



Integrated Catchment Modelling (ICM) using SIMPOL ICM

The Environmental Modelling team at WRc provides water quality modelling services to environmental regulators, water companies and industrial customers, to support water quality planning and permitting in surface waters, estuary, coastal and marine environments.

The services we offer include model development, scenarios and options appraisal, training, technical support and independent model audits. We are recognised as market leaders who provide innovative, bespoke models and solutions that provide cost effective impact assessments and catchment plans.

SIMPOL ICM is a flexible, integrated, environmental modelling package designed for fast, long term simulation of the whole water cycle. SIMPOL ICM can represent water resources, water treatment and distribution driven by customer demand. The clean water systems are coupled with the urban wastewater systems and river catchments, and produce flow and quality results in response to rainfall and temperature variations.

How SIMPOL ICM can help you

- **Get results faster** – SIMPOL ICM is a high level model compared to detailed models such as InfoWorks ICM and MIKE Basin i.e. it does not contain the fine resolution detail that these models need and therefore it runs much faster. A river catchment can be simulated in under two hours for 10 years of continuous hourly rainfall.
- **Test many combinations of solutions** - It allows optimal combinations of strategies to be identified, e.g. combinations of different catchment management, network and treatment options.
- **Use with existing models** - SIMPOL ICM uses the same sewer network parameters as InfoWorks and is calibrated against InfoWorks results, so it is used with existing sewer network models. ISIS and MIKE11 can provide river parameters and calibration results.
- **Determines upstream and diffuse load** - SIMPOL ICM also models the watershed catchment to provide flow and quality inputs to the river in response to the same rainfall. This provides the appropriate dilution and eliminates the need to estimate the receiving water flow and quality.
- **Continuous simulation** - Fast run times make multi-year continuous simulation practical. SIMPOL ICM runs at an hourly time step, which makes it easy and quick to investigate the effects of both long dry periods and back to back rainfall events over long periods, and for Climate Change scenarios.



Key features of SIMPOL ICM Integrated Catchment Modelling:

Wastewater

- Fully integrated modelling of river and sewer systems to assess the impact of continuous and intermittent discharges on river quality and compliance with standards.
- Handles multiple discharges CSOs, storm tanks, WwTWs.
- Continuous simulation accounts for drain-down times and follow-on storms.
- Rainfall driven – river and sewer respond to the same rainfall. Spatial rainfall can be represented.
- Sewer quality processes: surface water dilution, build-up and erosion of sediments, represents diurnal effects.
- Calibrated to InfoWorks results.
- It fully handles the correction factors for the Fundamental Intermittent Standards.
- Approved by the Environment Agency, SEPA and NIEA.

Agriculture and diffuse pollution

- Represents diffuse pollution from both agricultural and urban diffuse sources.
- Different land use types and associated wash-off loadings are represented.
- Fertiliser and pesticide application rates and periods are represented.

Resources and customer demand

- Built on the SIMPOL pedigree, SIMPOL ICM can now be used to model the whole water cycle: water resources, service reservoirs, treatment and distribution, and to identify pinch points where customer demand exceeds resource and/or asset capability.
- Property types and occupancy rates change dynamically throughout the simulation.
- Rapid simulation is a particular advantage of using SIMPOL ICM to produce multi decade projections e.g. for Climate Change scenarios.

See more at www.wrcplc.co.uk/water-quality-modelling



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