

# Lunch &

# Learn

A Bimonthly seminar series from the Department of Civil and Environmental Engineering (CEE), focusing on convergent research, bringing together Northeastern colleagues and collaborators to think big/bold, explore ideas that build cooperation and foster transformative innovation within CEE and across disciplines beyond CEE.



## Gerald Mills, PhD

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Dublin

**Thursday**

**October 19,  
2023**

**12pm–1pm**

**108 SN**

## Urban Climate Science: Status, Challenges, and Prospects

The study of urban climates had an auspicious start. Luke Howard in 1818 identified the urban effect on temperature (the urban heat island) and suggested that the city also affected precipitation. However, it took more than 150 years before the study of urban climates started to develop into a process-based atmospheric science. Throughout the latter part of the 20th century, observational experiments started to reveal the structure of the urban boundary layer and models evolved to capture the complex three-dimensional (and heterogenous) urban landscape. The early part of this century saw the emergence of urbanized meso-scale models capable of capturing urban effects and the integration of these with micro- and local-scale models. However, major obstacle to the use of these models is the absence of climate-relevant data on cities at a useful scale. The challenges that are still outstanding include: improved understanding of the boundary-layer; the integration of global models with urban-scales; the development of global-scale data on cities; and the inclusion of human decision-making (transport and housing).

In this presentation I will:

- Outline the field of urban climate science, its history, status, and challenges and,
- Place my research projects in this context.

**Bio:** I am a physical geographer working in the School of Geography at UCD (Ireland). I completed my education at UCD (Ireland) and at The Ohio State University (US), where I received my PhD in 1989. At OSU I specialized in climatology and geographic information systems (GIS).

I have been involved with the Geography Society of Ireland (GSI) since 1997 and have been Secretary and President of the organization. I was President of the Irish Meteorological Society. With the GSI, I am co-organizer of the next Congress of the International Geographical Union, to take place in Ireland in 2024.

My research focus is climatology, and my special interest is in the climates of cities. I have considerable experience in modelling and measuring urban microclimates using simple and sophisticated techniques. My current work focusses on global assessments of urban risks, modelling of GHG emissions at a national level, and multiscale modelling of Carbon emissions at urban scales. I received the IAUC's Luke Howard Award in 2021 for lifetime contribution to the development of urban climate science.