Release Notes 2022

MIKE+

Contents:

Introduction

Welcome to MIKE+ 2022 Update 1

In this Release Note, you will find information about new features of MIKE+, and what you need to know in order to install and get started with MIKE+ 2022.

MIKE+ is our new, flexible system for modelling and designing water distribution networks and collection systems for wastewater and storm water, as well as for modelling river networks and 2D surface flooding.

MIKE+ is offered in two versions:

- **MIKE+**
- **MIKE+ ArcGIS**

With MIKE+ you get:

- GIS-based model building and data management
- Powerful hydraulic simulation engine that supports parallel processing
- Integrated water quality, fire flow, real time control, flushing, multi-source tracing and hydraulic simulation (water distribution)
- Integrated water quality, control rules, LID and Soakway, rain dependent inflow and infiltration (collection system and river network)
- Long-term statistics (collection system)
- Integrated 2D hydraulic and water quality, dynamic interactions with collection system and river networks, surface flows visualisation (2D overland)
- Full undo and redo capability in all editors
- Thematic mapping and integrated result visualisation
- Open data models - easy integration with other applications
- Instant data checking and validation

With MIKE+ ArcGIS you get:

- Sophisticated GIS capabilities and smooth integration with ArcGIS Pro. MIKE+ embeds ArcGIS/ArcGIS Pro software for GIS-based model building, data management and result presentation.

System requirements

Operating systems

Fully supported Windows operating systems *	Windows 11 Pro, version 21H2 (64 bit) Windows 10 Pro, version 21H2 (64 bit) Windows Server 2022, version 21H2 Windows Server 2019 Standard, version 1809
Non-supported but partially tested operating systems **	Windows Server 2016 Standard, version 1607

* Fully supported operating systems are systems that have been tested in accordance with MIKE's Quality Assurance procedures and where warranty and software maintenance agreement conditions apply.

** Non-supported but partially tested operating systems are systems, which are not officially supported by the MIKE software products. These operating systems have only undergone very limited testing for the purpose of MIKE software, but the software and key features are likely to work. Installation of MIKE software on a non-supported operating system is done so at the user's own risk. The MIKE software warranty and software maintenance agreement conditions do not apply for unsupported operating systems and DHI is under no obligation to provide assistance or troubleshooting for cases where the software is being used on a non-supported operating system.

Please note that when running a fully supported operating system as a 'guest operating system' on a virtualization platform, it is automatically downgraded to a non-supported operating system under the conditions provided above.

Minimum hardware/software requirements

Processor	compatible with x64 instruction set, 2.2 GHz or higher
Memory (RAM)	4 GB or higher *
Storage	64 GB or higher *
Display	resolution 1024 x 720 (High-Definition) or higher, 24-bit color (true color)
Graphics adapter	64 MB RAM (256 MB RAM or higher recommended), 32-bit true color **
Software requirements	Microsoft .NET Framework 4.7.2 or higher

* The actual required amount of memory and disk space depend on the usage (application, model setup, size of data files etc.)

** MIKE+ utilizing GPU for 2D overland simulations requires a Nvidia graphics card with compute capability 5.2 or higher. Please note that some of these graphics' cards have varying performance in single compared to double precision calculations. The GPU functionality is based on version 11.1.1 of the Nvidia® CUDA® Toolkit.

Installation   **top**

To install MIKE+:
To install MIKE+, please go to the MIKE+ product folder and execute the setup.exe file either on the MIKE 2022 USB or from the downloaded, un-zipped installation files. Press the 'Install' button to begin installation.

The setup program will automatically install all necessary files and folders on your computer. Additionally, an entry is created in the Start Menu for MIKE+.

To install MIKE+ ArcGIS:
To install MIKE+, please go to the MIKE+ product folder and execute the setup.exe file either on the MIKE 2022 USB or from the downloaded, un-zipped installation files. Press the 'Install' button to begin installation.

The setup program will automatically install all necessary files and folders on your computer. Additionally, an entry is created in the Start Menu for MIKE+.

Please choose ArcGIS Pro's "ArcGISPro.msi" to install ArcGIS Pro separately. This version of MIKE+ comes with ArcGIS Pro 2.9. You find the installation of ArcGIS Pro in the folder "Prerequisites\ArcGIS Pro 2.9". Other versions of ArcGIS Pro might also work with MIKE+ but are not covered by warranty and software maintenance agreement conditions.

Optional installation of PostgreSQL/PostGIS:
Both MIKE+ and MIKE+ ArcGIS are installed with SQLite/SpatiaLite. If you wish to use the alternative database option, PostgreSQL/PostGIS then please install the two products found in the "Prerequisites\PostgreSQL 14.2" and "Prerequisites\PostGIS 3.2.0" folders. Before you install the two products, we recommend that you read the note describing how to install PostgreSQL/PostGIS - this is available here.

License file and dongle

Please Note that when using the local or network license option, which require a license file and a dongle, then

- the DHI License Manager must be installed separately.
- all licensed applications included in MIKE 2022 require a 2022 version of the DHI License Manager.
- a new license file format (file extension dhilic2) has been introduced with MIKE 2022 and these license files can only be used together with a DHI License Manager 2022 or newer.

To use MIKE software in licensed mode, please refer to the DHI License Manager Release Notes (License Manager Release Notes).

Product invocation

Launch MIKE+ from the Windows Start menu.

Support

For general support, please refer to our FAQ.

If you experience any difficulties, or if you have questions, please contact our Customer Care team at mike@dhigroup.com.

You can also contact your local Customer Care team for support in your local language. You can find the list here.

New features and fixed issues   top

Every new release of MIKE+ consists of new modules, new features and/or corrections to problems or significant inconsistencies discovered in previous releases. Please find below short descriptions of the most significant news.

Release 2022

MIKE Powered by DHI

New features

Module/type	New feature
General	SWMM model networks can now be coupled to a 2D overland model. This is enabled by activating the 2D overland module in the 'Model type' editor in SWMM model setups. This will enable the definition of the 2D overland model as well as 1D-2D couplings. In this version, couplings to the 2D model are only available with nodes (no lateral coupling along banks for open channels), and coupling of water quality components is not supported.
General	Map data from MIKE+ can now be exported to CAD files (.dwg and .dxf formats), using the 'Import and export' tool. Check the documentation to get the available list of assignments for CAD files.
General	Longitudinal profile plots can now be exported to CAD files (.dwg format). This new option is accessed from the context menu of the profile plot.
General	From the 'Import and export' tool, it is now possible to import data from an Oracle spatial database.
General	Connecting to a WMS server to display background layers now allow connecting through a proxy server.
General	A new 'Measure' tool is available in the ribbon bar, in the Map tab. It allows measuring distances on the map along segments or polylines, as well as polygons' areas.
General	A new 'Export map' button has been added to the ribbon, in the 'Map' tab. It can be used to save the map layout to an image file.
General	The 'Import and export' tool can be executed from a command line, reading the import/export configuration from a configuration file. Please refer to the documentation to get more details about the command line's syntax.
General	A new 'Automap sections' button has been added to the 'Import and export' tool. When importing data from a MIKE+ project to another MIKE+ project, this button will create all sections corresponding to all relevant tables in the MIKE+ database for the active working mode (e.g. Water Distribution), and will populate them with the proper assignments. This button should therefore be used to merge two MIKE+ projects together. Note that if some duplicate names are found in the two projects, the imported record will be renamed, and other features referencing this name may have to be updated accordingly after the import. This may e.g. be the case for tables of materials, which may be used in the pipes definition to assign the roughness value.
General	In the 'Import and export' tool, a new job property called 'Source text format' has been added. This option applies when converting input strings (texts) to numbers, and controls how the decimal separator is identified.
General	A new function called DoubleFromString has been added to the Expression editor, to convert input string (text) data to numerical values and controlling the format of the decimal separator in the input text. It can e.g. be used in the 'Field calculator' or in the 'Import and export' tool.
General	The date and time of results shown in the 'Property and result explorer' view is now synchronised with the date and time of results shown on the map.
General	It is now possible to export simulation files and run simulations from a command line (without opening the user interface) also for Water Distribution and SWMM model types. All model types therefore support the command line execution.

General	The tool 'Clone and repair database', available in the File menu, may be used with damaged / corrupt databases. It will create a new database but without the damaged tables, which can then be populated again manually.
General	A default unit system can now be selected from the 'User preferences' dialog, to choose between SI and US unit systems. It will especially control in which unit system the results are shown, when no model database is opened.
General	In the 'Model and result report' tool, 'Joins' can now merge data from model tables and results in a common table of the report. A new 'Time step' option also allows adding a column to the join table, with results from a selected time step.
General	In 'Rivers, collection system and overland flows' mode, closing MIKE+ while a simulation is running will offer an option to continue the simulation outside of the MIKE+ application. This option can be used to release the license module of the user interface while running a simulation.
Collection System and Rivers	Raster layers with type 'GeoTIFF' and 'Arc/Info Binary Grid' can now be used as input DEM for use in the 'Catchment delineation' tool.
Collection System and Rivers	A new 'Statistics' content type can be selected for catchments and network result files. This type of result file stores maximum / minimum / average values and time of maximum / minimum value, as well as accumulated values for the relevant result items, computed throughout the simulation. These statistics are computed during the simulation and therefore don't depend on a storing frequency of the results.
Collection System	A new 'Results differences' tool is available in the 'Results' tab in the ribbon. This tool is designed for comparing results from different variants of hydraulic network simulations, and report any significant difference of result. This may e.g. be used when comparing results from a former version of a model and results from a new version updated with the latest information from an asset management system. The tool allows you to quickly identify locations where results differences are observed, and visualise and compare results at these locations. It is not necessary to have a model database opened for using the tool.
Collection System	An 'Initial level' can now be specified in the weirs' and orifices' properties, to control the elevation of structures controlled by control rules at the start of the simulation.
Rivers	Several new types of structures are now available for river networks: Pumps, Bridge structures, Dambreaks, Tabulated structures, and user-defined Energy losses.
Rivers	River models previously created with MIKE HYDRO River or MIKE 11 can now be imported automatically into MIKE+, from the File \ Import menu. Please note that the import is limited to the river functionalities currently supported in MIKE+ (mainly the rivers and catchments definitions as well as structures and boundary conditions), whereas some functionalities remain unsupported for now in MIKE+ and are ignored during the import (e.g. storages, multiple zones resistance and time-varying resistance factors, variables, side structures, etc.). Before importing a river model, make sure that all expected river functionalities are available in MIKE+, and check for possible warnings in the Log view after the import.
2D overland	Improved performance for 2D overland applications using GPU acceleration: • Tuning of timings and numerous small tweaks. • OpenMP parallelisation for pre-processing of infrastructure. • Pre-processing of boundary conditions (initialisation). • Optimised data transfer on 2D flood statistics results. In addition, a new dynamic list approach is used together with optimised gradient calculation for forcing calculations.

2D overland	A new check box called 'Allow for recalculation' has been added to the '1D-2D couplings' editor. The default behavior of couplings remains unchanged, i.e. the location of the coupling in the 2D domain is updated / recalculated whenever the coupled 1D element is changed (new node ID, modified river chainages, etc.). However, when this check box is unselected, the location in 2D domain will always remain unchanged, which is especially useful when this location has been customized.
2D overland	Coupling of Advection-Dispersion components is now possible also when coupling the 1D network to a MIKE 21 FM or MIKE 3 FM file.
SWMM	The 'Topology repair' tool is now also available for SWMM model networks.
Water Distribution	A new 'Optimization' special analysis has been added. It is used to optimize pumps and valves' behavior to meet e.g. a target water depth, pressure or flow in the network.
Water Distribution	A new 'Online analysis' special analysis has been added. It is used to map the model data from MIKE+ to a SCADA system's data, especially for use in Water Distribution Online.
Water Distribution	The 'Pipe criticality' special analysis has been renamed 'Network vulnerability', and now also reports criteria related to nodes.
Water Distribution	In interactive fire flow analyses, a new 'Free discharge hydrant' method has been added, which computes both hydrant discharge and residual pressure for a free discharge hydrant.
Water Distribution	Extra result items 'Tap pressure' and 'Demand allocations pressure' are now saved during simulations.
Water Distribution	Extra result items related to pumps are saved during simulations: efficiency, energy costs, and energy. These items are saved only when the simulation is performed using the EPANET 2.2 engine version.
MIKE 1D engine	Added static volume output to Pump Emergency Storage calculations (TT59012).

Fixed issues

Module/type	Error/Inconvenience
General	User-defined columns were not exported, when a feature layer was exported to a shape file.
General	An unexpected error "Unable to open database file. x64 is True" was obtained when running a simulation from a MIKE+ project saved on a network location (other than the local machine).
General	Colors on extra result maps could be inconsistent with the defined color palette, when multiple result layers (from multiple result files) were added to the same map.
General	In the Profile plot properties, it was not allowed to apply negative values to control the minimum and maximum values along the right Y-axis.
General	An unexpected error sometimes occurred when loading the symbology for a shape file from a file.
General	RDI additional result items were not saved to result files.
General	An unexpected error about a non-existing source was provided in the 'Import and export' tool when trying to export a result layer to e.g. shape file.

General	When loading a .dfs0 time series in the list of result files, the "Time period to load" was ignored and the entire time series was always loaded.
General	Values imported from the 'Import and export' tool were wrongly altered in some cases, when the decimal separator in the source file was a comma.
General	Shape files exported from a model with a coordinate system with length unit in feet were defined with inconsistent coordinates and units.
General	Various errors preventing from showing background maps from some WMS servers have been corrected.
General	An error preventing from displaying a Google Map or Open Street Map background layer for some map projections, when the projection's false origin is defined exactly at the border of the valid region, has been fixed.
General	When exporting a feature layer to a shape file, the feature name was always appended as a suffix. It is now appended only when multiple shape files are exported for the same feature layer.
General	Flow tracing from results was wrong when the flow in the first pipe was smaller than the threshold value.
General	When activating the option 'Show columns in active tab' from the context menu of overview grids, several columns from the active tab were not shown.
General	An unexpected error occurred when using time series with a non-equidistant time axis, in the 'Plots and statistics' editor.
Collection System	In the Initial conditions editor, data in the table of local values were deleted when the set of initial conditions was renamed.
Collection System	Various improvements and corrections to the validation of data from the CS network and catchments have been made.
Collection System	Attributes 'Description' and 'AssetName' failed to import from MIKE URBAN classic, for the catchments table.
Collection System	The catchment's geometry on the map was incorrectly imported from MIKE URBAN classic when the catchment was defined with multiple polygons (e.g. when containing holes). Holes can now be imported. The biggest polygon is imported to define the catchment geometry in other (unsupported) cases.
Collection System	An unexpected error was sometimes obtained when computing the Distributed weights for grid distributed rainfall boundary conditions.
Collection System	Attributes 'NetTypeNo' and 'Element_S' were missing in the list of domains when applying the Field calculator in the 'Pipes and canals' editor.
Collection System	MIKE+ did not allow defining a boundary condition in a soakaway node.
Collection System	An unexpected error "Found non-noded intersection" was sometimes obtained when trying to merge catchments with the Network simplification tool.
Collection System	Wrong validation errors were reported in the Expression editor when using a sensor with type 'Action Active Time', because it was wrongly considering it as a double value.

Rivers	Rivers imported from shape files were always given a chainage length of 100 m, regardless of the actual length of the imported lines.
Rivers	An unexpected error occurred when exporting cross sections to shape file.
Rivers	From the 'Measurement stations' editor, using the arrow button to pick a river location from the map did not pick the chainage location along the river from the clicked location.
2D overland	MIKE+ did not provide the expected warning message when the generation of the mesh failed.
2D overland	The 'Apply' option for 2D boundary conditions was ignored, making the boundary conditions always active.
2D overland	Various errors occurring when importing a MIKE 21 and/or MIKE FLOOD file into MIKE+ have been fixed.
2D overland	Coordinates of the 2D domain's extent were wrongly converted between feet and meters during import from MIKE URBAN classic.
2D overland	Attributes from 2D overland editors could not be selected as target in the 'Interpolation and assignment' tool.
2D overland	The coupling tools 'Create couplings' and 'Edit location' were wrongly disabled when coupling the 2D overland module to a MIKE HYDRO River file.
2D overland	MIKE+ failed saving the 'Roughness value' and 'Infiltrated volume' result items in 2D result files when selected.
2D overland	It is now possible to filter the list in the '1D-2D couplings' editor by coupling type.
2D overland	When several 2D boundary conditions had the same code value (i.e. defining a discontinuous boundary condition), only the first part was displayed on the map.
2D overland	Simulations failed when including a 1D-2D coupling to a soakaway node, due to an unexpected error claiming the node type was incorrect.
2D overland	The list 'Couple to' was missing in the '1D-2D couplings' editor, when coupling to an existing MIKE 21 file instead of the 2D overland module.
SWMM	"Asset ID" could not be added as extra X-Axis below profile plots, for some SWMM network features.
SWMM	Date and times from time series with relative time, were wrongly interpreted in the simulation if they were typed in with values higher than 1 day.
SWMM	The 'Default time step for new rows' in the 'Time series' editor did not work properly.
SWMM	The layer type 'Catchments' was missing from the list of target layers, in the map's toolbar.
Water Distribution	An unexpected error was sometimes obtained when loading some .dat files in the 'Measurement stations' editor, due to a non-recognized format.
Water Distribution	The import of EPANET .inp files sometimes failed with missing error descriptions.
Water Distribution	Start date and End date could not be specified for special days in patterns.

Water Distribution	The relative viscosity was wrongly given a unit of m^2/s.
Water Distribution	Sustainability Analysis sometimes failed to report empty or full tanks.
Water Distribution	Option 'Report raw results' did not work.
Water Distribution	With EPANET 2.2 engine, a wrong demand value was considered in the fire flow analysis with the method 'Pressure for flow' and in the flushing analysis.
Water Distribution	An unexpected validation error about the input string's length was returned when selecting 'Link Flow (absolute)' as result item in the 'Plots and statistics' editor.
Water Distribution	Demand statistics was not taking into account the value of a demand multiplier if entered in the Multiple demands editor.
MIKE 1D engine	Added support for decimal entry of UHM curve number values (TT56536).
MIKE 1D engine	Fixed error causing failure of LTS job list (TT56780).
MIKE 1D engine	Fixed scripting error in which res1D file not released by MIKE 1D controller (TT58619).
MIKE 1D engine	Fixed error in display of collection system slope in html summary (TT58908).
MIKE 1D engine	Corrected data type expected for sensor type "ActionActiveTime" (TT59020).
MIKE 1D engine	Added more informative error message to users attempting to obtain LTS results for 'weirs out of system' for setups with internal weirs only (TT59036).
MIKE 1D engine	Added support for "Close" and "Open" actions for valves in RTC setups (TT59072).
MIKE 1D engine	Added informative error message for setups with duplicate branch definitions (TT59151).
MIKE 1D engine	Added informative error message for setups with time series missing continuously increasing time series values (TT59165).
MIKE 1D engine	Corrected errors in the application of catchment water quality boundary conditions (TT59196).
MIKE 1D engine	Corrected unhandled exception occurring when importing setup from MIKE HYDRO River (TT5930).
MIKE 1D engine	Corrected saving error occurring when results saving period is user-defined (TT59431).
MIKE 1D engine	Disabled unit conversion to standard units before input to control module (TT59445).
Couplings engine	Fixed error in which couplings engine did not close properly after an error during initialization (TT59563, TT59808).
MIKE 1D engine	Made change to order of calculations to enable 'SaveFullRunningDischarge" feature (TT5951).
Couplings engine	Fixed formatting error in html summary for coupled simulations (TT5951).
Couplings engine	Added informative error message when node coupled to 2D model located outside 2D domain (TT5923).

Release 2022 Update 1

New features

Module/type	New feature
General	A new account management has been added, to use MIKE Cloud services. Once signed into MIKE Cloud using the 'Sign on' button at the right end of the title bar, new functionalities become visible in the ribbon, to run simulations with the Simulation Launcher (see description below) or to create a domain file in Mesh Builder for the 2D overland module. Signing into MIKE Cloud requires a valid user account. If you do not have a MIKE Cloud account, reach out to your local DHI sales representative.
General	A new 'Versions Management' tool has been introduced, which is designed to support a cost-effective model maintenance. The tool can identify, report and visualize differences between any two versions of a model setup, as well as it can automatically update any model with the identified differences. Additionally, the Versions Management tool facilitates the organization of various model versions into a tree-like dependency structure that reflects the actual models' mutual relations and evolution. The tool is accessible from the 'Tools' ribbon tab.
General	The usage of user-defined columns in the editors has been improved. It is possible to populate them using the 'Interpolation and assignment' tool and to use them to create selections using the 'Select by attribute' tool. The content of user-defined columns can now also be used as label on the map to create customised labels, and to control the layer's symbology.
General	In the 'Import and export' tool, the user is now notified when imported data are identified to be in a different map projection than the one used in MIKE+, and is now offered the choice between reprojecting the data to the same map projection as used in MIKE+, or keeping the coordinates of imported data unchanged. This is especially useful when the two map projections are considered to be the same although minor differences are identified in their properties, in which case the data should not be reprojected.
General	A new 'Save as default' button has been added to the profile plot window. It is used to save the current list of layers and their symbology to the current MIKE+ project, for use as default layout for the future profile plots. It saves the settings for the model layers as well as for the result layers loaded on the plot.
General	When exporting a profile plot to a CAD file, the font size in the CAD file is now uniform and controlled by the user during the export.
General	When adding a CAD file to the map, the text layers from the CAD files are now also visible.
General	A new template has been added in the 'Model and result report' tool, to make a join table with results.
Collection System	A new tool 'Snap neighboring catchments' has been introduced, which updates the geometry of catchments on the map, to ensure that neighboring catchments are correctly snapped. It is especially useful to prepare catchments before attempting to merge them with the 'Network simplification' tool, because distant catchments cannot be merged even if the distance between them is negligeable. The 'Snap Neighboring Catchments' tool is accessed via the 'Special tools' menu on the Catchments ribbon tab.
Collection System	GeoTIFF rasters can now be used as input DEM in the 'Catchment slope and length' and 'CRS generation' tools.

Collection System and Rivers	The list of simulation parameters available in the 'MIKE 1D engine configuration' dialog has been improved. For relevant parameters, a different value can now be used for the collection system network and for the river network.
Rivers	New types of boundary conditions have been added, respectively for rainfall, evaporation and wind friction applied to the water surface of the 1D network.
Rivers	A new 'Storage' feature is available for river networks, to describe reservoirs, basins or any type of storage area using a single calculation point.
Rivers	A tool 'Compute storage from DEM' has been introduced, to compute the capacity of storage points. It uses a DEM to compute the Elevation-Area relationship of the storage, within the polygon shape of the storage points.
Rivers	A new 'Data Assimilation' module is available for river models. It allows continuous processing and updating of model states during simulations. Data assimilation is used for many types of applications, but in particular for real-time forecasting where the forecasted values of network state conditions (water levels, flows, etc.) are much more accurate and reliable when update and error estimation are included. In this version, the 'Data Assimilation' module only supports updating using a weighting function method.
Rivers	A new '2D map' type of result file is available for use in simulations of open channels. This result type provides interpolated results from the MIKE 1D simulation on a 2D rectangular grid file.
Rivers	The automatic import of MIKE HYDRO River and MIKE FLOOD model setups has been improved. It especially corrects the River IDs so that they use the same case in the Cross sections editor, in the Rivers editor, and in the 1D-2D couplings editor, which is a requirement in MIKE+. It also improves the import of side structures from MIKE HYDRO River, which are converted to Structure links.
2D overland	The MIKE ECO Lab module, used to simulate water quality processes, is now also supported by 2D overland simulations. Couplings between MIKE ECO Lab state variables used by the 1D and the 2D simulations are also supported.
2D overland	A new filter has been added for 2D overland result files, to control whether the file should store results in all elements from the 2D domain, only in real wet areas, or only in wet areas.
2D overland	The 'Interpolation and assignment' tool can now make use of .mesh and .dfsu layers to assign values to an attribute in the database.
2D overland	In the 'Coordinate system' editor, it is now possible to select the same coordinate system as the one used in a MIKE HYDRO, MIKE 21 or MIKE FLOOD file, using the 'Select file' button.
2D overland	In the '1D-2D couplings' editor, a new "arrow" button has been added to pick the ID of the coupled item from the map.
2D overland	The 'Create couplings' tool has been improved to specify the inlet area of the coupling to SWMM nodes.
2D overland	The Grd2Mike tool from the MIKE Zero toolbox has been updated to allow the specification of item details and land value.
2D overland	**Advance notice of end of support for 'Maxwell' and 'Kepler' type NVIDIA GPU cards.** The 2023 Release of MIKE+ utilising GPU acceleration will require NVIDIA graphics cards with compute capability 6.0 or higher. Accordingly, from this next release, MIKE+ will no longer support 'Maxwell' and 'Kepler' type NVIDIA GPU cards.

General	The Simulation Launcher is a new tool for execution of simulations in the cloud. It offers a credit-based solution to run simulations on different types of virtual machines with the option to automatically download results locally at the end of the simulation, all from within MIKE+. Supported simulations are 1D, 2D and coupled 1D-2D simulations from the working mode 'Rivers, collection system and overland flows'. The tool is accessible from the 'Run in MIKE Cloud' button in the 'Simulation' ribbon tab, once the user is signed into MIKE Cloud.
Water Distribution	A new 'Multi-species analysis' has been introduced, to run multi-species water quality simulations based on the EPANET MSX engine. It is accessible from the 'Model type' editor.
Water Distribution	The usage of Zones has been improved. Two different types of zones are now available: zones based on a selection for which the items included in the zones are populated in a list / selection, and zones based on network properties which are defined by the 'Zone ID' field in the network items. The list of network zones is automatically synchronized with the definition of the network items.
Water Distribution	A new Special selection called 'Nodes connected to selected point constituent sources' has been added to the Map ribbon tab.
SWMM	A new tool 'Transfer SWMM data to MIKE 1D' has been introduced. It is used to convert data from SWMM tables in the MIKE+ database to MIKE 1D tables, and therefore ease the conversion of SWMM model setups for use with the MIKE 1D engine. The tool is accessible from the list of special tools in the 'CS network' ribbon tab.
General / Results visualization	The button 'TS from map', used to pick locations on the map for time series plots, can now be used also on extra result maps, and not only on the model map.
MIKE 1D engine	Enabled using SWMM .out format as input to MIKE 1D network simulation (TT57945).
MIKE 1D engine	New tool to support conversion of MOUSE .crf format to .res1D (TT60422).
MIKE 1D engine	Made improvements to enable consistent results when running simulations on multiple threads.
MIKE 1D engine	Enabled catchment connections to river junction nodes (TT58984).

Fixed issues top

Module/type	Error/Inconvenience
General	Using the 'Transfer to map' button in the Selection Manager, some items from the selection did not remain selected on the map and in the editors.
General	When export results, the 'Import and export' tool sometimes failed to export the 'TsValue' field containing the result value.
General	The 'TsValue' attribute was not available in the expression editor, from the 'Import and export' tool.
General	In the profile plot exported to CAD file, some texts were missing in the table when they did not fit in their cell. The text wrapping has been improved to avoid this.
General	Some tools processing a DEM, including the 'Interpolation and assignment' and 'Create and update transects' tools, failed to assign a correct elevation value when the DEM was defined with a map projection in US units.

General	Background maps were not properly located when working with some map projections defined in US units.
General	Raster text files added to the map were sometimes shifted by half the cell size.
General	In the 'Import and export' tool, the 'Target preview' did not work when importing data from a geodatabase.
General	Instantaneous results shown in result tables were not showing the same time step as in other result windows.
General	When working with a scenario (other than the Base one), the name of the active alternative is now shown in the editors' tab name.
General	Under some circumstances, special characters were not correctly handled during import using the 'Import and export' tool.
General	When running a batch simulation, result files previously loaded on the map were not refreshed.
General	The 'Identify' button has been improved to also query elevations from rasters loaded on the map.
General	Running the 'Import and export' tool from a command line did not execute the repair process, as it does when executed from the user interface.
General	Creating a new time series from the 'Tools' ribbon tab did not offer the options to import data from raw data files.
General	Additional file extensions for world files, used to georeference image files, are now supported.
General	A new search field has been added to the 'Select by attribute' tool, to search amongst the list of unique values.
General	Various unexpected errors in pop-up windows have been fixed.
Collection System	The 'Boundary conditions' table was missing in the 'Select by attribute' tool.
Collection System	An incorrect unit was used during the rainfall-runoff simulation for the "constant degree day" coefficient, used for the snowmelt option in the RDI method.
Collection System	The 'Network simplification' tool changed the geometry of catchments to a rectangle, when attempting to merge distant catchments. Distant catchments are no longer merged (the new tool 'Snap neighboring catchments' can be used beforehand to snap catchments with small distances in-between, so that they can later be merged).
Collection System	The water level was sometimes not filled on profile plots, at locations with parallel pipes.
Collection System	In the 'Load points' editor, "Units" has been renamed to "Person equivalents" for clarity.
Collection System	The option to allow multiple tail nodes on pressure reaches, in the 'MIKE 1D engine configuration' dialog, did not work.
Collection System	While importing model setups from MIKE URBAN, the stop levels were not imported correctly in control rules for pumps.

Collection System	A wrong water level was sometimes plotted on profile plots for links defined with a generic shape of type 'HW Open'
Collection System	The option to specify the Preissmann slot ratio was disabled for closed cross sections.
Collection System	When using the 'Identify' button on a result map to display link data, the 'UpLevel' and 'DownLevel' were not displayed if no model database was opened.
Collection System	Control rules were still active in the simulations when 'Controlled by control rules' was unticked, in case the 'Apply' option was selected for the control rule. Control rules are now inactive if one of the two check boxes is unselected.
Collection System	When showing results from a 'LTS extreme statistics' result file in the 'Property and result explorer' panel, the time of the maximum result value was shown in accumulated seconds. It is now showing the corresponding date.
Collection System	The 'Reverse links' tool now offers the option to also reverse user-specified invert levels.
Collection System	In the 'LTS global parameters' editor, the dtQV attribute was not used during the calculation.
Collection System	Selection tools on the map used to select features even for layers being switched off. They now select features from visible layers only.
Collection System	The maximum speed of Valves was incorrectly showing a unit in % instead of %/seconds, and their minimum and maximum openings were showing a unit in % instead of fraction.
Collection System	Water age results were presented in seconds. They are now presented in hours.
Collection System	A rainfall boundary condition applied to "All" catchments was also applied to the water surface of the open channels from the network. This catchment boundary condition now applies only to catchments, whereas a new independent boundary condition type has been introduced for the rainfall on open channels.
Collection System	In the 'Catchment connections' editor, the catchment load allocations were incorrectly set after merging catchments with the 'Network simplification' tool.
Collection System	PID set point values were wrongly converted during the import from MIKE URBAN for projects defined in US units, when no conversion was expected.
Collection System	During Sediment Transport simulations, 'Dimensionless bed shear stress' result item was not saved to result files even when selected.
Collection System	The pipe top level was not shown in profile plots, after customizing the unit of the pipe diameter.
Collection System	Control rules settings for Valves were not correctly imported from MIKE URBAN.
Collection System	In the 'Curves and relations' editor, the volume computed for 'Basin geometry' curves was shown in SI units when the project was using a US unit system.
Collection System and Rivers	The 'Validation' menu in the Setup tree view has been replaced by a 'Validate' button in the 'Simulation setup's editor, for more clarity.
Collection System and Rivers	The default number of threads used for MIKE 1D simulations was usually twice the value shown in the 'Parallelisation configuration' dialog.

Rivers	Several corrections have been made to the import of river models from MIKE HYDRO River and MIKE 11.
Rivers	Rivers were shown in the wrong direction on profile plots, when rivers are defined with a negative flow direction.
Rivers	The MIKE+ database saved the path to the cross sections file as an absolute path, and this path became invalid when moving MIKE+ project files.
2D overland	Time series extracted from 2D result files were always shown in SI units, even when the project was defined to use US units.
2D overland	Several corrections have been made to the import of 2D models and couplings from MIKE 21 and MIKE FLOOD.
2D overland	The 'Set max. time' button in the 'Simulation setups' editor failed to work with 2D boundary conditions.
2D overland	The 'ArcGIS integration' tool did not export AD result items from 2D result files.
2D overland	While editing mesh arcs on the map, the edited arc could not snap to other arcs to create polygons.
2D overland	When changing the map projection of the MIKE+ project and reprojecting model data, the 2D domain file was deleted.
2D overland	The '2D boundary conditions' and '2D infiltration' editors did not report an error when the time series file is missing.
2D overland	When using a rectangular grid domain, the 'Create couplings' tool has been improved to not create couplings to nodes located on 'Land value' cells, when the option 'Couple items located within extent of 2D domain only' is selected.
2D overland	Result items 'Discharge to surface' and 'Water level of couped model' were not loaded in MIKE+ for couplings between a CS weir and the 2D domain.
2D overland	The creation of a 2D Surface Roughness file was very slow when pressing the button 'Review roughness file on map'.
2D overland	When the 2D domain file is created from MIKE+ definition, this file was re-created and saved every time the MIKE+ project was saved. This file is now saved again only if it has changed.
2D overland	The number of threads and subdomains used for 2D simulations was different than selected in the 'Parallelisation configuration' dialog.
2D overland	The 'Import and export' tool failed to import couplings' geometry from shape files, with the error "Well-known text is not valid".
2D overland	The '2D surface roughness' editor accepted dfs2/dfsu input files containing data with Manning's n values, whereas only Manning's M values are supported during the simulation.
Water Distribution	Wrong results were sometimes reported from optimization simulations in the .csv file, although the optimisation ran correctly.
Water Distribution	For fire flow simulations based on pressure zones, wrong junctions from other zones were sometimes taken into account, and no fire flow was calculated.

Water Distribution	Option 'Assignment from network neighbours' in the 'Assignment and interpolation' tool sometimes failed with WD networks.
Water Distribution	Valves regulation was incorrect, when the timing of the control rule was not defined in hours.
Water Distribution	Construction year (CDATE) attribute from Pipes table was not listed in the 'Select by attribute' tool.
Water Distribution	When a pipe was split from the map, its user-defined length (if any) was not updated, resulting in a doubled total length.
Water Distribution	Wrong Flushing Analysis results were obtained when the decimal separator was a comma in the Windows regional settings.
Water Distribution	The nodal demand was not correctly accounted for in the fire flow simulation, with residual pressure for given flow and flow for given residual pressure methods.
Water Distribution	The flow unit used for results presentation was sometimes inconsistent with the unit system selected for the project.
Water Distribution	Inactive elements (pipes, pumps, etc.) were hidden on the map. They are now shown with a grey line.
Water Distribution	Some demands and time patterns were missing after merging model setups using the 'Submodel Manager'.
SWMM	Raingage coordinates were not exported to the inp file for all simulations.
SWMM	Buttons 'View log' and 'View summary', from the Simulation tab in the ribbon, failed to show the files from SWMM simulations.
SWMM	From the 'Layers and symbols' tree view, the 'Zoom to layer' option did not work for SWMM layers.
SWMM	In the 'Curves and relations' editor, the head values for 'Pump curve 3 (Head-Flow)' curves with US units were shown in inches instead of feet.
SWMM	In the 'Time series' editor, the plot sometimes failed to show the correct X-axis values, when the time series was defined with a relative time.
SWMM	It was not possible to customise the units used by SWMM-specific attributes in the 'Catchments' editor.
SWMM	The ground slope in the 'Catchments' editor was wrongly showing a unit of o/oo instead of %.
MIKE 1D engine	Fixed error reading rain time series for LIDS (TT59912)
MIKE 1D engine	Fixed unhandled exception error when running UHM hydrograph (TT60752)
MIKE 1D engine	Corrected counting of events in annual/monthly statistics due to inconsistent application of time interval between jobs (TT60613)
MIKE 1D engine	Enabled running LTS Simulation if there is a blank character in a Job list criteria ID (TT60816)
MIKE 1D engine	Corrected errors occurring when using reduced result files (TT60634)
MIKE 1D engine	Enabled river – CS connection to orifice (TT60163)

MIKE 1D engine	Enabled saving water level results at nodes (TT60156)
MIKE 1D engine	Enabled simulating closed cross sections with Manning relative resistance (TT59119)
MIKE 1D engine	Fixed bugs related to running long-term urban simulations (TT59281, 54268, 55018, 57387, 57978, 58294, 58316, 58847, 58199, 59200, 59201, 59281, 59036)
MIKE 1D engine	Enabled running sediment transport using initial sediment depths (TT59610).