iFAST: The International Forum on Advanced Environmental Sciences and Technology

A series of distinguished seminars by eminent scientists

8 p.m. CDT, 9 p.m. EDT, Wednesday, Oct. 16, 2024
1 a.m. GMT, 9 a.m. China, Thursday, Oct. 17, 2024

TED SCHUUR
NORTHERN ARIZONA UNIVERSITY
https://www.permafrostnet.ca/people/ted-schuur/

Ted Schuur is a Regents' Professor in the Center for Ecosystem Science and Society at Northern Arizona University. Schuur is an ecologist; he has studied links between ecosystems and climate in locations across Alaska and the Arctic and is a leader in scientific research on the risk of Arctic carbon emissions to global climate. His work has helped to define an emerging body of literature connecting the influence of individual ecosystems and biomes to Earth system function. His work on this topic has included more than two decades of field research and, in this time, has resulted in more than 200 peer-reviewed publications in high-impact journals such as *Science*, *Nature*, and the *Proceeding of the National Academy of Sciences* as well as numerous book chapter, reports, and published abstracts in the proceedings of scientific meetings. These publications have garnered over 45,000 citations; he is a Web of Science Highly Cited Researcher ranking in the top 1% and is in the top 5% of the 2021 Reuters List of Top 1000 Climate Scientists. He participates in multiple national and international science meetings, workshops, panels, and steering committees on the topic of ecology and the environment, including as a lead author for the Intergovernmental Panel on Climate Change Special Report on Oceans and Cryosphere in a Changing Climate. He is also the the lead investigator for the Permafrost Carbon Network, an international consortium of researchers aimed at synthesizing new knowledge on permafrost carbon and climate. He graduated magna cum laude with a bachelor of science degree from the University of Michigan, and he received a doctoral degree from the University of California-Berkeley. In 2019, he was elected a fellow of the American Geophysical Union.

Permafrost and Climate Change: Carbon Cycle Feedbacks from the Warming Arctic

Abstract: Rapid Arctic environmental change affects the entire Earth system as thawing permafrost ecosystems release greenhouse gases to the atmosphere. Understanding how much permafrost carbon will be released, over what time frame, and what the relative emissions of carbon dioxide and methane will be is key for understanding the impact on global climate. In addition, the response of vegetation in a warming climate has the potential to offset at least some of the accelerating feedback to the climate from permafrost carbon. Temperature, organic carbon, and ground ice are key regulators for determining the impact of permafrost ecosystems on the global carbon cycle. Together, these encompass services of permafrost relevant to global society as well as to the people living in the region and help to determine the landscape-level response of this region to a changing climate. Nine scenarios of cumulative net carbon dioxide and methane emissions over this century were developed to encompass the full range permafrost carbon emissions projections linked to global and Arctic warming. These cumulative permafrost carbon emission scenarios range from 55 to 230 Pg C (C-CO2-equivalent units) and represent future Arctic carbon emissions can be compared relative to national-level emissions that are the focus of climate change mitigation conversations. This helps to place these scenarios alongside policy conversations aimed at reducing national greenhouse gas emissions. Many of the modeled climate change trajectories where mitigation of human carbon emissions leads to various global temperature targets do not necessarily contain all of the detailed information for the Arctic carbon cycle as compared to the projections reviewed here. In this way, it can be helpful to view potential Arctic carbon emissions as the equivalent of an additional nation of carbon emissions that must be accounted for in order to reach specific temperature targets.

DODGE FAMILY COLLEGE OF ARTS AND SCIENCES
INSTITUTE FOR ENVIRONMENTAL GENOMICS
The UNIVERSITY *of* OKLAHOMA

中南大學 CENTRAL SOUTH UNIVERSITY

Zoom webinar ID: 934 8142 2012 (zoom.us/j/93481422012)

More details and previous iFAST seminar videos are available on www.ou.edu/ieg/seminars.

Organizing Committee Chair: Jizhong Zhou (University of Oklahoma, USA; www.ou.edu/ieg)

Xueduan Liu (Central South University, China)