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Version 5.02.0180 – 18.11.2022
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New Features and improvements:

1. The PFAS module in 3D.
2. The PFAS computational modules print the air-water interfacial area, A_e . A_e is printed into the Nod_inf.out file in 1D instead of the v/KsTop column. A_e is printed into the new binary output file AWIArea.out in 2D and 3D.
3. The PFAS computational modules can display the air-water interfacial area under Results.
4. Users can display solute concentrations on the air-water interfacial area in the HYDRUS GUI (under Results) by selecting a concentration option on the View Tab of the Navigator Bar.
5. Users can display different modes (liquid, solid, AWI) of solute concentrations in the Profile Information Graph (1D).
6. A tool for entering the working plane graphically by clicking on any 3D surface.

Fixed errors: Several dozen bugs have been fixed

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Version 5.01.0460 – 05.04.2022
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HYDRUS version 5 merges two previously independent software packages HYDRUS-1D (version 4, for one-dimensional applications) and HYDRUS (2D/3D) (version 3, for two- and three-dimensional applications).

New Features and improvements:

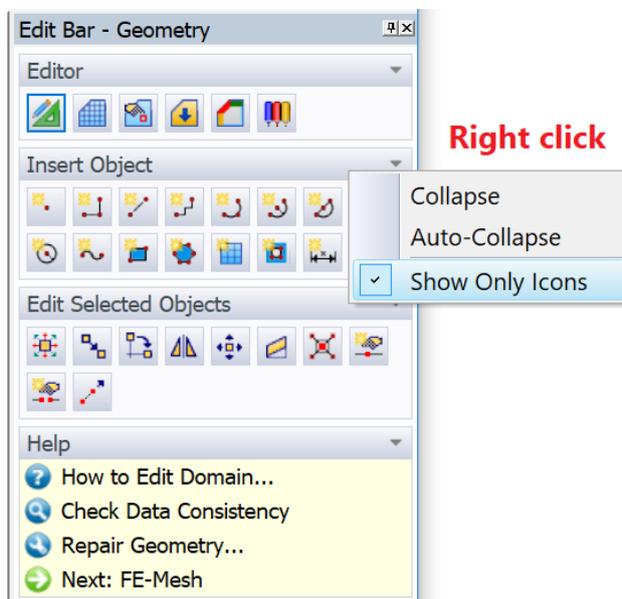
1. The **PFAS Module** (in 1D and 2D) considers sorption to the air-water interface and the concentration effects on surface tension and viscosity [Silva et al., 2020].
2. The **Particle Tracking** module (in 1D), tracking the position of hypothetical particles, which are either initially defined in the soil profile, or are released at its boundaries. The results of this module can be used to calculate soil water travel times and water age for different locations in the soil profile.
3. The **COSMIC** Module (in 1D) to simulate Cosmic-Ray Neutron Fluxes [Brunetti et al., 2019].
4. The **Dynamic Plant Uptake (DPU)** Module (in 1D and 2D) developed by Brunetti et al. [2019, 2021, 2022] simulates the translocation and transformation of neutral and ionisable compounds in the soil-plant domain.
5. The **Fumigant** Module (in 1D; previously available in 2D and 3D) considers options required to simulate the Fate and Transport of Fumigants (e.g., removal of tarp, temperature dependent tarp properties, additional injection of fumigant).
6. The **C-Ride** module (1D; previously available in 2D) simulates colloid-facilitated solute transport.
7. The transport of environmental **Isotopes** without fractionation or with constant fractionation (in 1D) during evaporation.

8. **Reservoir BC** (in 3D; previously available in 2D).
9. An increased number of print times to 10,000.
10. New graphical capabilities, such as z-t graphs of selected variables.

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 Version 3.04.0100 – 02.05.2021
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New Features and improvements:

1. Add-on Module Unsatchem-3D (with demo examples)
2. Inverse-3D – inverse solution for 3D projects with demo examples
3. Optimization of EditBar – an option to use only icons instead of long text items.



Fixed Errors:

1. Error in import of quantities from scattered points.
2. Error in the Clipper/Slicer dialog-bar. Numerically entered values were sometimes ignored.
3. Fixed wrong column names in the Reaction Parameters table for the DualPerm module.

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 Version 3.03.0300 – 16.12.2020
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New Features and improvements:

4. Inverse Solution was enabled for 3D projects
5. A dynamic rooting system (root growth) was included also into the Unsatchem and Wetland modules.
6. Line Probes - allows you to draw a graph of any quantity along any curve defined by a polyline.

7. Point Probes - allows you to display values of any quantity at points anywhere in the transport domain (independent of FE nodes).
8. The clipping of the 3D model and the FE-mesh has been extended with new option, the "Clipper-Box" tool.
9. Improvements of the functionality and performance of 3D graphics: Drawing of objects in transparent mode, control of the center of rotation when rotating a scene, speed up graphics when drawing complex models and large FE-meshes.
10. New options for manipulation and the graphical display of background layers and bitmaps.

Fixed Errors:

4. The root growth in 2D is active when horizontal root growth is inactive.
5. The HP2 calculation module could fail to start under certain circumstances
6. Error in SlopeCube2D when editing boundary conditions on mesh
7. Error when generating tetrahedral mesh for a 3D-Layered domain
8. Many other minor errors...

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Version 3.02.0440 – 10.10.2019
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New add-on Modules:

1. Furrow 3D
2. Slope Cube 3D

New Features:

11. The new ObsNodCh.out output file with EC and SAR at observation nodes of the UnsatChem computational module.
12. Export to Paraview: new array "Geo_Numbers" added to "PointData". This array contains number of corresponding geometric nodes (or "0" if the mesh node does not have a corresponding geometric node")
13. Export and import of the 3D viewing matrix (main menu -> View -> Import/Export View Settings) - allows setting the same view in different HYDRUS projects
14. Project Templates and initialization of project from a template (the "New Project" dialog and also Main Menu -> File -> Project Templates)
15. New type of selection: Main Menu -> Edit -> Select -> Select by Object Numbers...
16. New option to set the factor of translucency for geometric objects, FE-mesh, etc. (Main Menu -> Options -> Transparency Options...)
17. Added support for 4K monitors (high-dpi resolution)
18. Improved graphical tools "Slicer" and "Clipper"

Fixed Errors:

9. Flowing particles were not calculated in 64-bit version (HYPAR and H3D_Calc)
10. Error in Root Water Uptake Parameters dialog (combo-box selection)
11. Error in Heat Transport Parameters dialog for Inverse Solution (combo-box selection)
12. Several minor errors when working with bitmaps – see details at <https://www.pc-progress.com/forum/viewtopic.php?f=3&t=3418>

13. Fixed Chart printing
14. Fixed about 60 other minor errors in the GUI

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Version Hydrus3D_3.01.1450 – 28.01.2019

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Improvements:

1. New options in the dialog for importing values from scattered points

Fixed Errors:

1. Flowing particles were not calculated in 64-bit version (HYPAR and H3D_Calc)
2. Fixed several minor errors in the implementation of Expanded Root Growth (variable plant centers for root growth, etc.)
3. An error in the HP2-Components dialog (values in the “component” column were disabled)
4. A minor error in the dialog for Chart Options - some check-boxes were not displayed correctly under certain circumstances
5. Values in the Time-variable boundary conditions dialog were not updated correctly under certain circumstances
6. A minor error in the chart with results at observation nodes (inverse data were not displayed for some boundary conditions BC=7,8,9)
7. Several errors in HYPAR - if the Expanded Root Growth or Reservoir Boundary Conditions were used.
8. Allowing the Walker equation for both negative and positive exponent

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Version 3.01.1000 - May 1, 2018

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New Features and Changes (related to GUI):

1. Flowing particles in 3D projects
2. Streamlines
3. Graphical Manipulator
4. Clipping and Slicing
5. Velocity vectors in raster points
6. New options for Mesh-Sections and selection of mesh entities
7. Inactive objects
8. Named Views
9. Numbering of isolines
10. Export data to Paraview
11. Optimization and 64-bit version

New Features and Changes (related to computational modules):

1. Reservoir Boundary Condition
2. Expanded Root Growth Features