SimpleDEMViewer 7.5
SimpleDEMViewerAS 2.5

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.

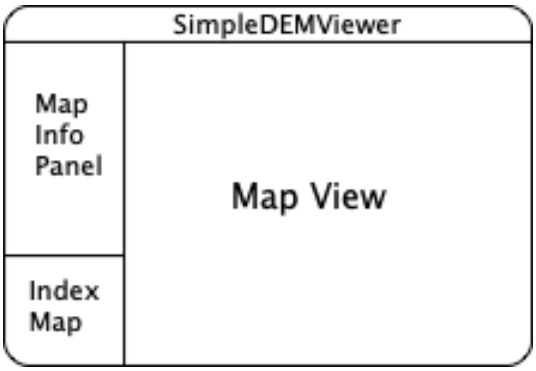
Mar.. 2023

http://www.jizoh.jp/english.html

Index

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 position in world map where Map View showing.

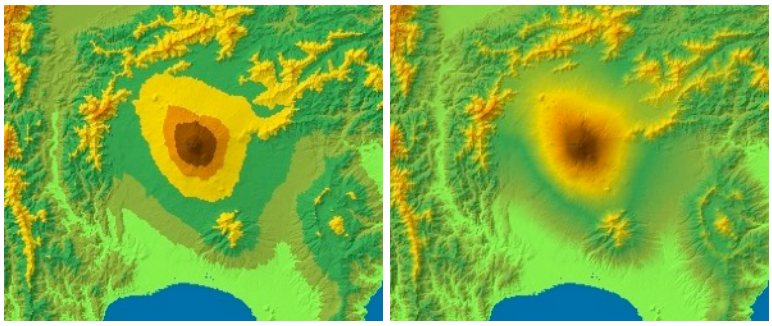
Main window always exists on the screen during SimpleDEMViewer running. You can hide Side bar anytime.

Draws maps colored by elevation

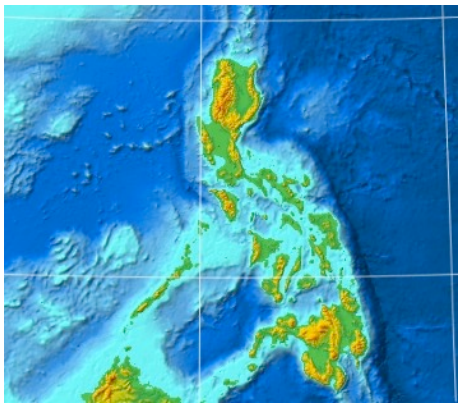
Reads various DEM data, and makes map colored by elevation with or without shading. It supports gradation color also.

- Draws Parallels and Meridians.
- Shows latitude, longitude and elevation at the mouse point.
- Draws contours calculated using DEMs.
- Support various DEM data available at online sites. See below.
- Makes maps with several projection methods. See below.

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



No gradation | With gradation



Conical projection map using ETOPO2

Supported DEM files

Followings are supported. Refer next section。

- GTOPO30 (30 sec.)
- ETOPO1 (1 min. with sea depth, Treated as BIL form)
- ETOPO2 (2 min. with sea depth)
- ETOPO5 (5 min. with sea depth)
- 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 address boundary or no addressing)
- ASTER GDEM (1 sec. / GeoTiff)
- JAXA ALOS (1 sec. / GeoTiff)
- GeoTiff DEM
- netCDF DEM (GMT compatible format)
- PDS DEM (Planetary Data System form NASA. File extension is 'IMG')
- ArcAscii DEM files (Geo and UTM)
- HYDRO1k (no address data)

Customizable items

- Elevation colors and its boundaries.
- White Antarctica and Greenland.
- Gradation colors.
- Lakes. Its color.
- Shading, 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.
- Go through landscape, 3D movie.
- 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, 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 data. 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 stand on Transverse Mercator Projection like as UTM. It is applicable for BIL and ArcAscii DEMs. See “Manage Projection Planes”

GeoTiff DEMs using other plane 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 could 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 or bil form DEMs. Refer BIL form DEM data section for BIL form DEMs.

All calculations are based on specified radius. Coordinate system should be geo-referenced. 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.

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.

ETOPO1, ETOPO2, ETOPO5, GLOBE

They are 1, 2, 5 minutes and 30 seconds mesh data. First three have bathymetry data, and covers whole world by one file. ETOPO1 provided as BIL or GeoTiff, and SimpleDEMViewer treats them as BIL or GeoTiff.

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

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 above SRTM site in its original format (its file extension is HGT), or in BIL format.

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".

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”.

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 xxxxCEL0.DDF file only.

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

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.

BIL FORM DEM

Supports 8 or 16 bits integer and 32 bits float format. Supports geo and UTM addressing. Supports elevation values in meters or feet. Refer next section.

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

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

Now, Version 3 includes ASTER Water Body Dataset (ASTWBD). This program refers only the ocean data from the attribute file.

<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 float format. Unit is meter or feet for elevation. Supports geo and 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 plane should be taken. In that case, you should select "General" usually.

SimpleDEMViewer accesses internet site to determine projection method if EPSG code is specified in the DEM without other detail. 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.

<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 file.

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.

You can download SRTM 3 sec ver.4 in this format at the CGIAR-CSI site.

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 is 16 or 8 bits integer with sign bit, or 32 bits float. 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. Meters for UTM or no addressing DEMs.
- Each value is 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 float.
- File size should be equal to "number of columns" times "number of rows" (times 2 if 16 bits element or times 4 for 32 bits float) described in header file.
- Header file must be exist in same folder. Its file name is same as elevation data but file extension. 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 BLW.
- -9999 in elevation value means sea, except when 'NODATA -9999' specified.

HDR file (text file)

This file should describe followings. Other items are ignored.
Specify one entry in one line. Each line has a key and a value pair. Result has no guarantee if conflicted entries 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 float. Can be omitted if file extension is FLT.
<followings 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 Manage Planes panel, 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 at the center of the north-west corner cell of the data in degrees, or UTM Y address. X address for other plane coordinate system in meters.
ULYMAP	Latitude at the center of the north-west corner cell of the data in degrees, or UTM X address. Y address for other plane coordinate system in meters.
XLLCORNER	Longitude at the lower-left corner of the south-west corner cell of the data in degrees, or UTM Y address. X address for other plane coordinate system in meters.
YLLCORNER	Latitude at the lower-left corner of the south-west corner cell of the data in degrees, or UTM X address. Y address for other plane coordinate system in meters.
XLLCENTER	Longitude at the center of the south-west corner cell of the data in degrees, or UTM Y address. X address for other plane coordinate system in meters.
YLLCENTER	Latitude at the center of the south-west corner cell of the data in degrees, or UTM X address. Y address for other plane coordinate system in meters.
XULCORNER	Longitude at the upper-left corner of the north-west corner cell of the data in degrees, or UTM Y address. X address for other plane coordinate system in meters.
YULCORNER	Latitude at the upper-left corner of the north-west corner cell of the data in degrees, or UTM X address. Y address for other plane coordinate system in meters.
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 is 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 entry exists.
SEALEVEL	If data has special value for sea area, specify it. -9999m is assumed if not specified here and NODATA is not -9999m.
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.
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 entry is specified, coordinate system should be geo-referenced, otherwise DEM file is ignored. 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 no UTMZONE nor XYPLANE is 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 address data.

<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
39.9998611111111
```

3. Read Elevation Data

Read data

"File" => "Open" menu shows file selection panel. You can read elevation data 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 for SDTS and JAXA ALOS instead of individual files.

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.

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

DEMs of different planets cannot coexist.

Start up time restoration

As a default, program restores DEMs and settings at starting if previous session ends without removing data. See "Save and restore working set" section.

To skip-restore function, start program with shift key pressing.

Read as named working set

You can read previously defined DEM data set anytime with various settings. See "Save and restore working set" section.

Remove data

To remove read data, select "File" => "Remove data" menu, and select data to remove. If you read new DEMs without removing current data, and they are not compatible, you will be prompted to remove read data or cancel new reading.

4. Map Handling

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.

Scaling 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 all the world, or all the DEMs in case of UTM or other plane DEMs

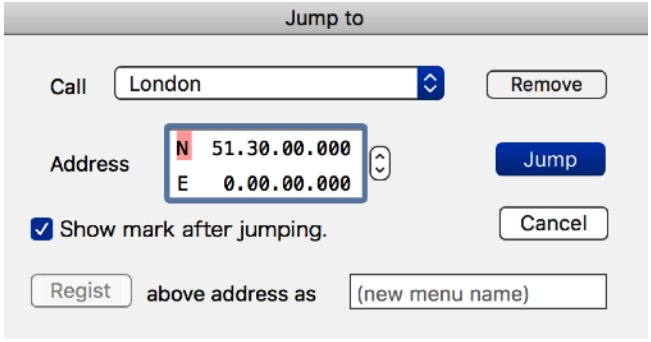
Other Scale menu

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

- Any percentage to data between 5 and 2000 percent.
- Specify milage in meter, km, yard or mile to data 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 significant decimals are kept.

Reposition map by address (Jump to)



You can reposition the map to any place specified by latitude and longitude. Select "Find&Jump" => "Jump to..." menu to display 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 to reuse later, they will appear in a place menu of the dialog.

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

Reposition map by searching user data string

You can search a user data by string in title or node comment, 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 theIndex map. Refer "Index Map" section.

Scrolling

Supports drag scrolling and scrolling by wheel mouse or scroll gesture on a track pad. You can scroll one dot by pressing arrow keys. If retina display is used, scroll two pixels.

If DEM has geo address, you can rotate map horizontally around the world.

Resize map window

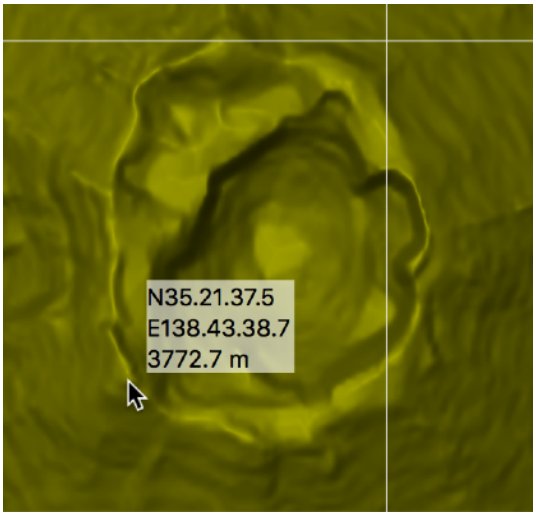
You can set Map view size by pixels. Select "View" => "Window size..." menu to display a dialog, specify width and height. Those values are applied to the Map view without window frame, title bar and side bar.

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

Showing address and elevation value

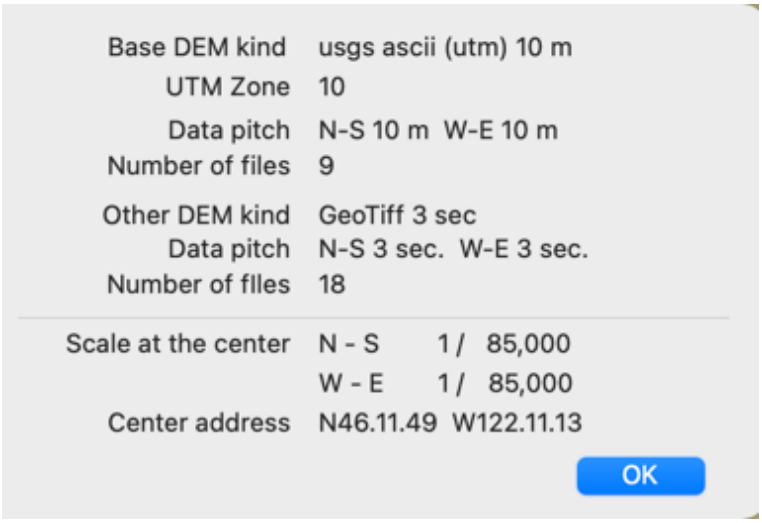
Move mouse on the Map View with option key pressing to show latitude, longitude and elevation at the mouse point. Its elevation value is nearest cell value of DEM file or interpolated which you can select in Preferences panel.

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



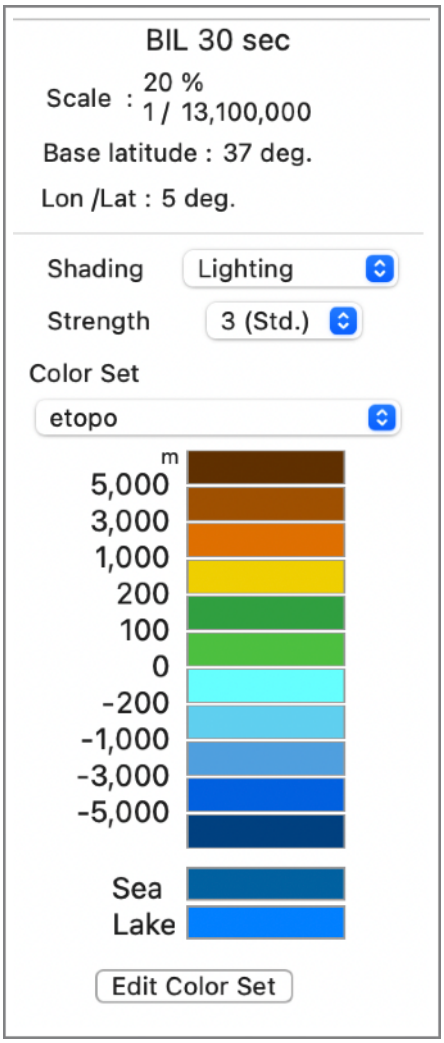
DEM information

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.



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 map instantly.



Showing items

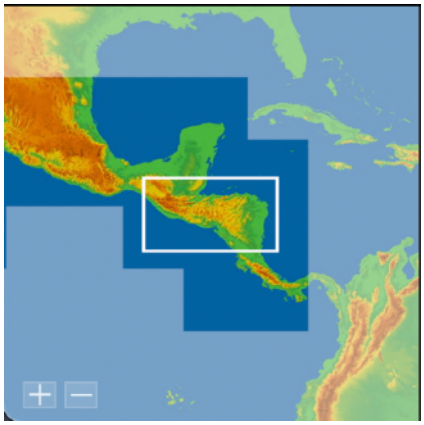
DEM data type	Type of DEMs currently showing. If they are UTM type, shows zone number, and plane ID for DEMs defined in Manage Planes panel.
Scale	Percentage of extending or shrinking rate based on one data cell to one pixel (if retina display, 4 pixels) on the screen. Also shows 1 / n style fractional number assuming that screen has 72 pixels per inch or 144 pixels per inch if retina display.
Base latitude	Base latitude for geo-referenced DEMs.
Lon / Lat	Intervals of Meridians and Parallels. If they are same value, shows only one.
Shading	Shows shading type. You can change it by popup menu.
Strength	Shows shading strength. You can change it by popup menu.
Color set	Shows current color set with color set menu. you can select color set here.

Operations

- “Show / Hide Side Bar” under the “View” menu shows or hides side bar of the main window including Index map.
- Changing shading or color set in this panel affects map view immediately.
- Changing settings here affects Preferences settings also.
- “Edit color set” button shows a dialog to edit color set.

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. Index map shows the area that DEMs are read with deep colors and pale colors for other area. When index map is expanded it shows international boundaries.

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

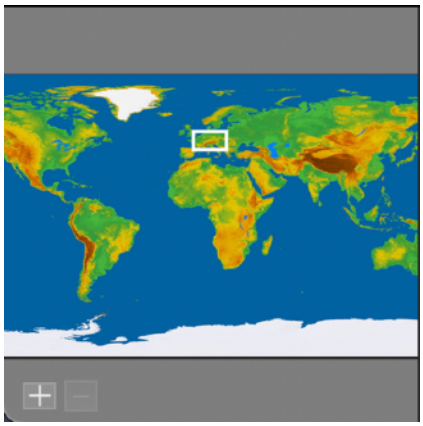
Index Map is not available for DEMs those have no addresses.

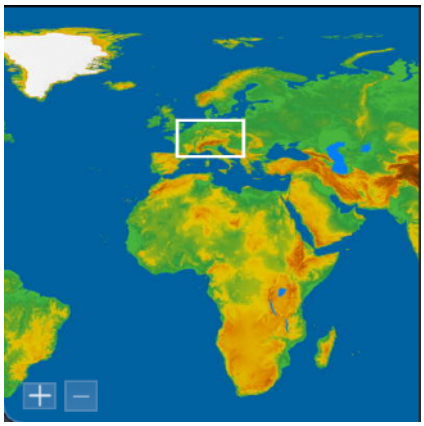
Scale of the Index Map

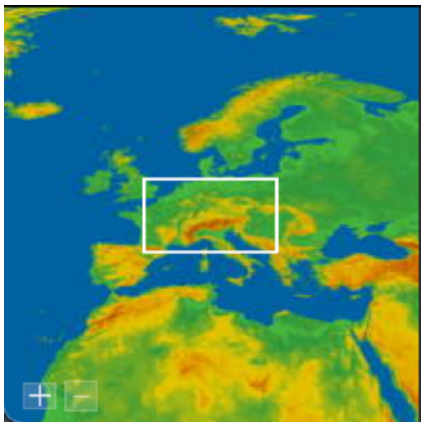
Depends on displayed region in the Map View, Index Map shows almost whole world to smaller area automatically. Based on smallest map, expands up to 64 times, or 256 times around Japan. Although each pixel of map has same size in degrees for horizontal and vertical dimensions in smaller maps, pixel width in degrees shrinks depends on center latitude for more expanded maps so that pixel width and height in kilo meters are the same at the center. International boundaries will be drawn in expanded map larger than 8 times.

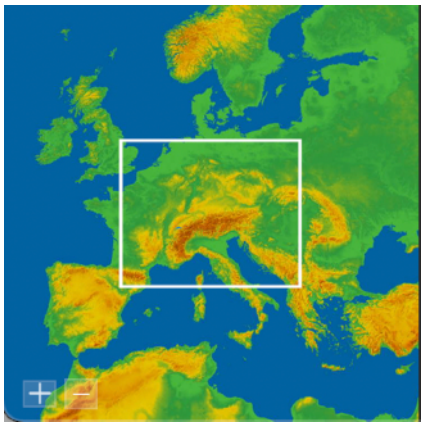
Although scale of the index map is automatically adjusted, you can change it temporarily by pressing [+] or [-] button, [+] button zooms in twice and [-] button zooms out half.

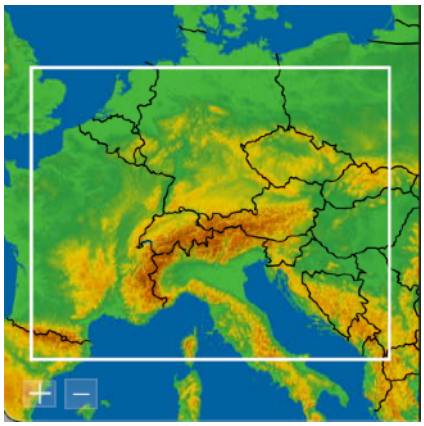
Following five pictures are 1, 2, 4, 8 and 16 times scaled Index Maps.



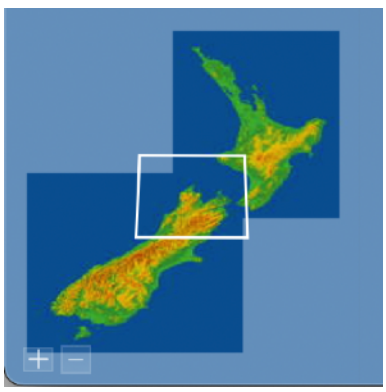








DEM range and Map View range



As pictures at top and at right, read DEMs region is drawn in deep color in each DEM region. Each DEM region defined with four corners addresses, region has no elevation values in the DEM are ignored. 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 read area is rectangle for each DEM always.

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

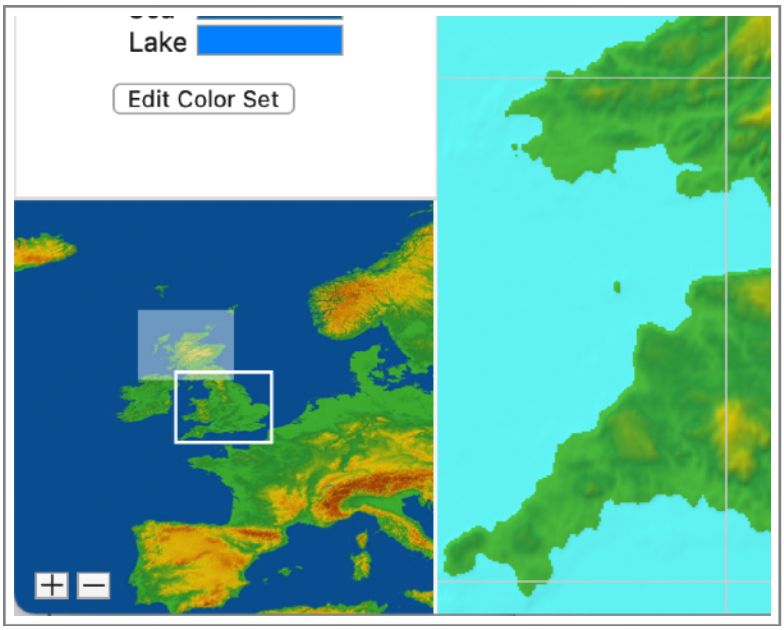
Operations on Index Map

Show / hide index map can be done by "Show / Hide Side Bar" under the "View" menu.

You can move Index map content temporarily by dragging map at outside of the white frame. It will be reset to default state when the Map view is redrawn.

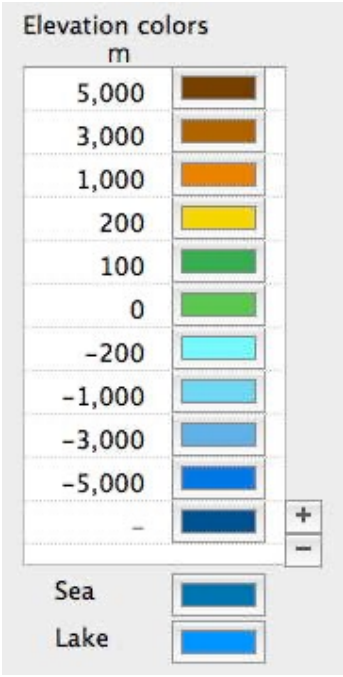
You can enlarge index map up to 64 / 256 times. [+] button extends twice and [-] button shrinks to half.

You can change the Map View 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" dialog. Select “Preferences...” under the application menu to show the dialog.



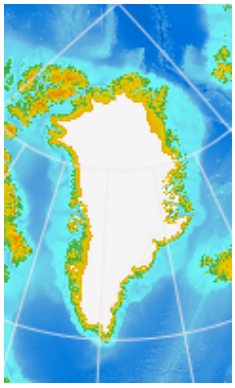
Elevation colors

- Elevation color table is like a picture at right. Elevations are boundaries between colors in same row and next. You can change all colors and boundary elevations, sea color and lake color. Click each color box to change it's color or each elevations to change boundary elevation.. You can specify float values for boundary elevations in unit of meters.
- Number of elevation colors are variable between 3 and 30. Clicking [+] button adds a row before selected row. If none selected, adds one at top. Clicking [-] button removes selected row. You can not remove bottom row.
- 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, usually -9999 m is specified.
  No sea color applied to ETOPO1 / ETOPO2 / ETOPO5 / SRTM plus and GEBCO since no sea level data exist.
- 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.
- Although you can edit color set here, you can use separate dialog to do it, click "Edit in separate window" button. Refer "Edit Color Set"

Vacant color

Color for the region where no elevation data exists.

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



Use gradation

Check if you want to draw elevation colors with gradation.

White Antarctica and Greenland

Make Antarctica to be white. Some low elevation outskirt of the land are depends on elevation colors.

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

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

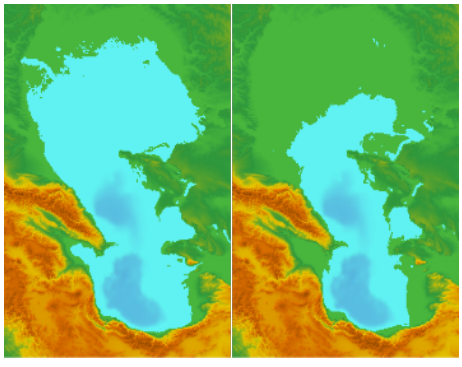
When using a color set with seabed color like the “etopo” color set, draw the color of the land lower than the sea level with the color just above 0 meter. However, in the case of the Caspian Sea it is applied only for area shallower than 28 meter, area deeper than it is drawn with the original elevation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

Target places are only followings.

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. Nagoya and Niigata Japan.

Do not turn on this switch if you use color set its 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.



Draw lakes

Check if you want to draw lakes with lake color. You should create lake data to draw lakes for each DEM kinds. Refer to section "Drawing lakes".

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

Some types of DEMs have sea area as 0 meter.

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.

Treat sea as no data region

Some DEMs have void or vacant area within their rectangle region. SimpleDEMViewer searches other DEMs to fill those region. If you check this option, 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.

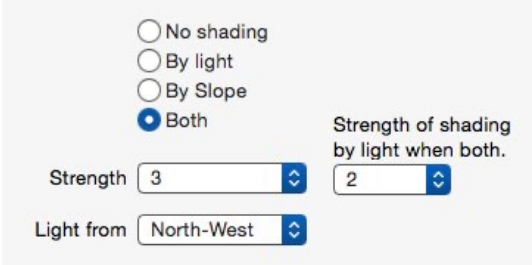
Color sets

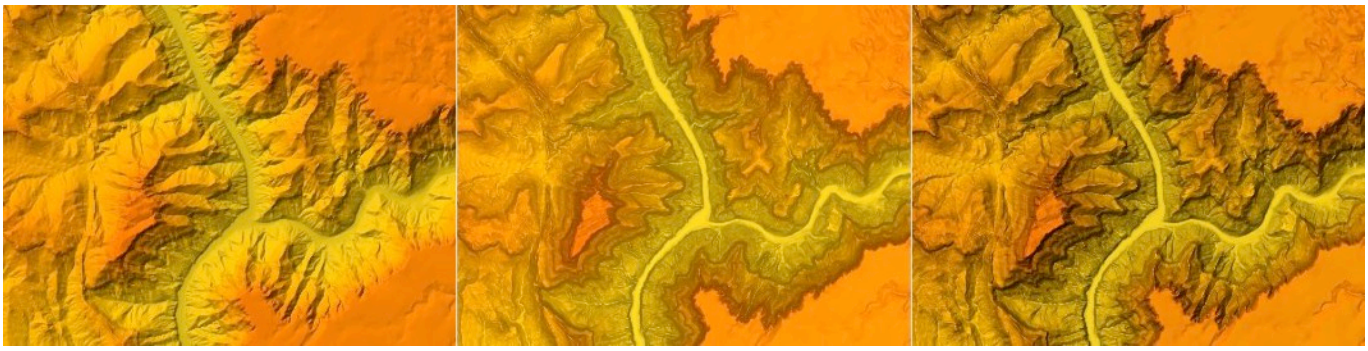
- A color set includes elevation colors, lake and sea colors, boundary elevations.
- You can create new color sets with names, they will appear in color set menu.
- You can delete named color sets created by user.

Shading

- Select one of "No shading", "By light", "By slope" and "Both".
- Strength has eight levels. 8 is most deep.
- You can select light direction from 8 direction menu when "By light" or "Both". Elevation angle is always 45 degrees.
- If "Both" you can select strength of shading by light between 1 and 5.
- If DEM has no address, assume upside towards north.

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





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. Float value is acceptable.

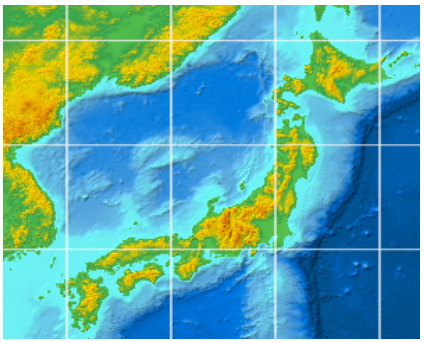
If the coordinate system is UTM or other managed planes, meridians will be drawn up to 10 degrees apart from base meridian for both side, but location accuracy getting worse if it leaves more than 6 degrees.

Base latitude

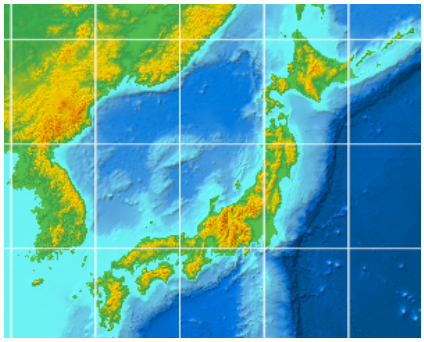
By default, each pixel of map has same size in degrees for horizontal and vertical dimensions, therefore pixels not on the equator are expanded horizontally wider as far from the equator. If your map is in larger scale (e.g. SRTM) and you want to look around high latitude region, you can specify "Base 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 latitude and longitude. It will be 6 arc seconds in longitude when you specify 60 degree as "Base latitude". "Base latitude" should be between 0 and 60.

"Set to current map center" sets base latitude to latitude of Map View center, but still restricted to 60. “Adjust Base Latitude” under the View menu does the same thing.



Base is the Equator.



Base is 36 degree.

Unit of milage

Specify unit of milage from "km", "mile" or “nautical mile”.

Scale panel, Milage measuring, Route data milage, Geo-profile and Panorama view support it.

Address format to copy

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

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

DD 12.58244414 -123.7650892

Showing elevation

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

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.

Lake data folder

- Specify a folder to save lake data.
  Default folder is "~/Library/Application support/jp.jizoh/SDVr7/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.

High density drawing

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 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.

Other buttons

Reset	Set all values in this dialog to program's default values except high density drawing and lake data folder.
Redraw	Redraw the Map View contents with current settings. Without clicking this button, latest settings will be applied at next drawing.

8. Manage Projection Planes

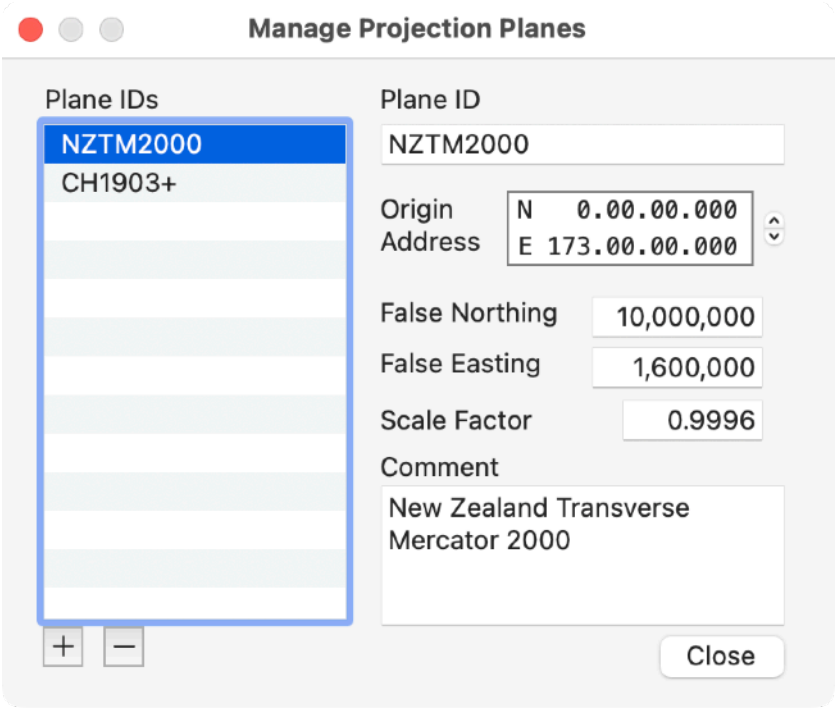
Define world's local planar coordinate systems which should use Transverse Mercator Projection like as UTM. Those systems should based on WGS84.

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

Dialog

Select "Manage Projection Planes" under the File menu to show this dialog.

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 characters to identify planes.
Base 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, will be shown at selection dialog when reading DEMs.

How to use

ArcAscii DEMs

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

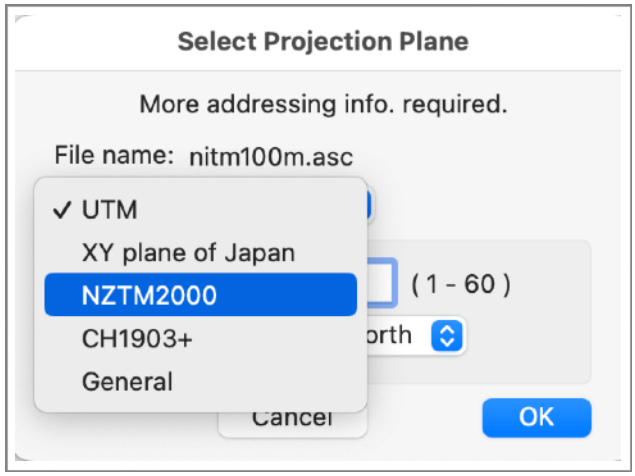
Bil form DEMs

Specify XYPLANE entry with Plane ID in the HDR file.

XYPLANE CH1903+

If Plane ID includes spaces, use double quotation marks.

XYPLANE "Swiss Projection"



Automatic register for GeoTiff

When reading GeoTiff DEM files, if their projection method is Transverse Mercator but not UTM, its projection plane will be registered here if not exists. 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 axis 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

Although editing color set is available in the Preferences panel and Panorama View dialog, this separate editing dialog provides more convenient way especially to create new Color Set with many number of colors.

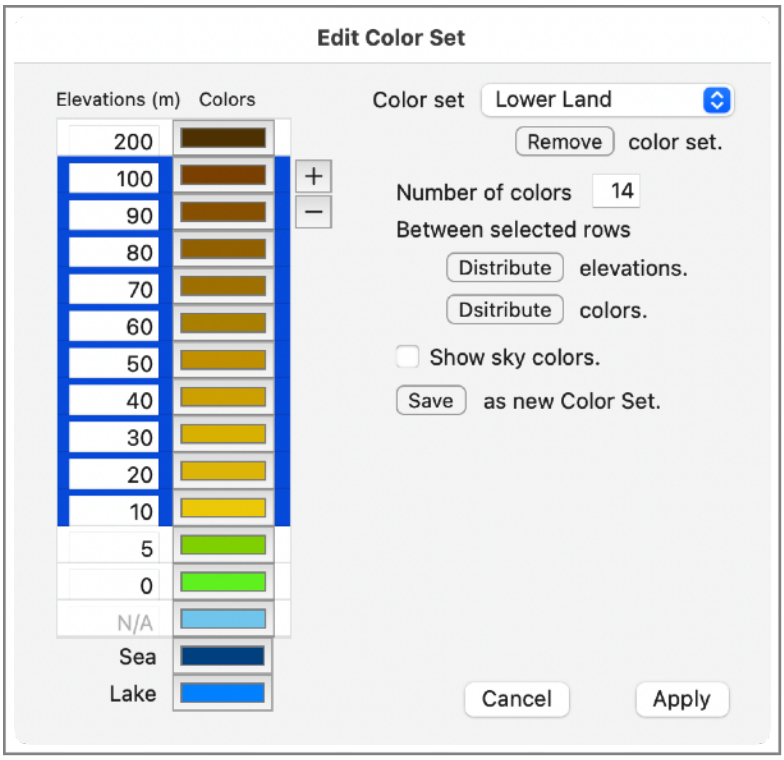
"Edit Color Set" button in Map Info Panel shows this dialog, "Edit in separate window" in Preferences panel and Panorama View dialog shows this dialog also.

Dialog

Content at first

Content shows the Color Set that is shown in caller dialog at first, but you can refer any Color Set by selecting Refer 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, minimum is 3 except sea, lake and sky colors.
- [+] button adds a row at 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 rows is increased, it works as [+] button clicked required times, if decreased, remove top most selected row and following rows.

Change boundary elevations

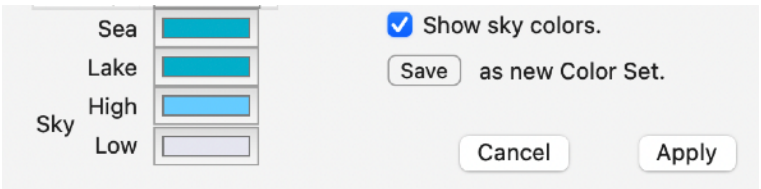
- Select a row and click elevation field you want change, and enter some value.
- If you want to enter elevations to many rows with regular intervals, enter top and bottom row's elevations in the range of rows, select those rows or all rows in range, click distribute elevations button.
- Elevations should 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 top and bottom row's in range first, then select those rows or all rows in range, 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 Set have Sky colors for using Panorama View. To show sky colors, check "Show sky colors" check box.
- If this dialog is called from Panorama dialog or type of referred Color Set is Panorama type, sky colors are shown initially.



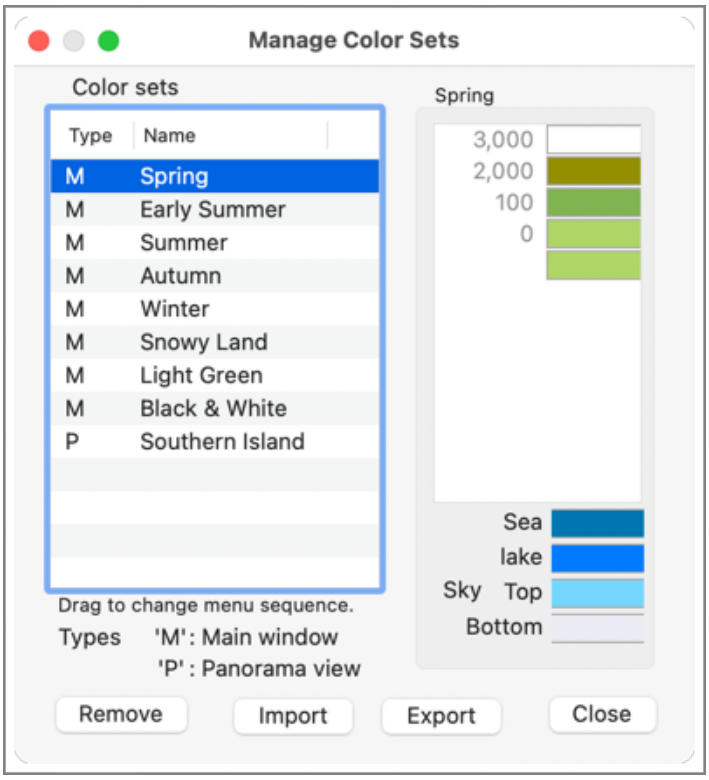
Save new color set or remove color set

- You can create new Color Set with names, 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 updated.
- Cancel button does not cancel creation or removal of Color Set.

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.

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 saved file. File extension is always ‘jzcolor’.

Importing

To read Color Set files, click "Import" button and select files in the file dialog. You can import old type color sets with file extension “jzcolr”.

If the same name exists, a dialog appear and you can overwrite or enter new name. Even 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 region is flat in the DEM data. Lake data are created for each DEM types and be saved as separate files.

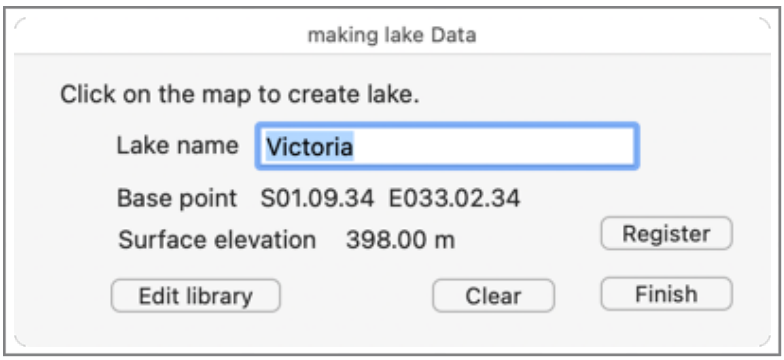
To create lake data, lake should be larger than 100 DEM data elements. If a lake surface is separated several elevation regions, you should make separate lake data for each regions. Picture at right is Lake Baykal using ETOPO2. It has different elevations for its northern and southern part. It requires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

You cannot create lake data for no addressing DEMs.

Create lake data

To create lake data, only one kind of DEMs are allowed in program. If more than one kind of DEMs are read, you cannot create lake data.

Select "Make lake data..." under "Tools" menu after reading DEM files to make lake data for them. "Making lake data" dialog appears and the cursor changes to a water bucket. If you click some point on the map, 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.



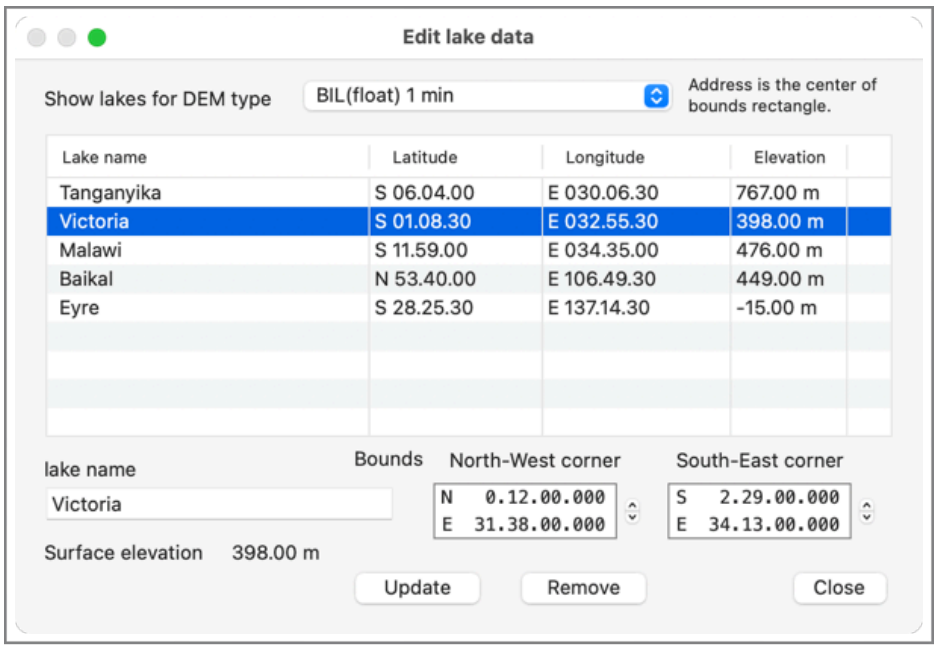
To finish creating lake data, click "Exit" button in the panel. Lake data are saved as lake data files.

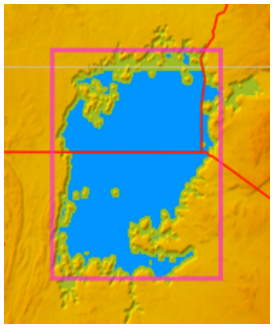
Lake name	Any name is acceptable. There is no need of uniqueness but preferable.
Click point	Address of mouse clicked point.
Surface elevation	Current lake's surface elevation.
Register	Finish one lake data.
Clear	Reset lake data creating status and clear fields,
Edit	Display lake data table and delete, rename or change lake data . Refer next paragraph.
Exit	Finish creating lake data and save them.

Edit lake data

You can delete individual lake data, rename and change the rectangle bounding of lakes. Program uses surface elevation and boundary rectangle only 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 with adjusting rectangles.

Sometimes, lake and aside land elevations are equal in DEM, in such a situation, you may adjust rectangle to limit lake area.





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 bounding address changing immediately, so that you can adjust bounding rectangle 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-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 only when you had saved during previous session. Another is the restoration when you want. Save working set with name, and restore it later. You can save many working sets with names, e.g. one is for world wide map, others for local maps, so that you can change maps easily with settings appropriate to DEM files.

Restoration at start-up

Specify this function's behavior in "Misc." tab of Preferences. Select one of "Always" or "When saved manually". If "Always", working set is always saved before you quit SimpleDEMViewer automatically.

If not "Always", select "Save working set..." under "File" menu to show "Save working set" dialog, save and quit program. You can continue the job instead of quitting.

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

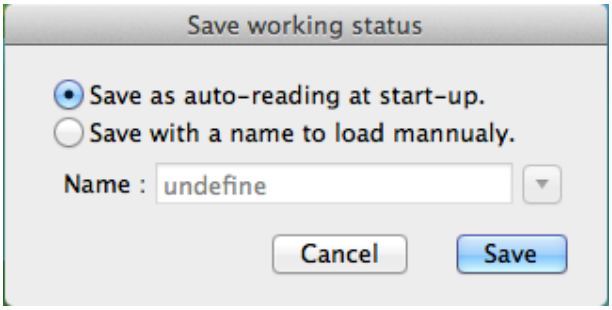
Named saving and restoration

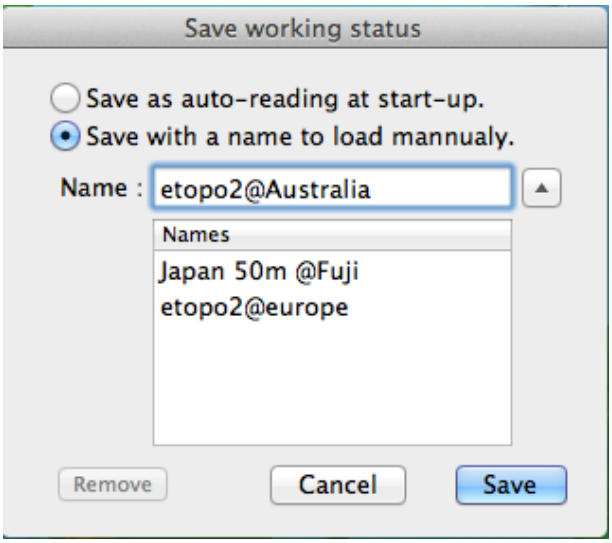
To save the working set, select "Save working set..." under "File" menu, enter any name to refer later, and click save button.

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 are re-loaded 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 information to be restored are followings.

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

Followings are saved in named working set.

- Settings in the preference dialog except misc page. In the misc page, only "Base latitude" is saved.
- Contour 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 quit to avoid losing data.

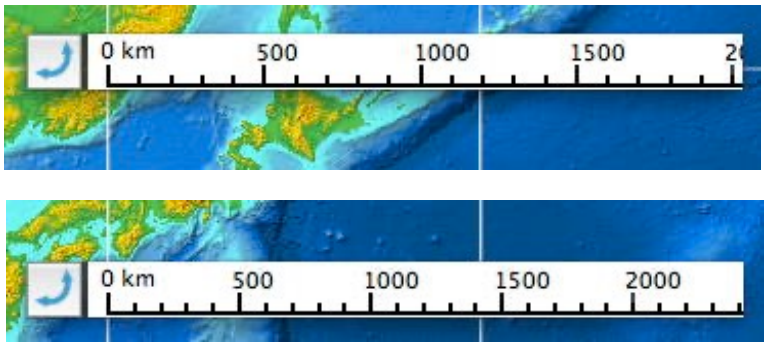
13. Scale Panel

When main window is front most, a scale panel appears.

Scale panel has two states, horizontal and vertical. If it is in horizontal state, the scale varies depends on latitude at bottom side 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 preference dialog.



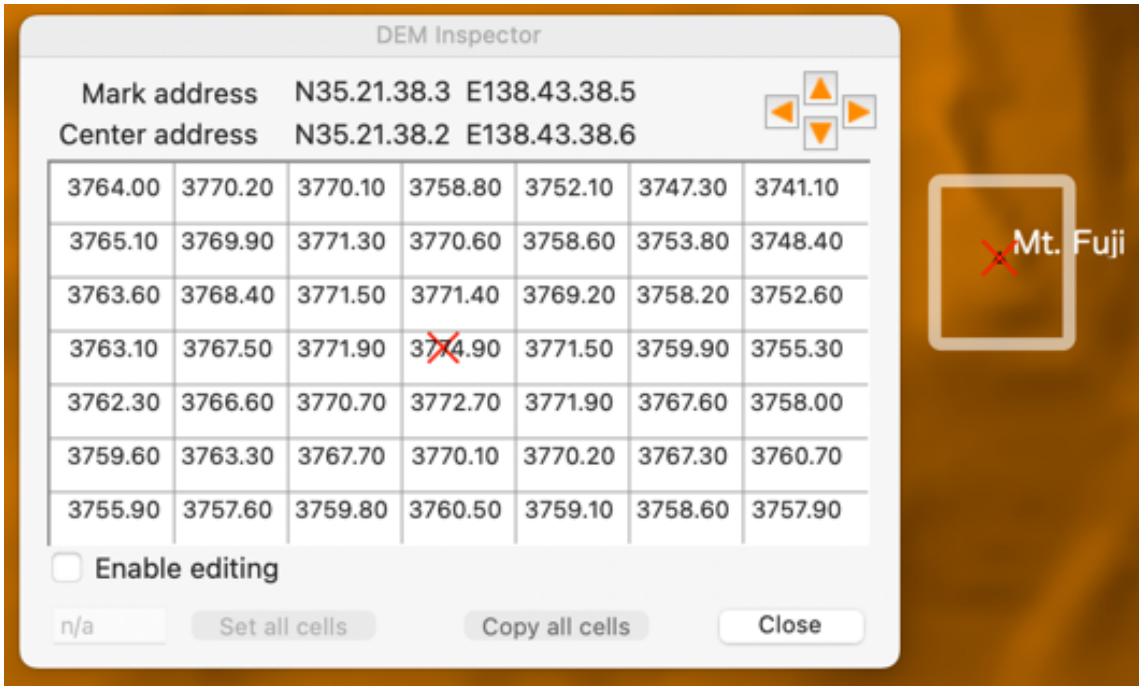
14. DEM Inspector

Showing cell values of DEM files

DEM inspector panel shows elevation values of 7 by 7 cells around the address started inspector there. 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 7 by 7 cells. Red cross on the panel and on the Map View represent mark address.

Each cell shows one of followings.

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



Change elevation values

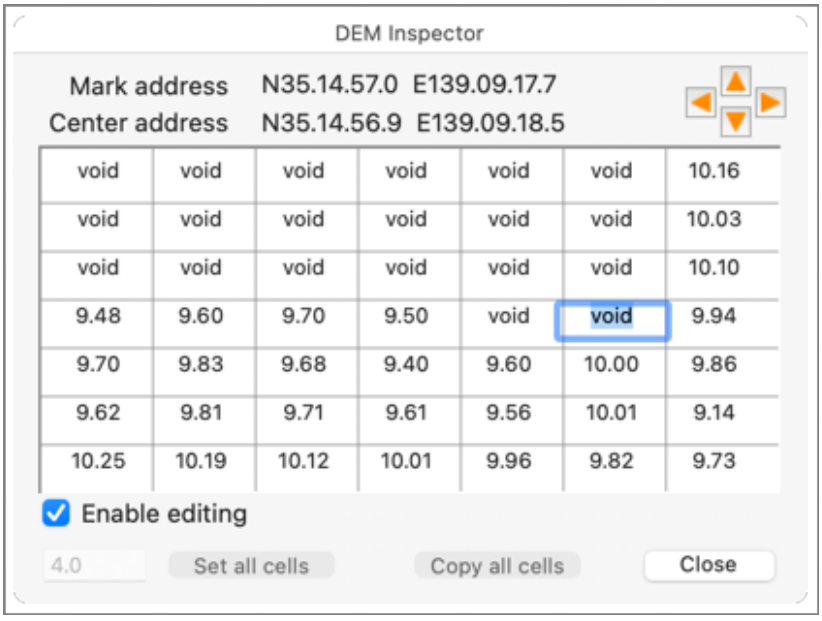
You can change elevation values of DEM data to flatten sea or lake region, or to amend invalid values. Check "Enable editing" to do it. Changed values are applied to image of the Map View immediately.

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 dialog to change an elevation value. To fix changed value, enter tab 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.



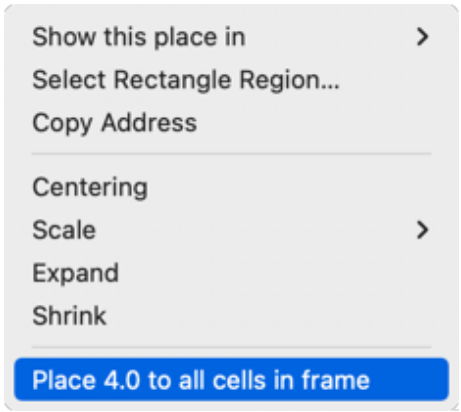
Set all cells to the same value

You can set all 7 by 7 cells to same elevation value. 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 rectangle region on 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 7 by 7 cell values as string data. It has tab separator, so that you can paste to 7 by 7 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 float number in meters even if DEM file elevations are in feet.

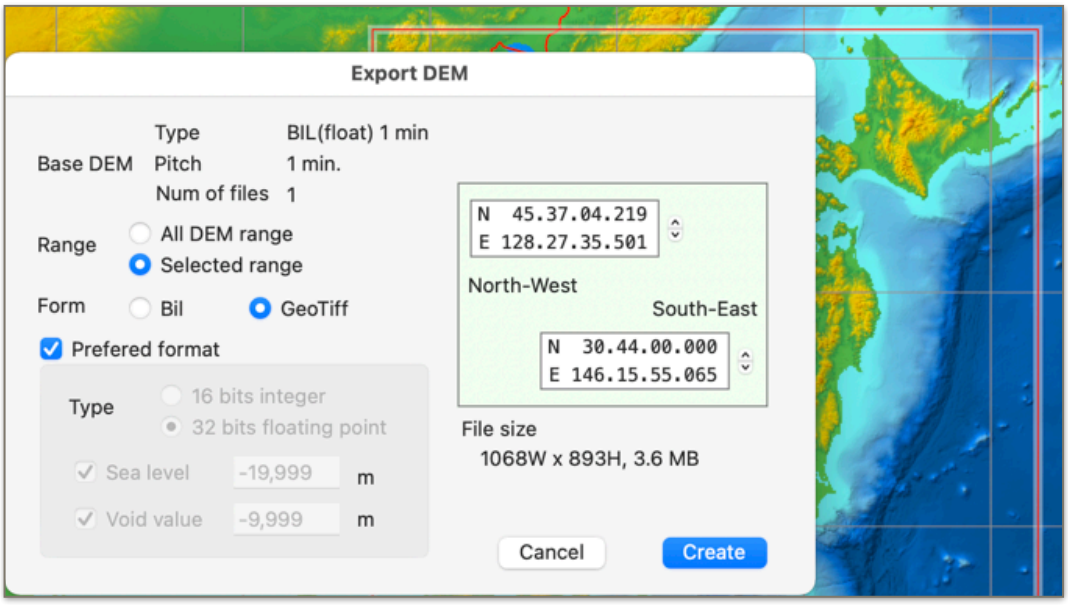
15. Export DEM File

Create new DEM file

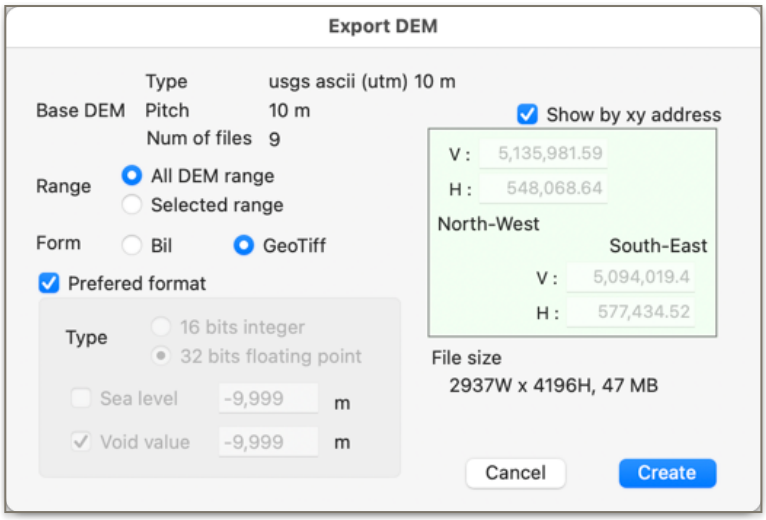
Create a new DEM file from read DEMs, whole DEMs or some rectangle portion of DEMs. You can create new large DEM file from many small DEMs, or create smaller DEM from part of large DEM. Also, you can save amended DEMs changed in DEM Inspector. Output DEM file format is BIL or GeoTiff. GeoTiff can be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

Only base DEMs can be used to create new DEM file. DEMs should be based on WGS84 or no address DEMs, 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.



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



Operations

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

If you have selected rectangle region previously, “Selected range” is on, otherwise “All DEM range" is on at beginning. 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, copied to SEALEVEL entry in the HDR file.
Void value	Specify elevation value treated as void data, copied to NODATA entry in the HDR file.
North-West / South-East	Shows rectangular region to create DEM file. 180 degree meridian should not be inside.

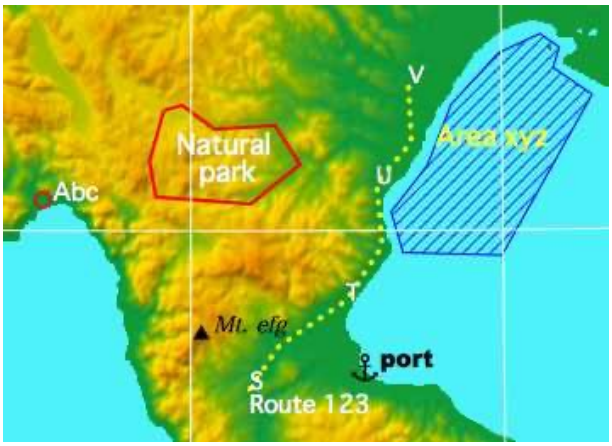
File size	Shows calculated output file size. If the size exceeds 2 Giga bytes limit, letters will be red.

Click “Create” button to show save panel, specify name and place there. File extension is “bil” always. Bil and HDR files will be created.

Notes

- Output DEM file can’t exceeds 2 giga bytes.
- 180 degree meridian should not be inside.
- Byte order is Intel form (LSB) always.
- If selected 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, start from pop-up menu by ctrl+click on the map. You can save them as files, read and show them later. You can pass those files some other person, so that they can see your memos and other user data.
User data are categorized by "Kind" and "Layer". 10 Layers are provided, and they are identified by numbers 0 to 9. You can create any Kind identified by strings. You can control visibility of each user data by Layer and Kind combination
User data cannot be shown and handling on the map of no address 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 use custom marks up to 50.

Route data

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

Area data

Area data is bounded by lines connecting points. Area type is one of frame only, translucent, hatching, etc.. Title is shown in the center of the area.

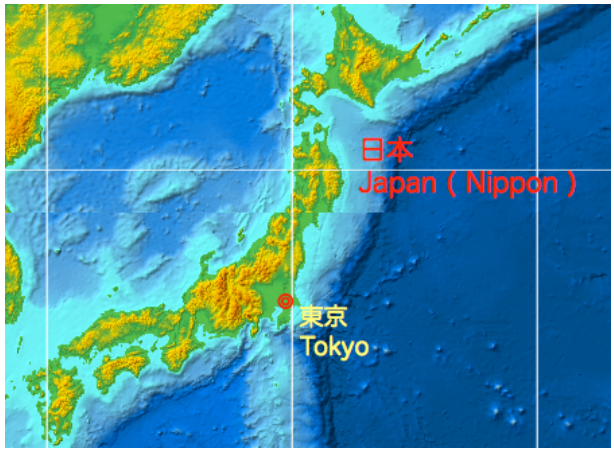
You can read ArcInfo exported file (e00 format) as user route data.

You can read GPX format GPS data file to create user memo or route data.

You can read Placemarks as user data from KML files.

16.1. Memo Data

About memo data

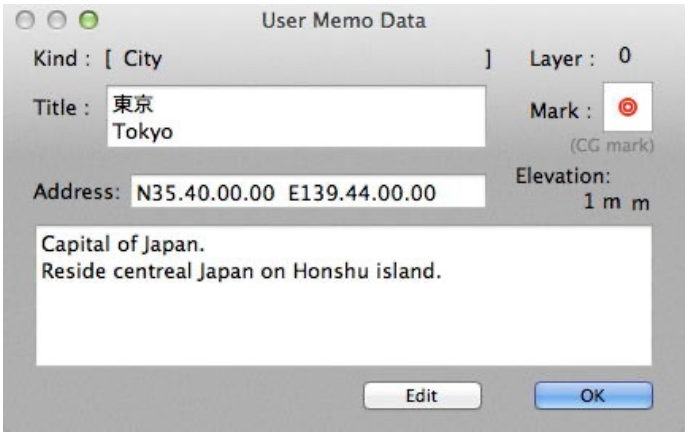


You can write memos link to an address (latitude and longitude). A memo consists of title, kind, mark, address, contents and elevation. Memos are shown on the map as a mark and title. You can make titles maximum 3 lines, and can set font and style.

Mark is drawn at the address and title are drawn at the right of the mark. If memo has no mark, title is drawn as below-center of the first line of the title points the address.

Memos have "kind" and "layer" code. 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 any mark up to 50.

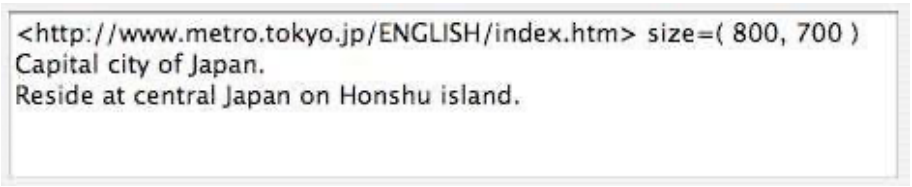


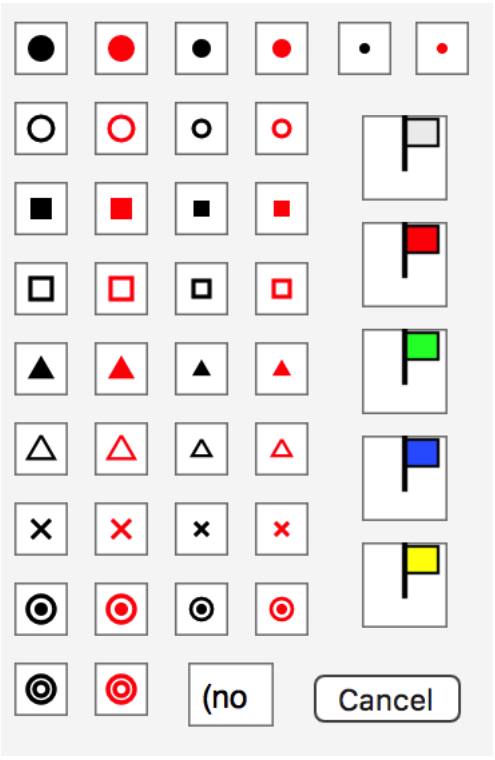
If mark or title string is double-clicked, memo content will be shown as next picture.

If url string is placed in the beginning of the contents field as picture below, pointed 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 turn it on in the Memo preference dialog.

If DEM is no address type, you can't use memo data.

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





Standard marks

Create new memo

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

Kind	Select from menu, or input any words for new kind.
Layer	Select one between 0 and 9 from menu.
Mark	Select one from popup table.
Defaults button	Set mark, layer 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.
Address	Latitude and longitude at the mouse point is set. Can be modified to any address.
Elevation	Elevation derived from DEM data of 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, face, color and background for title string.
Comment	Any comment strings. If url string parsed with '<' and '>' exist at the beginning, pointed 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 set to those of previous one.

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 "Memo preferences". 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.
- Comment field contains url of the file and creation date from exif information.

GPS address datum should be WGS84 except Tokyo.

<AS note> Pictures should be placed in Memo Library. Even if pictures reside outside of Memo Library, Memo data will be created and pictures can be shown until program terminates. Saved such Memo data could not show picture 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 during option key pressed.
- Click "Edit" button on the memo-content-window displayed by double-click memo on the map.
- Select "Edit user data" under “User Data" menu. Select one memo in the list and click "Edit" button.

Update common attributes

Select "Edit user data" under “User Data" 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 parsed with '<' and '>' is placed at the beginning of contents field of memo, pointed data (html document, a picture or a movie file) will be shown when memo is double-clicked.

You have options to select destination to display those pictures or web pages. Options are

- Always in SimpleDEMViewer window.
- Use web browser if those memo points web pages.
- Always use 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 Memo tab of user data preferences dialog, you can specify this option.

Web site access is not allowed in default for security purpose. To allow it remove check from “Don't show web site” in user data preference.

Url forms

"http:" 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 library folder.

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

Url auto collection

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 2 or 3 depending on where the file from.

If you drag & drop internet location file, the dialog takes pointed address instead of location file itself.

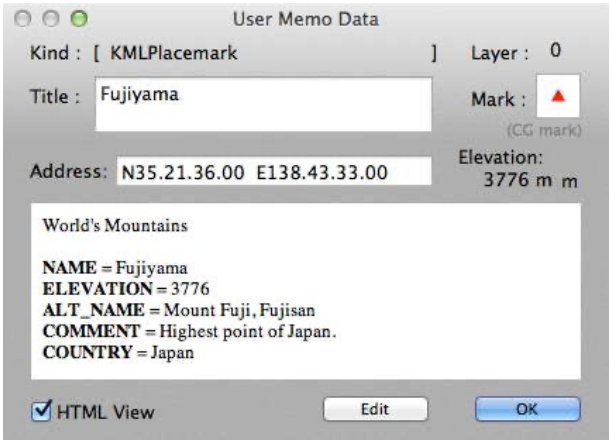
If dropped picture file has GPS information, latitude / longitude / elevation are taken for the dialog items. Also picture date (not the GPS time) will be placed in memo content.

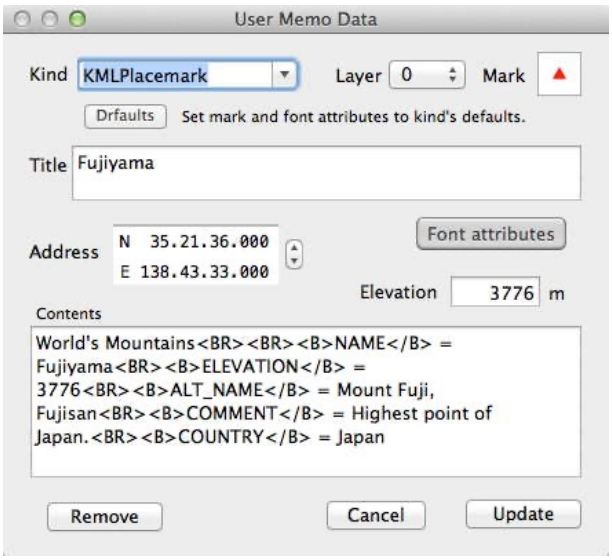
ex) <file://photo001.jpg> Date(2006.02.02 15:20:30)

Window size

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

<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,
, , , <h1></h1>, for each line break, bold, italic, header and paragraph. Any other HTML tags are acceptable but external reference to file or web site are ignored, and hyper links could not work.

Memo contents display panel (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 as right below picture. No WYSIWYG editing function available, so you should enter tags manually, or copy from some HTML editor.

If contents field text includes ‘<‘ and ‘>” characters even no HTML tags or no external reference as described in previous section, some text disappear in contents field of display panel. In such a case uncheck “HTML view” check box.

Pass memos to your friends

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. There 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 position. You can specify memo address in the update dialog, or simply drag memo mark on the Map View.

To drag memo mark, select memo by clicking memo on the map first, then drag memo mark. 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. If you drag title string to outside of the window, it is removed from the window.

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 is free, however size of 64 x 64 pixels are recommended, because marks are always drawn in the 32 x 32 pixels rectangle.

Maximum number of custom marks is 50.

Defaults of memos

Define kinds and defaults of each kind, also define "Memo data library folder". Do "User Data Preferences..." under “User Data” menu. Sequence of kinds in the list affects kind menu of the memo creation/update dialog.

New	Create new kind.
Remove	Remove a kind. Kinds used by memos cannot be removed.
Rename	Rename current one.
Up	Move a kind upward.
Down	Move kind downward.
String attributes	Set default title string attributes for each kind.
Mark	Click mark icon to change default mark for each kind.

You can define defaults includes string attributes and mark for each kind when only one kind is selected in the list. These defaults are referred when "defaults" button in the create/update memo dialog is clicked or when creating new memo first after program started.

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, such as Safari, Preview, etc..
  "default application" is determined from file name extension by system.

Data library folder for user memo

Choose a folder to save data to be displayed as memo data content.

Defaults for creating memo data by drag & drop

Select a kind and layer number as default values for new memo data creation by drag & drop a picture file.

Memo data library folder

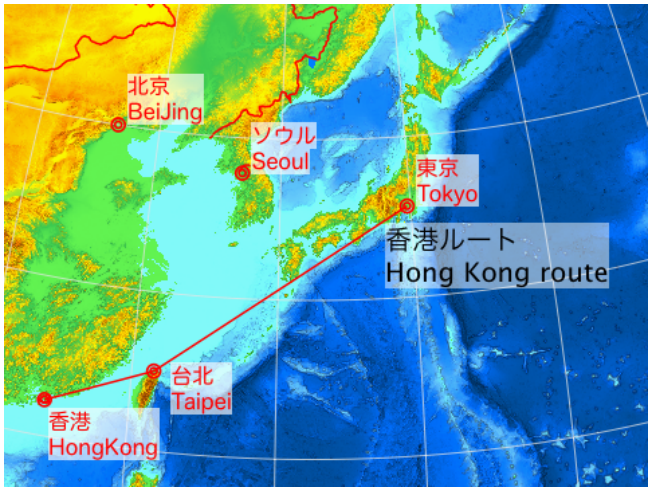
A folder for files referred by memo data content field, and for custom marks. You can specify any folder in the memo preferences dialog. Default is no library.

"MemoMark" folder containing custom marks should reside in this folder. Memo content files may be placed in this folder without folder structural restrictions.

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 line, 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 straight line on the screen.

Picture at right shows sample route data on an Orthographic projection map using ETOPO5.

Line types are solid line, broken line, chain line, dotted line. Any colors are set to lines. Line thickness can be set from menu between 0.5 and 3.0 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 DEMs have no address info you can't use route data.

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

Create new route data

To begin plotting new route, position mouse to an end of the route on the map. Do ctrl+click there, and select "Create route" from the context menu. Therefore a red line drawn from start point to mouse. Click mouse at the nodes, and double-click at the end node. If you click with option key, the node may have comment. If you make click on a string, any user data string, the string's address will be node address instead of mouse position, and the string itself is set to node comment. You can cancel last node by Esc key.

Creation dialog will appear after double-click, enter title, comments, line and string attributes as following list. You can modify each node address, and even add or delete nodes in the dialog.

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 in 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.
- Thickness	Select thickness of the line from menu.
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	Shows number of nodes in the route, including both ends.
Mileage	Total length of routes calculated on the assumption that the earth is ideal sphere with radius of 6380 km.
Node selection	Select 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 in 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 derived from DEM data of the above address is set. Can be modified to any value. If elevation has no meaning or uncertain, specify -19999 or less.
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.
Cancel	Cancel creation of this route data.
Create	Create this route data. Show it on the map.

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

Update route data

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

Update one route data

There are two ways to call dialog to update each route data.

- Double-click a route title or comment on the map during option key pressed. If it is done on one of the node comments, the node will be shown on the dialog.
- Select "Edit user data" under “User Data" 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 during option and shift key are pressed. 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 with option button pressing directly.

Update common attributes

Select "Edit user data" under “User Data" menu. Select routes and click "Set all" button. You can update following attributes of every selected routes.

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

Defaults for route data

Define kinds and defaults for each kind. Do “User Data Preferences…” under “User Data” menu. Sequence of kinds in the list affects kind menu sequence of the route creation or update dialog.

New	Create new kind.
Remove	Remove a kind. Kinds used by memos cannot be removed.
Rename	Rename current one.
Up	Move a kind upward.
Down	Move a kind downward.
Attributes	Following attributes are set as defaults for each kind.
- Title attributes	
- Comment attributes	
- Line color	
- Line width	
- Type of line	

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 user 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.
The file name will be "Kind" name of the user rout 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.

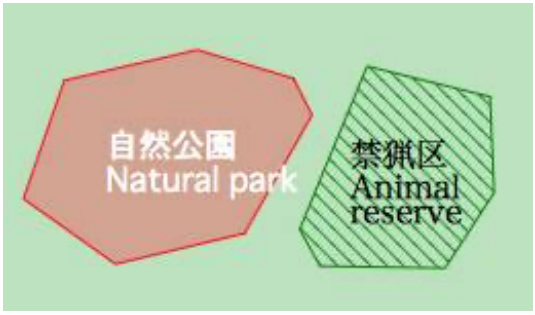
- Ignore all e00 file if it has no ARC data.
- Even if file contains area data, only boundaries are treated as routes.
- Datum should be WGS84.

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 User Route Data. Refer to KML Data section.

16.3. Area Data

About area data



Area data is a surface of the earth, bounded by points with addresses. Each area data has pattern and title showed 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" code. Visibility of each area data on the map can be controlled by kind and layer.
kind : You can create new kind with any string.
Layer : A number between 0 and 9.
Several kinds are prepared as defaults, but you can create any kinds, and can remove prepared ones.

If DEMs have no address info 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, position mouse to an edge of the area on the map. Do ctrl+click there, and select "Create area" from the context menu. Therefore a red line drawn from start point to mouse. Click mouse at the nodes, and double-click at the end node. If you click on any user data string, the string's address will be node address instead of mouse position. You can cancel last node by Esc key.

Creation dialog will appear after double-click, enter title, line and string attributes as following list.

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 in 3 lines. If title exceeds 3 lines, remains will be included in the 3rd line.
Pattern	Select an area pattern from menu. Frame only, Translucent, Dots, Hatchings (Horizontal, Vertical, right up, right down)
Color	Any colors from color picker dialog. Click color pane to show color picker dialog.
Title attributes	String attributes for title on the map. Refer String attributes.
Area size	Area size calculated on the assumption that the earth is ideal sphere with radius of 6380 km.
Cancel	Cancel creation of this area data.
Create	Create this area data. Show it on the map.

When dialog appears, kind, layer, area type, color and title attributes fields are set to those of previous one.
Addresses show far sides of area data.

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 dialog to update each area data.

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

You can drag each edge node on the map to update its position. To start drag-editing mode, double click title string on the map during option and shift key are pressed. 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 with option button pressing directly.

Update common attributes

Select "Edit user data" under “User Data" menu. Select area data and click "Set all" button. You can update following attributes of every selected area data.

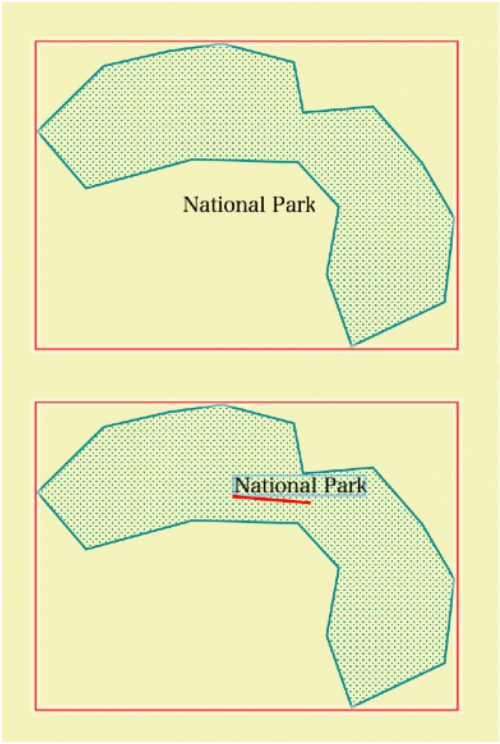
- Kind, Layer, Area pattern, Color, Title attributes

Repositioning title string

As a default, area title is drawn at the center of the surrounding rectangle. Sometimes it is drawn outside of the region 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 is drawn at unacceptable position.

Do the following actions to fix the position to 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 rectangular area 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.



Defaults for area data

Define kinds and defaults for each kind. Do “User Data Preferences...” under “User Data” menu. Sequence of kinds in the list affects kind menu sequence of the area creation or update dialog.

New	Create new kind.
Remove	Remove a kind. Kinds used by memos cannot be removed.
Rename	Rename current one.
Up	Move a kind upward.
Down	Move a kind downward.
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 are referred when "defaults" button in the create/update route 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 elevation data exists, it will be copied as each point elevation. Its unit should be meter.

Kind of user data is always "GPX". 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 file name plus serial number in the file. <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 anytime after reading to any kind as normal User Route data.

If track data, each segment is converted to one user route data.

Name attributes is copied to title field of user route data. If no name attributes, title will be file name plus serial number in the file.

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. Refer 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 earth surface area always, extrude option is ignored.

Common items

- User data kind will be set “KMLPlaceMark” always. It will be created automatically if not exist. If it exists, its attributes will be applied.
- Name entry in KML file is set to user data title field. If one Placemark contains many LineStrings or Polygons, all route or area data has same ‘name’.
- Layer of user data is 0 always.
- If altitudeMode is ‘clampToGround’, elevation value will be ‘none’, even other than ‘clampToGround’, if altitude is 0 set to ‘none’ also. For polygons ignore altitude and extrude option.
- Supports KMZ file that has only one KML file. If cannot read, unzip it previously and read it.
- You can change any attributes of read 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 set 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.

Rout 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, 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 is set 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 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 "User Data" 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 type 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.

Font	Select a font using Font panel.
Size	Specify font size between 5 and 256 points.
Style	Specify bold, italic and shadow.attributes.
Letter color	Specify any color for letters.
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, size. If you use 'Font Panel', 'italic' will be cleared.

Example of transparency.

Save / Read user data

You can save all memos, routes or areas (created or read in a session) or data for selected kinds as a file. Do "Save user data" under "File" menu to save them with any name anywhere. File extension are set to "jzmemo", "jzrout" or "jzarea".

Alert dialog will appear when attempt to quit program without saving new or updated user data and “Restoration working set” function is not set to “Always”.

To read user data file, do "Open" under "File" menu. You can double click user data file, or drop them on to application icon to read them. You can read old type data, their extensions are “sd-memo”, “sdrout” and “sdarea” used by previous version.

Saving user data always creates new file, no update. You can make new file has same name as existing file to replace it.

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, name, latitude and longitude. Data sequence 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, name string attributes.
route	kind, layer, line attributes, name and comment string attributes.
area	kind, layer, pattern attributes, name 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 affection to the file on a disk.

Search data

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

Export data

Export User Data currently shown in the table, depending on Data Type,.Kind, Layer and search result. Refer next section.

Find user data on the map

Any user data can be searched by sub-string of title or node comment shown on the map. Found user data (mark or node) are positioned at center of the window.

To search user data, show dialog by "Find..." under "Find&Jump" menu, enter some string to find and click "Find" button. To search next data that has same sub-string, do "Find next" under "Find&Jump" menu.

User data its position is out of the DEM data range can be searched, but cannot do 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 vise 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.

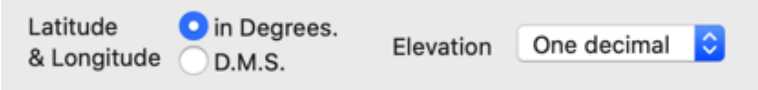
String attributes are not exported nor imported. When importing, if “Kind” is predefined in the User Data Preferences, those predefined attributes are applied. If you want, you can set string attributes by “Change All” function in the Edit User Data dialog.

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



Import

Select “Import User Data...” under the User Data 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

Write out following items, and read them.

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→|35→|51.50000000→|0.00000000→|(n/a)→|Capital of United Kingdom.\nPopulation: 7 millions.

Picture below is screen shot of Numbers.app.

;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.

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 or equal to -19999 meter. If omit this key word, it has no elevation data instead of copy previous data.
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.
- 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=	Select pattern by key word below. frame, translucent, dots, horizontal, vertical, rightUp, rightDown
AreaColor=	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.) AreaColor= (1, 0, 0, 1) ex.) AreaColor= green

Node header line forms

Specify Node_Begin only.

Node line forms

Specify one address entry only.

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, -145.2333333)

Node trailer line forms

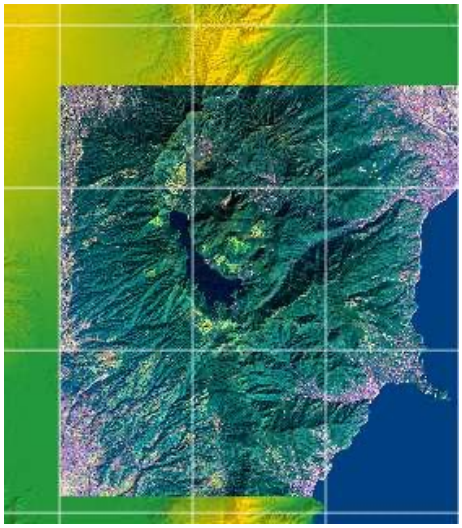
Specify Node_End only.

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 pictures 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 any projection maps. Targets are satellite images such as Landsat, aerial photographs, land use maps, topographic maps and others. The picture at right uses a Landsat image.

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

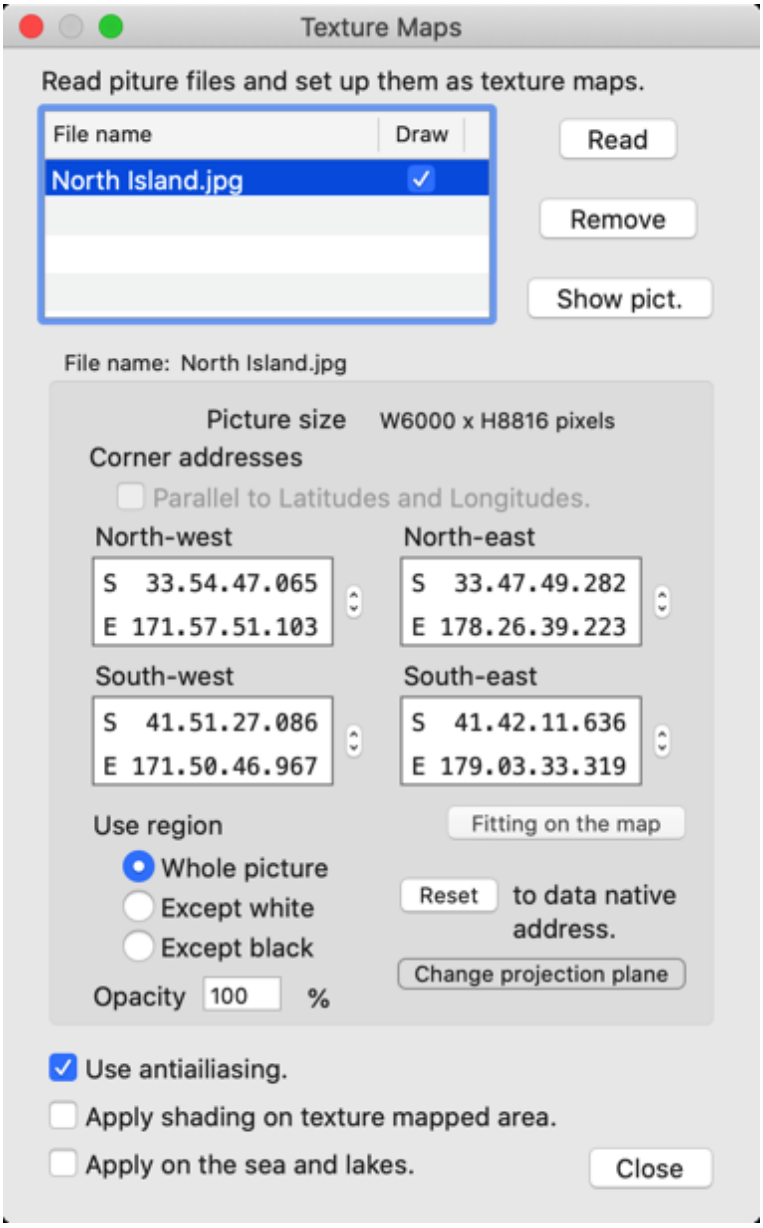
- Read any picture file to use as texture.
- Remove those pictures.
- Define addresses of four corners.
- Set transparency.

If read picture is GeoTiff, created by LSMixer3, world file 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.

(Note : LSMixer3 is included in SimpleDEMViewer 3.9.5 package)

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

Read

- Click to read a picture file to use as a texture.

Remove

- Remove selected file from texture list.

Show Pict

- Show picture of selected texture in a separate window temporarily.

Corner addresses

- If a texture is selected in the texture table, its contents are shown here.
- Only north-west and south-east corners can be set when the check box "Bounds by Latitude and Longitude" is checked.
- Specify Latitude and Longitude even if the picture has UTM addresses.
- You cannot define the texture range that contains south pole or north pole inside.

Parallel to Latitudes and Longitudes

- Check if bounds are parallel to each axes to faster drawing. If the texture has UTM or other plane address, cannot check this.

Use region

- Specify texture is full opaque or having transparent portion.

- Check "Except white" if the texture is topographic map with white background.
- Check "Except black" if the Landsat picture has black boundaries.

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

- Show picture on the Map View and place it to appropriate position.
- You can drag whole or each corner, extend or shrink whole picture.

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

- Check to use antialiasing for every texture mapping.

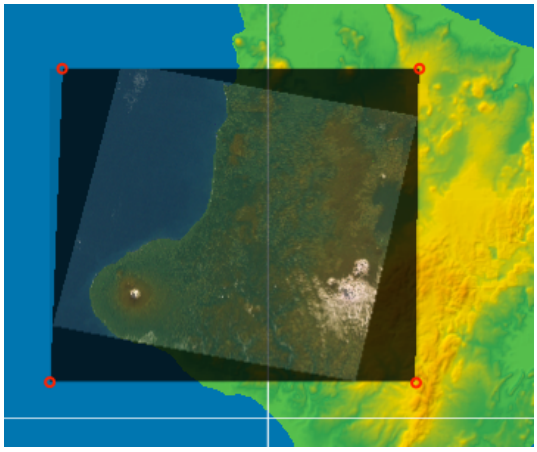
Apply texture on the sea and lakes

- Check to apply texture mapping on the sea and lake surface.

Apply shading

- Specify do or not do shading on the textured portion. Sometimes it is better not do shading if the texture has shade natively such as Landsat picture or aero-photographs.

Fitting on the Map View



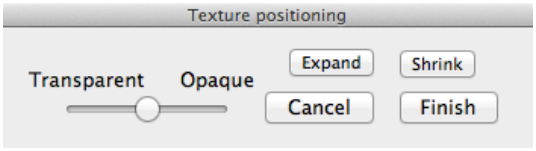
If you feel it difficult to enter four addresses directly, you can show texture on the map temporarily and place it correct position by dragging.

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.

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 clear the position.
- Transparent portion of the texture is drawn as translucent black.

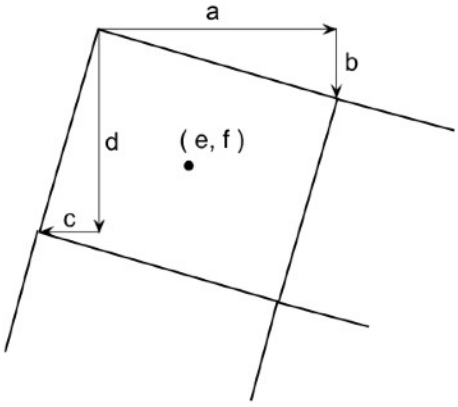
Cancel

- Cancel the positioning operation.

Done

- Quit positioning operation and use result.

World file



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

Line 1. (a) : Horizontal offset to right pixel.

Line 2. (b) : Vertical offset to right pixel.

Line 3. (c) : Horizontal offset to below pixel.

Line 4. (d) : Vertical offset to below pixel.

Line 5. (e) : Horizontal coordinate at the center of the top left pixel.

Line 6. (f) : Vertical coordinate at the center of the top left pixel.

'a' has plus value always.

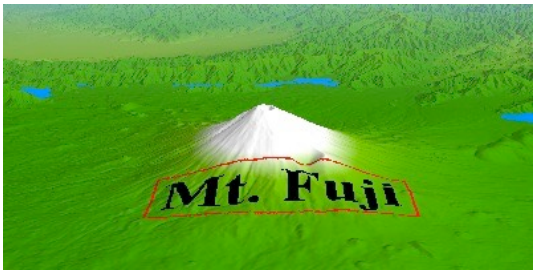
'b' and 'c' have minus value when slope down to right as this picture, plus value when down to left. Both are zero when picture is parallel to the axes.

'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 picture of letters with white background and red frame. Specifying white is transparent, and applied it to panorama view. 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 with jpeg format.



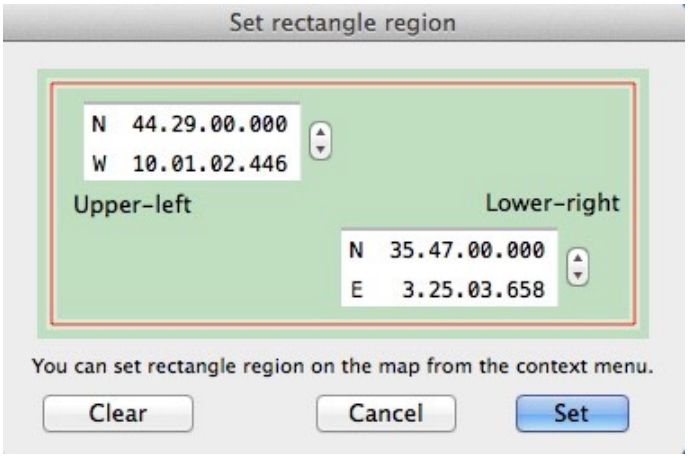
Notes

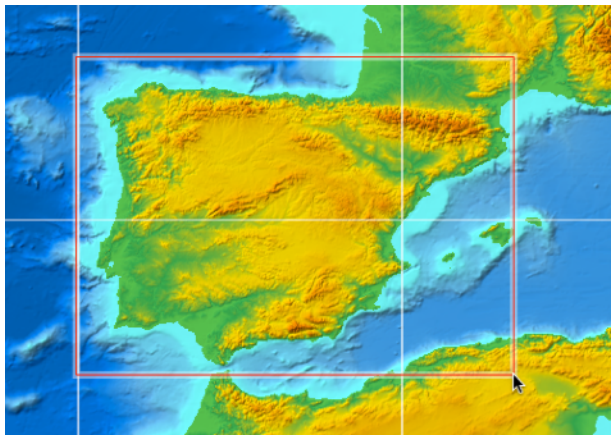
- Always specify addresses by Latitude and Longitude even if its native address is UTM or other planes.
- Alert will be display and cannot quit the dialog if you have not set addresses for all textures. If you cannot set them, remove them, or set temporary addresses using fitting-on-the-map function.
- 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. Select Rectangle Region

Any rectangle region on the Map View can be specified for making bird's-eye views, stereographs, and saving map picture, or set range to search highest or lowest elevations.

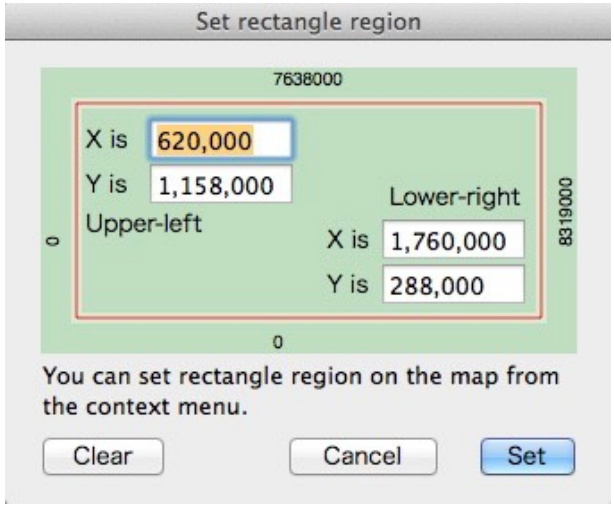
- Select "Select rectangle region..." from the context menu on the map, and move mouse cursor to make rectangle and click to define it.
- You can drag the frame of selected rectangle on the Map View to adjust it.
- You can specify rectangle region with longitude and latitude. Go "Rectangle region..." 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 address DEMs. All values are set in meters.

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



19. Copy / Paste Latitude and Longitude

You can copy and paste latitude and longitude as a text string during address control is focused in "Jump to address" dialog, "Memo" dialog and other dialogs. You can copy address on the Map View at mouse point, use context menu to copy. You can select copied text format from proprietary format and two floating numbers in Preferences.
Those text 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
```

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 numbers

```
±dd.dddd ±ddd.ddd
```

+ sign can be omitted. Latitude first.

ex)

```
38.33333 141.0123333
+42  142.666666
-65.3333    -23.456666
```

Two floating 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 first.

```
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 letter case. Control characters 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, decide 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" 経度131°34'05.0"

東経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 pointed in the Map View on Apple's "Maps" or "Google map" on safari. Internet connection is required.

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

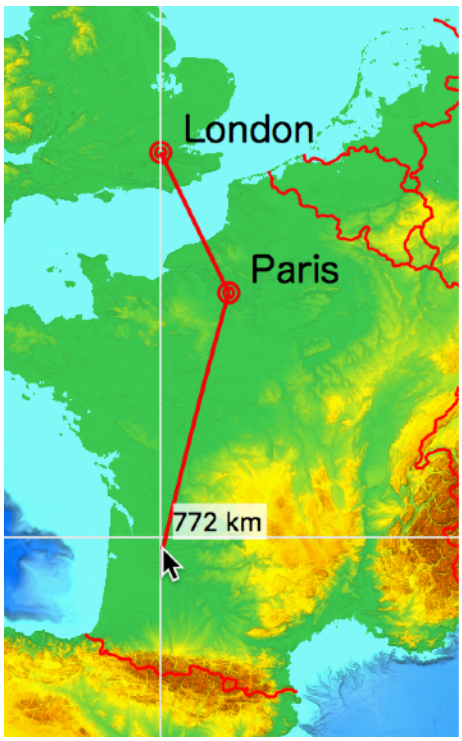
Show by "Maps"

Activates Maps if not activated, and set center to the place, and shows a pin icon there. Set appropriate scale depends on scale of SimpleDEMViewer.

Show by Google map

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

21. Measuring Milage



You can measure milage between two place along any route on the map.

To begin measuring, position mouse to start point on the map. Show context menu and select "Measure milage". Then a red line drawn from start point to mouse cursor and show milage near 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 address will be used instead of mouse position. You can cancel last node by Esc key.

22. Find Highest or Lowest Elevation

Find highest or lowest elevation point among the read DEMs. You can select search range from "Rectangle region", "Window region", or "Whole data". Result are shown in a small information window and a red-round-arrow on the Map View. You can copy address and elevation value as a text string from the information window.
Result elevation is raw value in the DEM file, not interpolated one.

Operation

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

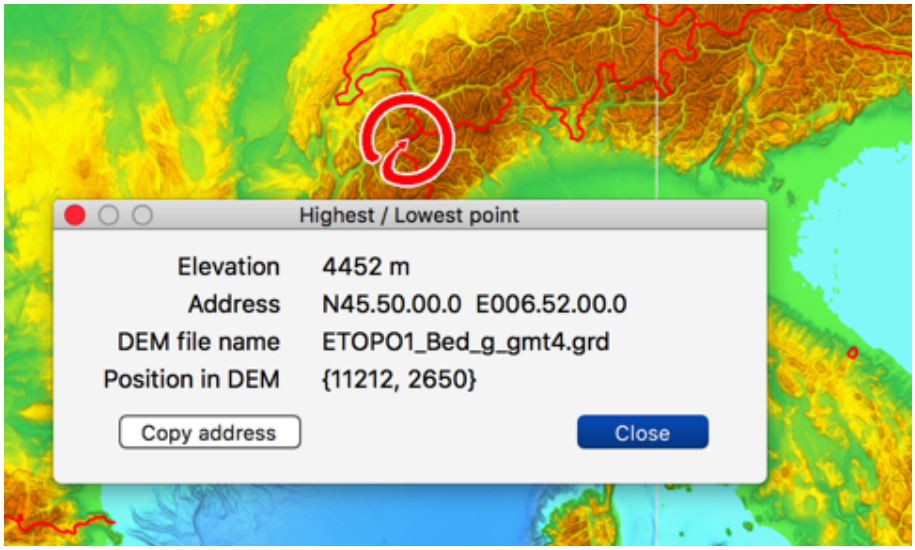
If the point is out side of the window, map will be redrawn, so that the point sits in the center.

Results

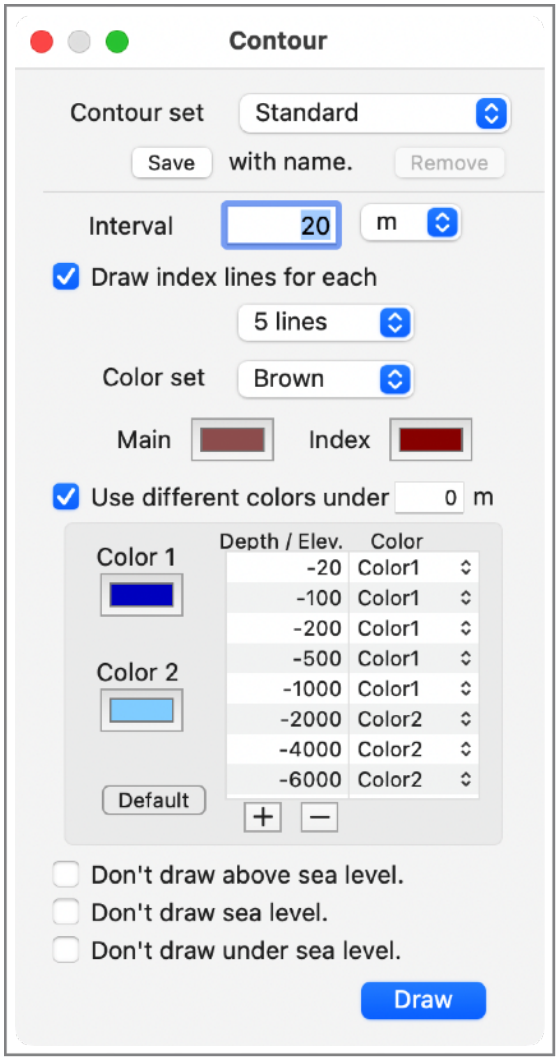
Elevation	Shows raw value in the DEM in meters.
Address	Shows Latitude and Longitude. If there are many same elevation points, address of first found point will be set. If the DEM has no address, will be blank.
DEM file name	DEM file name includes the point.
Position in DEM	XY coordinate in the DEM file. 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. DMS or DD format depends on setting in Preferences.

	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 in the Map View with or without index lines. You can select interval and its colors. Contour lines are drawn on the map once when you click the "Draw" button, and disappear when map is redrawn or scrolled.

With retina screen, and with specifying double density for drawing Map View, contour width will be half, and takes four times longer.

You can draw contour lines on the saved Map View pictures and projection maps. In those cases, contour settings are the same as for Map View.

Contour on the Map View is drawn as dot by dot always, but you can select line mode for saving Map View pictures and projection maps, 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. In the dialog, you can specify followings and draw contour lines.

Contour set — Load saved contour settings with name in the menu.

[Save] with name. — Save settings in the dialog with name. Its name will be listed in the menu.

Remove — Remove contour set showed in above menu. You cannot remove Standard set.

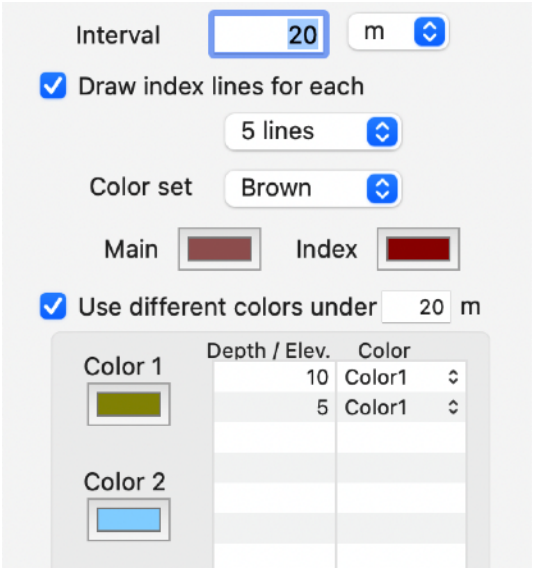
Interval — Enter any value directly in meters or feet. Minimum is 1 m or 1 ft.

Draw index lines for each — Check and select index pitch to draw index lines.

Color set — Select color set for normal and index lines.

Normal, Index — Color for normal and Index lines. Click color box to change them individually.

Use different colors for under [0] m. — Check 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 each elevation up to 1000 meter.



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

Depth / Elev. — Depth or elevation for each line in meters or feet. Unit is the same as one for interval.

Color — Color for each line. Select from Color1, Color2, Normal or Index color.

[+] [-] — Add or remove a line.

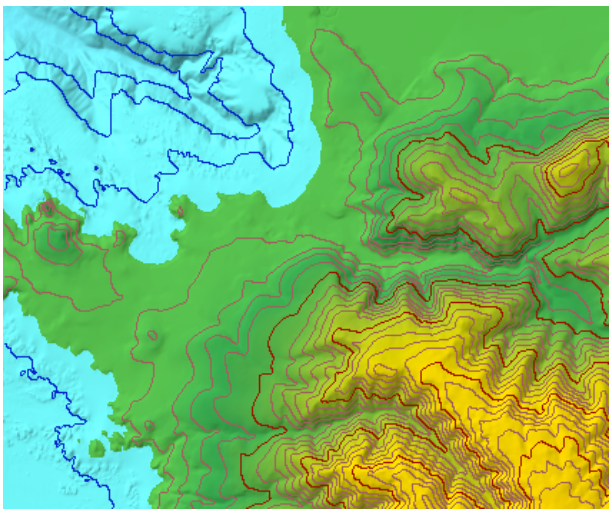
Default button — Reset all settings for "Use different colors" to default.

Don't draw above sea level.
: Check if you do not want contour lines on the land.

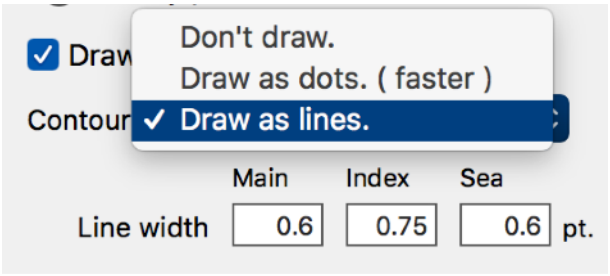
Don't draw sea level.
: Check if you want no lines on seashore. Inland contour of 0 meter also disappear.

Don't draw under sea level.
: Check if you do not want contour lines under sea level.

Draw button
: Click to draw contour on the Map View.



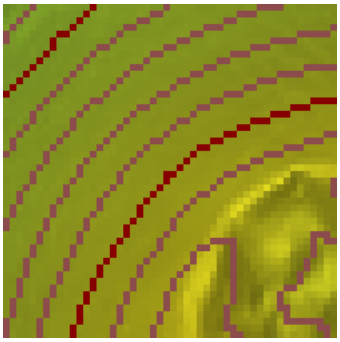
Line mode

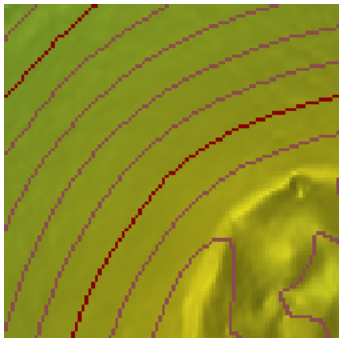


You can select line mode when saving Map View picture and creating projection maps in each dialog. In line mode, you can specify line width for main lines, index lines and sea depth lines each. Other settings are the same as ones to the Map View. If line color is Main or Index for depth lines, Main or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

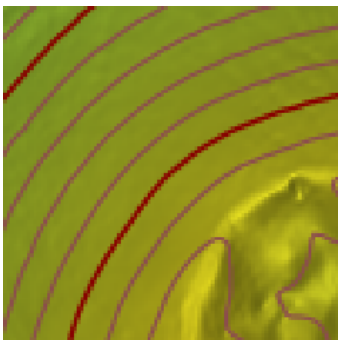
Following pictures show results of various settings and extended using graphic software. First three pictures are saved as PNG and last one as PDF. All line width and color settings are default value.

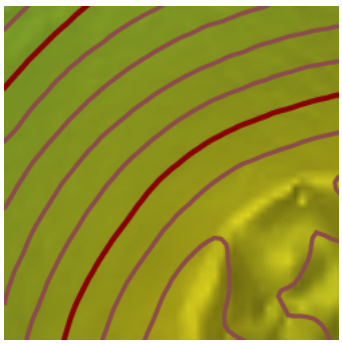
First one is drawn in dot mode and 72 dpi. Second one is drawn in dot mode and 144 dpi.





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

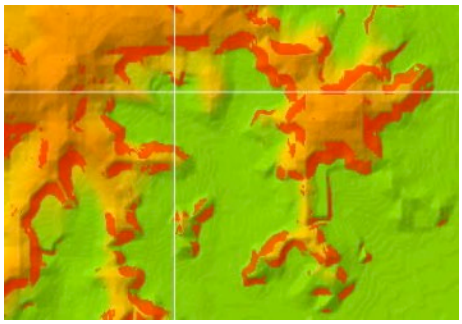




Notes

- Draw button does not erase previous drawing, so that if you changed the interval, you should erase previous contour lines by refreshing Map View.
- For saving pictures and projection maps, last settings to draw on the Map View will be used.

24. Coloring According to Slope Degree



Draw map with colors according to slope steepness. You can specify seven steepness grade and colors to them.

Colors drawn by this function will disappear when the map is redrawn. The result can be saved as picture files if the map is saved with window range.
In the right picture, red part shows steep slope over 30 degrees.

Settings

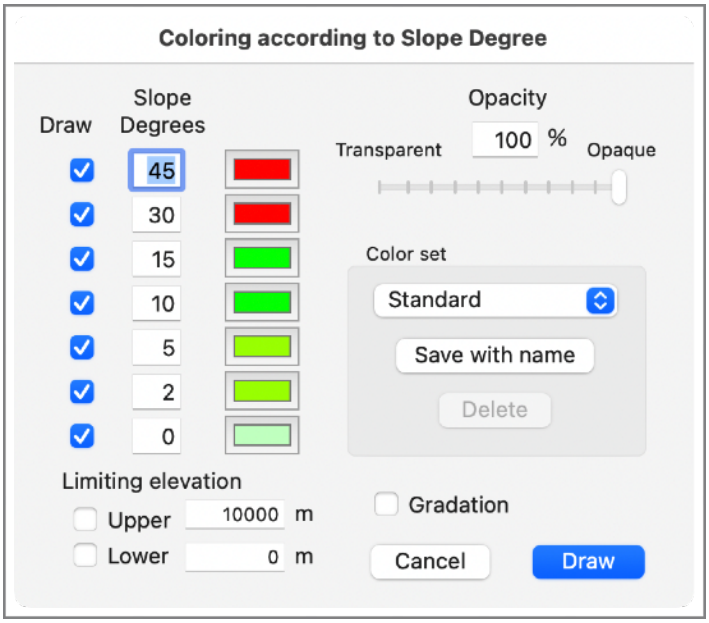
Select "Slope Degree..." under the "Tools" menu to show the dialog. You can specify degrees, colors and which part to draw. Click draw button after setting those.

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.

Because slope colors override current map without refresh, you need to refresh the map before redrawing slope colors usually.

Notes

- If you want to save map picture with coloring by this function, specify it in the Save Map dialog. Before showing save map dialog, set this function's dialog and check result.

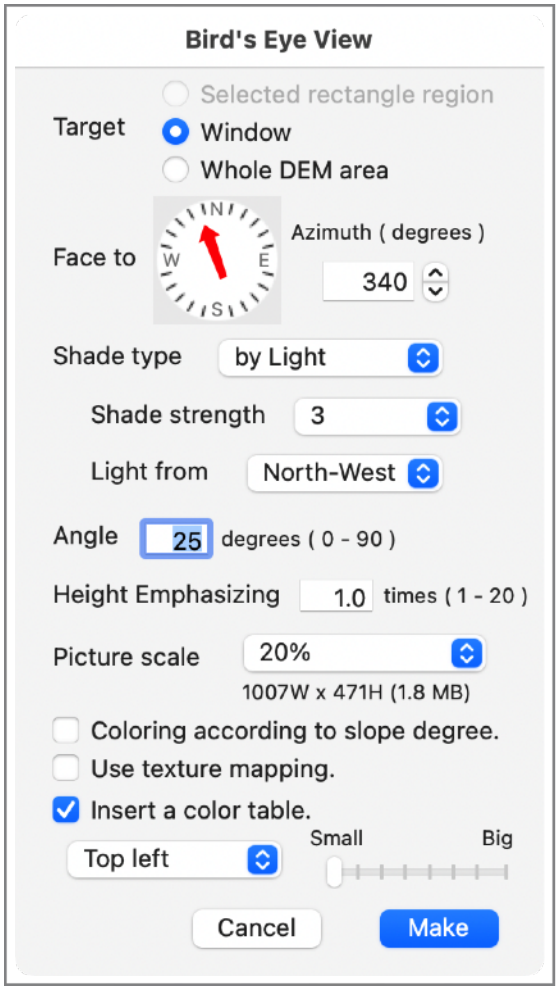


25. Bird's Eye View

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 picture.

Settings

Show dialog by selecting "Bird's eye view..." under "Tools" menu.



Target area

- There are three options. They are 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 at 180 degree. If data exist both side of meridian 180 degree, the rectangle goes around the earth.
- When DEMs without address info are used, window range doesn't cover 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 as same 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.

Angle of depression

- Specify depression angle 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

- Check to use texture mapping. Settings for the Map View are applied.

Insert a color table

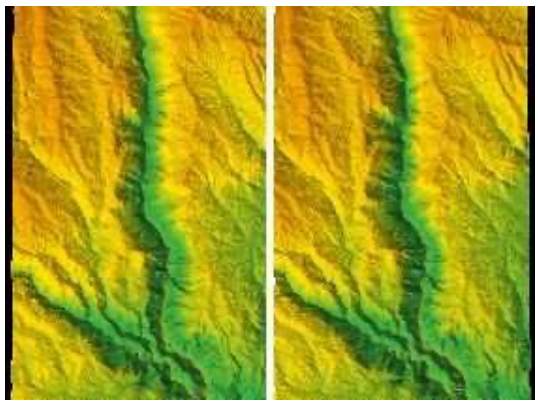
- Insert a color table into the picture. Select position and size.

Add strings in the picture

You can add any one line text on the picture. Click on the picture with control key pressed, and select context menu "add string". In a dialog you can enter string and its attributes.

26. Stereographs

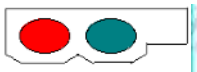
Stereograph



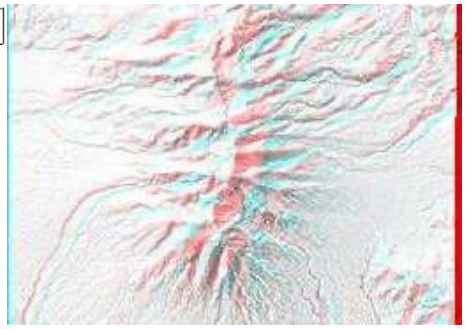
This function makes a pair of pictures in a window to see 3D image. There are three types, parallel, cross-eyed and anaglyph.

Parallel and cross-eye

- Two pictures are slightly different perspectives of same area. In parallel mode, left eye looks at left picture and right eye at right picture. In cross-eye, left eye looks at right picture, and right eye at left one.
- Picture can be full colored, but rather small picture size. Some skill is required to look as 3D.

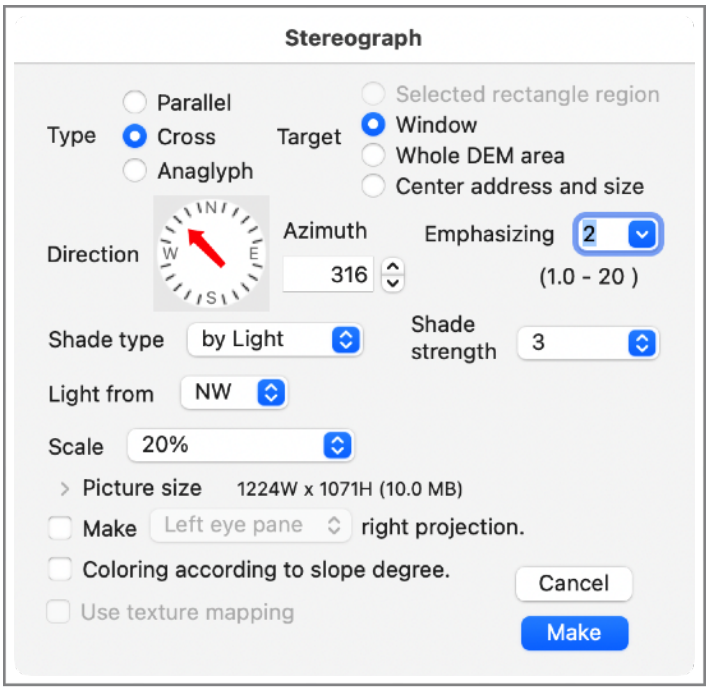


Anaglyph



- Red color from picture for right eye, green and blue from picture for left eye compose an anaglyph picture.
- It's mandatory to see terrain 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 “Tools” menu, or select "Create stereograph...".from the popup 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 popup menu, last one is selected.
- If whole data is selected, Minimum rectangle that includes whole data is assumed. This rectangle does not lay over meridian at 180 degree. If data exist both side of meridian 180 degree, the rectangle goes around the earth.
- When DEMs without address info are used, window range does not cover 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 as same 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.

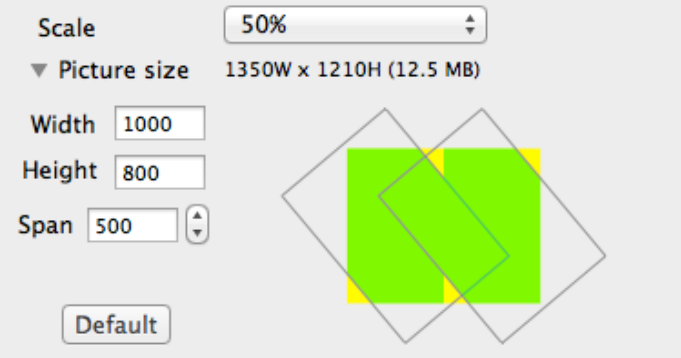
Height emphasizing

- Specify values between 1.0 and 20.0. 1.0 is similar to actual image, but it is difficult to recognize terrain unless ups and downs are significant. If too much emphasizing applied to mountainous area, getting difficult to recognize its image.

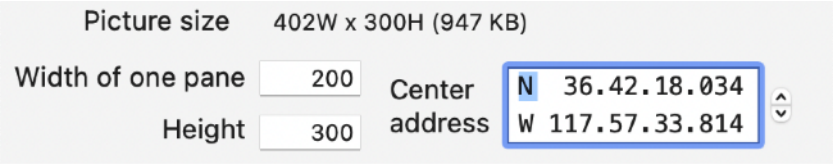
Scale

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

Picture size

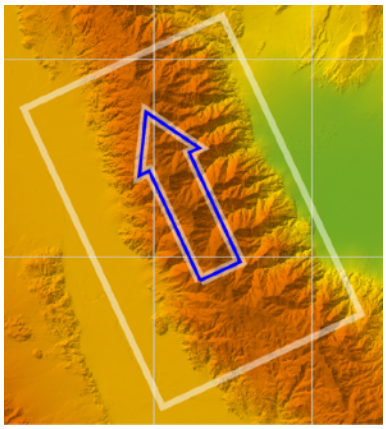


- Although default picture size is defined by target area size, direction and scale rate, you can set final picture size and distance of two pane in pixels for parallel and cross. No size option for anaglyph.
- Click triangle aside the string “Picture size” to show layout and input fields.
- Enter width 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 are drawn in each green part.
- Default button reset width, height and span to defaults.
- If layout is hidden, changing type, target range, direction or emphasizing resets to defaults always.
- Maximum picture width and height are 65,500 pixels each.



Center address

- If Center address and size is selected as target, specify width and height for one pane and center address.
- If activated by popup 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 projection

- Make one of two panes right projection to determine accurate address in the picture for processing later.
- 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

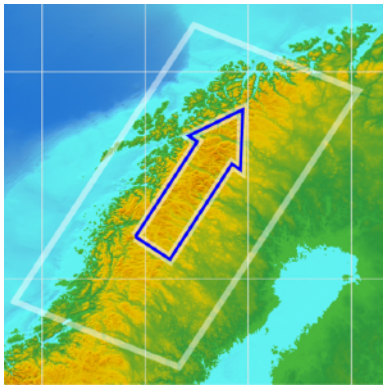
- Check to use texture mapping. Settings for the Map View are applied.

Add strings on the picture

- You can add any one line text on the picture. Click on the picture with control key pressed, and select context menu “Add string”. In a dialog you can enter string and its attributes.
- Added strings have no stereo effect.

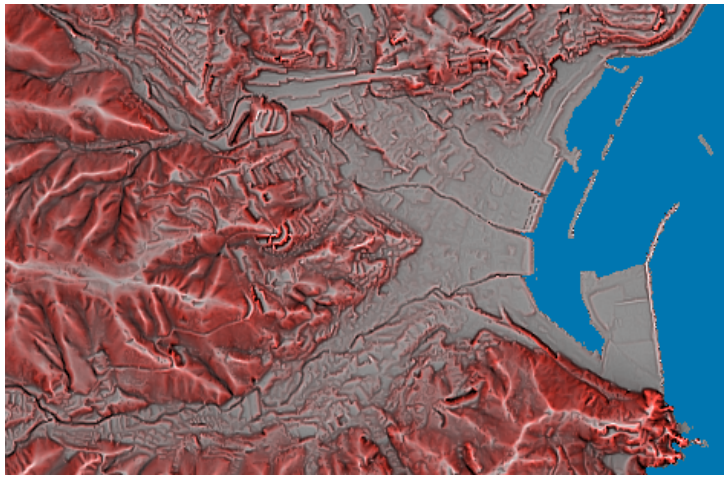
Notes

- 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.
- Anaglyph is composed of red component from right eye picture and green and blue component from left eye picture. Because of that, all white elevation color is preferable.
- Direction arrow on the Map View 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 DEM is geo-referenced and direction is not right angle. Distortion is larger when its position is far from base latitude.



27. SRVC Relief Map

What is SRVC Relief Map



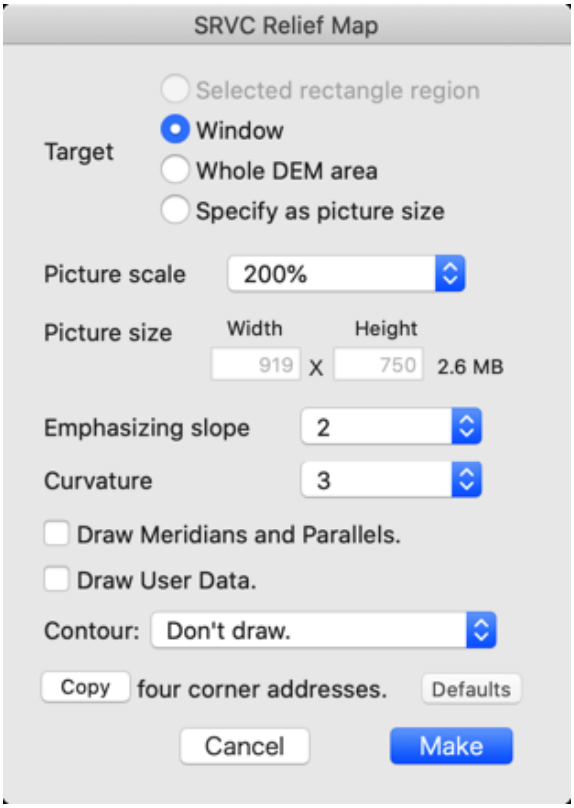
New relief map formed with slope degrees, ridge-valley degrees and surface curvature. It is independent from light direction as normal shading relief map. Furthermore, it is easy to capture landscape image without any tools nor skills like as stereographs.

"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. Draw it as plane land.
- Picture 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, picture 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 the Tool menu.



Target — There are four options. They are 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 DEMs without address info are used, window range doesn't cover outside of the whole data range.

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

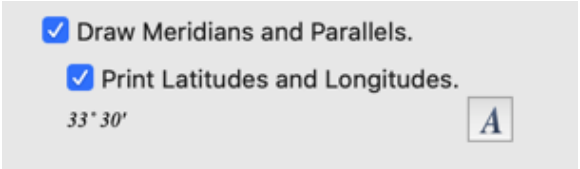
Picture size — Determined by target type and scale. If target type is the last one, you can specify width and height freely. Both should be less than or equal to 65500 dots.

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 pictures on next page.

Draw Meridians and Parallels.



Check 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

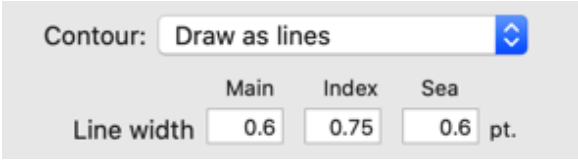
Add latitude and longitude values to each line.
To change font, click [A] button at right. You can change font, size and color.

Draw User Data — Check 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.

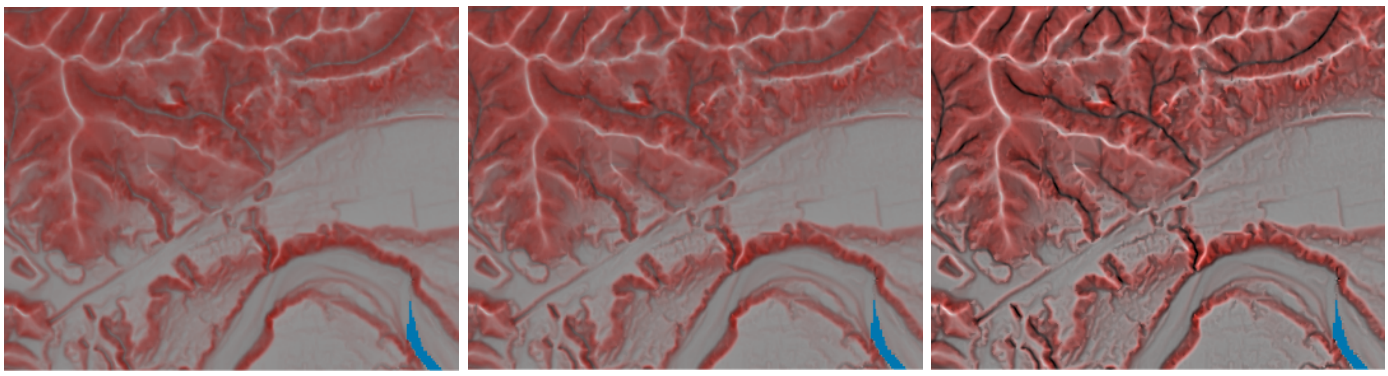
Add strings in the picture

You can add any one line text on the picture. click on the picture with control key pressed, and select context menu “add string”. In the dialog you can enter a string and its attributes.

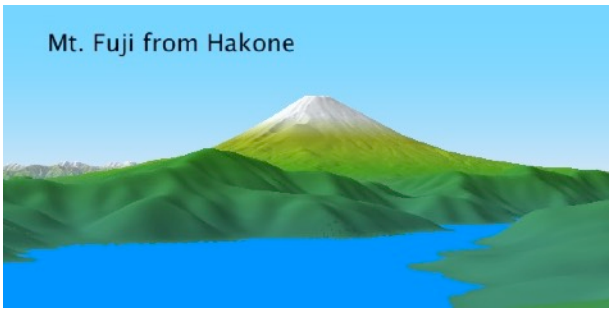
Sample pictures

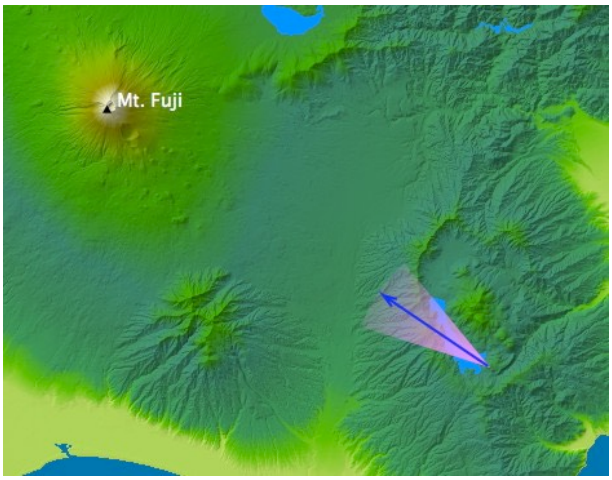
Emphasizing slope value is 3

Curvature value is 1 | Curvature value is 3 | Curvature value is 5



28. 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 picture 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 instead of eye direction and elevation angle. If user data exist, you can set the target to any user data string point.

Memo data strings, route data lines and strings can be drawn on the panorama picture, but no memo mark. Route is always drawn as normal line, line type and width are ignored.

Shading is the same as it of the Map View, no shadow of mountains. Although you can draw the sun(s) at the time at the eye point, 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) is drawing 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 the elevation angle.

Creation

There are tow ways to start creating panorama view as follows. Panorama view start drawing after you fix dialog settings and click “Draw” button. A window appears and the panorama will be drawn left to right with scrolling if needed.

Start from context menu

At some point on the Map View you want to view from there, show context menu and select “Create Panorama View”. An arrow and pink colored sector will appear toward mouse cursor. Move cursor toward target point, angle of the sector changes depends on cursor distance from eye point. Arrow direction is eye direction and angle of the sector 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 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 Tools menu

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

Cancel during drawing

Drawing panorama may take very long time depends on settings, if you want to cancel it, click close button of the window.

Settings

Eye point

Eye point 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 addressed surface.

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.

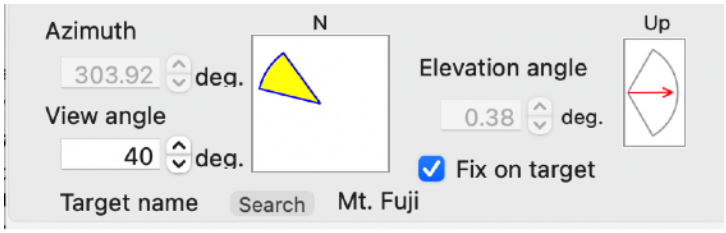
Even if elevation of string data is set originally, it will be changed as address changed. If address return to original, original elevation will be restored.

Above surface / Above sea

"Above surface" means final eye elevation is "Elevation at surface" plus 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 here when this dialog started by context menu activated on a string in the Map View. 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.

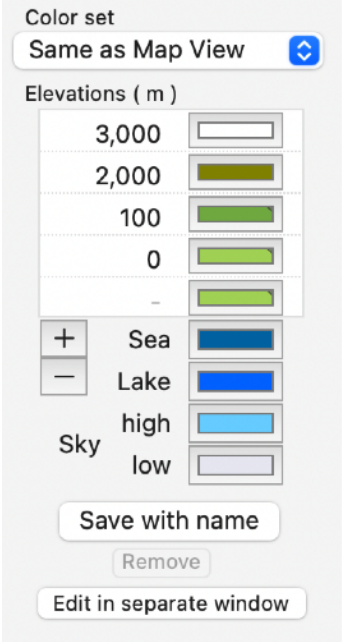
View angle — View width in degrees. Between 0.1 and 360. 360 degrees means all around eye point, and panorama view can scroll through.
View angle limited to 120 degrees if stereograph is set or "Elevation angle" lower than -45 degrees or higher than 45 degrees.

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 here when target specified previously by context menu on a string in the map. 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 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.

Boundary elevations — Specify in meters and descending order.

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

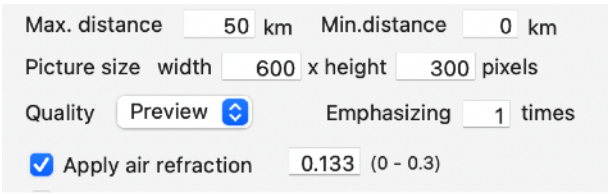
Sky color — Specify color at top and color at horizon. Between them filled with gradation color. Actual colors depends on eye point elevation and haze effect settings. If haze effect is stronger, every colors anywhere converges toward sky bottom color.

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 — Although you can edit color set here, you can use separate window to edit color set. Refer "Edit Color Set".

Other settings



Max. distance — The scene calculated up to this distance. Land farther than this distance is 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.

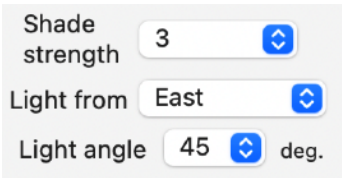
Min. distance — The scene is calculated farther than this distance. Land closer than this distance is drawn as sea. 0 km is treated as 2 meters.

Picture size (Width x Height pixels) — Width and height each should be less than or equal to 65500 pixels.

Quality — Trade off between speed and quality. Usually “Normal” is enough for quality and speed. Use “Preview” to check composition if normal drawing takes longer time. Use “Fine” if result is bad quality, for small pitch DEMs or 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.

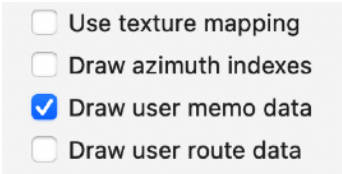
Apply air refraction — Distant mountains looks higher because of light refraction in the air. The default value 0.133 is at the sea level of standard atmosphere. Although the value differ depends on altitude, there is no much difference in scene. There is much difference depends on local weather conditions, 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 get deeper. Default is 3.
- Light from — Select one from 8 direction menu. Default is east.
- Light angle — Select elevation angle (angle of incidence) by menu between 10, 30, 45, 60 degrees. Default is 45 degrees.

Use texture mapping — Check if you want to apply texture mapping if exist. Settings are the same as the Map View.



Draw azimuth indexes — Draw azimuth index markers and azimuth numbers 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

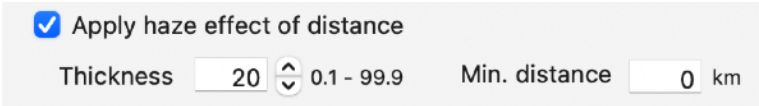
Check if you want to draw user memo title string on the scene if exist and visible. All settings are the same as those of the Map View, except.no mark drawn and string drawn vertically. String attributes can be change on a picture. Refer following sections.

Draw user route data

Check if you want to draw user route on the scene if exist and is 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.

Apply haze effect of distance

Because of haze effect, distant mountains getting dim.



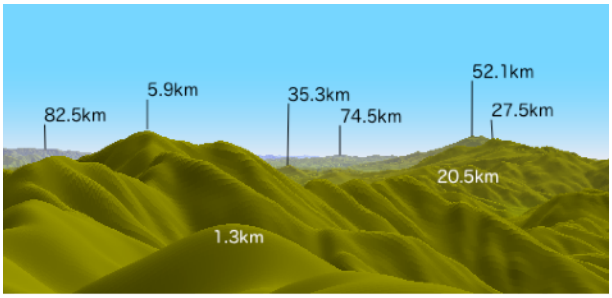
- Thickness

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

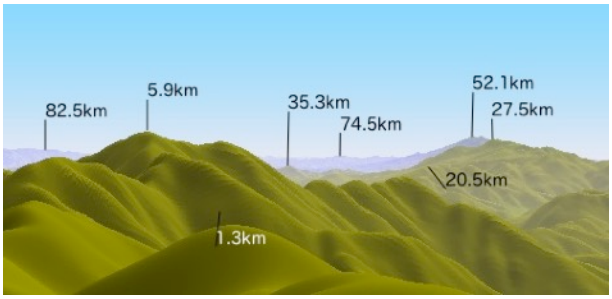
- Minimum distance

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

Haze effect is 20

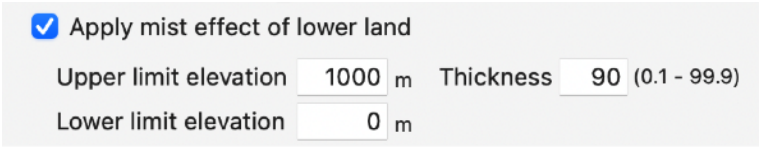


Haze effect is 30



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 for this elevation, and lower elevation getting more dense towards lower limit elevation.

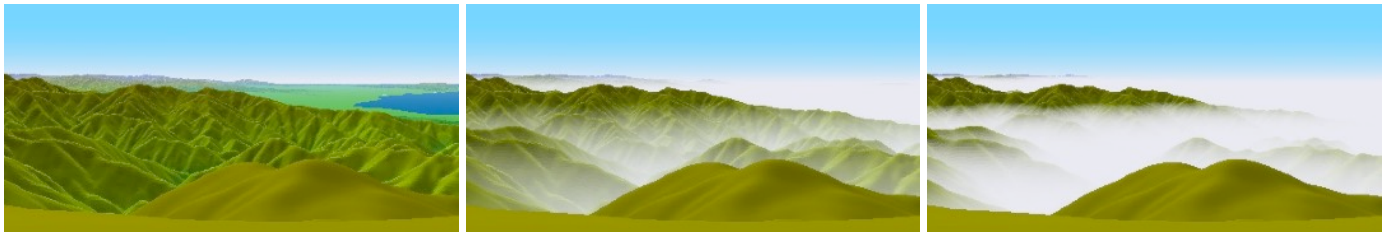
- Lower limit elevation this

Land lower than this elevation is drawn with sky color at horizon, so that if lower limit is 0 meter sea is drawn as horizon 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 getting towards sky (bottom) color as number becomes larger.

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

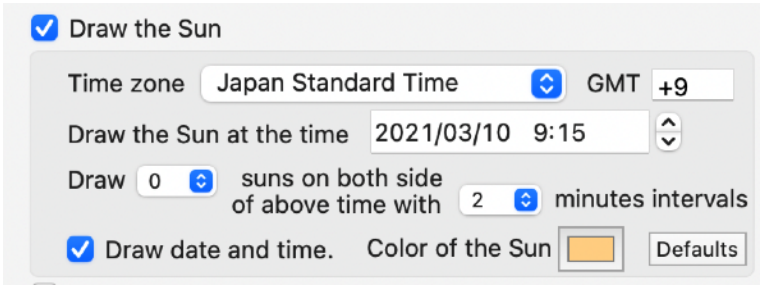


No effect | Density is 90 | Density is 98

Draw Sun

Draw the Sun or suns at specified date and time at the eye point. Refer “Draw Sun” section below. This option is not available on planet DEMs.

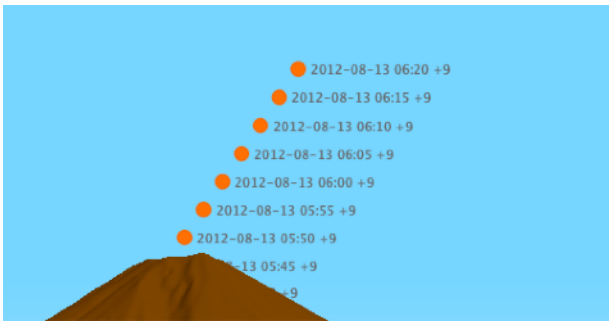
Draw Sun



You can draw a sun or suns at the time you specify between 1 Jan. 1990 and 31 Dec. 2099.

Time zone — Menu list up time zones near the eye point Greenwich Mean Time and your mac's system time zone. 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.

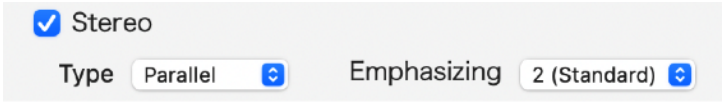
Draw date and time
Check to draw date and time next to suns on the picture

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

This program treat the Earth as a sphere, so that between sun position and landscape has some error. Margin of error 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.

Stereograph

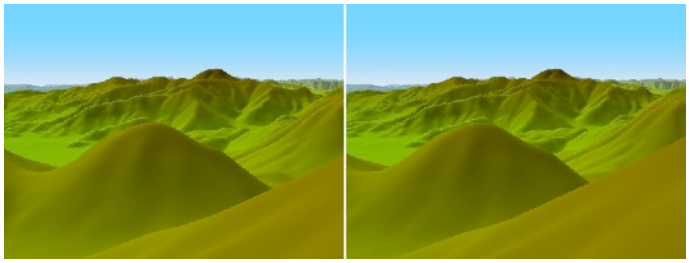


Create two panorama view from both side of specified eye point, one is for left eye, another is for right. Larger emphasizing makes distance between left and right eye point longer, then eye point may go underground if specified point is in a narrow valley. In such a case add some to elevation or cut near scene by set some value to "Minimum distance" other than zero.

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. Default is 2.

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 checked, 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 or 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 is for 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 substring in the “Name” column text. Table shows only the data those have substring typed here.

Handling after completion

Scrolling

Supports mouse wheel scrolling, drag scrolling, scroll gesture on track pad,

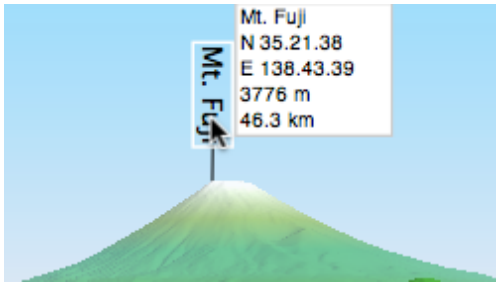
If view angle is 360 degrees, you can rotate picture horizontally.

Auto scrolling

Panorama view can scroll automatically if picture width is greater than or equal to 3000.

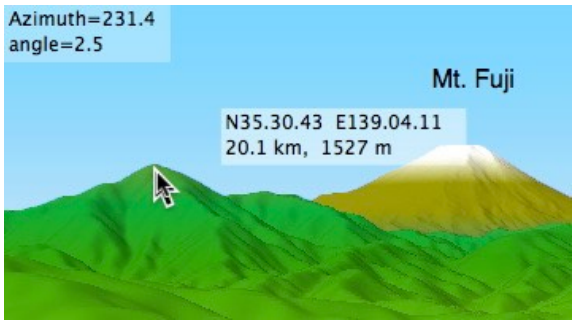
Pressing left or right arrow key start scrolling. More key down makes speed up or down, or change scrolling direction. If view is not 360 degrees, scrolling direction will change at both side. Space bar stops autoscrolling.

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 Preferences.



If you move mouse on the landscape with ctrl-key or option-key pressing, information of the place appears near the mouse cursor.

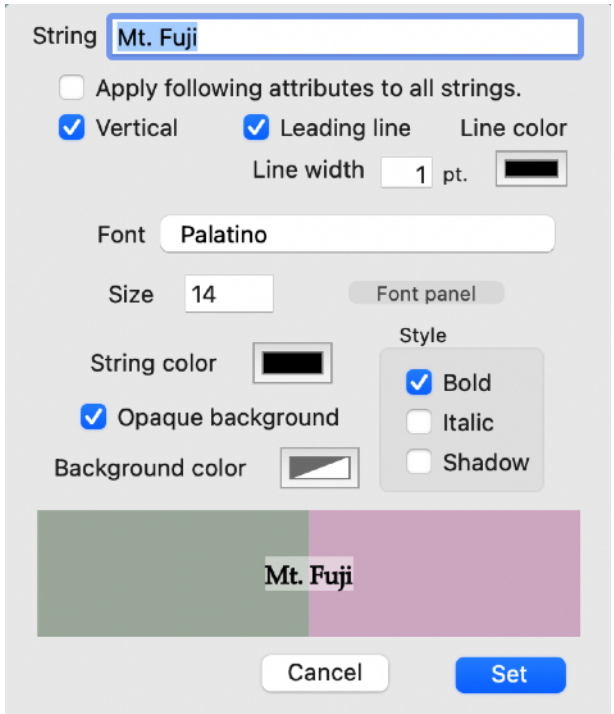
First and last information will disappear in six seconds if mouse doesn’t move. Just click somewhere on the picture to clear those information immediately.

Handling strings

You can move strings by drag them, and remove them by dragging them out of the window.

You can change attributes of any string on the picture. 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 picture . Select “Add string...” from context menu. It has address if added on landscape, no address on the sky.



String dialog

(Text field)	Original string is set. You can change to any string.
Apply following attributes to all strings	Check to apply attributes to all string on the picture.
Vertical	String is written vertically if checked, 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	Showing font name. Click “Font panel” button to change.
Size	Showing font size. Enter directly or use font panel to change.
Font panel	Click to show font panel.
String color	Click color box to set any color.
Opaque background	Back ground of the string has opaque if checked.
Back ground color	Click color box to set any color.
Style	Specify bold or not and italic or not.

You can use 'Font Panel' to specify font, size, style, Letter color. If you use 'Font Panel', 'italic' will be cleared.

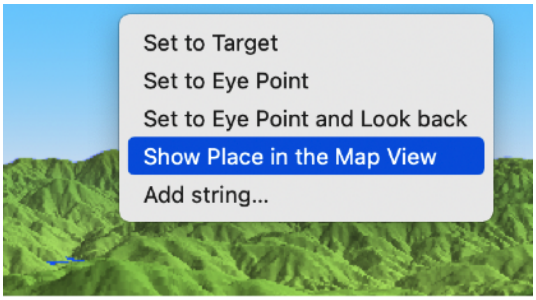
Set eye or target point from picture

Set new target or eye point from context menu.

Set to Target	Set the place where context menu start to target.
Set to Eye Point	Set the place where context menu start to eye point and show Panorama View creation dialog.
Set to Eye Point and Look back	Set the place where context menu start to eye point, current eye point to target and show Panorama View creation dialog.

Reposition map from a point of picture

Reposition the Map View as its center is some place of the picture. Show context menu at anywhere on the landscape, select “Show Place in the Map View”.



Show info

Select “Show info” under the File menu to show setting information. A sheet 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 some panorama view to a file, to refer later or to pass 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 ‘sdpano’.

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 setting file, or drop it on to application icon or main window to show panorama dialog.

Notes

- No DEM area is drawn as sea except using planet DEM.
- To check visibility of string, program uses elevation belong to it. If it is lower than calculated elevation from DEMs, uses calculated one. If the string has no elevation, calculated one is used.
- When result picture is saved as jpeg or tiff file, GPS information will be attached. They are Eye point address, elevation and azimuth.
- Antialiasing is applied to the sky lines automatically except preview mode.

29. 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 as a plane in landscape.
- Boat mode. Cruise by boat on the sea or a lake.

The movie window may not show landscape normally depending on your Mac. If your Mac's power is not enough to treat large data, try smaller data.

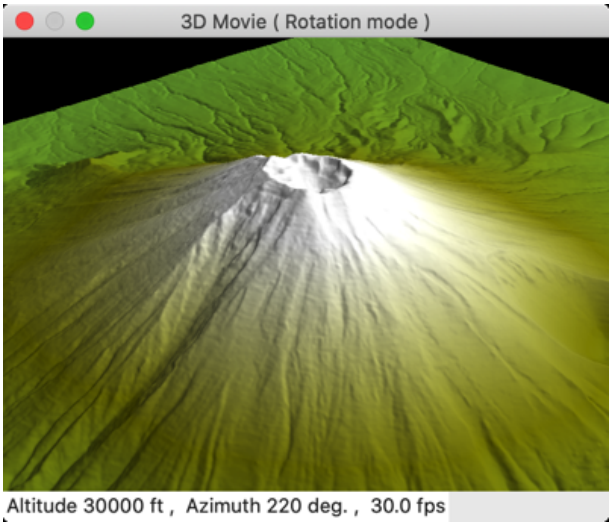
Functions

Common

- Start OpenGL view 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 later during playing.
- Maximum viewable distance is determined by DEM data pitch automatically.
- Can display eye altitude in a movie window. (Mac OS X 10.10 or newer.)
- Can display speed in a movie window except rotation mode. (Mac OS X 10.10 or newer.)
- 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).

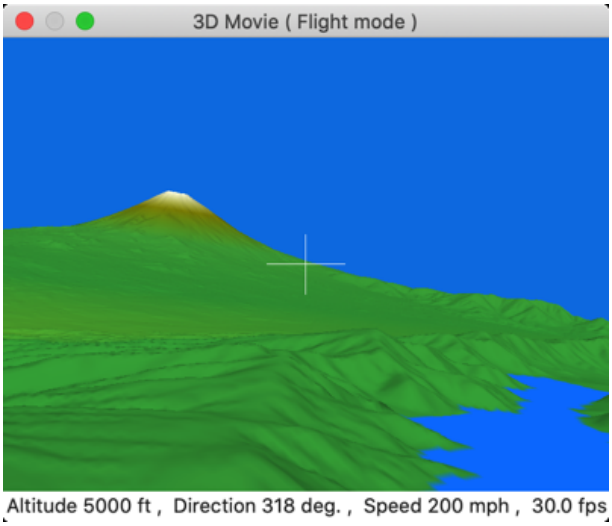
Rotation mode

- 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 include bank, this is not a flight simulator, 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.

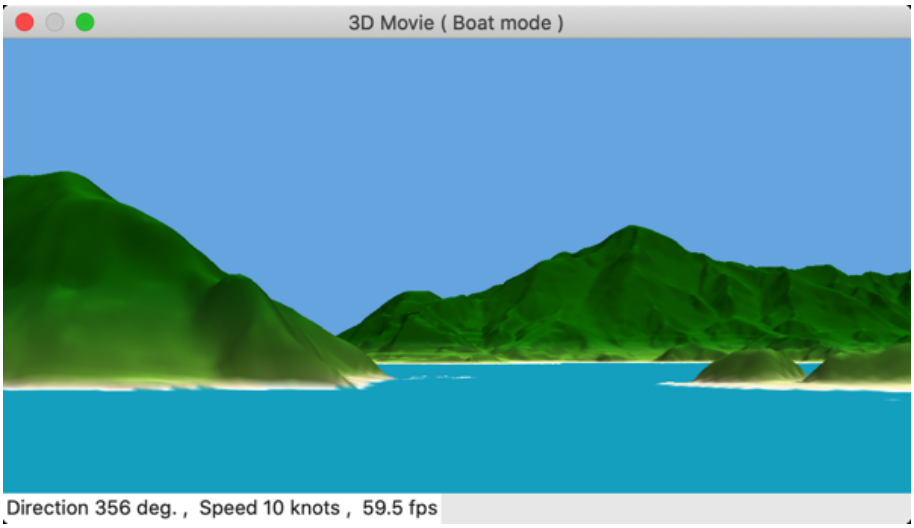


Boat mode

Differences from flight mode are follows.

- Altitude is fixed to start up setting.
- No bank during turn.
- Eye elevation can be specified between 0 and 20 degrees, and can change it during playing.
- No under front view.

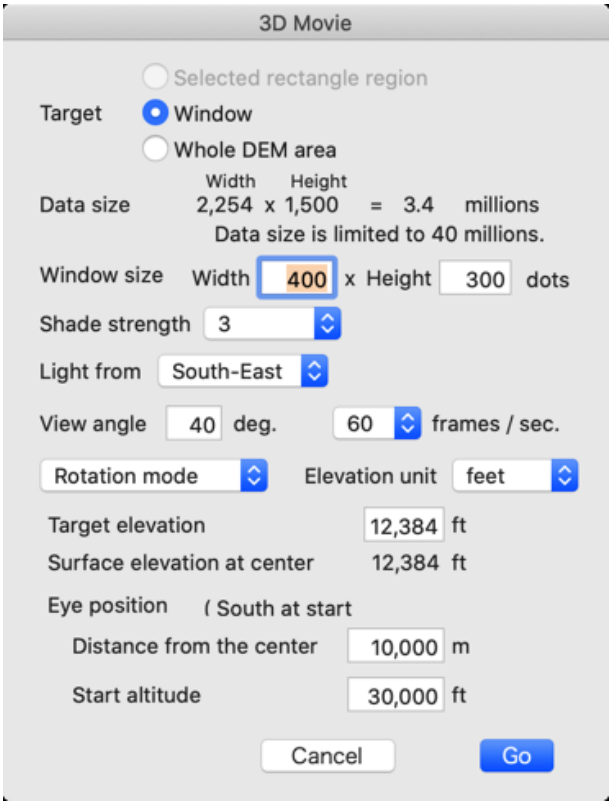
Activate boat mode on the flat surface, sea or lake.



Dialog

To display start up dialog, select “Start 3D movie...” under the Tools menu. If you start using context menu on the Map View, the dialog shows flight mode or boat mode, although you can select rotation mode.

All elevations and altitudes are based on sea level.



Common

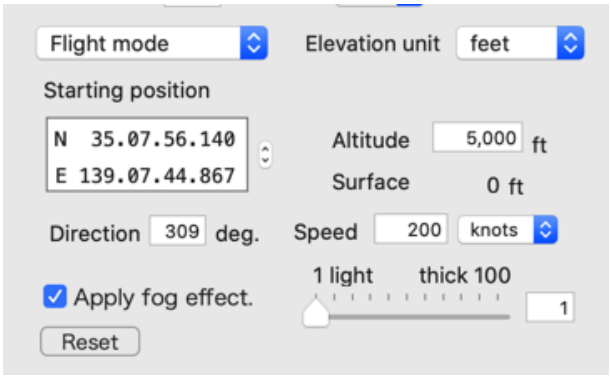
Target	Select DEM data range in it you can flight, cruise or rotate it. There are three options. They are selected rectangle, window and whole data range.
Data size	Showing data size for selected range. When several type of DEMs are loaded, shortest data pitch is used for whole region. If the usage ratio to the maximum buffer size supported by the GPU is large, the letters will be displayed colored with orange or red. When data size is too big, the "Run" button will be turned off. Even if the letters are black, it may be very slow or not draw correctly depending on the performance of the GPU. In such a case, please reduce the amount of data.
Window size	Set window size at the beginning. 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.
Light from:	Select light direction for shading.
View angle	View width in degrees. Between 10 and 120. You can change it during playing.
Elevation unit	Select unit of elevation and altitude from meter or feet. Selection is applied in the dialog and 3D movie view.
frames / sec.	Select number of frames to draw per seconds between 10 and 60. Default is 30. If data size is large, the movie may not draw correct images for specified frame per seconds. On the less power Mac, smaller number of frames is better to draw images, but may not be smooth movie.

Mode selection	Select on 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

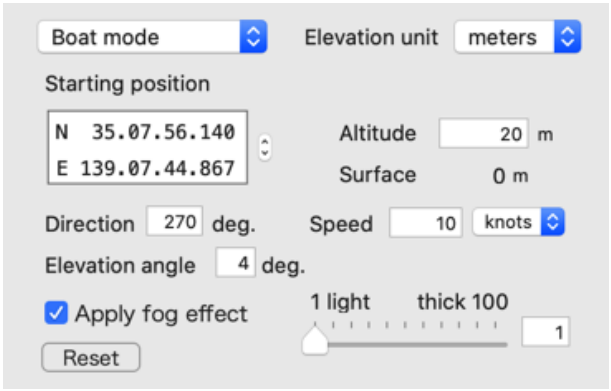
Target elevation	Specify elevation value of rotation center. Surface elevation is set at first.
Surface elevation at center	Surface elevation of the center position of the selected range is set.
Eye position	Determined by distance from the center and altitude. Start at south of the center point.
Distance from the center	Specify distance in meters. It is fixed 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 has no address, XY address in meters are shown. If you activate this function from the Tool menu first, the start position is bottom center of the selected target area.
Altitude	Starting altitude, should over surface elevation.
Surface	Surface elevation of the starting point is set.
Direction	Set starting direction in 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 as usual windows.
- Click zoom button to go full screen mode, or click full screen icon at the upper right of window on older system. 'esc' key return to normal window.
- '[' key extend view angle (to show wider scene), ']' key narrows view angle. Click once extend or narrower 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. On some older Macs, those cannot upgrade to Mojave, such information are shown in the movie.
- Space key pauses or restarts the movie.

Rotation mode

- Right and left arrow keys change rounding speed and direction. '/' key stops rounding.

- 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, mouse wheel rotates the landscape,

Flight mode

- Right arrow key turns right, Left arrow key turns left.
- Up arrow key nose up, Down arrow key nose down.
- '.' (period) key gets slower speed, '.' (comma) key gets faster speed.
- '/' key returns to straight and level flight.
- ‘/‘ with 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.

Boat mode

- Right arrow key turns right, Left arrow key turns left.
- Up and down arrow keys ups or downs eye direction.
- '.' (period) key gets slower speed, '.' (comma) key gets faster speed.
- '/' key returns 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.

Save as movie file

You can make a movie file with capturing 3D movie window using QuickTimePlayer.

- First activate 3D movie, stop playing by pressing space bar at appropriate scene.
- Set up QuickTimePlayer’s screen recording function, and start recording.
- Restart 3D movie by pressing space bar.
- You can use system’s screen recording function also.

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 corn, then projected landscapes are differ each other.

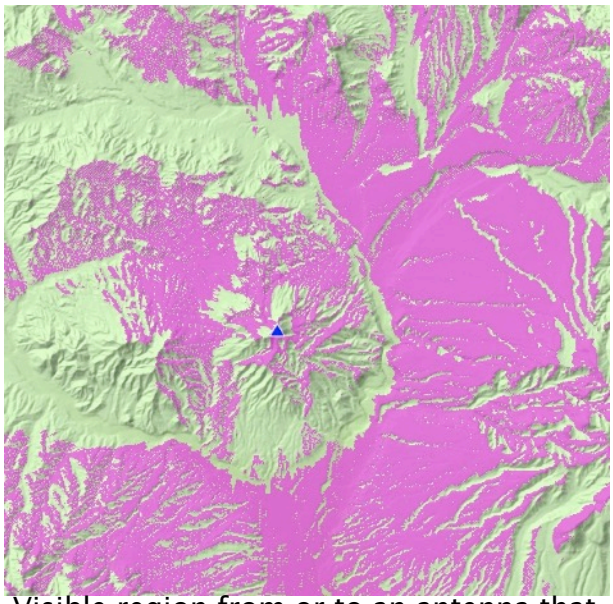
30. Visible Region

What is Visible Region

The places from where can see some point, or can be seen from some point This “some point” called “Target” is any point on the land or any object such as mountain peaks or buildings

Result color is drawn on the Map View.

To check the visibility, the eye point is set to one meter high from the surface and looks to target.



Visible region from or to an antenna that is 20 m high at the peak of the mountain.

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 show context menu is set to the target.

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 search name dialog. Select a name in the table shows user data titles and node comments. Search name dialog is the same as it of Panorama View.
Range	Select window or selected rectangle to draw.
Quality	Select “Faster” or “Fine”. Usually “Faster” is appropriate for speed and quality. If DEM data pitch is short (maybe less than 1 second) and focused place is affected by steep mountains, use Fine.
Draw on sea	Check to draw on sea also, otherwise no drawing on sea.
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, places 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.

31. Geo-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, mileages from the start node.

Creation

You should provide user route data before creating profile. Select "GeoProfile image" in the "Tools" menu. Select one route data to make profile along it, and click "Make" button. Profile picture window appears with default settings. You can configure appearance in settings panel.
You should read all DEMs under the route before creating the profile.

Settings

Height range	Specify upper and lower limit in elevation. This determines picture height.
Level lines interval	Select from 10/20/50/100/200/500/1000/2000/5000m/Auto.
Height emphasizing	Select from 1/1.5/2/3/4/5/10/20 times.
Profile color	Select one of white (only profile line), Gray (top is dark, lighter to bottom), Elevation colors. Elevation colors and gradation depend on preference settings if you select elevation colors.
Draw	Set show or no show for each items.
- levels	Level lines and their height.
- 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.
Set base to right edge	Position start point of route to right edge in profile picture. (flip horizontally)
Title	Any title string to show at top center position in the picture. Default is route data title.
Apply	Redraw profile picture.
Scale menu	Select from Auto/200/100/50/20/10/5%. If auto is selected, scale depends on window width.
Shrink button	Set smaller scale in the above scale menu.
Enlarge button	Set larger scale in the above scale menu.
Panel	Show or hide configuration panel.

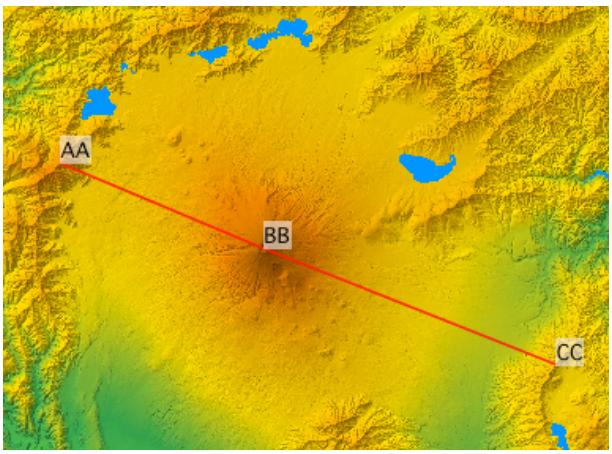
Always two level lines are drawn above the highest elevation.

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.

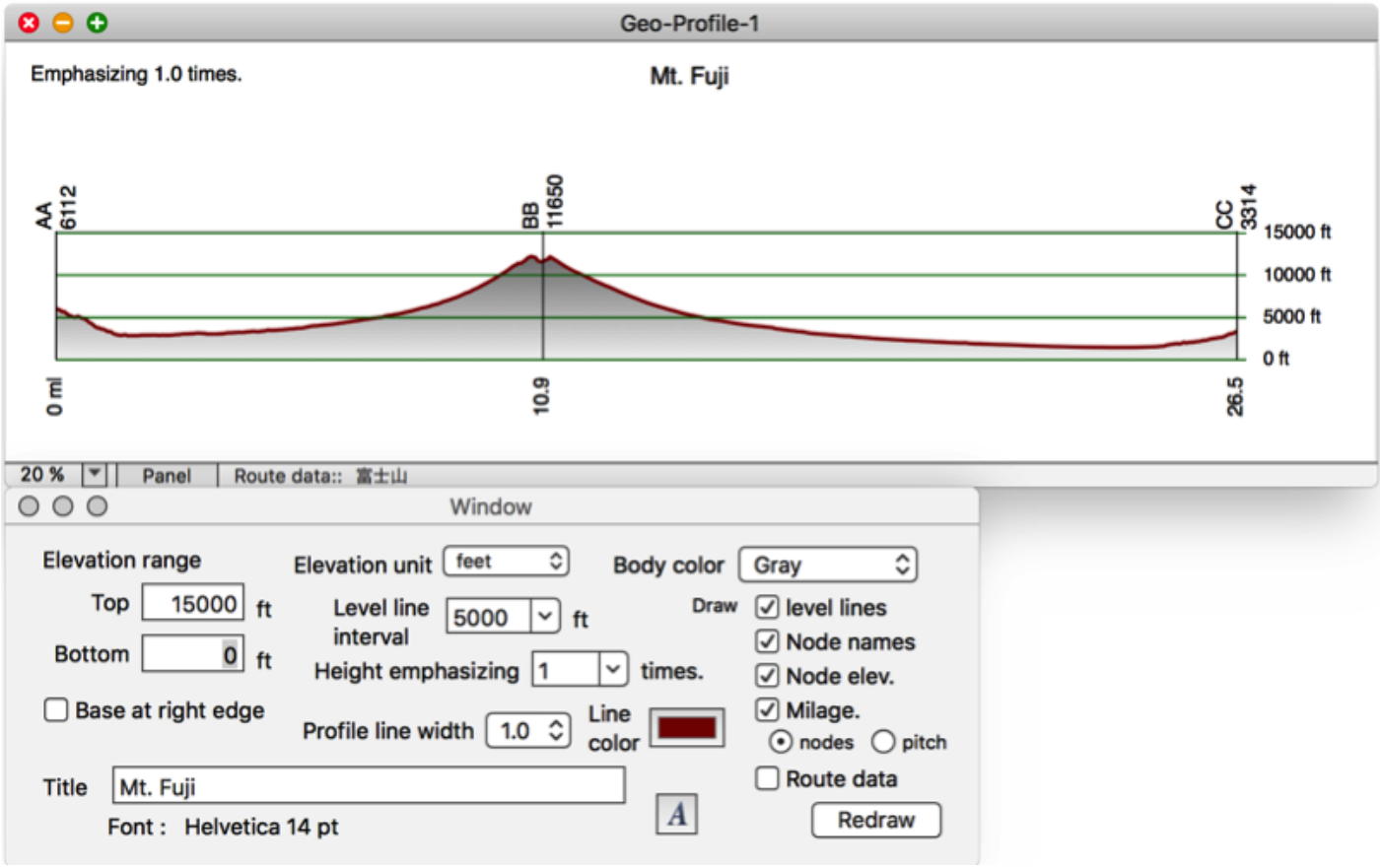
Save as

You can save the profile as a picture file. Saved picture depends on current configurations. Whole picture is saved ignoring current window size.



Notes

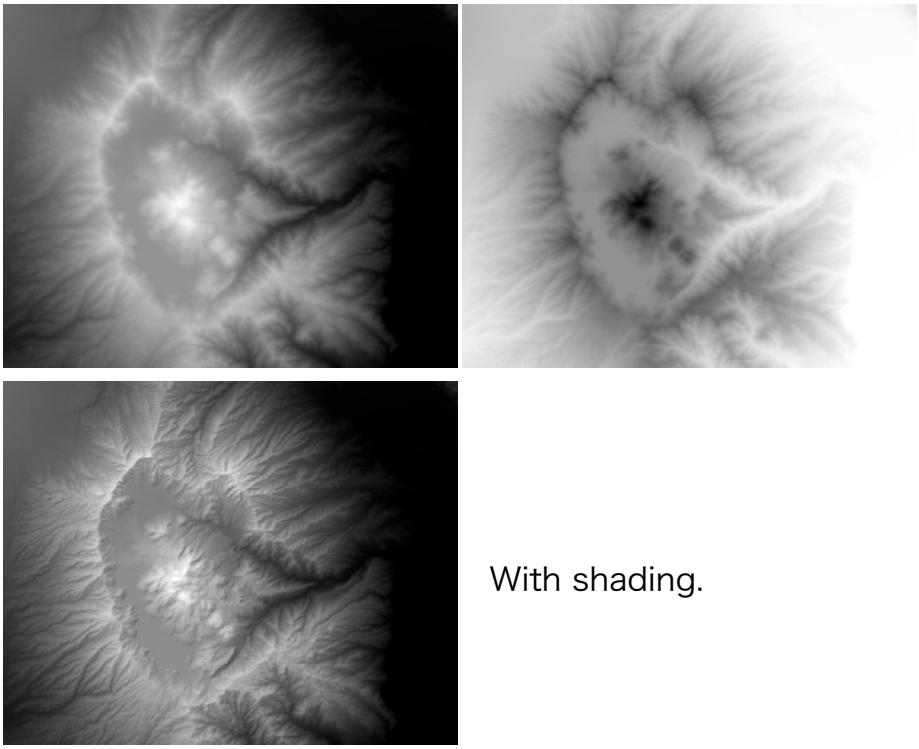
- Data interval of profile is same as DEM data north-south interval. E.g. 10 meters for 10 meter DEM, about 93 meters for 3 sec. mesh DEMs. If the map is extended in the Map View, data interval is shorten in same rate of map scale.
- If a distance between route nodes is long enough, intermediate points are calculated as they are on the great circle.
- Elevations in the route data are ignored. Always use elevations calculated from DEMs.


Geo-Profile-1
Emphasizing 1.0 times.
Mt. Fuji
AA
6112
BB
11650
CC
3314
15000 ft
10000 ft
5000 ft
0 ft
0 mi
10.9
26.5
20 %
Panel
Route data:: 富士山
Window
Elevation range
Top
15000
ft
Bottom
0
ft
Base at right edge
Elevation unit
feet
Level line interval
5000
ft
Height emphasizing
1
times.
Profile line width
1.0
Line color
Body color
Gray
Draw
level lines
Node names
Node elev.
Milage.
nodes
pitch
Route data
Redraw
Title
Mt. Fuji
Font : Helvetica 14 pt
A

32. Grayscale Maps

You can create 8 bits or 16 bits grayscale map. It may be imported to some 3D rendering software.

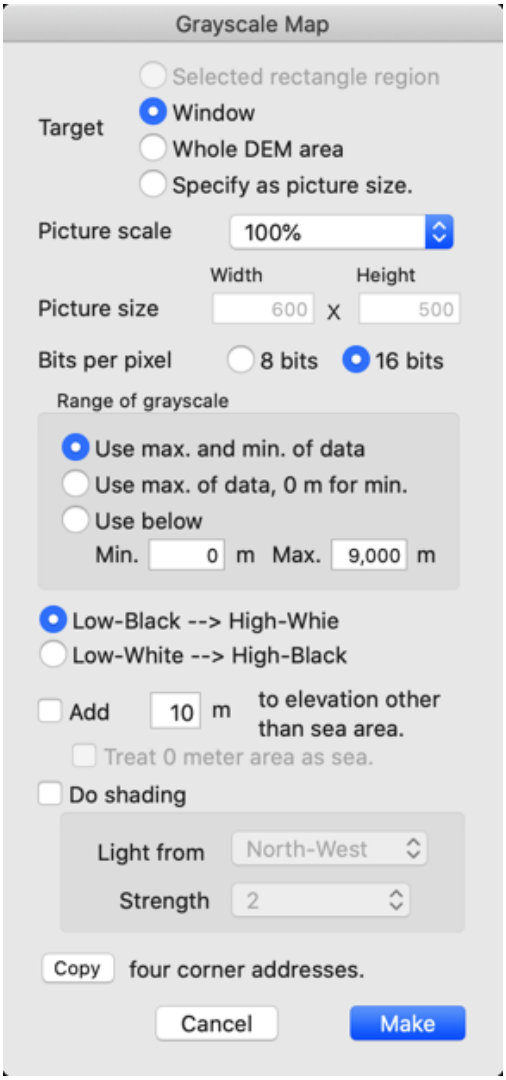
Grayscale direction, high-white or low-white, is selectable. You can choose shading also.



With shading.

Dialog

Select "Create Grayscale Map..." under the "Tools" menu to display the dialog. You can specify followings and click "Make" button to make grayscale map.



Target	Select data range to create grayscale map. One of selected rectangle region, window or whole data.
Picture scale	Select picture size as percentage to the original data.
Picture size	Width and height should be less than 65,500 dots.
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 used. If lowest elevation is below 0 meter, it is used.
- Use below	Use specified elevations to both limits. If highest or lowest elevation of DEMs is out of limits, it is used.
Direction	Select high-white or low-white.
Add ... m ...	Add specified number of meters to the elevations other than sea area to clear seashore in 3D software. Do not use this function if DEM has no sea info, such as ETOPO and SRTM.
Do shading	Check to apply shading.
- Light from	Select one of 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 one line text on the picture. click on the picture with control key pressed, and select context menu “add string”. In a dialog you can enter string and its attributes.

Save as picture file

You can save grayscale map as a picture file as same as other pictures. You can select any picture format for 8 bits grayscale, but only tiff or png format for 16 bits.

Notes

- With shading, white lines may appear along seashore. To remove them, specify 10 meters or so in "Add ... m ..." field.

33. 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.

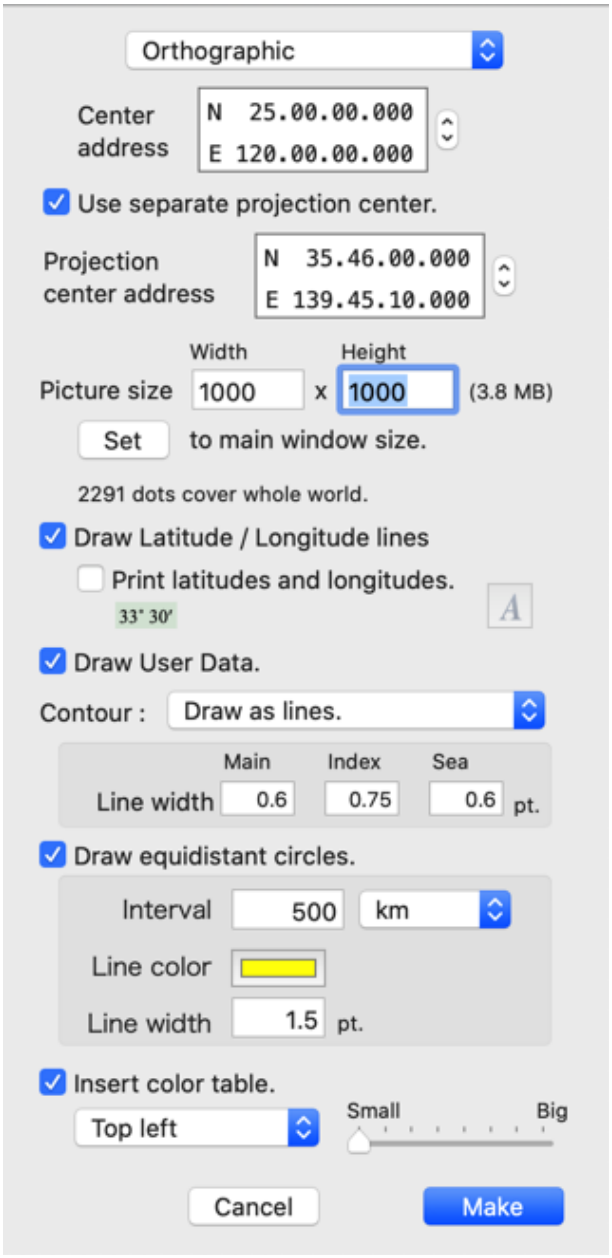
You can set center address of the map and size of the picture. Map scale will be the same scale of the Map View. Also elevation colors and shading parameters will be the same those of the Map View.

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. There is a sample picture at the last of this section.

To display the creation dialog, select "Create projection map" under the "Tools" 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 window is set.

To create projection maps require geo referenced DEMs, UTM DEMs or managed plane DEMs. No UTM projection map with celestial DEMs.

Settings



Type menu
: Select projection method.

Center address
: Set center address of the map. Initially it is set to center address of the Map View if called from Tools 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, and scale at the point is the same scale of the Map View instead of picture center.

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 and longitude lines
: Check 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 — Check 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.

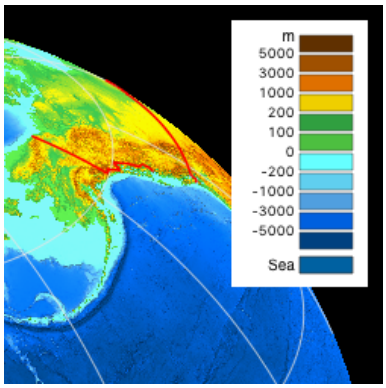
Draw Equidistant circles

Check 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 — Select line width from the menu between 0.5 and 2.0 points.

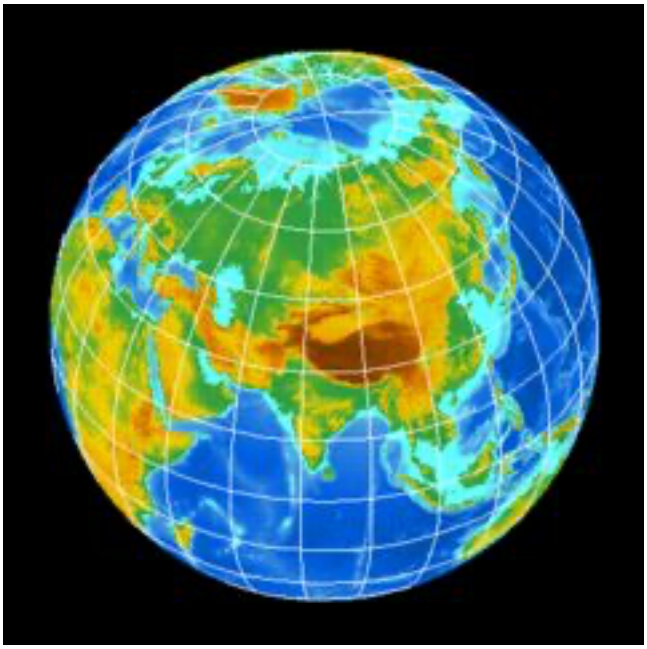
Insert color table — Insert a color table into the picture. Select position and size.

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.
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.
Picture at right is drawn as in the smallest size (5%) using ETOPO2.
To make this map, select "Orthographic projection map" under Tools menu Also available from context menu on the Map View.
Scale of the center is the same as the scale of the Map View.

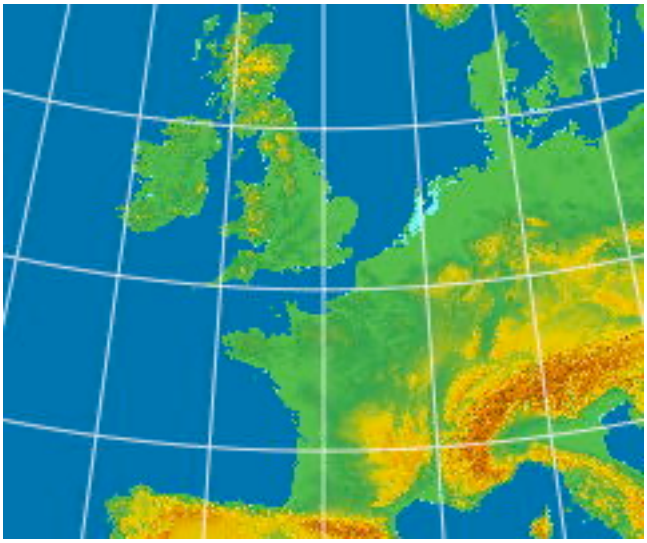


Conical projection map

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.

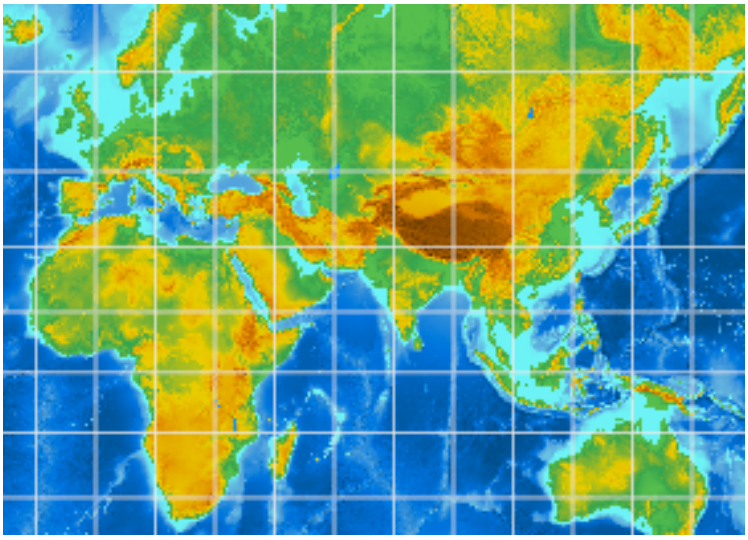
Center latitude should be between 80 degree south and 80 degree north.

Picture at right uses ETOPO2, and scale rate is 8%. Center latitude is 40 degree.



Mercator projection map

You can create Mercator projection map around the specified center point. Scale on the Equator is same as the scale of the Map View.
Picture size you specify in the dialog defines drawing range, no affection to scale.
Picture at right is drawn in the smallest size (5%) using ETOPO2.

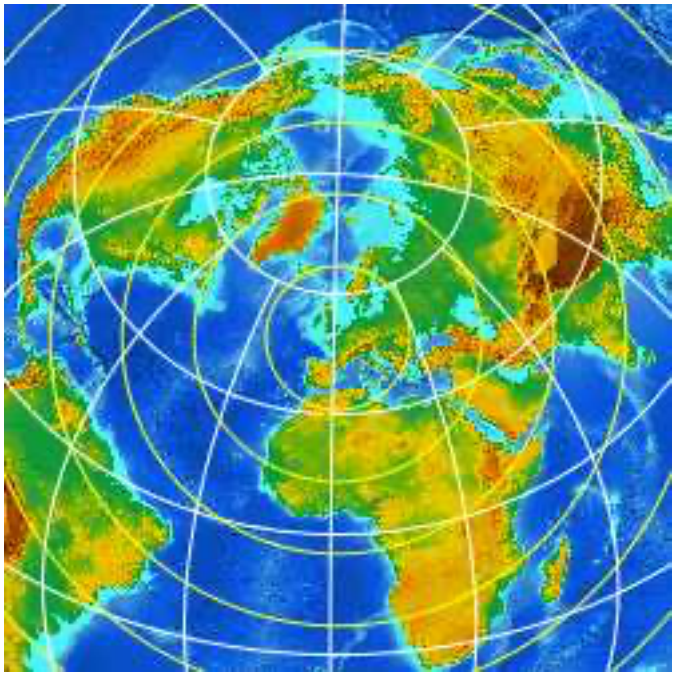


Azimuthal Equidistant projection map

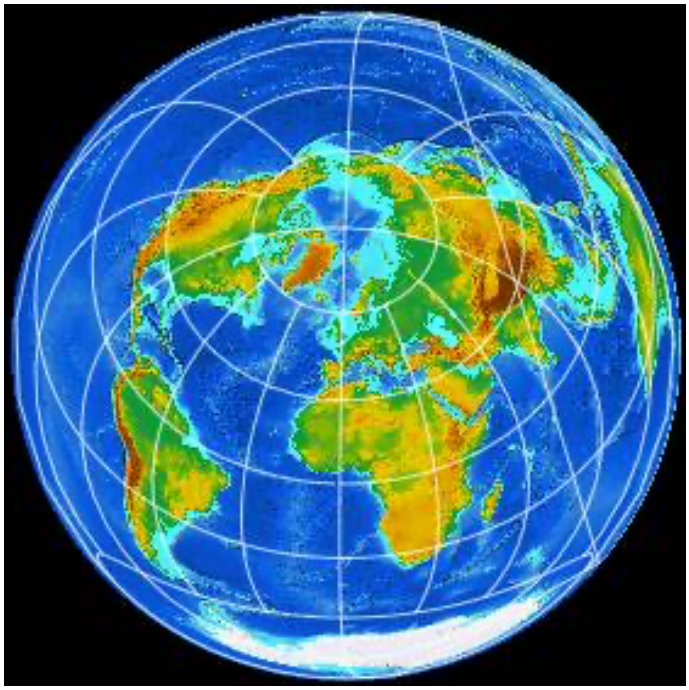
You can create Azimuthal Equidistant projection map around the specified center point. Scale is same as the scale of the Map View at the center point.

Picture size you specify in the dialog defines drawing range, no affection to scale.

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

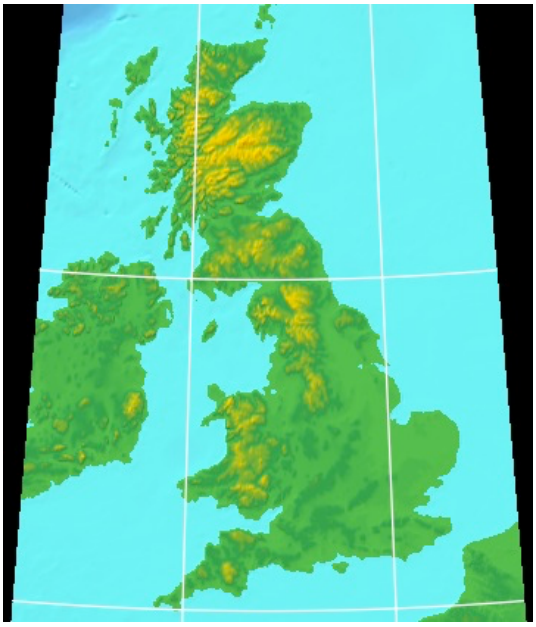


You can create Azimuthal Equi-area projection map around the specified center point. Scale is same as the scale of the Map View at the center point.

Picture size you specify in the dialog defines drawing range, no affection to scale.

Picture at right is drawn at 10% scale using ETOPO5, centered to Paris.

Universal Transverse Mercator (UTM) projection map

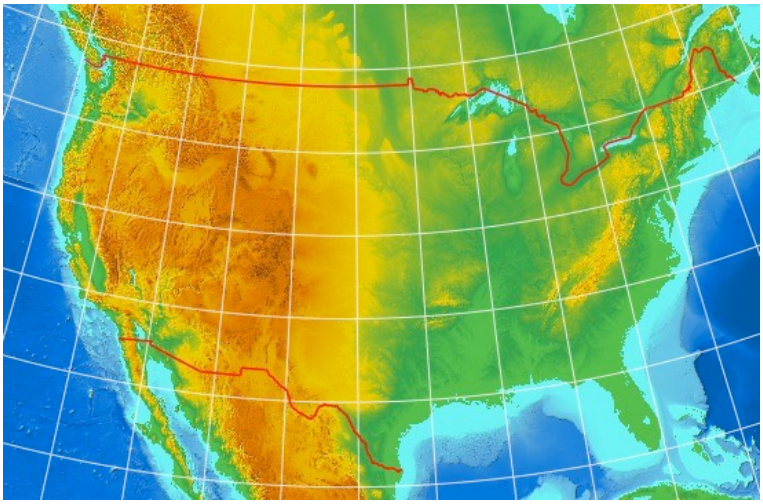


You can create Universal Transverse Mercator (UTM) projection map around the specified center point. UTM zone number is determined by center address. If just equal to boundary longitude, smaller zone number is taken.

Both side of center meridian are drawn up to 6 degrees. North and South pole can be drawn, but center latitude should be between 80 and -80.

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 point. Although standard projection method has two parallels touched surface of the earth, only one parallel at the center touch the surface here. Scale is same as the scale of the Map View at the center point.

Center latitude should be between 80 and 20 degrees north, or between 20 and 80 degrees south.

Sample picture below as created using ETOPO1 in 20 % scale centered at 40 degree north and 100 degree west.

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. Show context menu on a string and select “Update string” menu.

Save as a picture

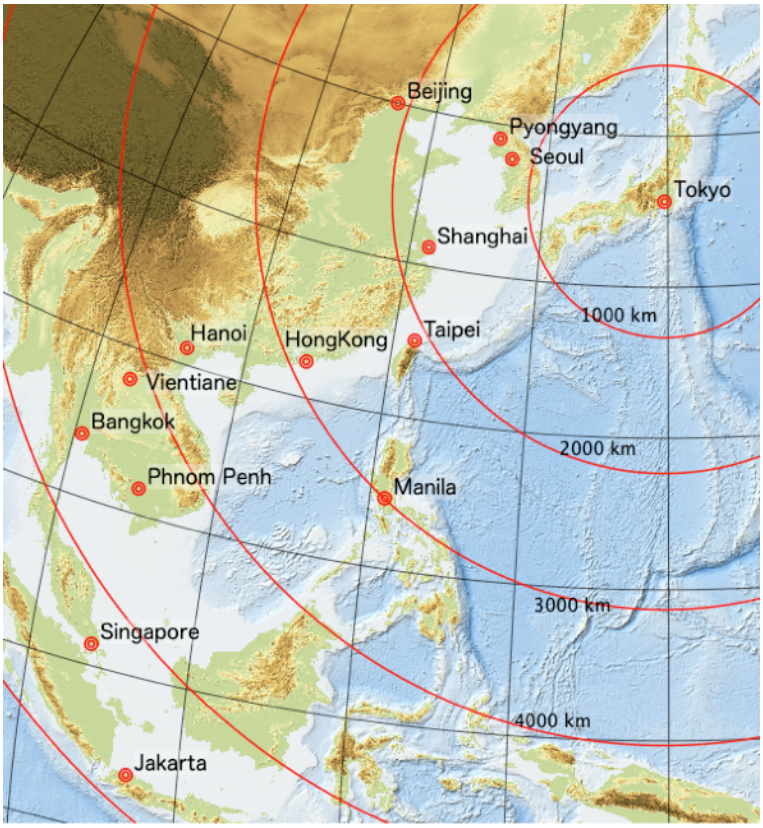
You can save projection map as picture files as same as other pictures. If picture format is jpeg, tiff or png, center address is written in the file as GPS information.

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 numbers are added after completion of drawing.



34. Picture Windows

This section describes handling windows of Bird's eye view, Stereograph, Grayscale map and projection maps. For main window, Panorama view and Geo-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) 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.

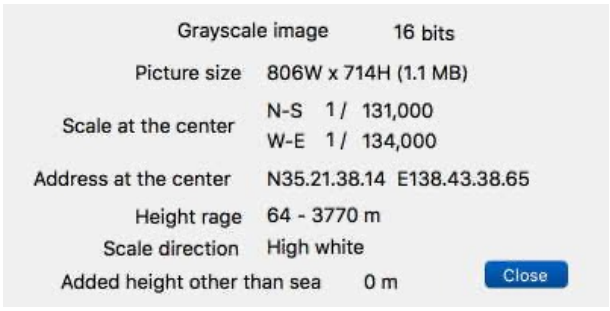
During being shrank, editing and moving string are not available.

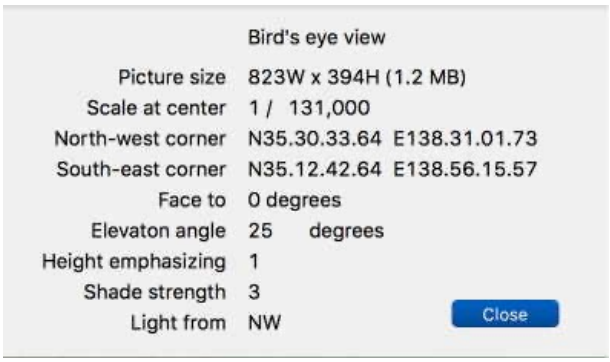
Latitude and longitude lines, equidistant circles and user data are not drawn if picture is shrank smaller than 20%.

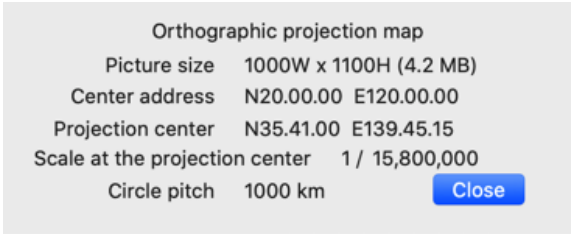
Show picture info

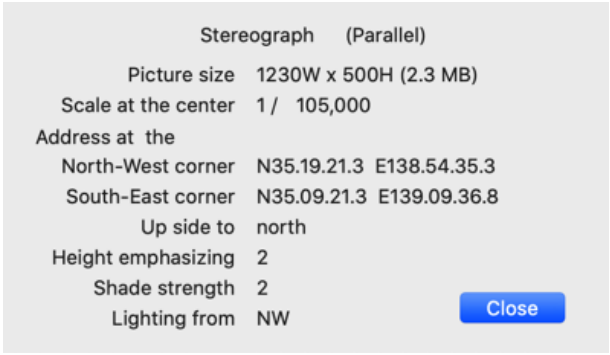
You can show information of pictures, such as size, address and some of creating settings. After selecting a picture window, do "Show info" under the File menu.

These are some samples.









Save picture

Do "Save" under "File" menu when target picture window is in front. Whole picture saved as 100% size anyway it is shrank.

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.

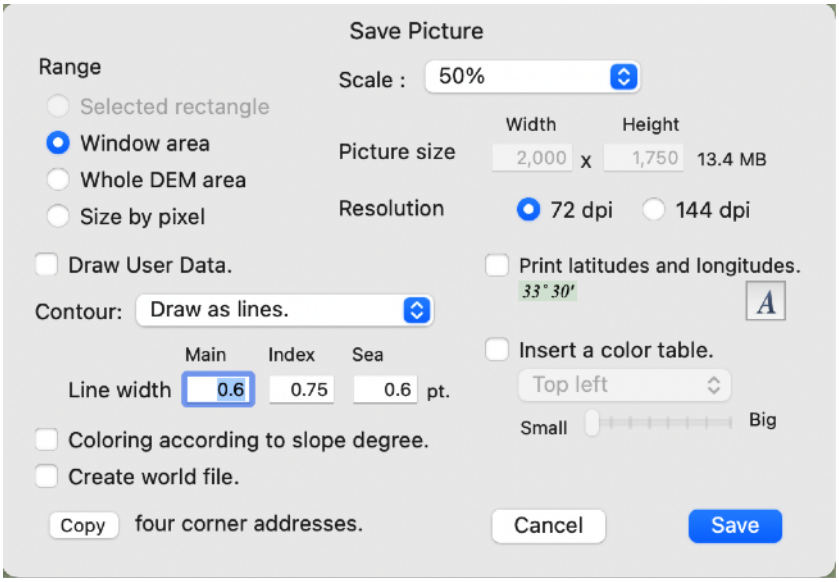
35. Save Pictures

You can save pictures of map image or pictures of other picture window images. Any picture file format is available as long as 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

Do "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 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 percentage to the DEM data. Initially, it is set to the same percentage of the Map View.

Picture size — Specify width and height of the picture if range is "Size by pixel", otherwise 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.

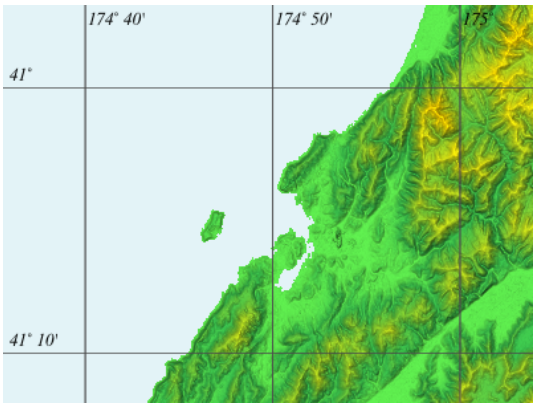
Resolution — Select 72 or 144 dot per inch. When 144 dpi is selected, String size and line width are extended twice to maintain balance with landscape as same as the Map View.

Draw user data — Check 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

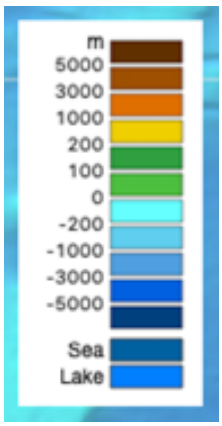
Settings previously used to draw in the Map View will be taken.

Create world file — Specify to create a world file. See below.

Print latitudes and longitudes

Check to add latitude and longitude value strings. No minus sign is added to west longitude and south latitude. No print if seconds part of the address is not zero.

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 when "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 pictures of windows such as Bird's-eye view, Stereograph, Orthographic projection map, etc.. Do "Save" under "File" menu when target picture window is in front. You can specify file name and format in the file navigation dialog.

Always you saves pictures as new files, not update.

If the picture is 16 bits grayscale, you 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 picture, in the Preferences dialog for grayscale maps.

Pictures satisfying following three can attach a world file.

- DEMs should be one of Geo, UTM or other plane coordinate.
- Map pictures or grayscale pictures.
- File type is one of TIFF, JPEG, JPEG2000, PGN or BMP.

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 XYPLANE.
6th line	Latitude at the center of the north-west corner cell of the data in degrees, or coordinate address of UTM or XYPLANE.

Extensions for world files are set as follows.

TIFF - TFW, JPEG - JGW, JPEG2000 - j2w, PNG - PGW, BMP - BPW

Note. : Many GIS software supports TFW but others.

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 GeoTiff.

Also Grayscale map and SRVC relief map and anaglyph that face to north and one pane is right projection can be saved as GeoTiff.

You should aware that datum of this GeoTiff file is WGS84 always, even if DEMs are not based on WGS84.

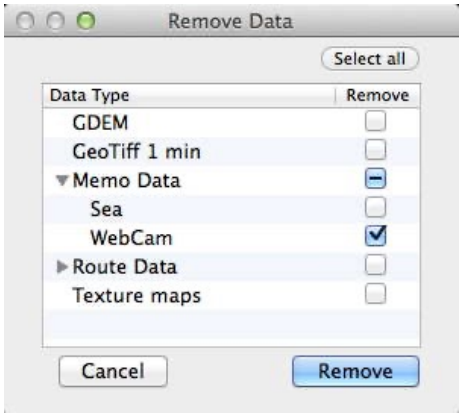
Add GPS information

GPS information (Latitude, Longitude and datum) are added in the picture as exif GPS information, when saving following pictures. Picture type should be jpeg or tiff. Latitude and longitude are at 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

36. Remove Data



You can remove data those are read in this program by the dialog looks like picture at 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 dat 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 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.

37. 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 read DEMs.
Manage Projection Planes…	Define world's local planar coordinate systems.
Manage color sets...	Rename, remove color sets. Arrange color set menu items. Export color sets as external file.
Import color sets	Read color set files and register them.
Show Info	Show information panel for DEM or pictures.
Edit	(only Copy and Paste have custom functions)
Undo	
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.
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) 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 another occurrence.
Jump to...	Reposition map to the address specified.
User Data	
Show/Hide User Data...	Show dialog to set show / hide status.
Edit User Data...	Show dialog with table of user data to editing.
Import Text User Data…	Import text formed User Data.
User Data Preferences...	Set defaults for user data, and maintaining user data kind.
Tools	
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 read DEM.
Contour...	Show a dialog to draw contour lines.
Slope Level...	Show a dialog to colorize map by slope degrees.
Visible Region...	Show a dialog to colorize map by Visible Region.
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.
GeoProfile...	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.
Create Lake Data...	Start to create lake data.
Window	
Minimize	
Zoom	
Bring all to front	
Help	
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 and show this place in it. (OS X 10.9)
Google Map	Activate safari (or other browser) and retrieve 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 move to the map center.
Scale	Change scale and Reposition map so that the mouse point will move to the map center.
2000% ~ 5%	Change the scale to the selected percentage.
Other (nn%)..	Change scale to any value.
Expand	Expand 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 Milage	Start to measure milage 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 the mouse point as the target.
Create Projection Map...	Show dialog to create projection maps and set the mouse point as the map center.
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 previous eye point as the target and show creation dialog.
Show Place in Map View	Reposition map so that the mouse point place move to the center.
Add (Edit) String...	Add new string or update pointed string on the panorama view.

38. Limitations for AS Version

All App Store programs are required sandboxing, because of that some limitations are added comparing to SimpleDEMViewer V7. 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.
- Cannot read alias files even they point DEM files if you select folders. You should select individual files for aliases.
- 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.