

iRIC Software

International River Interface Cooperative

ver. 3

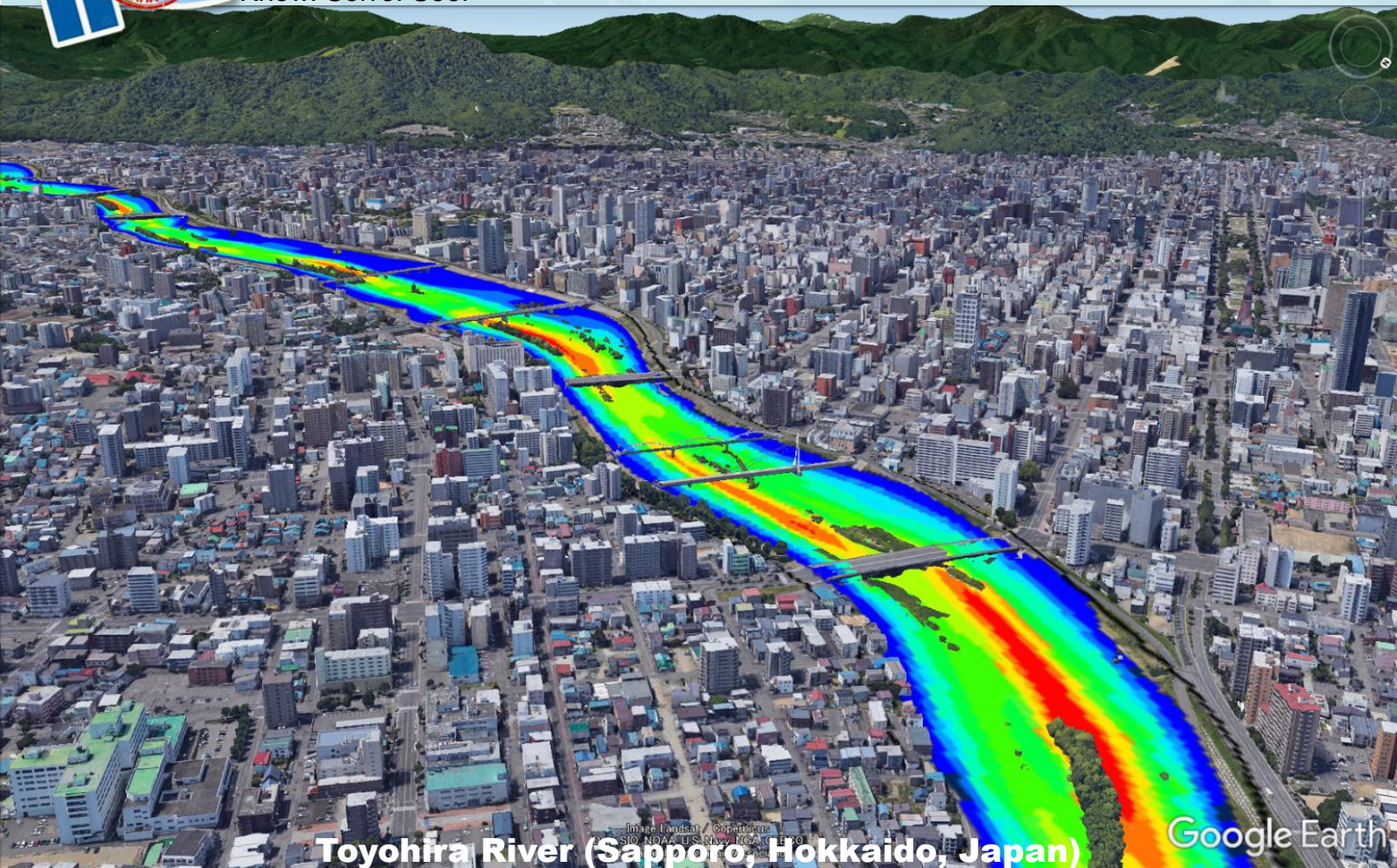
Changing River Science

iRIC: Free Software for Flow and Bed Morphodynamics

iRIC software can simulate rivers from Colorado River to the Nile.

A revolution in river flow calculations, riverbed morphology, and flood analyses.
Know! Solve! See!

iRIC Project
Changing River Science



Toyohira River (Sapporo, Hokkaido, Japan)

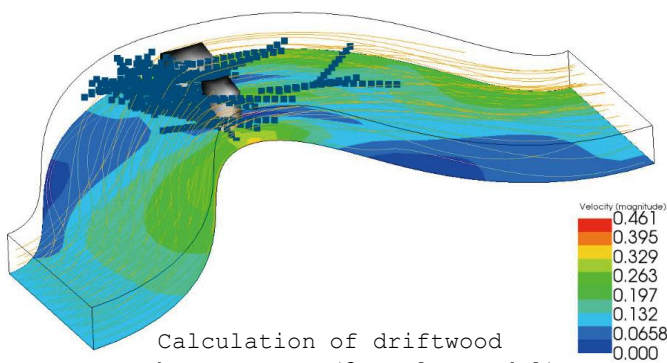
Google Earth

iRIC Software

- Included in iRIC software: runoff solver, flooding solver, tsunami solver, one, two, and three-dimensional models for flow and bed morphology calculations. **You can freely use any solver after registration.**
- Create impressive images and animations.

New features

- Download background images from google map, Bing Maps automatically
- import altitude data from web services such as USGS and import geographic information
- Analyze the differences in river cross-section survey data collected at different times
- Four new solvers (for more information, please refer to the reverse side)

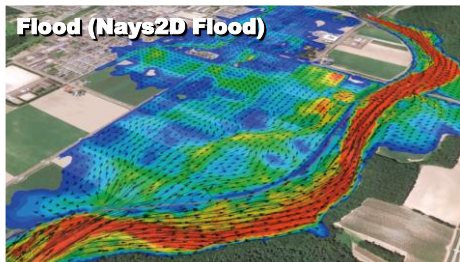


Calculation of driftwood
by NaysCUBE (3-D Flow Model)

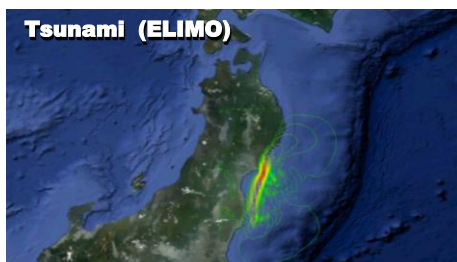
- ❑ iRIC can be downloaded freely. You can find the latest information about iRIC software (after user registration) <http://i-ric.org>.
- ❑ iRIC is a river flow and riverbed deformation analysis software package which combines the functionality of MD_SWMS, developed by the USGS (U.S. Geological Survey) and RIC-Nays, developed by the Foundation of Hokkaido River Disaster Prevention Research Center, Japan.

Examples of calculation results using iRIC solvers

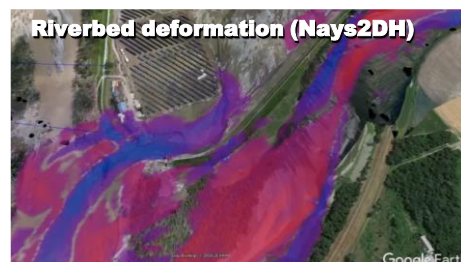
Flood (Nays2D Flood)



Tsunami (ELIMO)



Riverbed deformation (Nays2DH)



Debris flow (Morpho2DH)



River flow (FaSTMECH)



Habitat potential (EvaTRIP)



GUI Functions

< Grid generation >



- River survey and DEM data can be edited within the GUI
- Grids and meshes can be generated from river survey data and/or DEM data
- Aerial photo and map images can be set as backgrounds
- Grid attributes can be illustrated with contours and bird's-eye view

<Analysis/Visualization>



- Visualize the calculation results using contours, vectors, streamlines and particle tracks
- Save visualized image as jpg, pdf, etc.
- Export data in csv and vtk format
- Create kml files for Google Earth

<Other>

- XML Scheme:

XML scheme is used for constructing menus and specifying model parameters. This makes it simple to add new models or change existing models in the iRIC system.

- CGNS file format

The CGNS data file format is used in the iRIC system. Users can directly analyze results using software that can import CGNS files, including MATLAB, TECPLOT etc.

Solver Lineup

- **SRM:** SRM is a runoff calculation solver using storage routing models.
- **CERI1D :** CERI1D is a solver for one-dimensional (1D) unsteady flow calculations. CERI1D is capable of calculating river flow, river ice fluctuations and tsunami propagation into rivers.
- **Nays2DH:** Nays2DH (combined Nays2D and Morpho2D) is a two-dimensional solver for flow and bed deformation. Nays2DH can simulate complex unsteady flows and bed variation including bank erosion, river confluences, mixture of sediment, suspended load transport, rigid-bed, etc.
- **FaSTMECH:** FaSTMECH is flow and riverbed variation solver under quasi-steady flow. It also includes Quasi 3D.
- **SToRM:** SToRM is unstructured grid model. It can handle regular flow, jet flow, and waterfront boundaries.
- **NaysCUBE:** NaysCUBE simulates the fully three-dimensional flow, such as the horseshoe vortices around river structures, etc., and the associated bed morphodynamics. NaysCUBE ver.3 also equips the module for simulating driftwood.
- **Nays2DFlood :** Nays2DFlood is for flood calculation and was developed from Nays2D solver. It allows setting the overflow point of rivers, flooding discharges, and land elevations. Simulates the running or diffusing flow over land.
- **Morpho2DH:** Morpho2DH is the horizontal two dimensional bed deformation analysis solver which can reproduce the transport and deposition process of debris/mud flow with structures (ex. sabo dam and so on). Additionally, the unsteady horizontal two dimensional bed deformation analysis can be performed.
- **ELIMO :** ELIMO is a solver for tsunami calculation. It is capable of reliable estimations of Tsunami generation, propagation and evolution on coasts.
- **EvaTRiP:** EvaTRiP is aimed at utilizing the stability of river channels in river channel planning and design, the study of the river environment and maintenance management, evaluating the necessity of revetment, evaluating migration critical particle size, evaluating the availability of terrestrial plant growth, Evaluate fish habitat (HSI)
- **DHABSIM:** DHABSIM aims to evaluate comprehensive habitability of general fish species as easily as possible. It gives the flow velocity, depth, bottom sediment and vegetation distribution of river way as geographical information of iRIC. Just output the evaluation value and its distribution as a fish habitat.

You can download iRIC Software **version 3**
from <http://i-ric.org/>

