HGS Simulation™

Build cutting-edge hydrologic models

Using the world's most powerful integrated hydrologic modelling platform for coupled groundwater and surface water simulations.

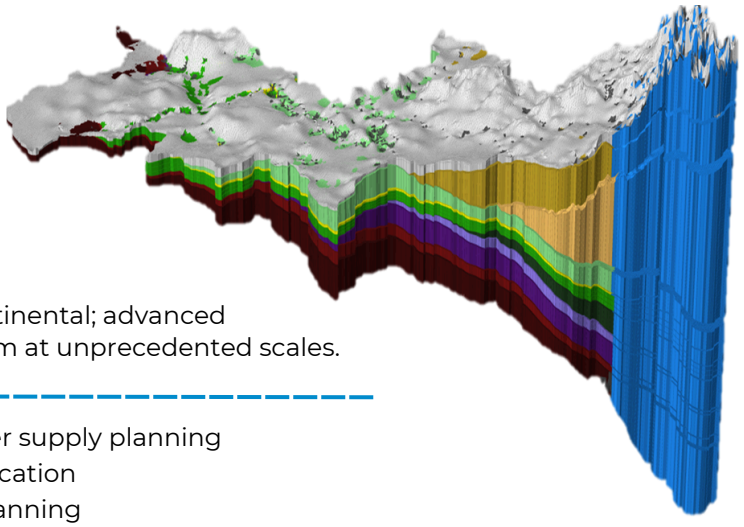
HGS – HydroGeoSphere

HGS is a fully-integrated hydrologic simulation engine that dynamically couples all key components of the terrestrial water cycle, seamlessly tracking the movement of water between surface water, soil water, and groundwater systems. As a physics-driven platform **HGS** is the best modelling tool to evaluate climate risk and adaptation measures in support of sustainable water resources development.

By tightly coupling integrated groundwater-surface water flow, **HGS** represents the next generation of hydrologic simulations. With a foundation of 3-dimensional variably saturated groundwater flow, HGS supports a wide range of interoperable capabilities including evapotranspiration, discrete fracture networks, time-varying material properties and winter processes, reactive solute transport, density-dependent flow, particle tracing and much more.

In the evolving landscape of water resources engineering an integrated approach to hydrologic modelling with **HydroGeoSphere** has emerged as the way of the future!

Benefits and Applications



- **Improved understanding of hydrologic systems**, through the explicit simulation of groundwater-surface water exchange
- **Minimize uncertainty of traditional/empirical modelling techniques** using HydroGeoSphere's physics-based approach
- **Fully-implicit coupling approach for all domains** provides for a robust, mass conserved solution scheme.
- **Simulate hydrology at any scale** from local to continental; advanced computational algorithms allow the code to perform at unprecedented scales.

- **Well and aquifer management** for municipal water supply planning
- **Contaminant plume migration** and source identification
- **Climate change risk assessment** and resilience planning
- **Flood plain mapping** and risk analysis
- **Scenario analysis for engineering applications** including designed mine operations and closure planning.
- **Evaluate land-use scenarios** and best management practices for watershed health

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Aquanty – World-Class Water Resources Science and Technology

Aquanty specializes in predictive analytics, simulation and forecasting, and research services. Our technology and services are deployed globally across a broad range of industrial sectors including; agriculture, oil and gas, mining, watershed management, contaminant remediation, and nuclear storage and disposal. Aquanty's scientists are recognized as leading international experts in integrated climate, groundwater & surface water modelling. Our mission is to deliver holistic water resource and climate solutions to support informed decision making for our clients in a rapidly changing world.

HydroGeoSphere™

The world's most powerful hydrologic modelling platform

- **Fully integrated surface and groundwater simulations** provide a holistic understanding of complex and interconnected watershed dynamics for water resources management.
- **Reactive solute and thermal energy transport** capabilities give you the tools to predict contaminant fate and travel time probability statistics for source identification.
- **Advanced numerical methods** to support simulations of unprecedented scale and complexity; fully-implicit coupling for all domains provides for a robust, mass conserved solution.
- **A physics-based approach** to hydrology greatly reduces the inherent uncertainty of empirical modelling techniques and provides the most robust approach to simulating the effects of climate change.

HGS REAL TIME

Reliable hydrologic forecasting powered by HydroGeoSphere

- **Multi-objective hydrologic forecasting** for flood, drought, base-flow, soil moisture, surface water and groundwater.
- **Enhanced decision support** for water resources management based on a holistic, integrated approach to watershed hydrology.
- **Synergize operational data sources** including near-real-time field observations and remote sensing products with meteorological predictions to produce reliable forecasts.
- **Cloud-computing architecture** supports ensemble of weather forecast scenarios, forecast outputs analyzed and reported in a probabilistic framework.

HydroClimateSight™

Aquanty's web architecture puts earth system modelling within reach of every person

- **Unify data management and analytics** for an integrated understanding of hydrology, geology, meteorology and climatology.
- **White label web infrastructure** to deliver best-in-class hydrologic modelling and decision support to your clients.
- **Flexible and extensible** architecture to handle any data pipeline world-wide, putting the right information in front of the right people at the right time.
- **Analytical tools and custom workflows** to simplify your unique operational requirements.

Modelling On Demand™

Automatic web-based simulations for decision support and scenario analysis

- **Time saving through automation:** models constructed at the click of a button using comprehensive geological data framework producing results in minutes for rapid decision support.
- **Flexible and agile** model inputs allow you to adapt to changing requirements. When needs evolve, models can be created or modified as necessary, enabling quick responses to dynamic situations.
- **Globally scalable, versatile and ready to deploy** for field-scale soil moisture forecasting and pesticide/nutrient runoff and fate; watershed-based customizable scenario analysis and climate change assessment.

Proud Partner of the Canada1Water initiative

CANADA ONE WATER

www.canada1water.ca