**Water engineering**

Design or optimisation of technologies relating to water resource management, treatment and distribution systems (including waste water and sewerage).

This area encompasses design and optimisation of technologies relating to water resource management, treatment and distribution systems. This research area also encompasses engineering research into the management and treatment of waste water and sewerage, including drainage systems.

Water engineering research in the global and UK context is becoming increasingly important, with future water security a clear priority across government, the water industry and UK Research and Innovation. Specifically, we will work with the community to facilitate multidisciplinary working and to address any research leadership gaps.

This area will be characterised by a portfolio of high quality multidisciplinary work, addressing topics such as:

* resilience of anthropogenic and environmental water systems to shocks under changing environments
* sustainable, long term management of the water system, from catchment to treatment to resource
* achieving water security
* water in the circular economy.

The community should seek to focus on concepts highlighted in the engineering grand challenge addressing sustainable engineering solutions to provide clean water for all. It should also continue to undertake collaborative research, working with EPSRC, other UKRI councils and relevant stakeholders to identify, facilitate and stimulate appropriate research and research funding opportunities, leading to tangible impact.

We will explore options to establish greater academic leadership throughout the community, including by continuing to encourage fellowships in the area from across relevant disciplines, and will take action as necessary.

This research area complements investments related to the cities and infrastructure agenda. In particular, researchers should work to maximise the impact of the investment in the [UK Collaboratorium for Research in Infrastructure and Cities (UKCRIC)](https://www.ukcric.com/) to capitalise on the potential for this investment to further strengthen UK leadership.

This area is of relevance to Foreign Commonwealth and Development Office’s [Official Development Assistance (ODA)](https://www.gov.uk/government/collections/official-development-assistance-oda--2) funding streams and has seen significant recent funding in this area. Given the community interest, we will continue to explore ODA-related opportunities.

Targeted interventions (for example the Big Pitch in Civil Engineering) have grown activities. These have brought new, creative thinking into the area, provided long term investments and prompted the community to integrate and engage further with stakeholders, for example the [UK Water Partnership](https://www.theukwaterpartnership.org/) and [UK Water Industry Research Ltd](https://ukwir.org/leading-the-water-industry-research-agenda).

This area benefits from a strong training component, with two core centres for doctoral training (CDTs). The number of students funded by EPSRC across CDTs, doctoral training partnerships and Industrial Collaborative Awards in Science and Technology gradually increased. This broadly aligns with the growing industrial demand and increasing relevance of this area.

UK water research has made major contributions nationally and internationally, with regard to society, economy and the built and natural environment. This area has been noted as a key societal challenge.

The development of novel smart water management solutions will underpin the future successes of the global smart water market, a sector expected to be worth over US$22 billion by 2020. Continued work with the water industry in this research area and other critical areas is core to success.

This area is inherently multidisciplinary, with academics well connected across research boundaries and with industry. Researchers often also have well developed links with government departments and public agencies.

Outputs from the EPSRC Water Workshop in February 2016 emphasised the need for a continued multidisciplinary approach. For example incorporating flood risk management with sustainable management of water resource systems by exploiting opportunities offered by digital technologies.

The impact of the UK Collaboratorium for Research in Infrastructure and Cities investment will be important to monitor in the longer term, especially in relation to maximising use of the urban water infrastructure facility led by Cranfield University, Newcastle University and the University of Sheffield.

This area is strongly linked with [Coastal and Waterway Engineering](https://www.ukri.org/our-work/browse-our-areas-of-investment-and-support/coastal-and-waterway-engineering/), [Infrastructure and Urban Systems](https://www.ukri.org/our-work/browse-our-areas-of-investment-and-support/infrastructure-and-urban-systems/) and [Synthetic Biology](https://www.ukri.org/our-work/browse-our-areas-of-investment-and-support/synthetic-biology/) research areas, with many cross-linking research challenges.

There are also overlaps with [Sensors and Instrumentation](https://www.ukri.org/our-work/browse-our-areas-of-investment-and-support/sensors-and-instrumentation/), [Process Systems: Components and Integration](https://www.ukri.org/our-work/browse-our-areas-of-investment-and-support/process-systems-components-and-integration/), [Clinical Technologies (excluding imaging)](https://www.ukri.org/our-work/browse-our-areas-of-investment-and-support/clinical-technologies-excluding-imaging/) and [Built Environment](https://www.ukri.org/our-work/browse-our-areas-of-investment-and-support/built-environment/), plus links with the [Physical Sciences](https://www.ukri.org/our-work/browse-our-areas-of-investment-and-support/physical-sciences-theme/), [Digital Economy](https://www.ukri.org/our-work/browse-our-areas-of-investment-and-support/digital-economy-theme/) and [Energy](https://www.ukri.org/our-work/browse-our-areas-of-investment-and-support/energy-theme/) themes.