

FEFLOW

All-in-one groundwater modelling solution

Groundwater projects are becoming more and more demanding - requiring modelling software with more sophisticated capabilities than ever before. FEFLOW provides **best-in-class technology** for groundwater flow, contaminant, groundwater age and heat transport simulations. With its **efficient user interface** and its yet **unmatched range of functionality and flexibility**, FEFLOW has become a standard in **premium groundwater modelling** over the last 35 years.

APPLICATIONS

FEFLOW is applicable for a multitude of groundwater, porous media and heat transport projects - from local to regional scale.

TYPICAL APPLICATIONS

FEFLOW is the ideal software for:

- Regional groundwater management
- Groundwater management in construction and tunnelling
- Capture zone and risk assessment via groundwater-age calculation
- Mine water management
- Simulation of open-pit progress
- Saltwater intrusion
- Brine water management
- Seepage through dams and levees
- Land use and climate change scenarios
- Groundwater remediation and natural attenuation
- Geothermal energy (deep and near surface, both open-loop and closed-loop systems)
- Groundwater-surface water interaction
- Groundwater induced subsidence
- Simulation of industrial porous media

FINITE ELEMENTS

FEFLOW uses the finite element method to handle a broad variety of physical processes for subsurface flow and transport modelling. The advantages of the finite element method include:

- Flexible meshing for detailed models of complex geological structures
- Layer-based, partially unstructured or fully unstructured (tetrahedral) meshes in 3D
- Precise spatial representation of features, such as rivers, fractures, pipes, tunnels and well locations
- Accurate representation of sloping layers and anisotropy

FEFLOW supports dynamic deactivation and reactivation of mesh elements to account for geometry changes in the model domain over time, e.g. a mining plan.

3D groundwater models are computationally demanding. FEFLOW employs optimised numerical solvers that use parallel computing on multiprocessor and multicore machines.

The highly nonlinear Richards equation is further stabilised using the Control-Volume Finite Element method.

FEATURES

FEFLOW supports a wide range of physical processes.

GENERAL

- Transient conditions
- Steady state conditions

FLOW MODELLING

- Darcy flow in porous media
- 2D/3D unsaturated flow
- Free surface (phreatic) flow
- Density dependent flow
- Fracture and pipe flow

MASS TRANSPORT MODELLING

- Advection-diffusion/dispersion solute transport
- Single and multispecies solute transport
- Equilibrium sorption
- User-defined kinetic reactions
- Fracture mass transport
- Geochemical and equilibrium reactions with PHREEQC-RM

GROUNDWATER AGE MODELLING

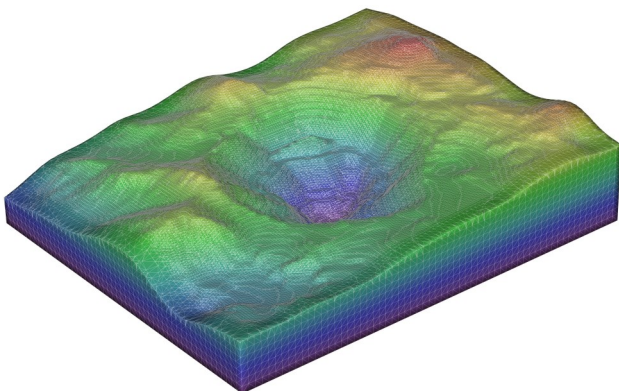
- Capture zone analysis
- Exit probability calculation

HEAT TRANSPORT MODELLING

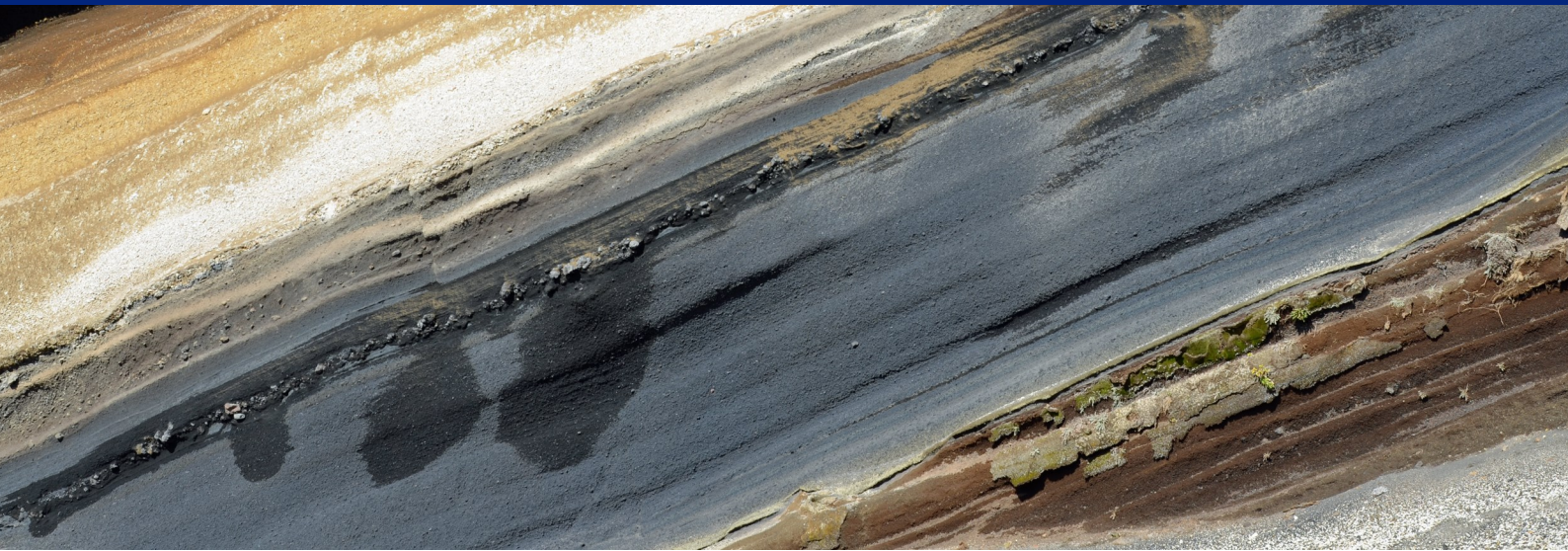
- Advection-conduction/dispersion heat transport
- Fracture heat transport
- Thermohaline convection
- 1D borehole heat exchanger elements and heat exchanger arrays

GROUNDWATER-SURFACE WATER INTERACTION

- Hydrodynamics coupling approach between FEFLOW and MIKE 1D to model rivers in the groundwater context
- Integrated fully dynamic 2D surface water overland modelling linked to DHI's MIKE 21 Flexible-Mesh engine



Open-pit mine



FEATURES

ONE FOR ALL

Whether you are interested in regional groundwater flow around a water supply well or formation of temperature and salinity induced convection in a coastal aquifer, FEFLOW provides everything you need.

FEFLOW covers everything from the first pre-processing steps, to helping you present results to clients or to the public.

UP-TO-DATE VISUALISATION TOOLS

FEFLOW dramatically visualises planar, cross-sectional and 3D structures. You can present your modelling results as high quality snapshots or in video sequences.

Stereoscopic visualisation and image/video export provide a level of insight into complex simulation models that has never been reached before.

FEFLOW even exploits 3D Virtual Reality technology so you can dive inside your mesh to access its secret regions!

OPEN PROGRAMMING INTERFACE

FEFLOW is designed to handle plug-ins for extended functionality. A convenient programming interface makes plug-in development a manageable task - even for less experienced programmers. Many plug-ins are readily available on GitHub, along with extensive documentation to help you get started.

GET THE FREE VIEWER

In viewer mode, FEFLOW's advanced visualisation and post-processing capabilities are available free of charge. Model reviewers and clients do not need a software licence to evaluate input data and simulation results.

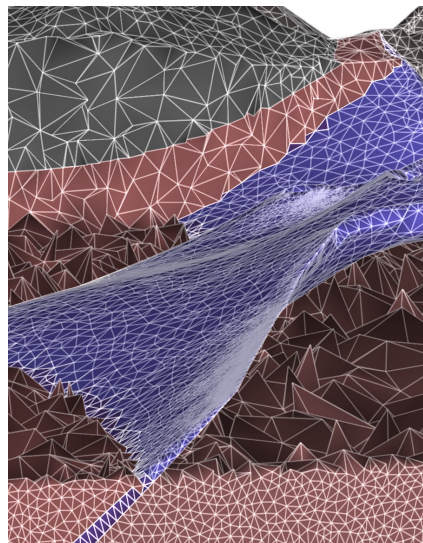
FEATURES

FEPEST FOR PEST

FePEST is FEFLOW's graphical user interface for PEST (Watermark Numerical Computing, John Doherty) and PEST++ (USGS). The convenient graphical interface of FePEST guides you through all steps of parameter estimation and uncertainty analysis. For increased efficiency, these tasks can be executed in parallel on multiple computers - with just one single corporate licence.

WGEO

WGEO is an outstanding tool for georeferencing and processing of spatially related raster data, as well as for transforming raster and vector data. WGEO enables quick and efficient rectification and georeferencing of data sets for use in simulations.



Fault system

RELIABILITY

OUTSTANDING TRADITION

Since 1979, FEFLOW has been constantly developed and applied to different types of groundwater and porous media simulation projects. Through these developments, we have provided a convenient graphical user interface since the late 1980s. For decades, it has been the trusted choice of leading groundwater modellers worldwide.

BENCHMARK SIMULATIONS

Users of complex simulation software, such as FEFLOW, expect reliability, accuracy and efficiency.

All parts of the FEFLOW simulation engine have passed extensive benchmark testing against analytical solutions, physical laboratory test results and results from other well-known simulation systems.

If your project requires accurate representation of the geology through flexible mesh modelling - even with time varying geometries - FEFLOW is the answer.

Thousands of users around the world know that highly-qualified support for complex groundwater modelling is only an email or a phone call away.

The very active FEFLOW user community shares application experience via the MIKE User Forum and other online groups. Use these platforms - even if you are not a FEFLOW user yet.

Regular user group meetings and FEFLOW conferences provide opportunities to share knowledge and connect to the global community of FEFLOW users.