



iMOD

# **iMOD v5.6**

## **Release notes**



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*August 2023*

## 1 Introduction

### 1.1 General information iMOD 5

iMOD 5 is an easy-to-use Graphical User Interface and an accelerated Deltares-version of MODFLOW with fast, flexible and consistent sub-domain modelling techniques. iMOD facilitates very large, high resolution MODFLOW groundwater modelling and geo-editing of the subsurface.

Key features of iMOD 5 are:

- One expandable data set covering all possible future areas of interest.
- Flow model nesting, toggling between grid resolutions and moving to new areas of interest.
- Efficient numerical modelling.
- Fast interactive 2D- and 3D-analysis and visualisation.
- Interactive editing the geometry of the subsurface.
- Consistency between regional and sub-domain models.
- Leaving the era of building series of individual models behind.
- Modelling of water quantity and water quality (iMOD WQ).

To obtain a copy of the Deltares-executables of iMOD (free-of-charge), a request can be submitted on <http://oss.deltares.nl/web/imod/get-started>.

### 1.2 Release overview

In August 2023 a new version of iMOD 5 has been released: iMOD 5.6 (svn 3750).

The new version of iMOD contains a new version of MetaSWAP and some minor changes in iMOD. The changes in iMOD 5.6 are:

- iMODFLOW and MODFLOW6-MetaSWAP are built with a new version of MetaSWAP (svn 2299). In this MetaSWAP version the simulation of flow through resisting layers has been improved and functionalities for measures have been improved or added. The new MetaSWAP version must be used in combination with a new MetaSWAP database.
- iMOD has some improved or added functionalities and minor bug fixes for general stability issues in iMOD.

For installation of iMOD 5.6 and support when getting started, please read the instructions on <https://oss.deltares.nl/web/imod>.

iMOD GUI, iMODFLOW and iMOD-WQ are released using the latest Visual Studio Environment (VS2017) and Intel Visual Fortran Compiler (v2019.1.144) in combination with an updated version of Winteracter 14.0 (only for iMOD 5).



## 2 Changes in iMOD 5.6

### 2.1 iMOD GUI and iMOD Batch

#### 2.1.1 Added functionalities

##### *iMODBATCH*

- Function **RUNFILE**
  - Converting landuse (**LGN**) for MetaSWAP deactivates locations for an LGN code less than or equal to zero.
  - Added the keyword **GENPUZZLE** to activate the internal puzzle algorithm to connect dangles in specified GEN files for the HFB package. This is an existing functionality that has been turned off in previous release as it can consume significant time and the iMOD Batch function GENPUZZLE can be used instead as a preprocessing step.
  - Added the keyword **DISTRCOND** which gives the option to specify how the conductance of RIV-elements needs to be assigned to the intersected model layers.
- Function **IDFTOIPF**
  - Converting and IDF to an IPF file.
- Function **IPFEDIT**
  - Added function to perform simple mathematical operation on IPF files, such as subtracting values from one column from another with simple conditional expressions. This function can also be used to reorder or thin out the number of columns in an IPF.
- Function **TOTBDGVOLUME**
  - Added function to lump all budget terms specified in a single positive- and negative output IDF file. Use this function to generate the absolute volume per grid cell. This is a measure of the volume that passes through a grid cell.

#### 2.1.2 Improved/modified functionalities

##### *iMOD GUI*

- Display of loaded **IMF**-files remains in the main window's title to distinguish between multiple iMOD-sessions.
- Using the move button results in an incorrect display of coordinates while in the IDF Value function, this is fixed.
- New files are opened with the Fortran **REPLACE** option instead of **OLD** which could not refresh files if they were not written.

##### *iMODBATCH*

- Function **IPESTTOPARAM**
  - This function is improved because it did not handle fraction of parameters correctly.
- Function **RUNFILE**
  - Modified the keyword IDEFLAYER with an additional option and the ability to read values from an IDF file.

#### 2.1.3 Bugfixes

##### *iMODBATCH*

- Function **GENPUZZLE**
  - Initialisation of IBINARY was not set.
- Function **RUNFILE**
  - Applying **IDEFLAYER=1** for an ISG yielded wrong results, this is resolved.

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#### 2.1.4 Known issues

For actual known issues, check the iMOD website: <https://oss.deltares.nl/web/imod/known-issues>.

## 2.2 iMODFLOW

#### 2.2.1 New or improved functionalities

- The new version of MetaSWAP (svn 2299) is included in iMODFLOW.

#### 2.2.2 Bug fixes

- Crash in case DRN/RIV/GHB is specified in a PRJ file but empty in a SIM\_TYPE=2 configuration of iMOD (output to standard MODFLOW2005 files).

#### 2.2.3 Known issues

For actual known issues, check the iMOD website: <https://oss.deltares.nl/web/imod/known-issues>.

## 2.3 MODFLOW 6

This release includes the latest version of MODFLOW6, version 6.4.2. Both the stand-alone version is included (\*.exe) and the library version (\*.dll) as part of the Coupler.

For more information on this MODFLOW6 version, visit <https://water.usgs.gov/water-resources/software/MODFLOW-6/>.

## 2.4 Coupling MODFLOW 6 and MetaSWAP

The new version of MODFLOW 6 and MetaSWAP are coupled using iMOD Coupler. For detailed information about iMOD Coupler, the coupling files and the coupling methods see the iMOD User Manual, Appendix section A.4. For the coupling between MODFLOW 6 and MetaSWAP use the iMODBATCH function RUNFILE described in chapter 8.7.6 of the iMOD User Manual.

#### 2.4.1 New or improved functionalities

- In release iMOD5.6 the Coupler contains new binaries for MetaSWAP (svn 2299) and for MODFLOW6 (version 6.4.2)
- In the new version of MetaSWAP the simulation of flow through resisting layers has been improved. The improved model code should be used in combination with a new database of MetaSWAP, in which the Van Genuchten parameters for heavily textured soils have been adjusted. Some input files of MetaSWAP have been changed in the new release to include additional functionalities. In addition, various (optional) functionalities for calculation of measures for the Freshwater Delta Programme in particular were added, tested and further improved. Further information about this new MetaSWAP release can be found in the releasenotes MetaSWAP v8.1.2.3 (Van Walsum, 2023).
- Logging support for exchange fluxes in the Coupler

#### 2.4.2 Known issues

For actual known issues, check the iMOD website: <https://deltares.github.io/iMOD-Documentation/coupler.html#known-issues>.

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## 2.5 iMOD-WQ

For this release, iMOD-WQ is unchanged. The same version (svn 417) as in iMOD5.5 is included in the installation.

For current known issues, check the iMOD website: <https://oss.deltares.nl/web/imod/known-issues>.

## 2.6 iMOD Manual

An updated version of the iMOD manual is available, including description of the new iMOD Batch functionalities.

## 3 Preview next release

### *iMOD 5*

A new release of iMOD 5 is not yet scheduled. Deltares will release a new version if a major bug in one of the iMOD 5 components needs to be fixed or maintenance and improved functionalities require an update.

### *iMOD Suite*

Deltares plans a new release of iMOD Suite at the end of 2023. This release will enable further use of MODFLOW 6. For more information on iMOD Suite, visit <https://deltares.github.io/iMOD-Documentation>.



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