

Departmental Colloquium

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**Monday, November 26, 2018
2:00pm, HH-3017**

Population Persistence and Spread in River Environments

Abstract:

River ecologists are interested in the drift paradox problem, which asks how stream-dwelling organisms can persist, without being washed out, when they are continuously subject to the unidirectional water flow. Water managers are tasked with meeting water needs for industry, agriculture, and urban consumption while mitigating ecosystem impacts. We develop mathematical models that couple hydraulic flow to population growth and dispersal, and establish theories of persistence metrics, critical domain size, and spreading speeds to describe population persistence and spread in a river environment. We then apply the theories as well as numerical calculations to analyze how biological, physical and hydrological factors affect persistence and spread of single and multiple populations in temporally and/or spatially varying river environments. Our work also provides a mathematical basis for water management.