iRIC Software

Changing River Science

DHABSIM

Examples

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This manual is applicable for DHABSIM version 1.0.1 and 1.1.x. Screen shots in this manual are mainly taken from version 1.0.1 on iRIC v2.3. New functions for version 1.1.x are explained using screen shots of version 1.1.0 on iRIC v3.

I. Introduction to DHABSIM

1. Purpose of this tutorial

You can understand the basic operation of DHABSIM in iRIC by simulating evaluation and also understand the method for evaluating river environment by using calculated results of Nays2DH, FaSTMEC and so on. The examples outlined here are provided to familiarize users with calculations of DHABSIM. Accordingly, descriptions of configured physical and numerical calculation conditions are omitted in some sections. Many functions other than those outlined here are also available on DHABSIM. For more details, see the DHABSIM Solver Manual.

2. Basic Operation Procedure

You can use DHABSIM in the iRIC for your calculations as following procedures;

Launch DHABSIM

Prepare to use DHABSIM in iRIC

↓

Import a Cgns file

Import a Cgns data file calucurated by Nays2DH, River2D, and other iRIC 2D flow solvers.

↓

Setting the computational conditions

Set initial and boundary conditions, etc.

↓

Running a simulation

Use DHABSIM to run a simulation.

↓

Visualizing the simulated results

Visualize the simulated results by contour maps.

3. How to get a sample file

You can download the sample file from the URL below.

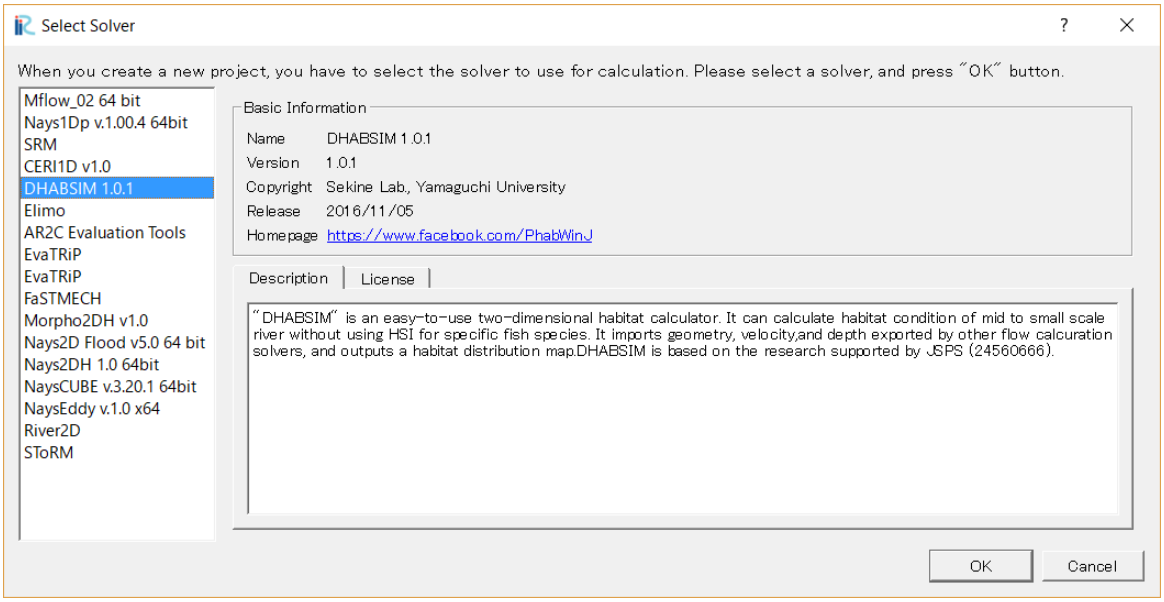
URL: http://i-ric.org/ja/downloads
Calculation examples : DHABISM

Japanese characters should not be used in the file path of the folder where the data are saved, as this may result in an error when the data are read from iRIC.

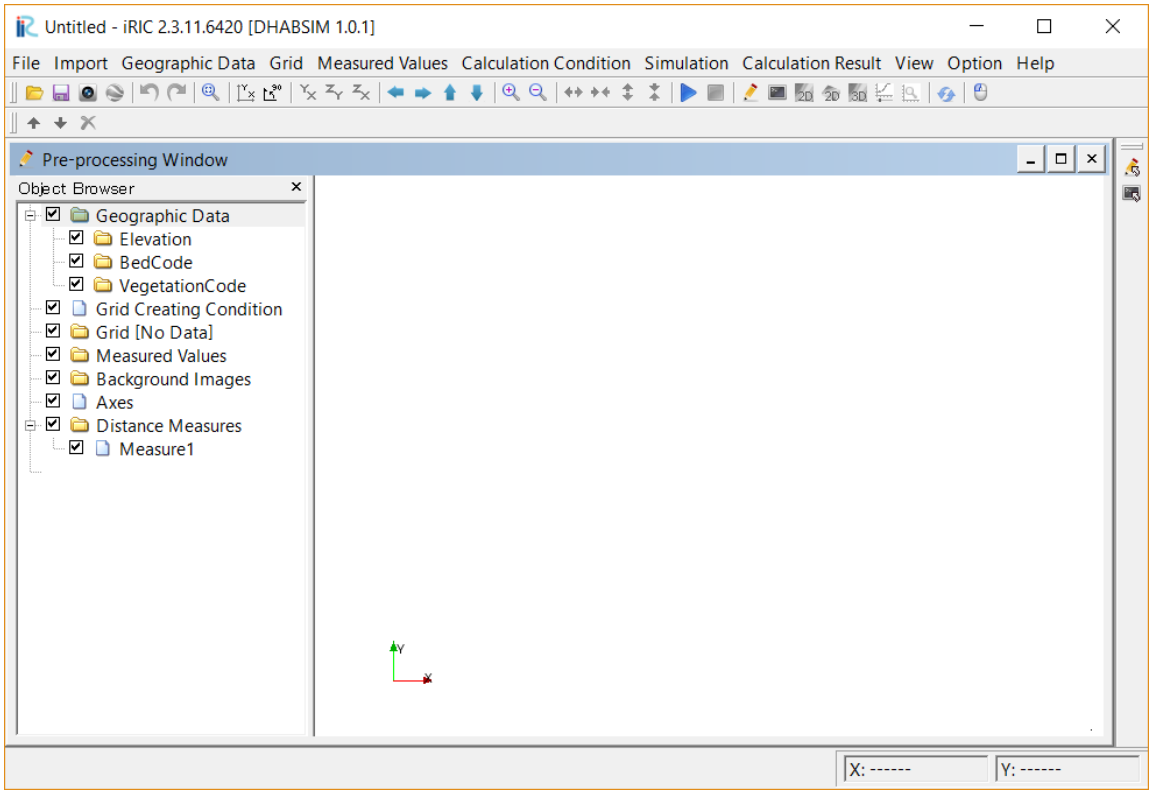
II. Start-up

Start-up of iRIC DHABSIM is described here.

When iRIC is started, the [iRIC Start Page] will open. In the [iRIC Start Page] dialog box, click [New project]. The [Select a Solver] dialog box will open. In the [Select a Solver] dialog box, select [DHABSIM] and click [OK].



A window with "Untitled – iRIC [DHABSIM]" shown in the title bar will open.

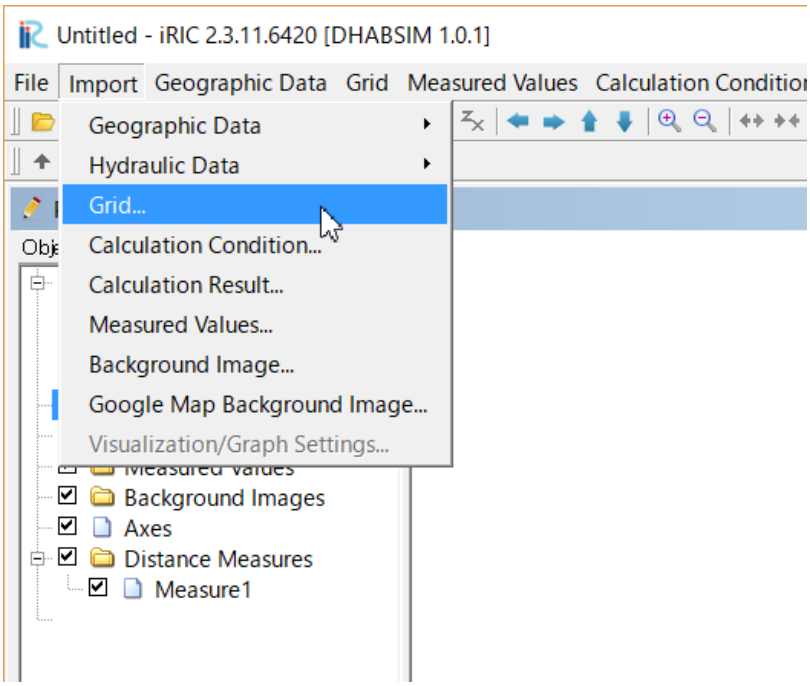


III. Import a Flow Simulation Result

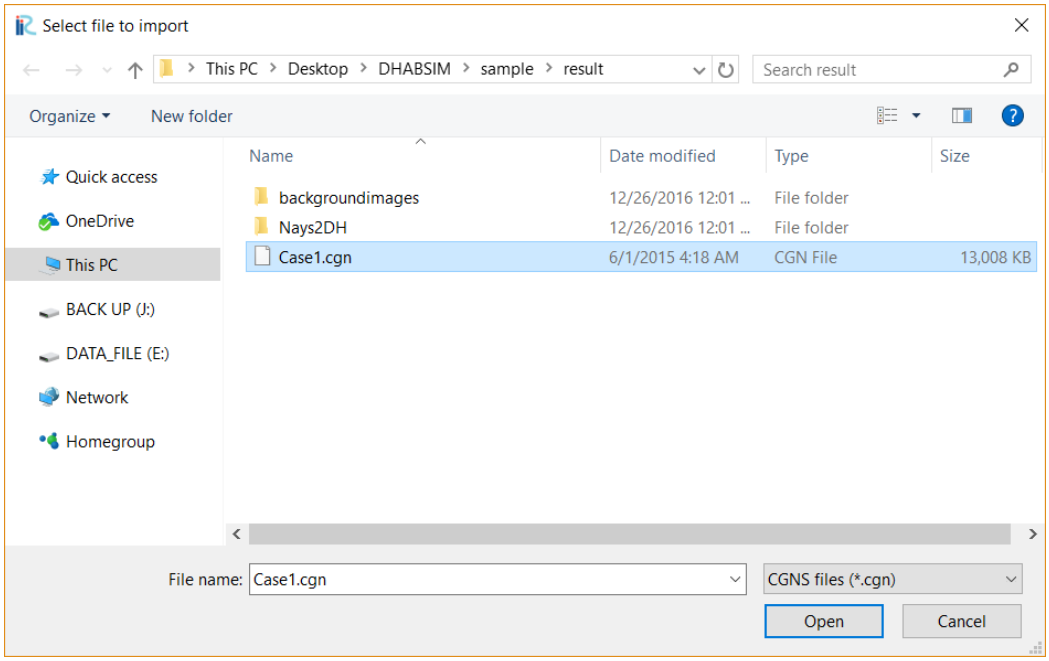
"DHABSIM" is an easy-to-use two-dimensional habitat calculator. It can calculate habitat condition for fish species by using a 2D flow calculation result (CGNS file), such as River2D, FaSTMEC and so on.

[How to import CGNS file]

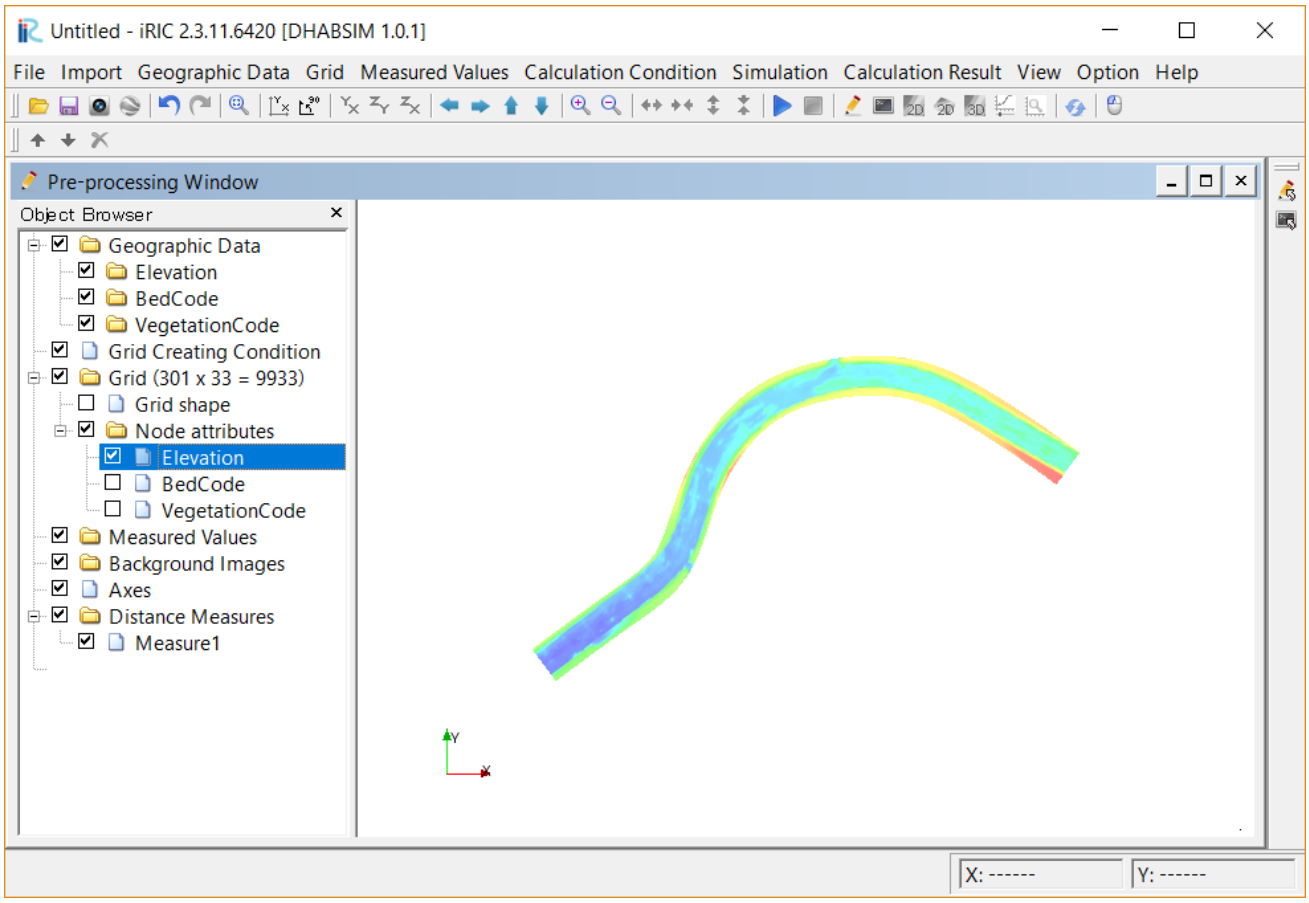
Select [Import]-[Grid] and click on it.



Select the cgns file in “sample” folder.



Elevation data will appear on the screen, if you will check the “Elevation” checkbox and remove the check from the “Grid shape” checkbox.

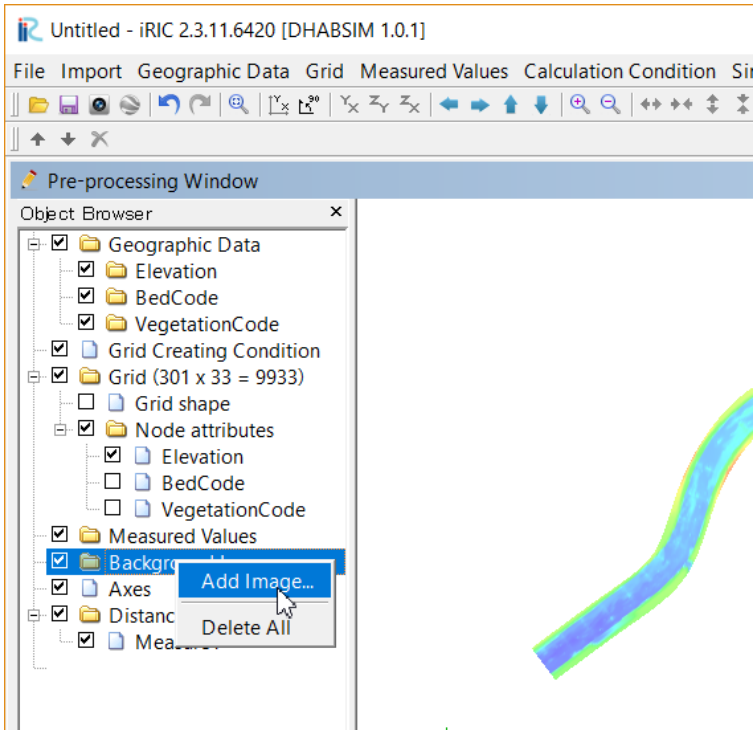


IV. Set calculation conditions

This section explains how to set the calculation conditions for DHABSIM.

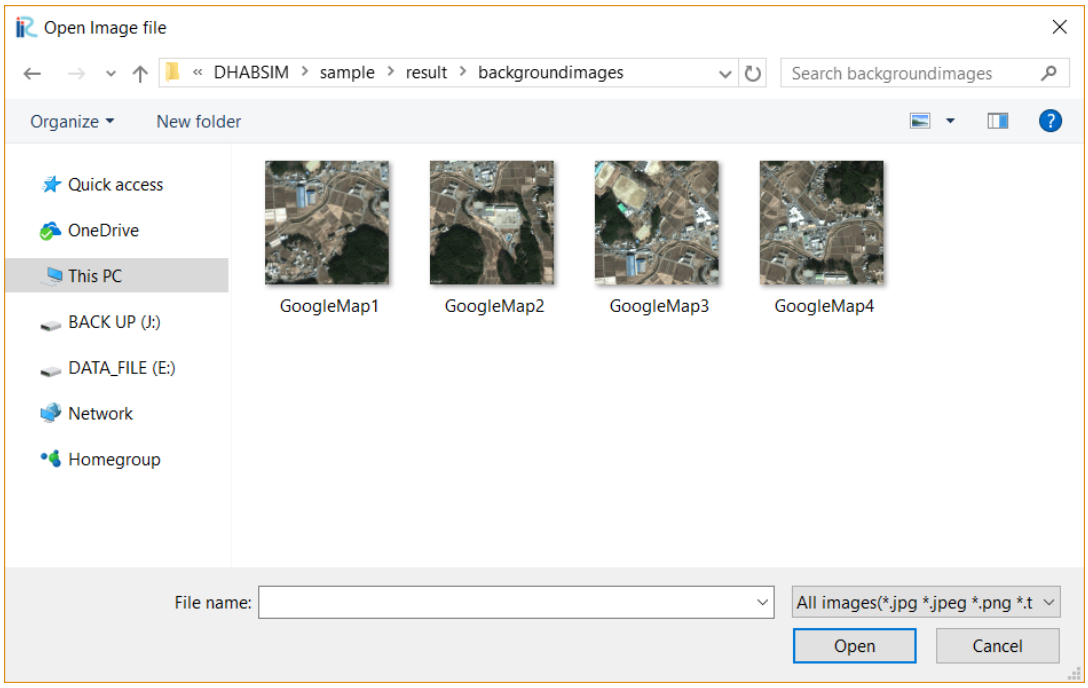
<Add image>

First of all, Right-click on [Background Images], and select [Add Image] on the pop-up menu.



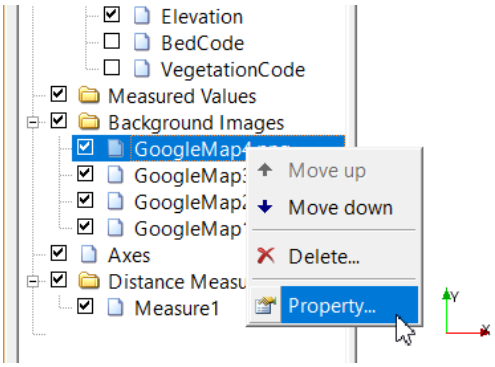
Sample photos are in the <result>-<background images> folder.

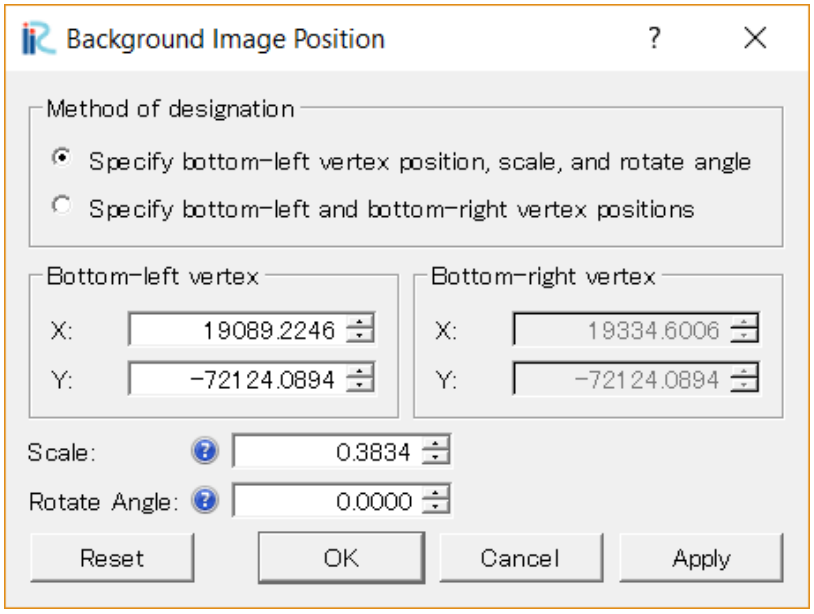
Select and add 4 images each.



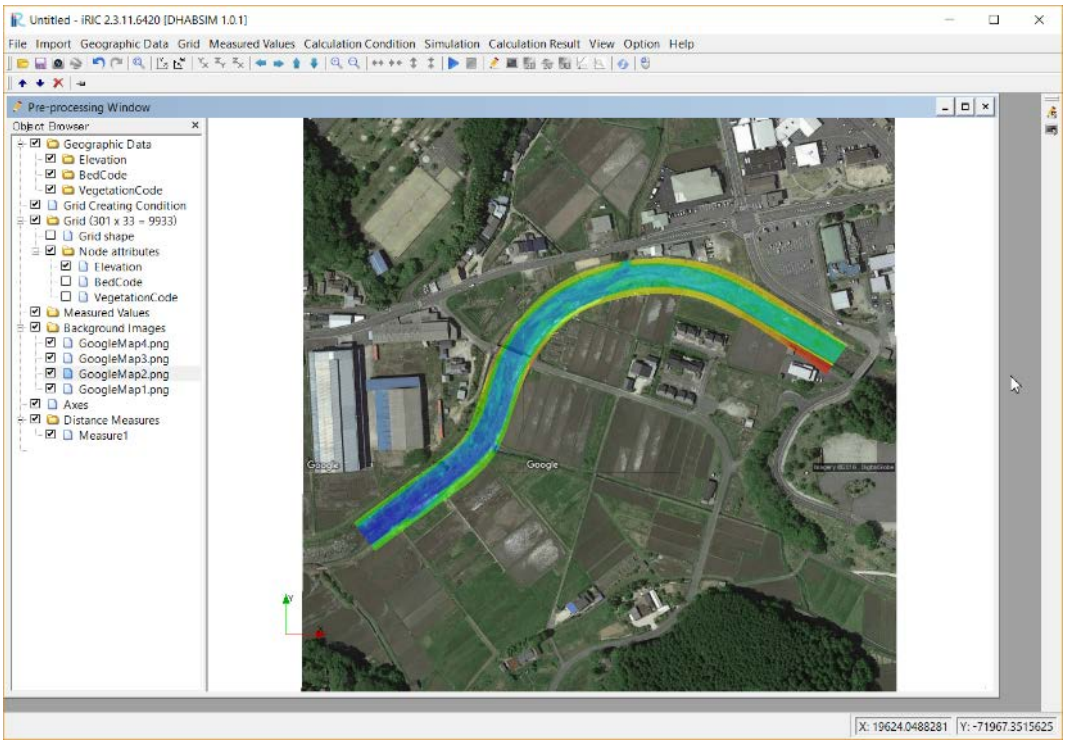
<rectify position of their images>

Right-click on [GoogleMap*.jpg] and select [Property] on the pop-up menu.



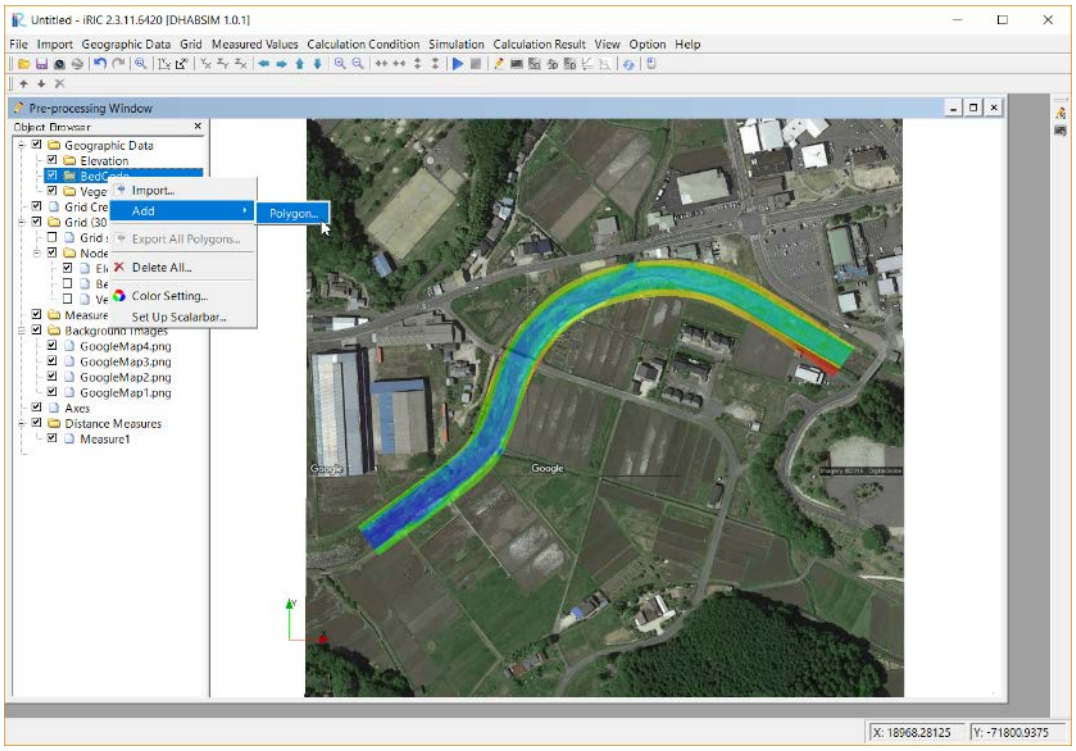


Background image	X	Y	倍率
GoogleMap1.png	18803.1	-72539.7	0.9741
GoogleMap2.png	19349.6	-72540.0	0.9741
GoogleMap3.png	18804.7	-72033.9	0.9741
GoogleMap4.png	19350.2	-72034.8	0.9741

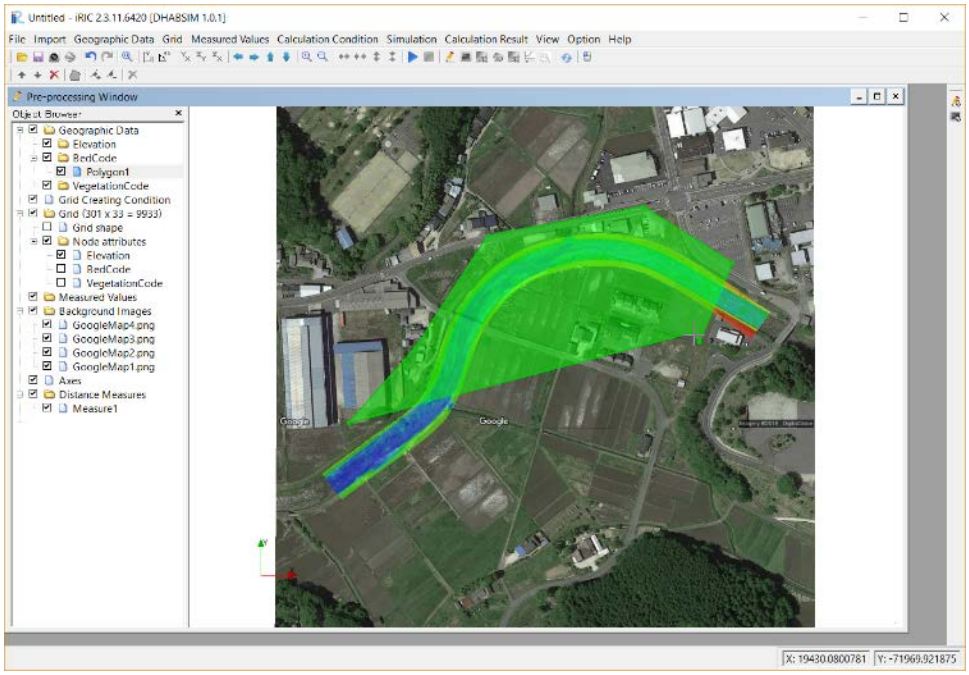


<Set bottom sediment condition>

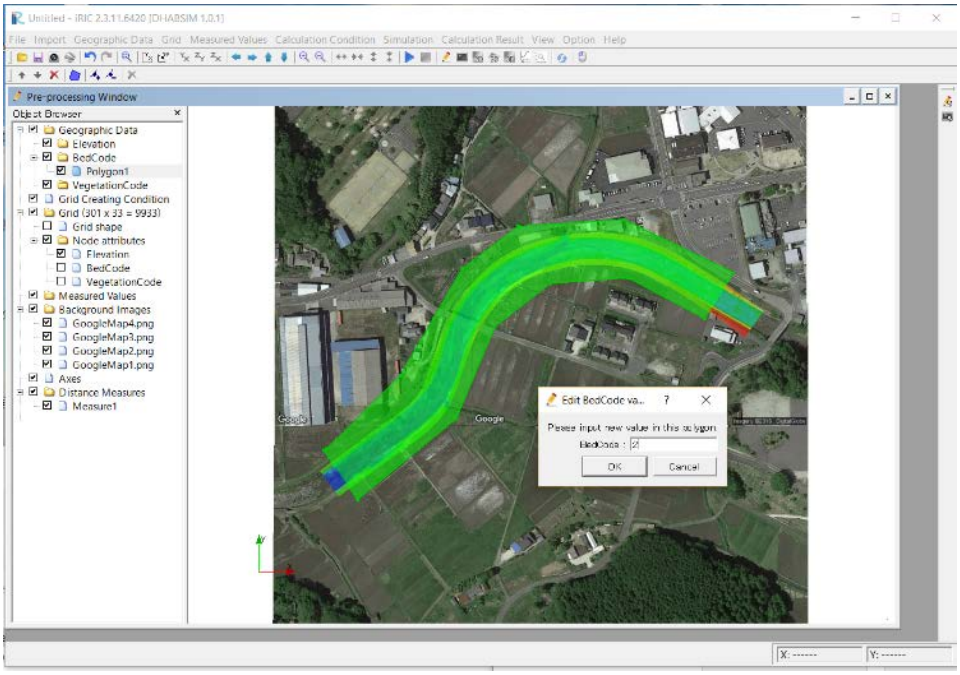
Right-click on [BedCode(*)], and select [Add]-[Polygon] on the pop-up menu.

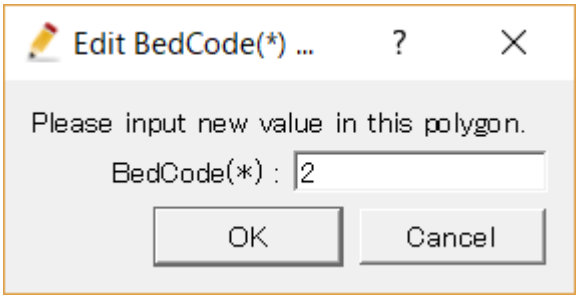


Create the segments by clicking the map, and double click to finish.



Put the number 2 in the box as bottom sediment was occupied by gravel size in this site.





Fill in the box using numbers between 1 and 3.

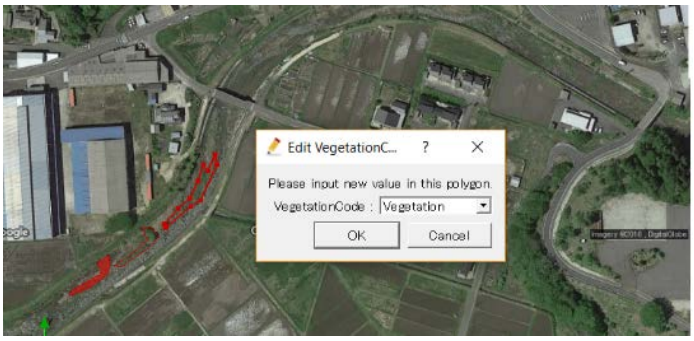
1. Silt-sand (under 2mm)
2. gravel (2mm-75mm)
3. Stone- (over 75mm)

*It is possibility to set sediment diameter, see DHABSIM manual.

<Set Vegetation condition>

Right-click on [VegetationCode], and select [Add]-[Polygon] on the pop-up menu.

Enclose the vegetation area to create the polygon, seeing a background photograph and current vegetation data. Then put the number 1 in the box. In the area without vegetation, it is not necessary to make a polygon.

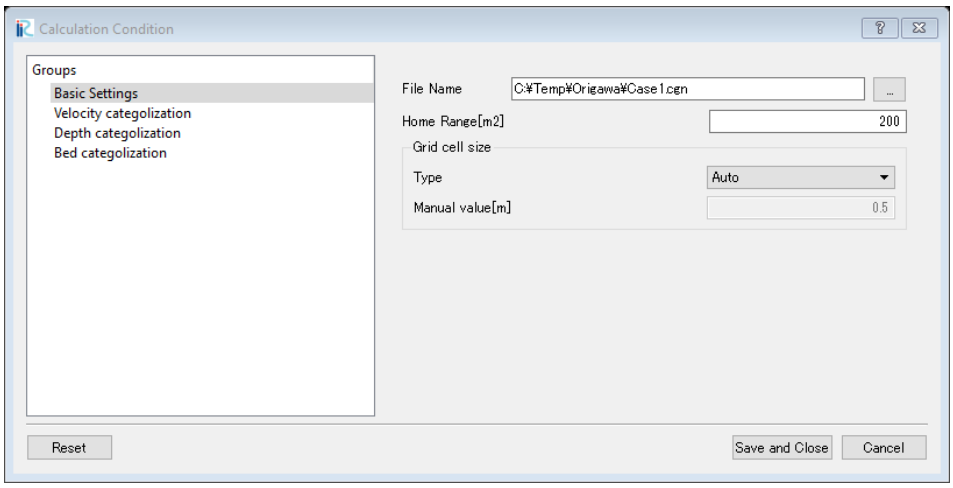


Create 3 polygons like the upper figure as well.

<Set the calculation condition data>

Select the [Calculation Condition].

Chose the Basic Settings and add case1.cgn as same as grid data.



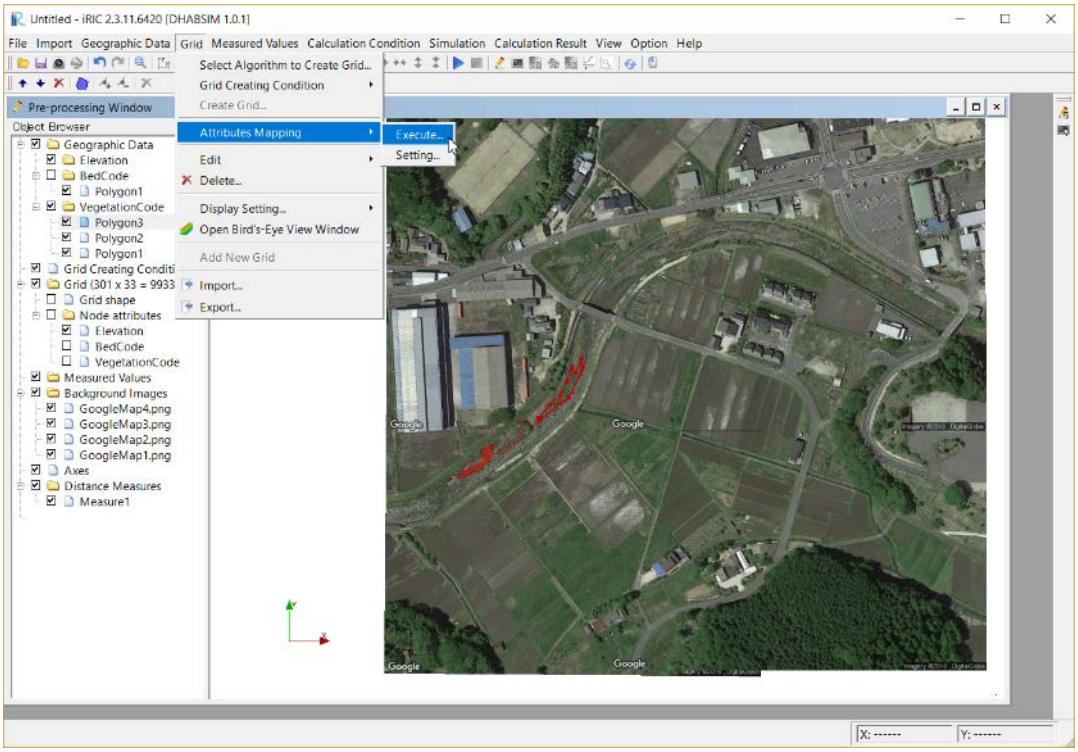
(V1.0.1 doesn't have Grid cell size box. See DHABSIM manual.)

Click on the "Save and Close" button.

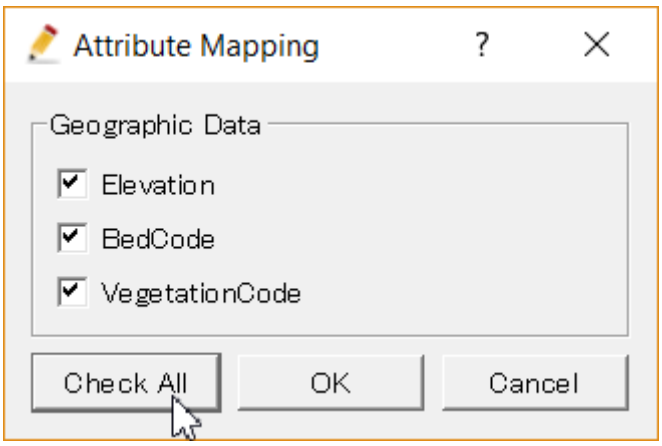
Default setting can help to evaluate habitat condition for popular fish species. If you want to set other conditions, see DHABSIM manual.

<Set the attribute mapping>

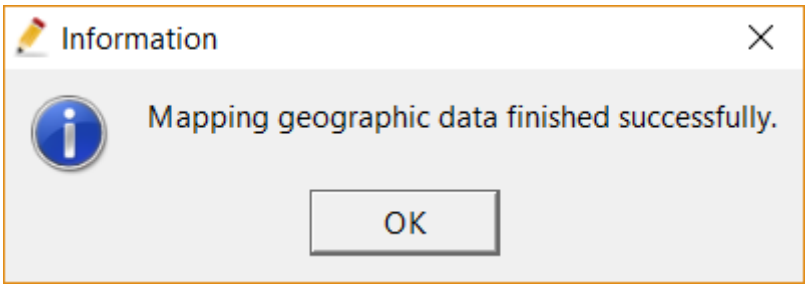
Select [Grid] – [Attribute mapping]-[Execute]



Click on the “Check All” and OK button



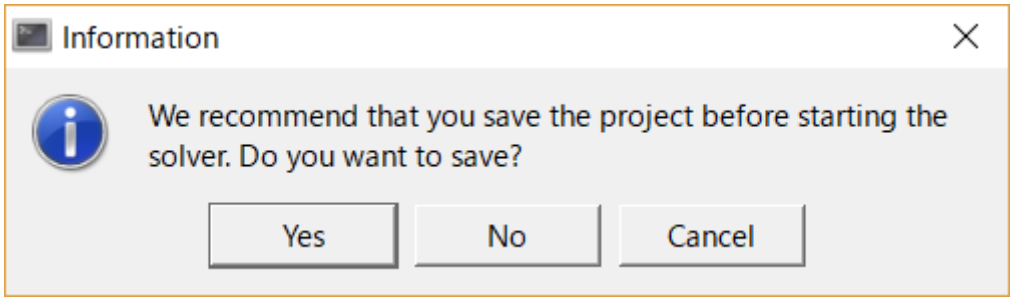
Information dialog appear, then click on the “OK” button.



V. Run a simulation

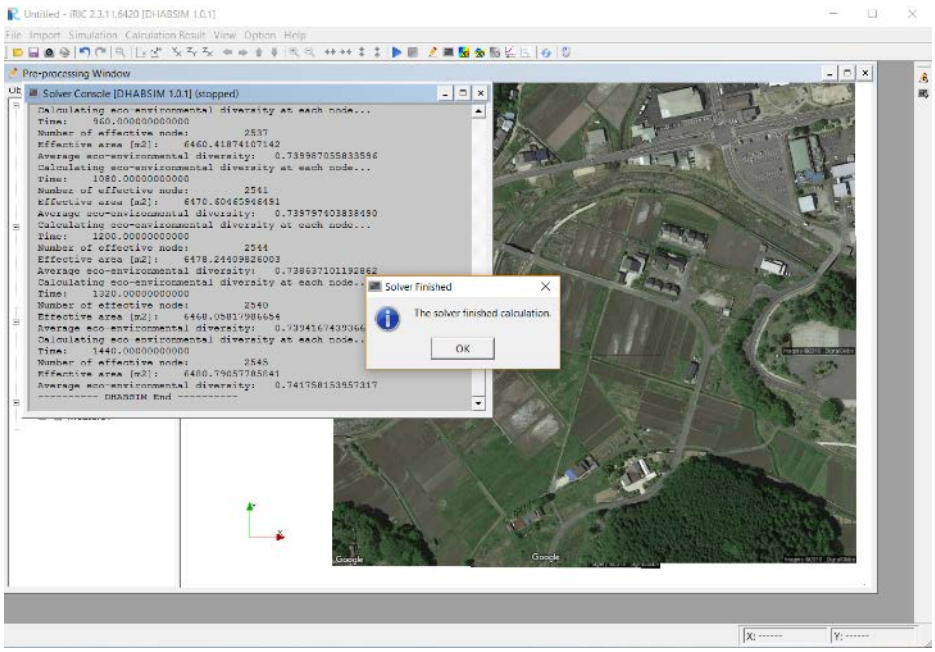
For running a simulation, select [Simulation] ->[Run] in menu bar or select ▶on menu tool bar.

If you want to save the data before starting the solver, click on “Yes”.



＊You can choose [Yes] or [No]. If you select [Cancel] button, the computation won’t be done.

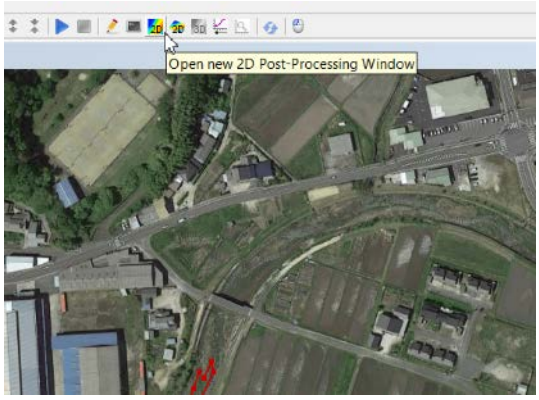
Solver console will appear, and it starts the calculation



Please record information displayed in solver console if you would like to get more results.

VI. Visualization of output data

Select [calculation result] -> [Open new 2D post-processing window] in menu bar, or click on the button shown in the following figure;



The buttons for visualization are from left;

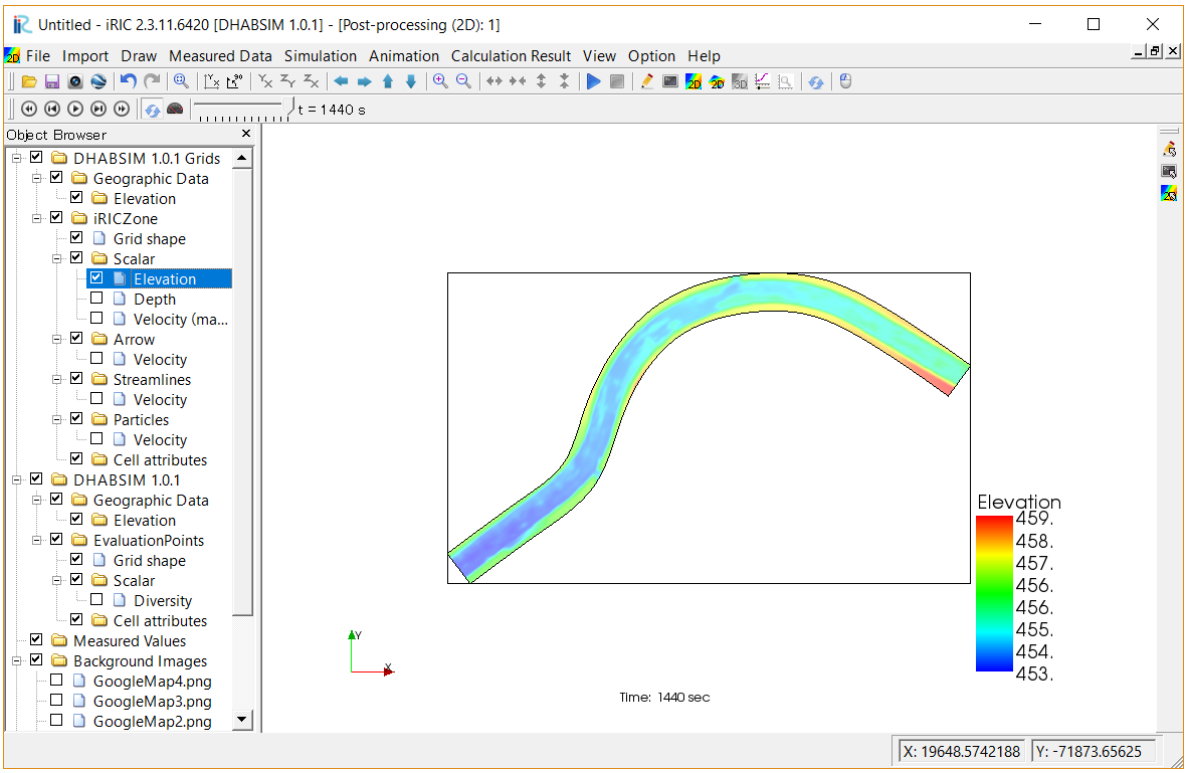
□ 2D post-processing window : for visualizing top view of the result

□ 2D bird's eye post-processing windows : for visualizing three dimensional view

□ 3D post-processing windows : for 3D model only

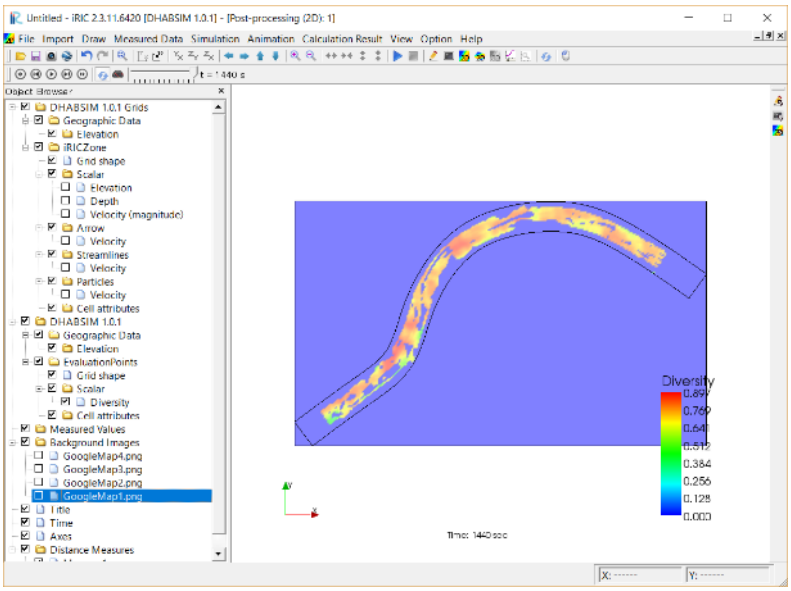
□ Graph window : for visualizing one dimensional graph

Open the 2D post-processing window. Mark the "Elevation" checkbox.

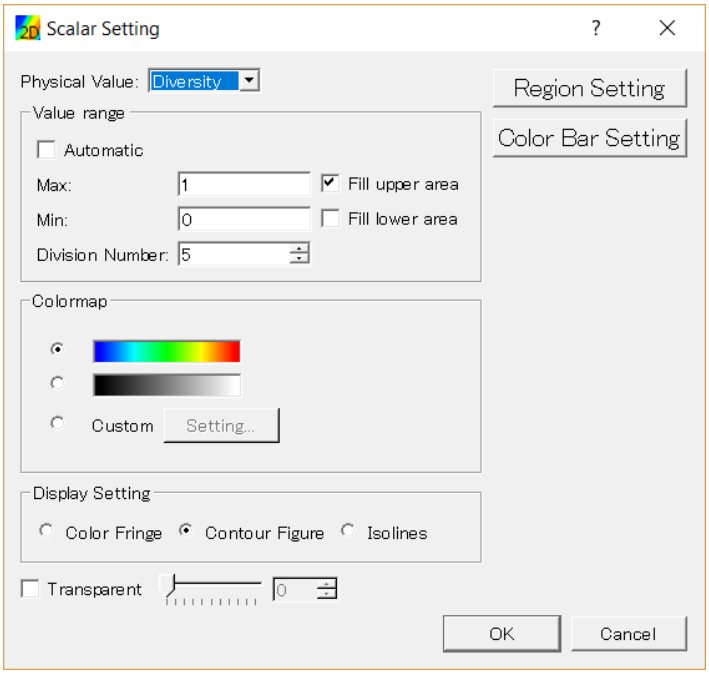


You can visualize the item listed in the object browser to the visualization screen. Firstly, for visualizing the result of “Diversity”, remove the check mark from the box of [Elevation] under [Scalar]. The contour map of an evaluation result was shown.

For changing the range of color legend, right-click on [Scalar] under [EvaluationPoints] and select [Property].



In this dialog, you can set the maximum/minimum value for the legend colors range, the number of la-bels for the color legend and etc.



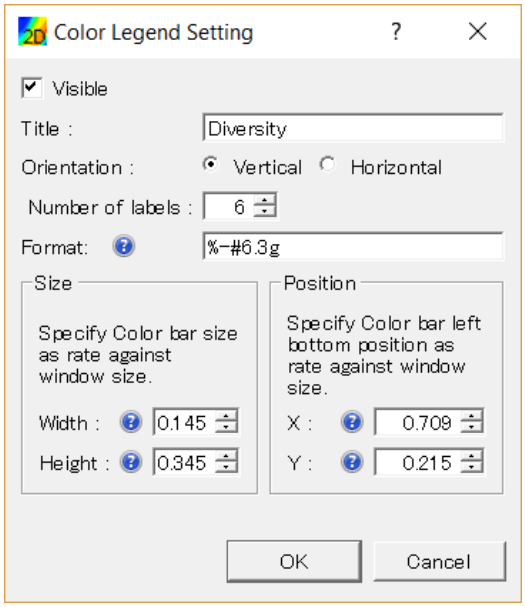
deselect [Automatic] box

- Max：1
- Min：0　; off “Fill lower area”
- Display setting：Contour Figure
- Division Number：5

deselect [Transparent] box

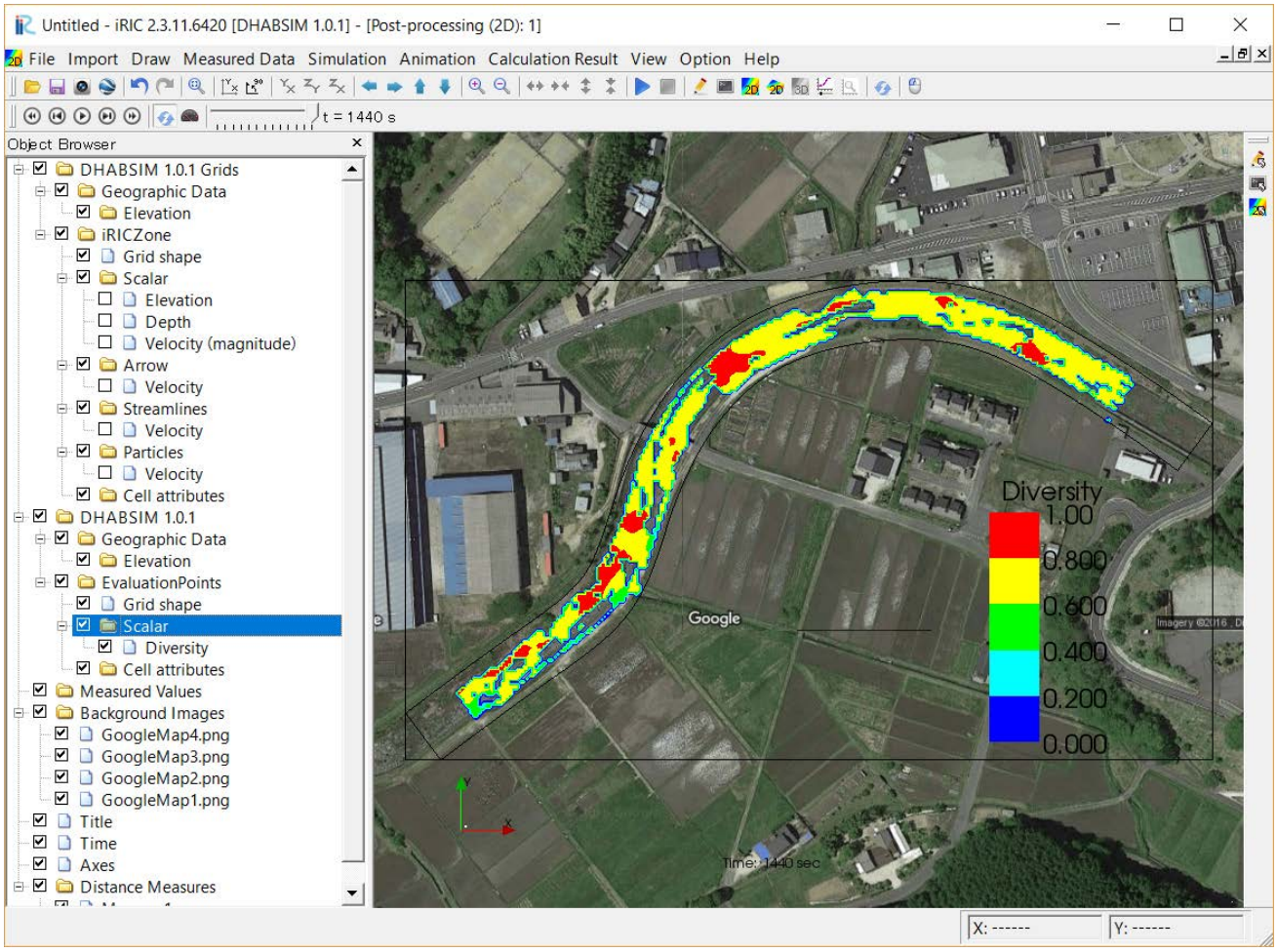
- deselect [Transparent] box

You can set number of labels in color bar setting. Click on [color bar setting]



Number of labels：6

Mark the check box of png files in the background images folder.
Now, you can clearly observe the map.



VII. To User

- When you publish a paper with the results using the iRIC software, please indicate that the iRIC software is used.
- The datasets provided at the Web site are sample data. It may different from the real condition.
- Let us know your suggestions, comments and concerns at **http://i-ric.org.**

iRIC Software

DHABSIM Solver Examples

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