Northeastern

Department of Civil and Environmental Engineering Distinguished Seminar
Global Pathogen Risks and Sanitation Goals
Joan B. Rose, Ph.D.
Department of Fisheries and Wildlife and Crops and Soil Sciences
Michigan State University
Thursday, January 18, 2018 3:00pm - 4:00pm
103 Churchill Hall

Abstract
Of all the global struggles around the protection and restoration of water quality addressing waste, wastewater and sanitation as well as animal wastes to control waterborne pathogens, chemicals of emerging concerns and overloading of nutrients to water systems are the most significant challenges of the 21stcentury. Our water quality is degrading, this includes impact on coastlines, ground water and water at the tap due to the lack of sewerage and sewage treatment. There are over 150 disease causing agents found in sewage (this includes not only diarrhea but chronic impacts, (heart disease, kidney failure, cancer, reactive arthritis, Guillian Bare' disease).   New data bases on pathogens and understanding of sewage treatment for control of these bacterial, protozoan and viral pathogens are needed to support the *Sustainable Development Goal 6.*

The books "Appropriate Technology for Water Supply and Sanitation" and "Sanitation and Disease Health Aspects of Excreta and Wastewater Management" by Feachem *et al.* were published in 1981 and 1983 respectively to facilitate the achievement of better public health through investment in sanitation systems. These texts have been cited extensively by environmental engineers and scientists, microbiologists, public health officials and water professionals. However, as a comprehensive data resource that is currently 30 years out of date, it is imperative to update the data and information in the book to achieve its initial goal. A collaborative project between Michigan State University and the United Nations Educational, Scientific, and Cultural Organization (UNESCO) will provide updated knowledge through the publication and dissemination of a new reference book of data organized through the development of an online book authoring resource. The objective of the Global Water Pathogen Project (GWPP) is an online open-access data base and knowledge platform, to serve as an update on water pathogens and to disseminate information relating to efficacy of treatment technologies and quantitative data to support risk assessment (http://www.waterpathogens.org/).

Biographical Sketch
Prof. Joan Rose serves as the Homer Nowlin Chair in Water Research at Michigan State University, the Co-Director of the Center for Advancing Microbial Risk Assessment (CAMRA) and the Co-Director of the Center for Water Sciences (CWS). Prof. Rose was elected to the National Academy of Engineering in 2011 and was named the 2016 Stockholm Water Prize Laureate, the world's most prestigious water award. She received her B.S., in 1976 from University of Arizona, her MS from University of Wyoming in 1980 and Ph.D. in Microbiology from the University of Arizona in 1985. She served as a Professor in the College of Marine Science, University of South Florida (USF) from 1998-2002 and Associate Professor, Department of Marine Science, USF from 1994-1997. She was an Assistant Professor in the Department of Environmental and Occupational Health, USF, and from 1986-1989. Prof. Rose is an international expert in water microbiology, water quality and public health safety, publishing more than 250 manuscripts. She has been involved in the investigation of numerous waterborne outbreaks world-wide. Her work has examined new molecular methods for waterborne pathogens and zoonotic agents such as *Cryptosporidium* and enteric viruses and source tracking techniques. She has been involved in the study of water supplies, water used for food production, and coastal environments as well as drinking water treatment, wastewater treatment and

reclaimed water. She is specifically interested in microbial pathogen transport in coastal systems and risks to recreational waters and the study of climate factors which impact water quality. Prof. Rose has been involved in the development of quantitative microbial risk assessment (QMRA) frameworks, methods and data sets. Considered one of the international experts in this evolving arena and is the developer and curator of the QMRAwiki.

Joan Rose

Homer Nowlin Chair in Water Research

Department of Fisheries & Wildlife, and Plant, Soil, and Microbiological Sciences

College of Agriculture and Natural Resources

MICHIGAN STATE UNIVERSITY

Education

- **PhD Microbiology, UNIVERSITY OF ARIZONA**
- **M.S. Microbiology, UNIVERSITY OF WYOMING**
- **B.S. Microbiology, UNIVERSITY OF ARIZONA**

Research Interests

- **Water microbiology**
- **Water quality & public safety**
- **Molecular tools for mapping water pollution**
- **Assessment of innovative water treatment technologies**
- **Quantitative microbial risk assessment**

Selected Service and Awards

- **Co-Director, Center for Advancing Microbial Risk Assessment (Center of Excellence DHS/EPA)**
- **Co-Director, Center for Water Sciences, MSU**
- **Leader of the Global Water Pathogens Project (with UNESCO)**
- **2016 Stockholm Water Prize winner**
- **Member, National Academy of Engineering**
- **Fellow, American Academy of Microbiology**