

# 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.



## Alexander Baklanov, PhD

Science & Innovation  
Department, World  
Meteorological  
Organization

**Monday**

**December 5,**

**2022**

**12pm–1pm**

**Churchill 103**

## Seamless Prediction: From Earth Systems to Integrated Urban Hydrometeorology, Climate and Environment Systems

The new generation of integrated atmospheric dynamics and composition models is based on the seamless Earth System Modelling (ESM) approach to evolve from separate model components to seamless meteorology-composition-environment models to address challenges in weather, climate, and atmospheric composition fields whose interests, applications, and challenges are now overlapping. This approach considers several dimensions of the seamless coupling, discussed and demonstrated in the presentation:

- Time scales: from seconds and nowcasting to decadal time-scale;
- Spatial scales: from street-level to global scale (up & down-scaling);
- Processes: physical, chemical, biological, social;
- Earth system components: atmosphere, hydrosphere, lithosphere, biosphere;
- Different types of observations and modelling tools: observations-model fusion, data processing and assimilation, validation and verification;
- Links with health and social consequences, impact assessment, services and end-users.

A modern seamless unified modelling system that allows a single platform to operate over the full scale will represent a substantial advancement in both the science and the computational efficiency.

Prof Alexander Baklanov (PhD in Geophysics – 1983, Dr.Sci. in Meteorology and Climatology – 1998, Professor in Meteorology – 2008), Science & Innovation Department of the World Meteorological Organization (WMO), has been working in the field of atmospheric and environmental sciences since 1979, with the focus on developing a new generation of online coupled meteorology-chemistry models, environmental risk and urban climate research. He is the WMO Secretariat's focal point for the WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) activities and for the UN Coalition for Combating SDS, one of the developers of the WMO Integrated Urban Systems methodology, keeps also Professor affiliation at the Copenhagen University, Member of the Academia Europaea and editor-in-chief of the Urban Climate journal. He led several Nordic and EU research projects on climate and environmental risk (e.g. ArcticRISK, NordRisk, FUMAPEX, MEGAPOLI, EnviroRISKS, EuMetChem, EnviroHIRLAM, PEEX). He has published 15 books and more than 200 journal publications, supervised 15 PhD students.