

Title: Network-based inference to assess the impact of extreme weather and other factors on the international wheat trade

Date: Wednesday, December 16th from 1:00 PM to 2:30 PM

Speakers:

- Srishti Vishwakarma (presenter), University of Maryland Center for Environmental Science
- Xin Zhang, University of Maryland Center for Environmental Science
- Vyacheslav Lyubchich, Center University of Maryland for Environmental Science

Chair: Mike Bellow, National Agricultural Statistics Service

Format: Presentation

Platform: Microsoft Teams (may not be compatible with some systems): [Click here to join the meeting](#)

Abstract:

International trade plays a crucial role in balancing food resources among nations. In the situations when extreme weather events (e.g., drought or flood) decrease the crop yield and cause shortage of food supply, international trade acts as an adaptive mechanism to reallocate food commodities among nations and alleviate the impact of such shocks. In the context of global food systems and food security, it is extremely important to investigate the factors behind establishing the trade connections, however, the effect of extreme events remains unexplored. We approach this problem using a flexible framework of exponential random graph models (ERGMs). We investigate a comprehensive set of variables quantifying various weather conditions relevant to agricultural production. To account for predisposition of countries to trade, we propose a novel predictor – synchrony of crop yield fluctuations. In addition, we considered variables that are often used in studies of international trade (distance, common official language, and contiguity). We demonstrate our approach by quantifying the network effects of these variables on the international wheat trade network. Additionally, we assess the performance of the ERGM by comparing it with the machine learning approach of random forest.

Presenter's information:

Srishti Vishwakarma is a PhD student at the University of Maryland Center for Environmental Science, USA. She received a Master of Science degree in Hydraulics and Water Resources from the University of Iowa, Iowa. Prior to coming to the USA, she earned a Master of Technology (M.Tech) degree in Hydrology from the Indian Institute of Technology (IIT), Roorkee, India. During her stay at the IIT, Srishti was awarded the prestigious German fellowship by DAAD and she spent a semester at the University of Stuttgart as part of her M.Tech project. In her PhD project, Srishti investigates global issues of nutrient use efficiency, agricultural production and trade.

For more information about this seminar, please contact [Jeffrey Gonzalez](#), WSS Methodology Program Chair.