

## “Cars, Carbon, and Concrete: Unveiling hidden flow paths of urban water quality”

Funded PhD Position in the School of Civil Engineering, University College Dublin (UCD)

Supervisor: [Dr. Devon Kerins](#)

Start dates: May, or September 2026



### Background

By 2050, it is estimated that ~70% of the world's population will live in urban areas. Although geographically limited, urban areas significantly influence hydrology and carbon dynamics. Urban streams often show higher surface flow, higher levels of dissolved organic and inorganic carbon (DOC and DIC), and poorer health compared to minimally impacted catchments. Understanding how urbanization impacts water flow path partitioning, biogeochemical reactions, and terrestrial-aquatic cycling is vital for maintaining water quality for growing urban populations.

This PhD project sits at the intersection of hydrology and biogeochemistry. It will explore how urbanization changes water flow-path partitioning, biogeochemical reactions, and terrestrial-aquatic carbon cycling. Using stable-isotope geochemistry, reactive transport modelling, and data-driven approaches, you will generate new insights critical to safeguarding water quality in growing urban populations and address critical water quality challenges directly related to the UN's Sustainable Development Goals.

### Requirements

We welcome applicants from engineering, Earth sciences, environmental sciences, or related fields. An ideal candidate should bring:

- A strong interest in hydrology, water quality, and biogeochemistry
- Enthusiasm for developing computational, GIS, programming, and/or statistical skills
- Commitment to working in an inclusive and collaborative research environment

The Kerins Lab actively fosters diversity and encourages applications from candidates of diverse academic, ethical, and cultural backgrounds.

### **Funding and Support**

The student will be based at UCD under the supervision of Dr. Devon Kerins in the School of Civil Engineering.

- **Duration:** 4 years
- **Support:** Tuition fees + annual stipend in line with university standards
- **International Experience:** Opportunity to travel to Xi'an, Shaanxi, China as a Teaching Assistant (funded travel and subsistence).

### **Application**

Interested applicants should fill out the following form including their CV, a letter of motivation, and contact information for 2-3 references: <https://forms.gle/DkJa7SVYpjkPrfe6>

The application will close *December 20th* and prospective students with relevant background and experience will be contacted. Please reach out to Dr. Devon Kerins at [devon.kerins@ucd.ie](mailto:devon.kerins@ucd.ie) with any queries.