dialog to draw contour lines.
Slope Degree...	Show a dialog to colorize map by slope degrees.
Visible Region...	Show a dialog to colorize map by Visible Region.
Measure Volume...	Show a dialog to measure volume of islands or mountains.
Create Lake Data...	Start to create lake data.
Window	
Minimize	
Zoom	
Bring all to front	
Help	
Release notes	Show a text window of release notes. ( AS only )
Online manual	Show latest manual with Safari ( or another browser ) through internet.
SimpleDEMViewer Help	Show some faqs and topics in HelpViewer.

## Context Menu on the Map View

Show this place in	
Maps.app	Activate Maps.app and show this place in it.
Google Map	Activate Safari ( or other browser ) and show Google map of this place.
Show DEM inspector	Show DEM inspector panel showing cell values of DEM files.
Select Rectangle Region	Start selecting rectangle region on the map.
Copy Address	Copy address of the mouse point.
Centering	Reposition map so that the mouse point will be the map center.
Scale	Change scale and Reposition map so that the mouse point will be the map center.
2000% ~ 5%	Change the scale to the selected percentage.
Other (nn%)..	Change scale to any value.
Expand	Zoom in map by changing scale one step larger in menu.
Shrink	Shrink map by changing scale one step smaller in menu.
Create User Data	
Memo...	Create Memo data at the mouse point.
Route...	Start to create Route data from the mouse point.
Area...	Start to create Area data from the mouse point.
Measure Mileage	Start to measure mileage from the mouse point.
Create Panorama View...	Start to create Panorama View as you are on the mouse point.
Set to Panorama View Target	Set the mouse point as the target of Panorama View.
Draw Visible Region...	Show dialog to draw visible region, and set target to the mouse point.
Create Projection Map...	Show dialog to create projection maps. Set its center to the mouse point.
Place nnn to all cells in frame	During DEM Inspector panel showing, set all cells in the selected rectangle on Map View to same value "nnn".

## Context Menu on Panorama View

Set to Target	Set the mouse point as the target.
Set to Eye Point	Set the mouse point as the eye point and show creation dialog.
Set to Eye Point and Look back	Set the mouse point as the eye point, set the current eye point as the target and show creation dialog.
Show Place in Map View	Reposition Map View so that the mouse point place move to the center.

Add (Edit) String...

Add new string or update selected string on the panorama view.

## 39. Limitations of AS Version

All App Store programs are required sandboxing. Because of that some limitations are added comparing to SimpleDEMViewer V8. Following list shows all of them.

- Does not support DEMs from GSI of Japan those have file extension 'LEM'.
- You should select folders instead of individual files for SDTS, JAXA ALOS DEMs.
- To recognize sea region of GDEM version 3, you should select folder includes both DEM and sea information file.
- All tiff format files can be selected by Open panel even if those files are not DEM files. They will be checked after you close the panel. netCDF files those have file extension 'GRD', and PDS DEM files those have file extension 'IMG' are the same also. Bil form files are checked later if HDR file is exists or not.
- if you select folders, cannot read alias files even they point DEM files. You should select individual alias files.
- Topographic maps from GSI of Japan is just treated as normal pictures as a texture maps.
- User Memo Data cannot show pictures, if referencing pictures reside outside Memo Library.
- Closing the main window terminates application.