

# MIKE HYDRO RIVER

## Comprehensive river network modelling

MIKE HYDRO River is our **new generation river modelling** package - successor of the world-known MIKE 11 river modelling system. MIKE HYDRO River is **top quality river modelling**, covering **more application areas than any other river modelling package** available. It enables you to model a variety of tasks related to river hydraulics, water quality, flooding, forecasting, navigation as well as catchment dynamics and runoff.

### APPLICATIONS

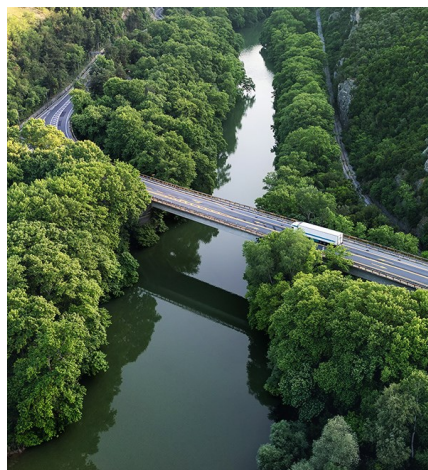
Our 1D river modelling package is developed over decades and applied in a large range of complex applications, guaranteeing that MIKE HYDRO River is a perfect and safe choice for your river modelling projects.

#### TYPICAL APPLICATIONS

MIKE HYDRO River is the ideal software for:

- Real -time flood forecasting
- Dam break analysis
- Reservoir optimisation including complex structure operations
- Ecology and water quality assessments in rivers and wetlands
- Flood analysis and flood alleviation design studies
- Water quality forecasting
- Sediment transport and long term assessment of river morphology changes
- Salinity intrusion in rivers and estuaries

Additionally, optimal river modelling solutions often require integrated modelling, in which the river model interacts with surrounding flood areas or groundwater. MIKE HYDRO River is perfectly suited for fully integrated applications by seamless model couplings with MIKE FLOOD and MIKE SHE.



### ENGINES

MIKE HYDRO River offers a variety of hydraulic and hydrological simulation engines.

#### HD - HYDRODYNAMICS

This is a powerful, parallelised 1D hydrodynamic engine for rivers and open channels. It is unsurpassed in flexibility, robustness and features. Key features include:

- Fully dynamic solution to the 1D St. Venant equations
- Hydraulic routing options for simplified channel routing
- Automatic adaptation to subcritical and supercritical flow
- Comprehensive hydraulic structures library
- Extremely flexible control module for operational gates, pumps and turbines

#### HYDROLOGY

The MIKE HYDRO River packages also include options to further improve the solution through inclusion of distributed hydrology in river modelling. Hydrology features include:

- **Overland flow** using a 2D diffusive wave approach or more simplified methods to include long term exchange across floodplains
- **Unsaturated infiltration** using Richards Equation or more simplified methods to calculate infiltration losses in floodplains
- **Evapotranspiration** from leaf interception, ponding, the root zone and groundwater, to assess catchment water balances and riparian ET
- **Groundwater** using a 3D finite difference or linear reservoir approach for river bed exchange in gaining and losing rivers

### MODULES

MIKE HYDRO River includes a wide range of add-on modules, enabling you to tailor the river model framework specifically to the requirements of your projects.

#### RR - RAINFALL-RUNOFF

This includes a variety of RR-models, amongst others, a lumped conceptual and continuous hydrological model, urban runoff models as well as the standard unit hydrograph SCS method.

#### SO - STRUCTURE OPERATION

This simulates operational structures such as sluices, overflow and radial gates as well as pumps and turbines from user-defined operation strategies.

#### DB - DAM BREAK

This provides different methods for simulation of dam breaches from an initial dam geometry. The options available are modes for soil erosion failures or user-defined breaches. DB includes NWS DAMBRK and energy equation breach calculation methods.

#### AUTOCAL - AUTOMATIC CALIBRATION

This is an automatic calibration process for a wide range of parameters, including RR parameters, Manning numbers, head loss coefficients and water quality parameters.



## MODULES

### DA - DATA ASSIMILATION/FLOOD FORECASTING

Data assimilation and real-time flood forecasting, including continuous model state updating during simulation, Kalman filter and uncertainty assessments.

### AD - ADVECTION-DISPERSION

Transport and spreading of conservative pollutants and constituents, including a linear decay option.

### MIKE ECO LAB - ECOLOGICAL MODELLING

MIKE ECO Lab is applied for all water quality related and heat balance applications with MIKE HYDRO River, using predefined or user defined water quality model templates. See more on page 20.

### ST—SEDIMENT TRANSPORT

Modelling of cohesive and non-cohesive sediment dynamics including transport, erosion and deposition of uniform and mixed sediments. Includes calculation of morphological changes of river bed bathymetry and bed sediment composition.

### ONLINE OPERATION AND FORECASTING

Online, real-time data management and forecasting with MIKE HYDRO River is possible – through integration of river models in the modelling framework, for water forecasting and operational control using MIKE OPERATIONS. See more on page 36.

## BENEFITS

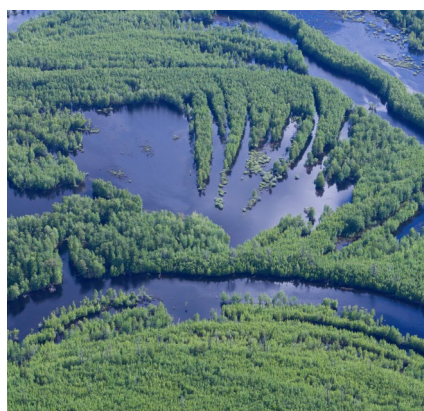
MIKE HYDRO River is a powerful river modelling software with more features than any other river modelling package.

With MIKE HYDRO River, you get the successor of MIKE 11 - one of the world's most well-proven and widely applied 1D river modelling packages.

Our 1D river modelling package is the preferred choice of professional river engineers when reliability, versatility, productivity and quality are the keywords.

MIKE HYDRO River facilitates efficient and accurate integrated modelling applications for e.g. flooding and integrated hydrology through seamless coupling to other MIKE models.

MIKE HYDRO River continues the successful era of MIKE 11 - the product that made the MIKE brand name synonymous with top quality modelling software from DHI and which remains one of the most widely used MIKE products.



DHI's river modelling package is accepted by US Federal Emergency Management Agency, FEMA, for use in the National Flood Insurance Program (NFIP).



Contact: [mike@dhigroup.com](mailto:mike@dhigroup.com)  
For more information, visit:  
[www.mikepoweredbydhi.com](http://www.mikepoweredbydhi.com)