

**Environmental Engineering**

**and Earth Sciences**

**EEES Department Seminar**

**Tracing water quality across hydrological systems –**

**From continental margin to heartlands**

PRESENTED BY

**Jeeban Panthi, Ph.D.**

Postdoctoral Research Fellow

Kansas State University

**Abstract:**

Water quality degradation in surface water and groundwater systems is driven by complex interactions between natural and anthropogenic factors, necessitating a comprehensive, multi-scale analytical framework. Traditional methods provide valuable insights into hydrological and biogeochemical processes, but an integrated approach combining field observations, geophysical techniques, and numerical modeling enhances the accuracy and predictive capability of water quality assessments. This seminar presents two case studies from distinct hydrological settings to illustrate the effectiveness of interdisciplinary approaches. In coastal aquifers, the integration of hydrogeological field data, geophysical imaging, and numerical simulations facilitates a refined understanding of groundwater salinization and freshening dynamics. In inland reservoir systems, coupling watershed-scale hydrological models with in-lake process-based hydrodynamic models enables the quantification of nutrient transport, transformation, and retention mechanisms. These case studies underscore the necessity of hybrid methodologies to improve water quality management and inform sustainable decision-making across spatially and temporally dynamic hydrological systems.

**3:30 PM**

**Thursday, March 6, 2025**

**Rich Lab Auditorium**

***Attendance is highly recommended and encouraged.***