Carleton University

# Climate Change Seminar Series

## Geo-environmental challenges for subsurface decarbonization efforts in Canada

Dr. Cole Van De Ven
Carleton University

As Canada strives for net-zero emissions by 2050 to combat climate change, the energy sector aims to diversify from fossil fuels, leaving thousands of legacy energy wells and requiring the use of the subsurface to store new fuels and capture greenhouse gases (GHGs). As a result, geo-environmental gases (e.g., methane, carbon dioxide, hydrogen) may be released from and/or generated in the deep subsurface. These gases may pass through the subsurface becoming a source of emissions to the atmosphere, presenting a safety concern due to explosion, or dissolve to groundwater threatening potability through physiochemical and biological changes. Some might see dissolution as a process to reduce GHG emissions and resulting climate impacts. However, this comes at the expense of vital sources of fresh drinking water. Each of these potential impacts to the environment are severe and require quantitative understanding to develop monitoring techniques and engineering solutions to mitigate risk. This talk will explore the geo-environmental challenges we face to reach net-zero emissions. Through a variety of studies, we will consider the complex interactions between subsurface GHGs, shallow groundwater, and the atmosphere.

**Monday, November 7th**

**417 St. Patrick's Building**

**10:30am-11:30am EST**

**Registration required**

**10:30-11:10am Presentation**
**11:10-11:30am Q&A**

Dr. Cole Van De Ven is an Environmental Engineer and Assistant Professor in the Department of Civil and Environmental Engineering at Carleton University. Prior to joining Carleton University, Dr. Van De Ven was a NSERC Postdoctoral Fellow in the Department of Earth, Ocean, and Atmospheric Sciences at the University of British Columbia. He received a bachelor's degree in Civil Engineering from McMaster University and a Ph.D. in Civil Engineering from Queen's University. The Van De Ven Research group studies physical, chemical, and biological processes controlling the fate of gases and other contaminants in the saturated and unsaturated subsurface. A current focus of the group is investigating the transport of geo-environmental greenhouse gases (GHGs) within the shallow subsurface and connection with the atmosphere. High-resolution, laboratory and field experimentation allow for empirical interpretation and numerical modeling of multiphase and multicomponent subsurface processes.