



DHI MARKET AREA: SURFACE & GROUND WATER

GROUNDWATER

Uncovering and protecting the hidden resource beneath our feet

Groundwater is the least visible and most complex water resource. It enhances water security by providing drinking water for over two billion people, supports irrigated agriculture and industrial supplies and is a source of energy and geothermal heating. Driven by both pressure and gravity, groundwater may also pose significant risks by causing excess pressures in dams and reservoirs, and seepage in mines and urban drainage systems. Contaminants can be mobilised and transported from their source to impact water supply wells and surface water bodies. Groundwater’s long-term memory carries the fingerprints of catchment land use and pollution for hundreds of years.

Interactions with surface water are complex and are difficult to measure, but essential to quantify. Surface water infiltration recharges groundwater storages, which in turn feed our rivers, wetlands and lakes. Sustainable use of groundwater depends on reliable assessments of the total resource, balancing abstraction with recharge, and ensuring water quality is maintained.

THE CHALLENGES

- Quantifying, protecting and managing an ‘invisible’ resource
- Understanding the interaction between climate, land use, surface water and groundwater
- Quantifying recharge
- Dealing with complex geology such as fractured and fissured rocks
- Predicting the movement of contaminants
- Assessing the impacts of surface water and groundwater abstraction
- Understanding complex hydrodynamic, biological and geochemical processes
- Working with sparse monitoring data
- Addressing data uncertainties

OUR APPROACH

At DHI, we adopt a holistic approach to groundwater, taking into account all the driving forces from local catchment to regional scales. We utilise available data and local knowledge to develop an initial conceptual understanding. From this, we build numerical models at the appropriate level of detail to describe the physical processes and quantify the uncertainty of predictions.

OUR SOLUTIONS

- Groundwater yield assessments
- Well field production and protection
- Quantifying groundwater recharge
- Mine dewatering plans
- Contaminant transport investigations
- Groundwater remediation studies
- Surface water-groundwater interactions
- Geothermal power feasibility and production
- Long-term sustainability assessments
- Decision Support Systems (DSS)

THE ULTIMATE GOAL UNDERSTANDING AND SUSTAINABLY MANAGING GROUNDWATER RESOURCES

Groundwater accounts for **97% of the usable fresh water resources** on earth.

OUR TOOLS AND SERVICES

We can help you use and manage groundwater resources efficiently and sustainably. Our tools and services include:

- borelog analysis and conceptual model design
- state-of-the-art two-dimensional (2D) and three-dimensional (3D) numerical modelling
- integrated surface water-groundwater modelling
- salt and contaminant transport
- heat transfer modelling
- geochemical and biological process modelling
- model parameter uncertainty estimation
- capacity building and training by THE ACADEMY by DHI
- MIKE Powered by DHI simulation tools:
 - FEFLOW
 - MIKE SHE
- industry standard data visualisation and uncertainty analysis tools:
 - LEAPFROG
 - FEPEST
- software tailoring

Contact us: info@dhigroup.com
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