



iMOD

Release Notes

**Deltares**  
Enabling Delta Life 

## **iMOD v 5.0**

### **Releasenotes**



**Title**  
iMOD v 5.0

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# 1 Introduction

## 1.1 General information iMOD

iMOD 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, water quality modelling and geo-editing of the subsurface.

Key features of iMOD:

- 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

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 December 2019 a new version of iMOD has been released: iMOD 5.0.

This version includes as new main feature: the iMOD Water Quality (iMOD-WQ) component. iMOD-WQ integrates the functionalities of SEAWAT (density-dependent groundwater flow) and MT3DMS (multi-species reactive transport calculations) and brings these codes into the iMOD environment by using iMOD formats for input and output. The new executable of iMOD-WQ is a separate executable with its own runfile format that is described in a separate chapter in the iMOD manual.

The new version also contains:

- New Simulation Manager;
- Use of the 3D tool for 4D visualization;
- Other improved functionalities and some bug fixes.

Detailed information can be found in the iMOD manual 5.0.

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

iMOD and iMODFLOW are released using the latest Visual Studio Environment (VS2017) and Intel Visual Fortran Compiler (v2019.1.144) in combination with Winteracter 12.



## 2 Changes in iMOD 5.0

### 2.1 Added functionalities

#### *iMOD WQ*

- iMOD Water Quality (WQ) is a new main feature within iMOD. iMOD-WQ integrates the functionalities of SEAWAT (density-dependent groundwater flow) and MT3DMS (multi-species reactive transport calculations) and brings these codes into the iMOD environment by using iMOD formats for input and output.

### 2.2 Improved functionalities

#### *PROJECT MANAGER & SIMULATION MANAGER*

- Complete reconstructed dialogs to support all functionalities from the MODELTOOL and the keywords present in the IMODBATCH function RUNFILE;
- Order of modules and packages are sorted differently to be more logical;
- Support the usage of MT3D/SEAWAT, packages can be extended with information on concentrations;
- For the computation of KVA combined with values for FCT and IMP not equal 1.0 and 0.0, respectively, needs to be inversed in the internal computation;
- First functionalities to support the use of MODFLOW6.

#### *3D TOOL*

- Visualization of time dependent IDF files (e.g. concentration in time) is added.

#### *iPEST*

- Option to wait before starting another process using the keyword NSWAIT in combination with iPESTP;
- Option to save the Jacobian Matrix and Eigenvalues/-vectors in a Matlab \*.m file for debugging. Use the keyword PDEBUG=1 to activate that;
- Usage of the DRES in iPEST (acceptable error) is modified, if the absolute difference was more than the entered DRES, the difference became measured minus observation but need to be corrected for DRES;
- Usage of layer number of 0.0 to get the first active model layers for measurements; needed for unconfined simulations. Also, if a layer falls dry and the layer number is not 0, iPEST looks for the next one;
- The truncation level for the SVD-Eigenvalue truncation can be specified via SVD\_EIGV. The default value is 99.0 (equal to the original value, it might be encouraged to increase this number).

#### *IMODBATCH*

- CUS-FUNCTION: added option to specify the keyword MINEXTENT to discard elements with spatial extent less than entered at the keyword;
- IDFSCALE, improved the option #12 to remove all cells above- and below the entered threshold for numerical robustness;
- WBALANCE TOOL-FUNCTION, usage does not give a pop-up window after completion, also output folder is now created;
- IDFTIMESERIES-FUNCTION, modified such that timeseries are added as second column in the associated TXT files instead of first column. This is done as iPEST needs measurements to be at the first column in those files always.

*MF2005*

- Always save dates as-is as written in the RUNFILE, those names are written the DIS file, MF2005 is adjusted accordingly to use those;
- MNW package automatically correct for filters above- and beyond the vertical limits of the model (minimal 0.10 m);
- MNW package does not support the automatic correction for partial penetration due to numerical issues in combination with unconfined, dry layers, PPFLAG=0 instead of PPFLAG=1.

*MetaSWAP*

- A new version of MetaSWAP is used. Additional information about the use of the new MetaSWAP version will be sent to the Dutch users.

**2.3 Bugfixes***PARTICLE TRACKING*

- Usage of the options to repeatedly apply fluxes in a transient model is improved to cope with simulation windows that are shorter than the entered budget files.

*ROTOOL*

- Made this functionality compatible with the double precision IDF file format.

*MF2005*

- MNW package of MF2005 had a bug in determining the start position of a well in combination with inactive cells above;
- The timestamps from the RUNFILE and/or during the conversion from the PRJ files to the NAMFILE are now echoed in the DIS-files for MF2005. These are used in the construction of the output names. More steering for this is now possible.

*GENERAL*

- Conversion of an ASCII GEN to a BINARY GEN crashed if the number of columns in the associated DAT file was not equal for all rows.

*TIME SERIES TOOL*

- Filenames with {name}{date}{ext} are recognized by the iMOD Time Series Tool, before only {name}\_{date}\_{text}.{ext} were recognized, e.g. RCH\_20110101.IDF is now applicable as it was not before.

*ISGEDIT*

- There was a crash if two ISG files were present for which one ISG was active in ISG Edit and the other was used to zoom to full extent.

*IMPORTSOBEK*

- Aggregation to daily values has been improved.

*IMODBATCH*

- CUS-FUNCTION determining the WINDOW from given IDF files instead of specifying the WINDOW priority was incorrect;
- IDFMEAN function was not working correct for those configurations where ILAYER was defined;

- RUNFILE function to write MF2005 files the combination KVA with FCT and/or IMP values not equal 1.0 and 0.0, respectively, needs to be inverse.

#### *CROSS-SECTION TOOL*

- Display of boreholes and/or seismic-measurements went wrong on last point of a cross-section while snapping the points to the boreholes/seismic locations.

### **3 Preview next release**

In June 2020 Deltares will release iMOD 5.1, which includes basic use of the computational kernel of MODFLOW 6 within iMOD.

In December 2020 Deltares will release iMOD 5.2, with improved functionalities of the use of MODFLOW 6 within iMOD, including the coupling with MetaSWAP.



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