

Smart water

The Smart Water Group specializes in quantity and quality issues associated with research into collection, treatment, storage, retrieval and use of smart water resources. The research in this area recognises the importance of integrated urban water management (IUWM). Within the context, an urban watershed is considered as the unit of managing freshwater, wastewater, and storm water. The IUWM approach has emerged from the growing recognition that an integrated approach to water management at the urban level offers a relevant framework for decision-making and concrete action.

Research in this area can be divided into:

- Urban water systems
- Water quality treatment
- Wastewater treatment
- Distribution and collection systems

The research of the smart water group is supported by excellent laboratory facilities. The water quality laboratory has areas dedicated to teaching, analysis, unit processes, microbiology, preparation and administration/storage.

Analytical equipment includes a spectrophotometer, atomic adsorption spectrophotometer, gas-liquid chromatographs, UV monitor, video imaging microscope and a range of samplers, loggers and portable meters for the field determination of a wide range of determinands.

Urban water systems

[Open all sections](#)

- [Energy-Water Nexus \(pdf 20 KB\) \(/Documents/college-eps/civil/research/rose-energy-water-nexus.pdf\)](#)
- [Neighbourhood-Scale Greywater Recycling for Non-Potable Reuse in Mixed-Use Urban Areas \(PDF 152 KB\) \(/Documents/college-eps/civil/research/greywater-recycling.pdf\)](#)
- Integrated Urban Water Modelling Tools
- Systems Modelling of Urban Water Sustainability
- Risk Assessment of Urban Water Systems for the City of the Future
- [Uncertainty in Water Infrastructure Provision and the Implications for Future Planning and Design \(PDF 13KB\) \(/Documents/college-eps/civil/research/water-infrastructure.pdf\)](#)
- [Catchment management on the River Itchen, Hampshire \(PDF 13 KB\) \(/Documents/college-eps/civil/research/catchment-management-river-itchen.pdf\)](#)

Water quality and treatment

- [Cost optimisation of water treatment works design and operation \(PDF 227 KB\) \(/Documents/college-eps/civil/research/cost-optimisation-water-treatment-design-operation.pdf\)](#)
- [Management of Trihalomethanes at Water Treatment Works and in Distribution \(PDF 18 KB\) \(/Documents/college-eps/civil/research/trihalomethanes-water-treatment.pdf\)](#)
- [Modelling of Water Treatment Processes using Computational Fluid Dynamics \(PDF 18 KB\) \(/Documents/college-eps/civil/research/ModellingofWatertreatment-processes-computational-fluid-dynamics.pdf\)](#)
- [Characterising Water Treatment Works Performance using Fluorescence Spectroscopy \(PDF 41 KB\) \(/Documents/college-eps/civil/research/water-treatment-works-performance-fluorescence-spectroscopy.pdf\)](#)
- [Dissolved Organic Matter Fluorescence and Water Quality \(PDF 60 KB\) \(/Documents/college-eps/civil/research/organic-matter-concentration-raw-water-treatability.pdf\)](#)
- [Organic matter characterization for drinking water treatment \(PDF 13 KB\) \(/Documents/college-eps/civil/research/organic-matter-concentration-raw-water-treatability.pdf\)](#)

Wastewater systems

- [Biology of wastewater treatment: Characterisation and control of Microthrix Parvicella in a laboratory-scale activated sludge plant \(PDF 134 KB\) \(/Documents/college-eps/civil/research/activated-sludge-treatment-paper-mill-effluents.pdf\)](#)
- [Industrial wastewater treatment: controlling sludge bulking in pulp and paper mill wastewater: biological decolourisation of textile wastewaters \(PDF 55 KB\) \(/Documents/college-eps/civil/research/activated-sludge-treatment-paper-mill-effluents.pdf\)](#)
- Phosphorus removal technology in sewage treatment:
 - [effect of iron dosing on biological and physical characteristics of activated sludge \(PDF 66 KB\) \(/Documents/college-eps/civil/research/iron-dosing-biological-activity-activated-sludge.pdf\)](#)
 - [investigating fractionation of phosphorus and metals in iron-dosed sludge \(PDF 32 KB\) \(/Documents/college-eps/civil/research/metal-phosphorus-sewage-sludge.pdf\)](#)
 - maximizing digestibility of iron-dosed sludge
- [Biogas optimisation: nutrient bioavailability to increase biogas from anaerobic digesters \(PDF 97 KB\) \(/Documents/college-eps/civil/research/biogas-quantity-quality-anaerobic-digestion.pdf\)](#)

Distribution and collection systems

- Design of flexible urban water networks using real options theory
- [Water Quality Analysis using Fluorescence Spectroscopy in Distribution Systems \(PDF 60 KB\) \(/Documents/college-eps/civil/research/water-treatment-works-performance-fluorescence-spectroscopy.pdf\)](#)
- Pipe condition assessment models for urban water networks
- Whole Life Cost Optimisation Model for Urban Water Networks

