



Integrated Hydrologic Simulations for Insurance Agencies

Aquanty operates simulation technology and real-time and on-demand hydrologic forecasting platforms to equip insurance agencies with a more robust understanding of water-related risks, enabling them to make better-informed decisions, manage risks effectively and offer more tailored insurance products to customers. Gain insights on sustainable water resources, drought and flood risk, and impacts of climate change to a particular area of interest. From large-scale hydrologic analyses in support of national/provincial/watershed level flood and drought risk analysis, to localized real-time hydrologic forecasts to bolster flood warning capacity, Aquanty's **HydroGeoSphere (HGS)** simulation technology represents a valuable tool for the insurance/reinsurance industries to reduce exposure and losses to hydrologic catastrophes.

Benefits

- **Comprehensive Risk Assessment**
- **Accurate predictions of water-related risks**
- **Develop adaptation and resilience strategies**
- **Achieve Regulatory Compliance**
- **Reduce Uncertainty**
- **Educate clients about potential risks**

Applications

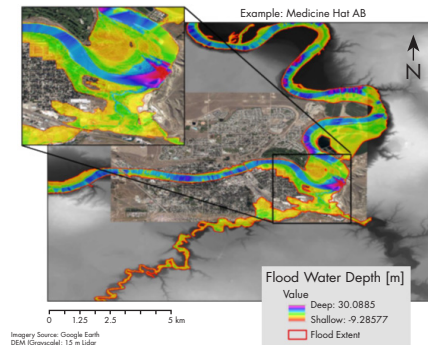
- Recreation of 2013 Southern Alberta flooding. Simulation results (left) depict a flood pulse derived from basin scale hydrologic simulations being routed across a local scale model of the City of Medicine Hat. LiDAR topography was used for the Medicine Hat model, and results show excellent agreement between simulated and observed high water marks.
- Developed model-based flood and drought risk index and real-time hydrologic forecasting portal throughout South Saskatchewan River Basin on behalf of the Government of Alberta; providing 7- and 32-day forecast and automatic alerts based on response of digital watershed twin to daily weather forecasts.

Key Features

- Aquanty's fully-integrated hydrologic modelling technology incorporates all elements impacting water-related risks, such as precipitation patterns, land use changes, soil types, topography, and infrastructure to provide a **Comprehensive Risk Assessment**. This comprehensive view enables insurance agencies to better assess the potential risks associated with floods, droughts, or other water-related events.
- Offer more **accurate predictions of water-related risks**, by integrating hydrologic simulations with real-time weather forecasts. This information can be used to evaluate the likelihood and severity of potential losses, enabling better risk management and pricing of insurance policies.
- Through state-of-the-art models, identify vulnerable areas and **develop adaptation and resilience strategies**. This might include encouraging policyholders to adopt specific mitigation measures or investing in infrastructure improvements to minimize risks and potential losses.
- **Achieve Regulatory Compliance**. In some regions, regulators may require insurers to consider comprehensive risk assessment methodologies. Comply with these regulations by demonstrating a thorough analysis of potential water-related risks.
- Gain insights into long-term trends and potential changes in hydrological patterns due to factors such as climate change for **Improved Decision-Making**. Make informed decisions regarding policy, coverage limits, and premium adjustments to adapt to evolving risks.
- By incorporating a wide range of data into models and utilizing forecasting capabilities, you can **Reduce Uncertainty** related to flood and drought risks. Provide more reliable risk assessments and enhance the ability to manage financial exposure.
- **Educate clients about potential risks** using data-driven insights from HGS generated models and forecast predictions. This engagement not only helps customers understand their risks better but also encourages them to take proactive measures to mitigate these risks, reducing the likelihood and magnitude of claims.



Calculated Flood Water Depth from Alberta Env. Flood Extents and 15 m Lidar



FURTHER READING

The high-tech future of flood fighting by Alexis Stockford, Manitoba Cooperator.

The science of seeing into the future: Canada's groundwater, in *Simply Science* by Natural Resources Canada.

Aquanty's physics-based hydrologic forecasting web services, Aquanty webinar hosted by the Meteorological Service of Canada.



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.

HydroGeoHub™

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.

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.

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
Canada 1 Water initiative



www.canada1water.ca